

DESIGNING THE 'INFORMAL'

Spatial design strategies for the emerging urbanization around water
bodies in Ethiopia

Dissertation

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Zegeye Cherenet Mamo (B.Sc., M.Arch.)

of

Addis Ababa, Ethiopia

HafenCity University

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Dissertation submitted to the HafenCity University Hamburg, 2015

Author: Zegeye Cherenet Mamo

Supervisor: Prof. em. Dieter Läßle

Hamburg, July 2015

I hereby confirm that this dissertation entitled '**Designing the 'Informal': Spatial design strategies for the emerging urbanization around water bodies in Ethiopia**' is the result of my own work. I did not receive any help or support from commercial consultants. All sources and /or materials applied are listed and specified in the thesis.

Furthermore, I confirm that this thesis has not yet been submitted as part of another examination process neither in identical nor in similar form.

Hamburg, July 5, 2015

Place, Date

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Abstract

This research claims that Ethiopia is experiencing a historic shift in its urbanization pattern in particular and settlement structure in general. It asserts that the shift is happening rapidly in a predominantly informal process in the absence of an urban tradition which can support the peculiarity of the emergence. Focusing particularly on the relationship between urbanization and major water bodies in the country, the research underscores an emerging change which is generated by the interplay of poverty; persistent population growth; a forceful top-down steering to speed up economic development; and the fragility of the regional ecological systems.

The longstanding Ethiopian urban setting, which has been predominantly concentrated on highlands, and its current predicaments defy descriptions of (African) urbanization. Major water bodies in particular (large rivers and lakes which characterize the landscape of Ethiopia), have not been contributing to urbanization and urban development neither as preferred locations for habitation nor as inputs or media for production (be it agriculture, manufacturing or exchange). Describing the peculiarity as a background, the research reveals an emerging shift which redraws water bodies and their surroundings as contested spaces. It also draws attention by highlighting possible threats and potentialities within the emerging socio-spatial, socio-economic, and environmental reconfigurations which is dominated by informality.

The study approaches the phenomenon of change from two complementary perspectives - macro and micro levels. While from the macro level it examines the nature and orientation of historical and current trends of urban patterns in relation to major water bodies, from a micro level, through multiple case studies, it investigates the details of the emerging urban manifestations around water bodies focusing on the spatial dimension of the informal modes of urban production. The macro level study identified a rather multiple but interrelated factors which confined Ethiopian urban centers on highlands and away from large water bodies. These forces are discussed under four main categories: geographic and environmental, geo-political and security, socio-cultural, and socio-economic forces. By tracing changes in the configuration of these factors, it underscores the causes of the emerging shift. The micro level investigation, in the other hand, reveals that water related livelihood opportunities are the main forces which pull inhabitants towards water bodies and give structure for both physical (spatial) and social formations. Moreover, it also highlights that the water body and the physical space around it, as central common resources for the production of both livelihood and architectural space, are governed primarily by self-organized local associations. The research, however, underscores the limitations within these associations in order to respond to challenges wider than their immediate localities, which exposes both the water body (the environment at large) and the settlements (including both the livelihood production and architectural spaces) to serious challenges. Hence, recognizing these local processes (of both production and governance - which commonly are referred as 'informal'), as key entry points, the study asserts the necessity and urgency of devising a strategy to guide the processes of urbanization - hence, 'designing the informal'. Accordingly, it proposes readjustments in both macro and micro levels targeting the coordination of core processes through a balanced interplay between the local societal organization (bottom-up) and the formal administrative structures (top-down). Architectural space production, livelihood production, and environmental rehabilitation are identified as core processes which need to be coordinated. At the macro-level, it calls for a policy re-orientation and proposes an enabling policy framework which promotes the empowerment of local processes as its core principle. At the micro-level, spatial design guideline is formulated. Recognizing the existing local decision making and production processes, the guideline aims to enable them to respond to large scale economic and environmental challenges. Furthermore, the study underscores the need of reorientation in the education of spatial design professionals in Ethiopia in order to make it responsive to local processes and realities.

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Abbreviations

AACA: Addis Ababa City Administration
AD: Anno Domino
BC: Before Christ
CSA: Central Statistical Authority
EC: Ethiopian Calendar
EOC: Ethiopian Orthodox Church
EiABC: Ethiopian institute of Architecture, Building construction and City development
EOC: Ethiopian Orthodox Church
EPA: Environmental Protection Authority
EPRDF: Ethiopian People Revolutionary Democratic Front
F(MOH): Federal (Ministry of Health)
FDRE: Federal Democratic Republic of Ethiopia
GTP: Growth and Transformation Plan
GER: Gross Enrollment Rate
GERD: Grand Ethiopian Renaissance Dam
m.a.s.l.: meters above sea level
MOARD: Ministry Of Agriculture and Rural Development
MOE: Ministry Of Education
MOFED: Ministry Of Finance and Economic Development
MUDHCo: Ministry of Urban Development, Housing and Construction
NER: Net Enrolment Rate
NEST: New Ethiopian Sustainable Town
NGO: Non-Governmental Organization
ORAAMP: Organization for the Revision of the Addis Ababa Master Plan
PASPED: Plan for Accelerated and Sustainable Development to End Poverty
RUPI: Regional Urban Planning Institute
SDPRP: Sustainable Development and Poverty Reduction Program
TVET: Technical and Vocational Education and Training

Selected local terms

Areqie: traditional alcohol drink
Bahrshesh meret: (appropriated) flood plane
Birr: Ethiopian currency
Chika: Mud and wood construction
Chereka biet: Squatter house usually built overnight
Debo: a reciprocal collaboration among neighbors or relatives
Dergue (also spelled *Derg*): Committee (in Geez, ancient language of Ethiopia)
Ghibi: Palace
Idir: Voluntary neighborhood association for collaboration in funeral and wedding
Iqub: Voluntary association for money lending scheme (Social banking)
Injera: Ethiopian traditional flat bread
Kebele: Local government, the smallest administrative unit
Khat: a green narcotic plant
Saar biet: Thatched-roofed hut

Sefer (also spelled *safer*): Neighbourhood

Tela: traditional bear

Tela biet/Areque Biet: bear house/liquor bar

Tsebel: holy water

Woreda : An administrative unit, one level higher than *kebele*

Yenewariwoch Maheber: inhabitants association

Chapter 1

Introducing the Research

General context

Since the beginning of the second half of the last century, Ethiopia has been characterized by extended environmental degradation, a staggering population growth, and exigent poverty which extensively challenged the otherwise stable highland based settlement. Owing to the interplay of these characteristic phenomena and coupled with a forceful top-down steering for economic development by the current political establishment, this research claims that the country is experiencing a historic shift in its settlement structure. It underscores both the rural-urban demographic shift (urbanization) and the corresponding predominantly informal transformation of ecologically sensitive landscapes into urban centers – particularly areas around major water bodies.

In terms of settlement structure, Ethiopia is predominantly rural - concentrated on highlands and based on subsistence rain-fed farming. Various reports estimate that less than 16% of Ethiopians live in urban areas (localities with more than 2000 inhabitants) but if towns with less than 10,000 inhabitants are discounted as urban, the proportion drops to 3%, leaving the country as the least urbanized in Africa (UNHABITAT, 2008:6). However, it is also a country with relatively long and continuous history of nationhood in Africa with established urban centers. Ethiopia is also grouped among the poorest countries in the world with a struggling agrarian economy. However, with a rapidly growing population (currently estimated as more than 90million), it is projected by the government plan to transform rapidly from a predominantly subsistence agrarian economy into an industrial economy (MoFED 2010). In such transformations of social and economic structures which imply urbanization, sites with key natural resources, such as water, become primary targets for both formal and informal appropriations for both habitation and production.

Historically, Ethiopian urban centers and the majority of rural settlements are located on highlands (85-90% lives above 1500m.a.s.l.). They have an ambivalent relationship with water bodies - depending on springs and increasingly irregular seasonal rain but categorically distanced from major rivers and lakes. For long, most lake shores and banks of large rivers located in both highlands and lowlands have been desolate or scarcely populated. The current capital city, Addis Ababa, and all major historic cities are situated on highlands with more or less similar hydro - social relations. Compared to any of its neighboring countries, the role of major water bodies in the formation of urban centers in Ethiopia is insignificant. Lake Tana and the chains of Lakes in the Rift valley; and the multitude of large rivers crossing the country, including Blue Nile River, have little accounts in Ethiopian urbanization history, saving few young cities such as Bahr Dar. This research project highlights the emerging change in this long standing settlement pattern producing new socio-spatial, socio-economic and environmental configurations around key natural resources - particularly major water bodies. However, this phenomenon of change is imbedded within two intricate contextual settings: 1) Rapid urbanization characterized by informal mode of production (Davis 2006, UNHABITAT 2008) and 2) An urban and architectural tradition lacking historical experience in handling the complex relationship between water bodies and the built environment.

The research approaches the phenomena of the changing pattern from two levels: macro level and micro levels. On the macro level, the study explains the general characteristics of the traditional Ethiopian urban settlements focusing on its site preference (location) and its spatial relationship with water bodies(Chapter 2); it identifies the factors which forced urban settlements to be confined on highlands and away from major water bodies (Chapter 3); and it claims that current changes in these forces are creating new patterns through both formal and informal modes of development by indicating the precursors of change (Chapter 4). It investigates the top-down government initiated projects and development strategies and their impact on the formation of new urban centers around water bodies (Chapter 5). On the micro-level, the study zooms into selected cases of informal developments around water bodies and investigates the architectural (morphological, spatial, material and functional) relationship between the water body and the urban physical structure (major part of part II). It claims that the current emerging informal spatial appropriations around major water bodies are primarily driven by the need to find a means for an alternative urban livelihood production. Urban agriculture and other water related trades are identified as the major forces which influence the architectural (morphological and spatial) and social structures within these informal urban developments (Part II, chapter 6, 7).

Informed by the nature and trend of the emerging shift from part I and its architecture from part II, the study in Part III underscores the urgency of the need to have a policy direction which responds to the sensitive relationships between major water bodies and urban structures around them. It explores potentials and reveals threats within the emerging relationships and its corresponding spatial structures. Hence, it forwards a policy framework as a recommendation aiming to guide the emerging urban manifestations towards a sustainable urban development. It also draws a spatial design guideline to inform both design practice and design education in academic and professional fields related to spatial design (Part III).

Objectives

The issue of the shifting urban pattern involves a multiple of subjects ranging in time and space including social, political, economic, spatial, and environmental aspects. These aspects in relation to a given context create phenomena that are inevitably very complex. Hence, setting the boundary of a research project of a complex subject with little locally based background material is obviously challenging. Hence, it is necessary to define a boundary in order to cope with the limited time available. Hence the objective of the study is focused to the following points.

>To understand the locational rationales of the dominant urban tradition in Ethiopia which prefers highlands that distanced itself from major water bodies; and to examine changes and their root causes - particularly in the relation of water bodies and urbanization;

>To understand the architectural and spatial implications of the relationship between surface water bodies and the emerging informal urban structures around them;

>To identify threats and opportunities of the emerging spatial patterns around surface water bodies and draw possible spatial design strategies to guide the urbanization processes particularly on ecologically sensitive areas.

Main Questions

In order to understand the phenomena systematically, the research poses two major questions, as indicated earlier, directed from two different but complementary perspectives. One - from a macro level perspective posed to examine the urbanization trends of the country, and the other - from a micro level in order to explore architectural details of emerging urban manifestations around water bodies. Moreover, a third normative question is added inquiring possible intervention strategies primarily addressed through a synthesis of findings from the two main questions. The following are the main questions:

>what were the reasons which forced the prevailing Ethiopian urban tradition to be confined on highlands and distanced from major water bodies, what are the current changes which challenges the status quo and enforce a shift?

>What are the prevailing architectural, economic and social characteristics of the emerging informal urban structure which are developing around major water bodies? What are the threats and opportunities within it?

>How can the emerging urban pattern, which is dominated by informal processes, be guided for sustainable socio-spatial transformations?

Methods

The research argues (methodically) that a relevant investigation in any architectural and urban studies have to be founded on a fair understanding of a larger contextual setting. In the case of

Ethiopian urbanization, about which finding documentation and studied materials is obviously difficult, both the larger contextual understanding and the detail investigation demand equal research vigor and attention. Though the nature of the object of investigation in the two parts is different, the research - due to the nature of the subject, the nature of data and its collection methods - uses primarily qualitative method for both. While it heavily relies on literatures, discussions and interviews reinforced by document investigation for the macro level studies, a case study method with direct observation, on-site discussion and in-depth interviews is adapted for the micro level architectural investigation of the emerging informal settlements around water bodies. In short – the first part is a study to describe the larger contextual reality; the second part is an exploration of the reality unfolding now, for which, the author, as an architect, relies more on direct observation. Further details are given in the respective parts.

Scope and limitations

The research discusses the prevailing trend in Ethiopian urbanization pattern without ignoring the possibility of variations and exceptions present within the vast territory of the country and its notable cultural diversity. Nevertheless, the rural socio-spatial and economic organization dominates the constructed landscape of the country and hence the emerging shift crosses over the barriers and differences among enclaves of traditional settlements. Interviews, observations and study tours have covered the main cities across the country but particular focus was limited to three regional governments – the city administration of Addis Ababa (as the capital city for the federal government and also the seat for the regional state of Oromia), the regional state of Oromia (the largest regional state where the Rift-Valley lakes are located), and the regional state of Amhara (where the largest surface water bodies are located – Lake Tana and Abay(Blue Nile) river). Within these areas representative cases had to be selected and studies had to be focused only on limited number of cases due to the obvious limitations of time and resources. In order to minimize the gap, an over- viewing study covering most of the major water bodies have been done prior to focusing on selected cases.

The expansion of large scale redevelopment projects in cities and the promotion of commercial agriculture(through land leasing) in rural areas - both by the government which controls land - makes the issues of land sensitive in both urban and rural area. Particularly in areas around water bodies, where informal urban manifestations are observed, any inquiry related to land and legality; measurements of land and houses; and inquiry related to property and income is reacted with extra caution. Hence, gathering of data and information is limited due to the sensitivity of the subject particularly for inhabitants of informal settlements. Data collection had to rely on first-hand observations and in-depth open ended interviews and discussions with inhabitants than questionnaires or structured interviews. Moreover actual spatial measurements on informal settlements are done to a limited degree. Official data, from both government and non-government organizations are also referred with care due to their possible political or other opportunistic manipulations. However, whenever used it is triangulated with other sources and first hand observations. Documentation in almost all levels of institutions and organizations visited is poor and hence in-depth interviews with officials, senior citizens, practicing professionals and academics was necessary in order to supplement documents.

Sources

As many urban historians refer it as one of the least documented and researched, finding materials on Ethiopian urbanization is challenging. Therefore for both general overviews of water bodies and Ethiopian urbanization and detail descriptions of the current informal developments around water bodies, sources of materials for research are destined to be a patch work of information from multiple sources. Older documents such as Chronicles of the kings, 'KebreNegest' (glory of kings), and correspondence of kings, with new documents comprised of news reports, urban planning reports, environmental protection review guidelines, city council proclamations, interviews (academics, experts, inhabitants etc.), site photographs and videos, documentary films and TV reports, news coverage, satellite photographs, maps and drawings, demographic information, economic statistics, UN agencies reports, etc. are explored. Understandably this will not be an exhaustive collection on the subject but will be a sack for collecting and comparing the diverse range of materials about the case. Furthermore, in many of the documents collected the subjects in question are rarely the focus in which they are addressed and therefore extracting, translating and appropriating the materials is necessary. It is necessary to underline that the informal, which is one of the core subject of the research, is by definition an undocumented phenomenon. Hence, for the detail study, the author, as an architect, relies more on direct observation.

Organization

The research thesis is organized in three parts corresponding to the three main research questions. The main empirical study is organized in the first two parts- addressing the two main questions, and a third part synthesizes findings and compiles recommendations drawn to address the third normative question. While the first part of the study dwells on a macro level - describing the norm and its shift in Ethiopian urbanization (changing patterns), the second part zooms-in to examine the architectural and spatial tendencies within the emerging pattern focusing on the dominant mode of production -informal settlements around water bodies. By doing so, the two complimentary studies would lead to theoretical positions and practical insights in order to draw recommendations to address the what and how-to-do question which are addressed in part three (see table 1.1).

Parts	Topic	Contents in brief	Method of inquiry	Chapters
0	General introduction	What and how? Introducing the research and its method		1
I	Changing patterns	What was the pattern and why? Understanding context and background	Literature and document reviews, interviews and discussions, maps, drawings	2,3,4
II	Emerging patterns	What is emerging and why? Description and analysis of possible evidences	Case studies: On site observation, interviews, document reviews, discussions, maps, drawings, satellite images	5,6,7
III	Designing the informal: recommendation	What should be done and how? Synthesis of findings and recommendations	Synthesis and recommendations	8,9,10

Table 1.1 Thesis Organisation

Detail questions

Part I: This part of the study attempts to understand both the foundations of the longstanding pattern and the root causes for the emerging change. To operationalize the first major question noted above, the following questions are posed:

- >what are the main characteristics of the longstanding Ethiopian urbanization pattern in relation to major water bodies?
- >what were the driving forces behind urbanization (settlements) pattern which preferred highlands which are also distanced from major water bodies?
- >what is the current configuration of these driving forces? What are the current challenges threatening the longstanding pattern?
- >Is there a shift in Ethiopian urbanization pattern regarding its relation with large surface waters?

In its introductory overviews it covers theoretical positions on the general understandings of water-space binary in the formations of cities through human civilization. In an attempt to clarify the contextual basis of the whole research, it gives an overview into the Ethiopian urban assemblage. Moreover, the study also attempts to establish a basis for a clearer and contextual understanding of the concept of 'urban' from an 'Ethiopian perspective' based on a thorough literature review assisted by expert interviews related to Ethiopian historiography.

Part II: In the context of rapid urbanization in Ethiopia and its major causes, part II investigates the prevailing trends focusing on the where and the how. The hypothetical claim is that sites around water bodies in Ethiopia are increasingly contested locations for both habitation and production - changing the age long pattern of settling away from large surface waters. It discusses the converging vectors contributing for this change.

The research couples the formal and informal appropriations of sites around major water bodies as evidences for the emerging new urban pattern. It discusses the possible impact of some selected mega projects (representative of top-down formal actions) as possible evidences of the formal contribution in the emergence of new urban pattern around water bodies. For this end, in addition to governmental reports, news coverage, project descriptions, UN reports; the research uses satellite images and field visits to explore the cases and answer the question:

- >What are the major causes for the increased appropriation of sites around water bodies?

However, as its main investigation, the study zooms into a micro level analysis of formations at a neighborhood scale in selected sites around rivers and lakes to study the architectural mechanisms of informal spatial formations around water bodies. The study has grouped the cases into two - A) Appropriations of spaces around water bodies within existing cities which can demonstrate, though informal but matured and developed mechanisms of operation and B)

Manifestations of new urban formations in sites around water bodies which can demonstrate the new manifestations.

The main research question in this part is further operationalized with the following questions:

- >What are the material and spatial characteristics (architecture) of these settlements particularly in their interaction with water bodies? (Developed/transformed through the interaction of informal socio-economic activities and systems?)
- >What are the underlining principles being used among the inhabitants of the informal settlements (self-organized communities) while using the common water (from the river or lake) and shaping spaces (for both habitation and livelihood production)?
- >What are the possible threats within the emerging water body – settlement interaction?
- >What are the potentialities (in the hydro-social and environmental, socio-cultural and socio-economic interactions) within these informal processes which can be explored and maximized with design intervention?

Part III: Synthesizes the findings of the above two parts of studies and respond to the normative questions in its last section (recommendation) addressing policy, practice and education:

- >what are the main points which shall be considered in a policy framework to guide the shifting urbanization processes?
- >What are the major points which shall constitute a spatial design layout for developments around water bodies?
- >what are the 'informal' operations and processes which can be adapted within spatial design (architectural/urban) processes to engender positive transformations? And how can such operations and processes be incorporated and guided within a larger policy framework for a sensitive but robust urban production?
- >How can spatial design processes be better informed to respond to sensitive settings as is the case of informal urban production around water bodies?

Underlying assumptions

The research bases itself on certain assumptions related to key concepts such as *urbanization*, *water bodies*, *(spatial) design*, and *informality* which in turn inform the way the questions are approached and the analysis of the collected materials. As much of the operations within the phenomena in question and the discussion in this study are attached with these terms, it is helpful to briefly clarify how such terms are used and what they are used to describe. However, further theoretical discussion is given in the corresponding parts of the research document.

In its current adaptation, an urban center in Ethiopia is defined as a locality with more than 2000 inhabitants whose majority lives on trades other than agriculture. The urban, otherwise, is generally considered as a predominantly human-construct and hence with constant change with the changing realities in human conditions – be it knowledge, economics, politics, etc. Urbanization implies the process of rural-urban shift in demographic concentration, economic

structure, socio-cultural organization, spatial configurations and political structures. Its various competing definitions are further discussed on part I, however, the term is generally used to imply both the demographic shift and spatial transformations. The phrase *Urbanization around water bodies* implies, both the transformation of the area from being rural into urban and the area around water bodies becoming a venue (center) for a rural-urban demographic shift (Hutchison 2010, Satterthwaite 2006).

The term space carries a multifaceted concept – one that evades simple definitions. In this research however, it refers to the natural material space (environmental space) and its transformations through a mechanism of physical qualifications – be it architecture or any other. Hence, in the course of the discussion it is qualified as either natural space or architectural/urban space. When it refers to any other possible use, the corresponding contextual meaning is given. Design, in the other hand, is exclusively used to imply spatial design as a pivotal tool in the process of architectural\urban space production. It is often understood as an operation of professionals such as architects and urban designers. However, in this research, it is referred as an operation by any actor to favorably influence individual\collective spatial concerns in the making of human habitat. It is taken as an intentional operation of appropriation and projection through generating alternatives (choices) and decision making.

The relevance of water (as a resource) and sites around it (as contested space for urbanization and livelihood production) have been fundamental historic facts in any discussion of the urban. Water as a basic biological need - as a substance of life; water as a destructive or formative force of nature; water as an economic element; water as an infrastructural substance; etc., have been the subject of numerous scientific studies. It is almost irrelevant to indicate it as the single most contested resource in the known history of urbanization and in almost all human civilization narratives. It has shaped civilization and has continued to do so. It is the most contested substance particularly in the north east African current or historic political and economic processes. This research focuses on large surface waters in the form of rivers and lakes (dynamic and static forms) and their direct role in the urbanization processes in Ethiopia.

Both in Ethiopia and in the continent of Africa, informality as a mode of city production accounts for the prevailing majority favoring both the poor and the under-served inhabitants (UNHABITAT 2006). Though referencing the main mode of production as 'informal' raises the question of the validity of the reference for the 'formal', in this research it refers to both the organizing logic of the physical space and communality for urban production (for both individual and collective use) which is not recognized by the formal governmental structures. It denotes the bottom-up urbanization strategy with self-built (self-made) spatial structures and its own norms of social organization. However, informal settlement refers to the built product. The study has a deliberation on its definitions in part II in order to establish its contextual understanding.

Brief summary of results

In this research projects, four major contributions are claimed: 1) A theoretical framework to better understand the nature of the spatial pattern of traditional urban Ethiopia and its current predicaments; 2) A description of the nature of the emerging urbanization pattern and its architectural and spatial structure particularly around water bodies - revealing opportunities and threats within it; and 3) A policy framework addressing urbanization on ecologically sensitive areas in Ethiopia, 4) An architectural and spatial design guidelines addressing both design practice and design education particularly in relation to urban developments within the context of informality and ecological sensitivity. Evidently, these contributions affect both theory and practice in the rapidly growing Ethiopian urbanization which otherwise suffers from lack of analytical reflections on its current trend.

In Part I, the study identified a rather multiple but interrelated forces which confined Ethiopian urban centers for centuries in the highlands and away from large water bodies. It discusses these driving forces under four main categories - geographic and environmental, geo-political and security, socio-cultural, and socio-economic forces. By tracing changes in the configuration of these factors, it claims that the emerging shift in the current urbanization pattern is rooted in the corresponding change within these driving forces.

In Part II, the study reveals that areas around major water bodies are currently contested by both formal undertakings (supported by government policies and programs) and informal land appropriations. The review into government development policies and 'top down' mega projects shows that the new hydro-political re-orientation and an intensified interest in using surface water bodies for large scale development projects are instigating urbanization processes around water bodies. The investigation on informal settlements around water bodies through multiple case studies, which is the main subject in Part II, reveals that water related livelihood production opportunities are the main pulling factor which also give structure for both physical and social formations. In describing local processes of decision making and production (of livelihood and architectural space) at a neighborhood level within the informal settlements, the case study reveals that (self-organized) local associations play a crucial role in regulating communally used resources such as common spaces, material, and water. Though the study also confirms that both processes and architectural spatial products in the informal settlements respond to local economic and social realities, both the water body and the settlements are exposed to various threats.

Part III recognize these local processes, which are commonly referred as informal, as keys in steering the emerging urbanization around water bodies. However, it also underscores the necessity and urgency of guiding these processes towards a sustainable path - hence, 'designing the informal'. Accordingly, it proposes structural readjustment and interventions in both macro and micro levels targeting the empowerment and advancement of local processes. At the macro-level, it calls for a policy re-orientation and proposes an enabling framework which promotes 'Subsidiarity' as its core principle. At the micro-level, spatial design guideline is formulated which recognizes and qualify local processes in order to coordinate core sub-processes and respond to large scale economic and environmental challenges.

However, the central goal in both levels of interventions is to establish a systematic coordination of architectural space production, livelihood production, and environmental rehabilitation which is operated by a balanced interplay between the local societal organization and the formal administrative structures. Furthermore, the study in Part III proposes a corresponding revision of key concepts in the education of spatial design professional in Ethiopia. It argues that professional practice has to be made relevant by building responsiveness in the educational structure to the prevailing contextual social, economic, environmental, and political realities of the country. Rather than excessive specialization which promotes professional exclusivity, revisiting curriculums for a more comprehensive understanding of various relationships within the actual reality of human habitat is proposed as a way forward.

Part I

(Chapters 2-4)

CHANGING PATTERNS: Major Water Bodies and Urbanization in Ethiopia

Introduction to part I
Context and Background;
Forces which determined the prevailing urbanization pattern in Ethiopia and its relationship with
major water bodies;
Precursors of change in urbanization patterns;
Conclusion and discussion on part I

Introduction to part I

This part of the research focuses on the macro level of the phenomena of the changing pattern. It explains the general characteristics of the traditional Ethiopian urban settlements focusing on its site preference (location) and its spatial relationship with water bodies (part I, chapter 2); it identifies the factors which forced urban settlements to be confined on highlands and away from major water bodies (part I, chapter 3); and it claims that current changes in these forces are resulting in creating new patterns through both formal and informal modes of development. Accordingly, it examines the changes within the forces which created the longstanding pattern (part I, chapter 4). In other words, Part I, within its three chapters tries to answer the major context related research questions: 1) what were the reasons which forced the prevailing Ethiopian urban tradition to be confined on the highland and to be distanced from major water bodies? 2) What are the current changes within these forces which challenge the status quo and enforce a shift? Hence, before it arrives on the discussion to address the main questions in chapter 3 and 4 consecutively, in an attempt to establish a basic understanding of the context, it starts with theoretical discussions, an overview of the country and discussions on the nature of the relationship of water bodies and urbanization pattern in Ethiopian urban tradition. In conclusion, it highlights the emergence of a new pattern which will be investigated in detail based on case studies in part II.

Though the study in part I relies heavily on literature and document reviews, extended observation on sites around major water bodies has been carried out in order to substantiate the notion. The following are water bodies visited in the course of the study in which the observation is assisted with numerous interviews, discussions with inhabitants and authorities of the areas – both government and social organizations. Due to an obvious limitation in time and resource covering all major water bodies was not possible.

>The major group of water bodies visited within the study time was the Rift Valley lakes from which Lake Zway, Awassa and Lake Langano with their major tributary rivers were visited more than ones. Lake Chamo, Abbaya, Abiyatta, and Shala were visited only once.

>From crater lakes - Bishoftu and Wanchi are visited. Due to its proximity to Addis Ababa, developments around Lakes in Bishoftu have been visited repeatedly.

>from Lakes made by lava flows, Lake Tana with its counterpart River Nile has been visited. Due to their size, historical, economic and political significance in the region, these two major water bodies and development around them have been visited repeatedly.

In order to study the general relationship between urban settlements and flowing water bodies, the attempt to relate locations and possible networks of urban centers with the flow of rivers was not successful and hence, rather than rivers connecting cities, cities with rivers were visited. Addis Ababa and its various rivers and Bahr Dar with river Nile were cities repeatedly visited in order to read the possible logic of the relationship of water bodies and the spatial dimension of the everyday life of urban inhabitants around water bodies. Informal settlements in these two cities were also selected for the case study section in part II. Moreover, other cities by the shore of lakes such as Hawassa, Batu (Zeway), and Arba-Minch have been visited repeatedly in order to reinforce the general observation on how urban settlements around water bodies generally operate in Ethiopia.

In interviews and discussions made for this research, attempts are made to cover a cross section of profiles of individuals (scholars, authorities and inhabitants) and also institutions (government, non-governmental and social/customary institutions). From the Federal level, experts and authorities from the Ministry of Urban Development, Housing and Construction (MUDHCo) and Ethiopian Environmental protection Authority (EPA) were interviewed and discussed with. The study particularly focused on two regional states (Oromia and Amhara) and Addis Ababa City Administration and conducted interviews with various levels of government structures – from directors of the regional urban planning offices to local Kebele heads (see appendix for detail reference). The two regional states were selected because it was believed in a preliminary assessment made that most water bodies exposed to rapid urbanization are located in these two states – most of the Rift Valley lakes in Oromia Regional State and Lake Tana and the major water source of Blue Nile river in Amhara Regional State. Addis Ababa is also an obvious choice both as the primate city and for being a venue for the majority of urban experimentation in both policy and practice. Moreover the city is characterized by its various rivers and streams. These three are also where the particular case study sites are located so that the macro level discussion can also be aligned with the detail case studies in part II.

As the research deals with both the general and specific characteristics of urbanization in Ethiopia, an overview of the physical and cultural landscapes of the country is found necessary in order to lay a foundation in understanding the context and the background. In doing so, possible literature has been covered in areas related to the core content of the research project – urbanization and urbanization around water bodies in Ethiopia.

Chapter 2

Context and Background

2.1. Urbanization

Urbanization has been referred as one of the defining global phenomena of our age. The United Nations predicts that by the year 2030, more people in every region of the world will live in urban than in rural areas, even in Asia and Africa. It also projects that virtually the whole world's demographic growth over the next 30 years will be concentrated in urban areas (UNHABITAT 2008a:4, 5). Urbanization is also linked with economic growth and level of urbanization is often taken as its indicator. Most nations with high per capita incomes are among the most urbanized, just as most of those with low per capita incomes are among the least urbanized (Ibid). The global economy is already dominated by cities and their importance is growing as emerging markets rapidly urbanize (Sanyal 2011). Cities will inevitably host both the vast majority of future population and economic growth.

Down through history, cities have occupied the central stage of human civilization. They have been the centers of political, economic, cultural and intellectual processes. However, the world remained dominantly rural until the arrival of Industrial revolution in late 18th century when the shift started to happen. Countries taken by the wave of industrialization have experienced rapid demographic shift from rural to urban while those distanced from it remained overwhelmingly rural. Hence urbanization has been understood for long as a twined phenomenon with industrialization. Though the causal relationship between the two is unambiguously clear, the unfolding phenomenon of urbanization, which grew in complexity in various parts of the world, demand a wider understanding.

Unresolved concepts

There has also been a celebratory declaration since 2007 that already half of the world population is urban – 54% in 2014 (DESA-UN 2014). Even though such broad claims are agreeable - based on generalized empirical evidences - the lack of clarity and definition of key concepts which can be used across the board put the claim in a cloud. The most basic problem in trying to understand urbanization is that there is no universally endorsed standard for the classification of urban centers. Though all countries differentiate between urban and rural population, the criteria for denoting an area urban varies among countries and in some cases it even varies over time within a single country. The most varying element in defining urban areas is population size which varies from 200 to 50,000 globally. Even United Nations statistics on urban and rural populations rely on such varying definitions of rural and urban among its member states. In such a state, the generalized statistical description of the present condition of urbanization and future projections falls into vagueness. However the disparities and problems in understanding the concepts within urbanization and the discussion about the future trajectories of social, economic and political processes, in global, regional and national levels, are becoming the discussions of the trajectories of cities.

The other confusion which is rampant in many literatures and academic discourses is on the use of the term urbanization itself. As a complex phenomenon, it is understandable that the concept is spread in almost all sectors of societal transformations and hence discussions often fail to specify from which dimension the term is used. Socio-cultural organizations, economic structures, demographic changes, spatial configurations and legal-administrative structures are the main factors that contribute to the understanding of urbanization. However, reports and discussions across the various disciplinary lines and groups use varied definitions and meanings for both terms - urbanization and urban. According to David Satterthwaite, urbanization can be best defined in a demographic perspective (statistical terms) as an increasing *proportion* of a population living in settlements defined as urban centers (Satterthwaite 2007:2) - differentiating it from urban growth, which is a relative or absolute growth of urban population. Such definition, however, is also subjected to the varying meaning of urban centers. It also disjoins the reading of the process of the shift and the creation of urban centers from the concept of urbanization. In another attempt, in the encyclopedia of social studies, urbanization is defined more loosely as a *process* whereby large numbers of people congregate and settle in an area, eventually developing social institutions, such as businesses and government, to support themselves (Orum, 2004: 853). Here also, how large, how dense, what sort of businesses, and what structure of governance differentiate the congregation of people from being rural to be referred urban, are left for varying definitions by different countries and times.

Urbanization generally implies rural-urban shifts in demographic concentration, economic structure, socio-cultural organization, spatial configurations (land use) and political structures. The problem with applying the term urbanization to these possible simultaneous changes along these different dimensions is that they do not occur together, and the very notion that there is a clear rural/urban distinction in economic activities or cultural norms is difficult to maintain. Even the distinction between urban and rural land and populations is becoming blurred (McGranahan

and Satterthwaite 2014:6). In both cases, either taking one strand of shift – such as demographic change, as in the case of Satterthwait (2007) – or the whole complex bundle, as in the case of Orum (2004), definitions about urbanization are still unresolved. Urbanization as an ongoing complex transformation, however, is believed to provide economic, social and even environmental opportunities, as long as they are seized properly. By pulling surplus labor from the rural areas and agricultural sector, it also contributes to the sustainability of agriculture and the conservation of the resource base - generally contributing to growth. Almost unanimously though, writers agree that the case of African – particularly sub-Saharan Africa - is atypical.

Africa: the chaos and the perils of generalization

To write the world from Africa or to write Africa into the world, or as a fragment thereof, is a compelling and perplexing task, writes Mbembe and Nuttall(2004). In discourses of world affairs and in particular urbanization, the case of Africa quickly falls into a box which many refer as *otherness*. It is only recently that the otherness itself became a point of interest for many who wishes to make a study on the urban revolution in Africa. As in any radical phenomena, though, the reading from these academic literatures illustrates two opposing pictures: one of despair and hopelessness, and the other of an opportunity for a more creative and responsive urban future.

Currently Africa (particularly Sub-Sahara Africa) is the least urbanized region of the world. The United Nations projects that the proportion of the urban population in Africa will increase from the current 40% (37% for Sub-Saharan Africa and 23.7% for East Africa) to 61.8% by 2050 (UNHABITAT 2008a). Many writers, however, agree that African urbanization has unique characteristics in both its processes and spatial structures – dominated by informal processes. Perhaps, the largest research area of African urban studies is concerned with the impact and legacies of colonialism on the continent's cities (Myers 2011:50). These studies and developed theories - on both urbanization processes and urban structures in Africa - are built by making the colonial era as the most defining historical phenomena. In these theories, the periodic categorization of urbanization as pre-colonial, colonial and postcolonial is one of the most common structures. Accordingly, the growing number of literature on urbanization processes in Africa addressing postcolonial urbanization, claim two characteristics which makes African urbanization unique: *urbanization without growth* (World Bank 1999, 2009; Fay and Opal 2000, Fox 2011, Gollin, Jedwab, and Vollrath 2013, et. al.) and *urbanization without industrialization* (e.g., Fay and Opal 2000; Collier and Venables 2007; Gollin et al. 2014, Fox2011, et. al.). In the rest of the world (other developed and developing countries) rapid urbanization has been accompanied by macro-economic growth and sector transformation from agriculture to manufacturing - things which could not be observed in Sub Saharan African post- colonial urbanization in a measurable and convincing way. Such observations through set criteria - often urban economic and social development indexes centered outside of Africa - made many writers to refer urbanization in Africa as 'pathological' or 'dysfunctional'. However, considering the unaccounted 'informal' sector which constitute as large as 93% of all new jobs and 61% of urban employment in the region (see UNHABITAT 2008a:22-28), the 'dysfunctional' or 'pathological' reference of African urbanization simply implies that the measurement apparatus of the school of thought, which assumes so, categorically refuses to consider the 'informal' as

part and parcel of the dynamics of urbanization. Such views are adamantly rooted in the assumption that urbanization (as an increasing proportion of population living in urban areas) is healthy as far as it is established in a formal economy which results in a formally measurable macro-economic growth of the nation state. Why the nation state and formal macro-economy are taken as indicators, is a question which leads into wider discussions which are beyond the scope of this research.

The recent urbanization trends of Africa are also associated with the manufacturing sector of industrialized nations – being referred as urbanization based on export of resources (raw materials). Such positions also read African urbanization as a result of an unfair exploitation by the global capitalist producing extreme levels of poverty, physical oppression and social exclusion. Writers such as Mike Davis (2006) picture the condition as the state of devastation with no hope - reinforcing the ‘dysfunctional’ position. By linking African urbanization directly to industrial processes outside of the continent, such positions implicate the emerging urban revolution as a continuation of the same pattern of the colonial era urban processes which is imposed from the outside – making studies on African cities from within less imaginable.

In the other hand, the fact that the primary production sites of theory and policy (for African cities) are outside of Africa plays a role in underestimating the potentials of micro-economic and ‘informal’ processes occurring within the countries of the large continent. If noticed by the radars of researchers from afar or even from within (but with the same criteria), the overly simplified generalization often produces a conclusion which either excludes African cities from the cityness league of the world or attempts to qualify the urbanization processes to fit into existing theory boxes and normality standards. Mbembe and Nuttall, in their attempt to establish the not othernessness of Africa and African cities writes - the obstinacy with which scholars in particular (including African scholars) continue to describe Africa as an object *apart from the world*, or as a failed and incomplete example of something else, perpetually underplays the embeddedness in multiple elsewheres of which the continent actually speaks (Mbembe and Nuttall 2004:348).

Both approaches of describing African urbanization (‘otherness’ and ‘not-otherness’) often work in a generalized theory undermining the diverse realities on the ground – creating a wide gap between the discourses and practice (in both policy formulation and planning practices). They often have a specific reference to examine African urbanization with or against. Moreover, the utter fixation of many African planners and decision makers on western and (more recently on eastern) references (models) for what a city should look like and how it should perform its cityness impose unnecessary burden on attempts of devising policies and planning practices which is rooted in the contextual realities of African countries themselves. Rather than affirming or disproving established positions, for instance – the position which asserts that urbanization is entwined with industrialization and macro-economic growth, the case in Africa opens up a new possible reading of the phenomena of urbanization. Such a repositioned curiosity demands answers for basic questions such as what drives rural to urban migrations in different regions of Africa (which happens to be the main cause of urbanization) and what absorbs the migrants in the cities?

The UNHABITAT report of 2008 affirms that the three factors which drive urbanizations in today's world to be rural-urban migration; natural population increases and reclassification of rural into urban areas. It also underscores that rural-urban migration accounts the major share for urbanization particularly in regions with initial low rate of urbanization (UNHABITAT 2008:22). However, Another UNHABITAT report suggests low agricultural productivity and associated rural poverty, rural population growth, war, and natural disasters are some of the major reasons, if not all, to push the rural inhabitants to migrate to urban areas. Particularly for the youth, the perception of the city as a place of better life than any “developed village” (UNHABITAT, 2004) and the availability of more developed services in cities adds up for the increasing migration as a pull factor. If migration as a major force of urbanization is driven by poverty and insecurities in rural areas, then the absorptive capacity of cities can also be assumed(at least partially) to be self-generated by the migrants themselves than to be pre-existing in cities of Africa. The other possibility, as observations indicate (such as the one discussed and documented in this research project), self-organization which often is termed as ‘informal’, with a capacity to grow into urban centers around new sites rich in life supporting resources, would be a parallel phenomenon demanding a reading of its own.

The attempt to find a theoretical position which tries to draw self-describing possibilities for African cities both in urbanization processes and urban spatial structures is however growing (see Robinson 2002, 2004, 2006; Myers 2011; Pieterse 2008, 2010; Freund 2007; Simons 2004; Mbembe and Nuttall 2004). On the other hand there have also been a wider attempt to find a more inclusive theoretical position to describe urbanization in the global south – sub-setting Africa - by conceptualizing ‘informality’ and ‘informal urbanization’ as a major mode of urban production (see Hart 1973, Thurner 1972, for earlier writings and AlSayyad and Roy 2004, Robinson 2006, Rahul Mehrotra 2010, also see part II of this research document for more theoretical discussion). In many of the writings though, Africa is often reduced into a single nation with single socio-economic space and similar historical background and contextual setting (usually overshadowed with the phenomena of colonialism). Such generalization automatically excludes countries like Ethiopia which neither share the direct impact of colonialism comparable with the rest of Africa nor it fits into common narratives describing the pre and post-colonial African urbanization.

The unique land tenure system, which according to Joireman, is the most complex in Africa (Joireman 2000 quoted in Crewett, Bogale and Korf 2008); the sustained isolation of the country until the end of the last century(Zegeye 2010) and its long, continuous and independent nationhood and self-governance culture; the currently emerging economy being one of the very few in Africa which grew without the export of natural resources(World Bank 2014); and the complexities of its physical and cultural landscapes can be counted as some of the major reasons which makes Ethiopian urbanization difficult to fit into generalized theories developed to describe urbanization in Africa. Ethiopia can be taken as one possible site/entry to introduce a new reading of urbanization in Africa or an entry for the project of defamiliarization of the commonsense reading of Africa as claimed by the writings of Mbembe and Nuttall.

In the attempt to overturn predominant readings of Africa, we need to identify sites within the continent, entry and exit points not usually dwelt upon in research and public discourse, that

defamiliarize commonsense readings of Africa. Such sites would throw people off their routine readings and deciphering of African spaces. Identifying such sites entails working with new archives—or even with old archives in new ways. (Mbembe and Nuttall 2004:352)

In an attempt to explain the historical root of Ethiopian urbanization (referring to spatial structure) and urban culture, Peter Garretson listed three frontiers from which the uniqueness of Ethiopian urbanization (referring to spatial configurations) arises: the north and north east, the south, and the Ethiopian highlands. According to Garretson, from the north and east came the traditions of the Middle Eastern or less correctly, the 'Islamic city'. Cities like Suakin and Massawa along the red Sea coast (referring to the pre-1993 Ethiopian territory) and the inland walled town of Harar in eastern Ethiopia. In the south of the Ethiopian empire urbanization was closer to an African model of extended villages with periodic markets and in comparison with the Middle East a lesser prevalence of long distance trade. Finally, the Ethiopian highlands supported an extremely long Christian tradition which led to urban centers concentrated around church foundations (beta Krestian) and a Christian court (gebbi). Nowhere else in Africa or the Middle East over similar span of centuries, asserts Garretson, has there ever been such a triple conjunction (Garretson 2000: xvii).

The process of urbanization in Ethiopia in general can also be referred as unique and similarities are relatively few. Therefore, discussions about urbanization in Ethiopia have to be rooted in a fair understanding of the physical and cultural complexities of the country within its unique historical and geopolitical settings.

2.2 Ethiopia

In 1986 FAO reported that the highlands of Ethiopia contain one of the largest areas of ecological degradation in Africa, if not in the world – losing an estimated 1900million tone of top soil every year (FAO 1986:3). These fragile highlands have been the major venues of life in Ethiopia. Nearly half of the population lives above 2200 m.a.s.l. while 11 percent lives at altitudes below 1400m.a.s.l. The remaining 40 percent live between 1400 and 2200m.a.s.l (UNESCO 2004) – a total of 90% lives on areas above 1400 m.a.s.l., which is less than 40% of the total land area (see fig. 3). Population density varies substantially with altitude. The highest population density prevails in some areas of the high land with 500 or more persons per square kilometer and the lowest with 10 or fewer persons per square kilometer in the lowland areas (ibid).The highlands have been the home of an indigenous class society of lords and peasants for many centuries; however, although trading settlements have undoubtedly existed for a very long time, urbanization was a weak force (Freund 2007:8).

According to the World Bank report Ethiopia is grouped among the poorest countries in the world with a struggling agrarian economy. With the current population - estimated 94million and growing at the rate of 2.7% (UN – DESA 2012) - the country, according to the vision of the government, is expected to transform rapidly from a predominantly subsistence agrarian economy to become a middle income economy (MOFED2010). In such ambitious plan for social and economic transformation, sites with key natural resources like water become primary targets for large scale appropriations in both formal and informal modes of development.

However, water bodies and sites around them had been largely unexploited for both urbanization and industrial developments. Until today, the longstanding and prevailing urban settings in Ethiopia seem to defy the common notion about water bodies and sites surrounding them as the favorite location for cities or the notion of large water bodies as facilitators of urbanization. In the presence of large water-bodies - major rivers and significant number of lakes, urban centers and dense settlements in Ethiopia are distanced from major water bodies. They rely on springs, smaller rivers and seasonal rain for water source.

Ethiopia is often referred as a country of complexities (see Woldemariam 1986, Crummy 2000, Alvarez 1966, Kebede 1999, Levine 1965). Both its physical and cultural features are characterized by extreme differences and diversities. The combination of the country's location in the tropical zone and the astounding contrasts in its topographic variations are referred as the main causes for its physical complexity (Woldemariam 1986:8, also see Woldemariam 1970). Its location in relation to the Arabian Peninsula, the Arabized North Africa, and the inner heart of Africa coupled with its long and sustained isolation played a role for its cultural diversity and complexity (see Tefla 2000, Garretson 2000, Zegeye 2010). It is evident that these physical and cultural complexities influence the way patterns of settlements develop in the country. Hence, a brief overview of these complexities will serve as a useful background to understand urbanization pattern in Ethiopia.

Ethiopia has a total area of around 1,133,380 square kilometers. Currently, it is the second largest population in Africa with an estimated population of 94million growing at the rate of 2.6% (UN-DESA 2013). With an urban population of less than 17%, which is far less than the sub-Saharan average of 30%, it is one of the least urbanized and least industrialized country (CSA 2010, UNHABITAT 2008), dominated by rural economy and rural spatial organization. The country is currently witnessing one of the fastest rates of urban growth in the world, namely an average five percent per annum.



Fig.2.1 –location of Ethiopia source: adapted from Google maps

The physical complexities: Topography, Climate, and Hydrography

The natural landscape of Ethiopia has diverse topographic features with mountains and high plateaus, deep gorges and river valleys, and lowland plains. According to some estimates about 50 percent of African mountains, about 371,432 km² above 2,000 meters above sea levels, are confined within Ethiopia (FAO 1984, also see Hurni1990). Altitude ranges from 126 meters below sea level in the Dalol Depression on the northern border, to the highest mountain, Ras Dashen in the Semien Mountains north of Lake Tana rising to 4,620 meters above sea level (m.a.s.l.). The most basic understanding of Ethiopian land use is defined by a distinction between highlands and lowlands, traditionally defined at 1,500 m.a.s.l. The mass of the Ethiopian highlands occupy the central part but are divided into two by the Ethiopian rift valley which runs from northeast to southwest. Both the Northwestern highlands to the west and to the northwest of the Rift Valley and the Southeastern Highlands to the south of it are made up of corrugated plateaus and massifs which are deeply cut by gorges (see Woldemariam 1970, 1972, 1986, Ayenew et al. 2005).

Altitude determines so much about rural life that it is the first thing Ethiopians tend to refer to when identifying a given area. Lower elevation makes for hotter temperatures and less rainfall; higher elevations are cooler and wetter. This distinguishes the three main, traditional Ethiopian ecological/altitude divisions: the relatively hot and dry agricultural lowlands – ‘qolla’ - below some 1500m.a.s.l.; the temperate middle highlands – ‘woyna dega’ – between about 1500 and 2300 m.a.s.l., often subdivided into ‘dry’, up to about 1900 m.a.s.l., and ‘wet’ from 1900 to 2300 m.a.s.l.; and then upwards of 2300 the highlands – ‘dega’ – which tend also to have the highest precipitation in addition to cool temperatures. The very highest elevations, upwards of some 3500 m.a.s.l., are a tougher option, with very cold temperatures in season, high winds and frequent frosts – ‘werch’ – after which these elevations are traditionally named. At the opposite extreme are the elevations under 1000 m.a.s.l. in the east and south where crops may sometimes be grown, but which are mainly rangelands ‘bereha’. These are the pastoral and agro-pastoral areas (Atlas of Ethiopian livelihood, 2010:4).

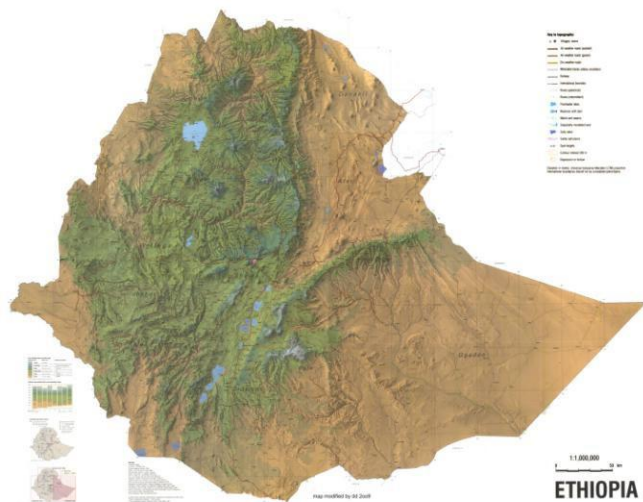


Fig 2.2- Topography of Ethiopia, (Source: SCRP 1995, modified 2004)

The great majority of the country's rural population inhabits the highlands and middle-highlands, which comprise less than one-third of the inhabited surface area. Some 66% of Ethiopia's inhabited lower-lying land area holds just 17% of the country's rural population (Ibid: 6).

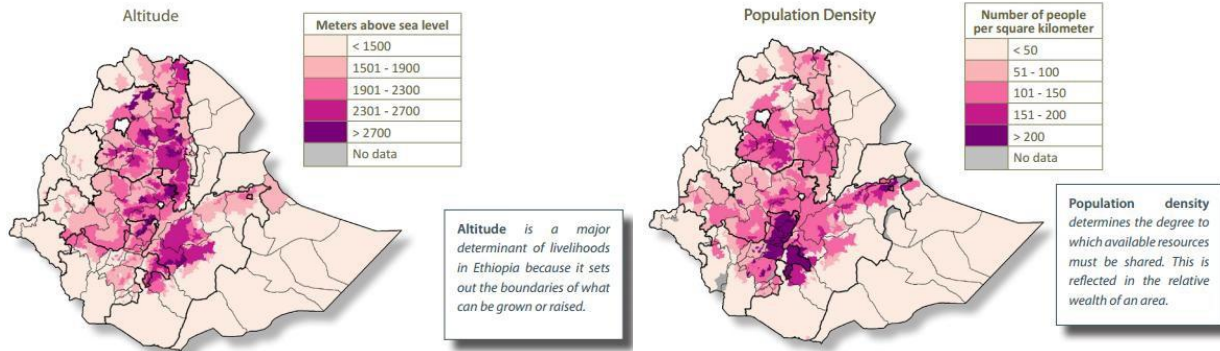


Fig. 2.3 Altitude and population distribution, Source: (An Atlas of Ethiopian livelihood 2010)

Ethiopia is often referred as the “water tower” of East Africa (see Fig.3). Around 70,000km² areas are covered with natural inland water bodies including rivers, lakes and associated wetlands (Woods and Tallings1988 in Ayenew 2009). Its many rivers systems drain into neighboring arid countries almost all originating from the highlands and flow outward through deep gorges. Tesfaye (1990) listed 58 lakes and major marshy areas (ibid). Wetlands cover 1.4 percent of the total landmass of the country (Hillman and Abebe 1993). The potential of surface water is estimated at 122 billion cubic meters per annum, equivalent to a per capita fresh water resource of about 1920 m³/yr, one of the highest in sub-Saharan Africa from 9 river basins (UNHABITAT 2013). The general direction of flow of the rivers, as dictated by topography, is away from the rift system escarpment, towards the Indian Ocean in the south-east and towards the Nile in the west. Only short and intermittent streams flow into the red sea. Rivers flowing through the Rift- valley from closed endoreic basins (table 2). Most of them are captured by lakes (Chamo, Abbaya, Awassa, Abiyatta, Shala, Langano, Zeway, Beseka). Crater lakes (Bishoftu, Dandi, Wanchi, Hayk) and lakes made by lava flows (Tana, Asange) are common on the highlands (table 3). Ethiopia, through the Abbay and the Atbara basins (only 20% of Ethiopian territory), contributes 86% of the water of the Nile at Aswan (more if the Baro and its tributaries which flows into the White Nile are added).

The highlands, from which the streams flow, are humid and rugged; the surrounding lowlands, into which the rivers flow, are arid and relatively flat. These conditions encourage rapid run-off, low retention in soil layers, and soil erosion on the highlands; and the flood plains of the streams are flooded every rainy seasons. Flood and flood damage in the lowlands are common annual phenomena. Considerable risk to lose property and crops exists on the flood plains in the highlands during the rainy season. Seasonal variation of stream flow in the basins reflects the seasonality of rainfall. Most of the rivers which are flowing in deep valleys and canyons are interrupted by falls and rapids.

Water bodies are targeted as major resources in major development policies to address the recurrent draught and famine since mid 1980ies (Formally accounted overall irrigation

development is estimated at some 5 – 6 percent of the developable potential of 3.7 million ha.) (Awlachew, et. al. 2007:2). Rivers are obvious sources of water in a mountainous country, but steep gradients make river engineering strategy a challenging task.

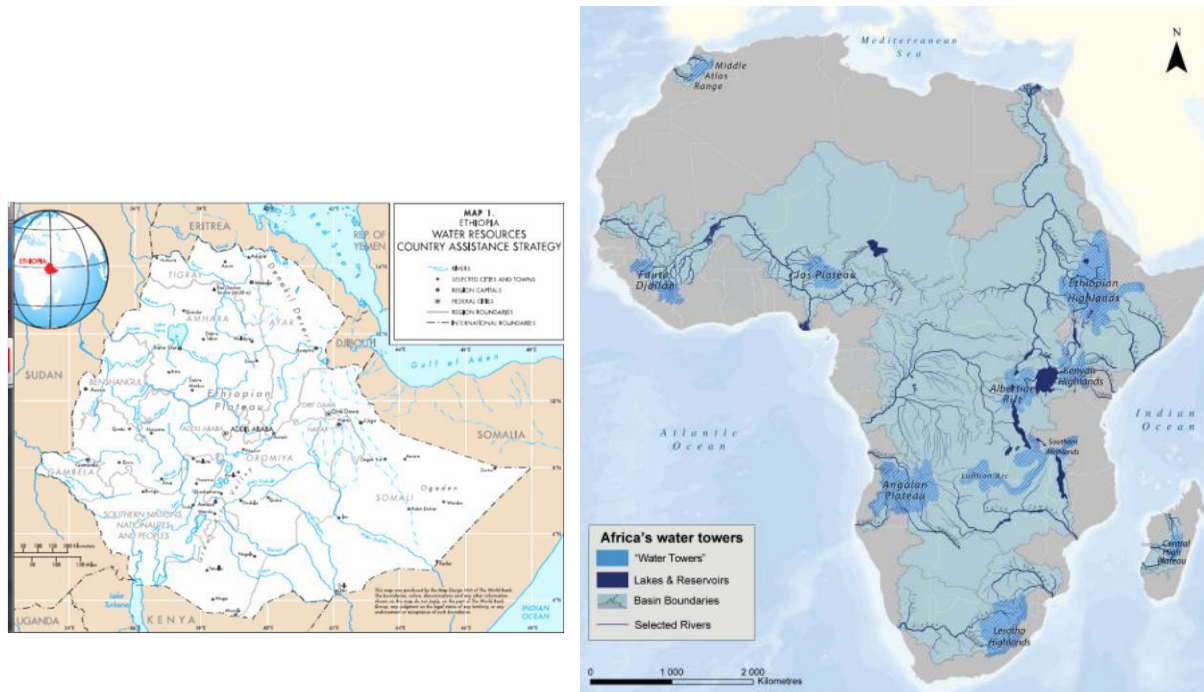


Fig. 2.4 (left) Map showing major rivers and lakes in Ethiopia source: Adapted from report of Nile Basin initiatives.

Fig. 2.5. (right) Main water towers of Africa source: UNEP 2010:6, Africa water Atlas

Cultural complexities

Culture is a wide concept which includes the modes of life, beliefs, traditions and the whole set of the material and spiritual wealth which characterize a certain society as distinct from others. While soil and climatic variations are the material foundations of cultural diversities and complexities in Ethiopia (Woldemariam 1986:12), languages and religions are primary elements in cultural landscapes.

In Ethiopia, there are four major language families: the Semetic, the Kushetic, the Nilotic (Nilo-Saharan), and the Omotic. It is believed that there are around 87 languages under the four families. Since 1991 the administrative organization of the country is restructured according to ethnicity which primarily uses language as its major criterion. In terms of religion, the country is also home for the three main religions of the region with their various derivatives – Christianity, Islam, and Judaism. Christianity and Islam, as inscribed in their Holy Books, claim to enter to Ethiopia at the same season they were introduced into the world. Judaism, other than being practiced in enclaves in north eastern Ethiopia, has a deeper cultural presence. Traditions and rituals of the major religious denomination - the Ethiopian Orthodox Christians – is referred as the most Judaistically oriented Christian tradition (see Pawlikowski 1971, Pankhurst 1992, Ullendorff 1968, Bruce 1813)

In an attempt to explain the peculiarity and slowness of urbanization processes in Ethiopian past, Zegeye in his article -‘the portrait of an isolated nation’, have noted that the isolation of the country for more than a millennia has created a culture of reservation towards the outside world blocking any further metamorphosis of cultures (Zegeye 2010) which could have been induced through interaction with the outside world. This isolation, sustained due to the regional geo-political conflicts, restricted the assimilation of the various cultural groups internally and the possible intrusion of a homogenizing dominant culture externally – helping to retain diversities in the cultural landscape of Ethiopia. The combination of linguistic and religious diversities coupled with the sustained isolation of the country generated considerable cultural complexities.

The combined effect of the physical and cultural complexities produce diversities in the way people organize their life in the physical landscape. The various forms of vernacular architecture and settlement patterns on the vast Ethiopian territory can be referred as manifestations of these complexities.

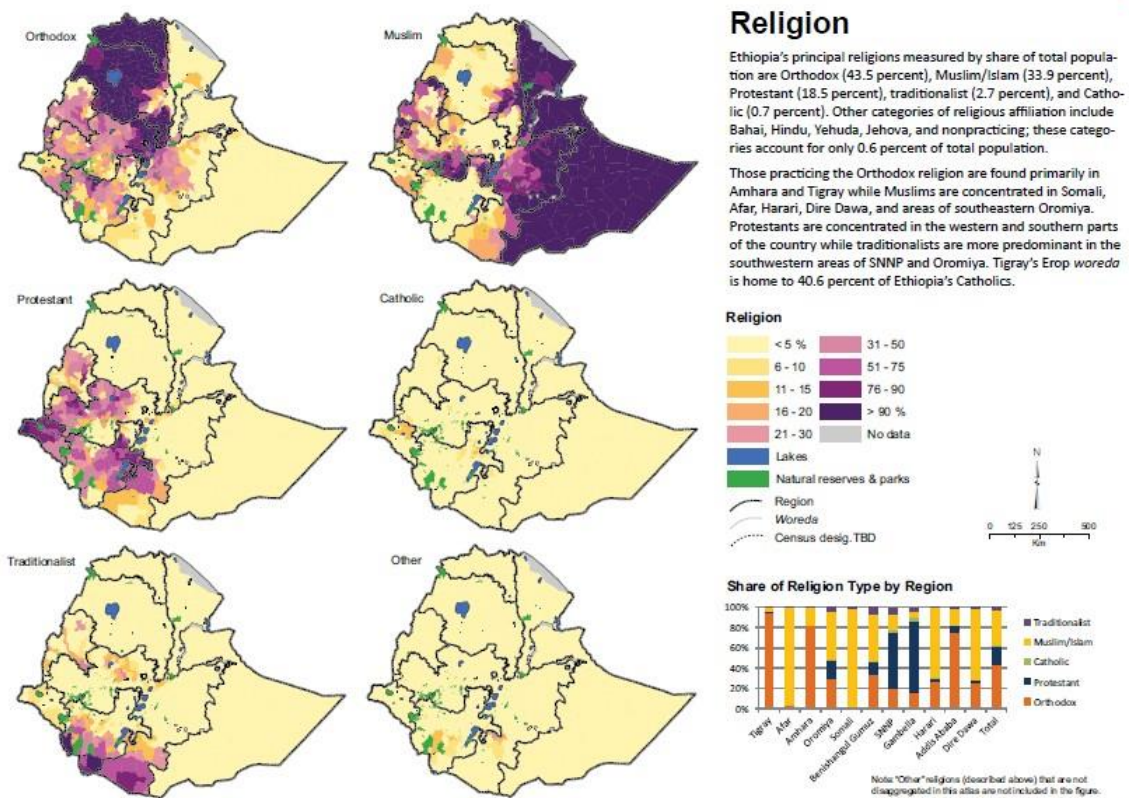


Fig.2.6. spatial distribution of major religions religion, Source: Atlas of Ethiopia (CSA 2007)

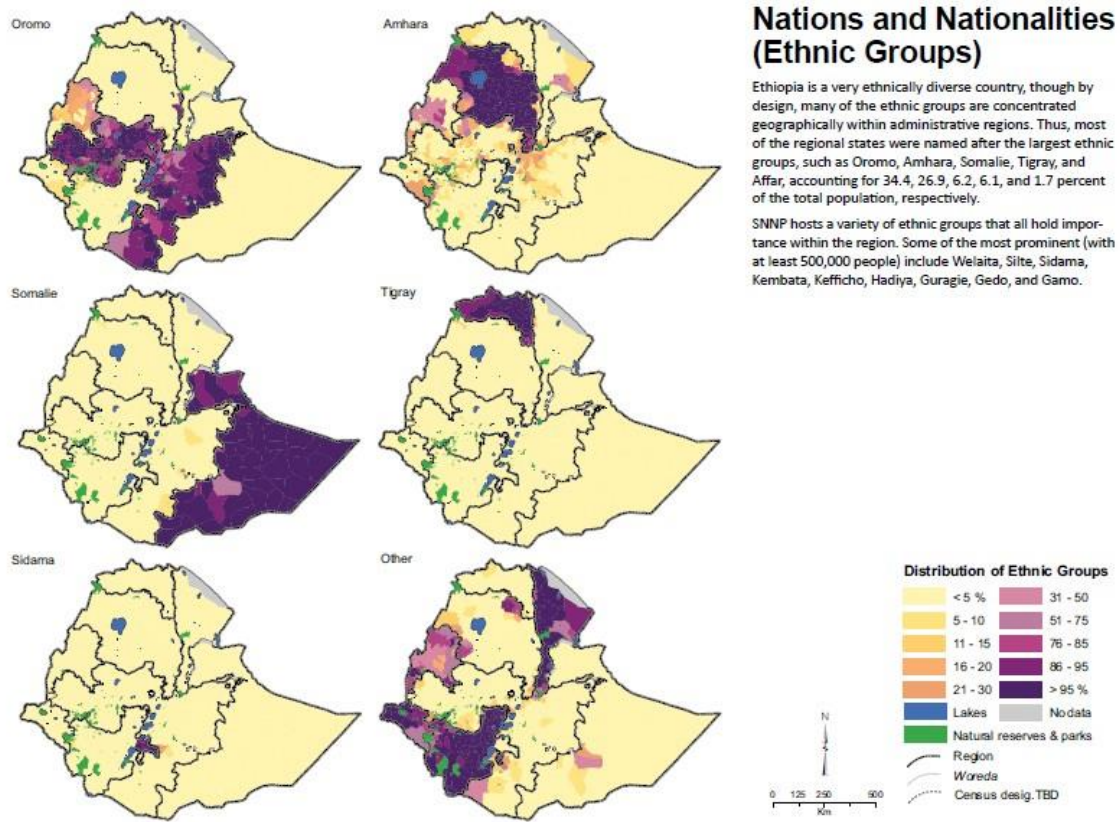


Fig.2.7 Language and administrative boundaries Source: Atlas of Ethiopia (CSA 2007)

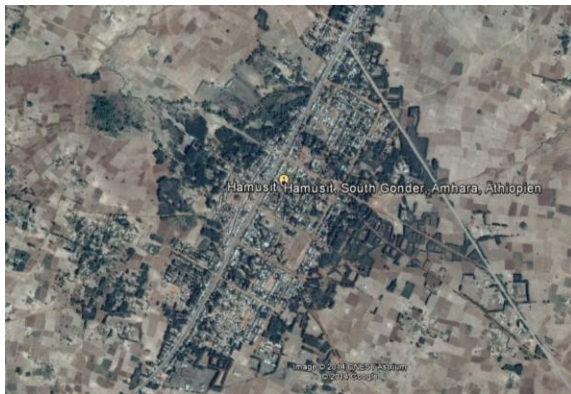
The constructed landscape, though diverse and disconnected, is generally characterized by rural settlements with a minimal single family houses ('gojo') scattered over the vast landscape of especially the high plateaus. Most of the small towns have grown informally following main transport arteries with single story structures (Fig. 2. &2.9). However, the recent sudden surge in urbanization and the increasing demand for 'modernization' (as it is often referred publicly by policy makers) with the opening of the country for the global market, further complicates the building culture. Though this increasingly demanded 'modernization' is tightly related with urbanization, its basic connotations in Ethiopian current public discourse are rooted in the installation of standardized infrastructure and services which are primarily targeted to attract global capital. Nevertheless, it is evident that both the physical and cultural landscapes of Ethiopia are confronted with the triple but intertwined phenomena: urbanization, modernization (modernity) and globalization. It is necessary to have an overview of these phenomena in Ethiopian context.



A. Abosa, a small town around Lake Zeway



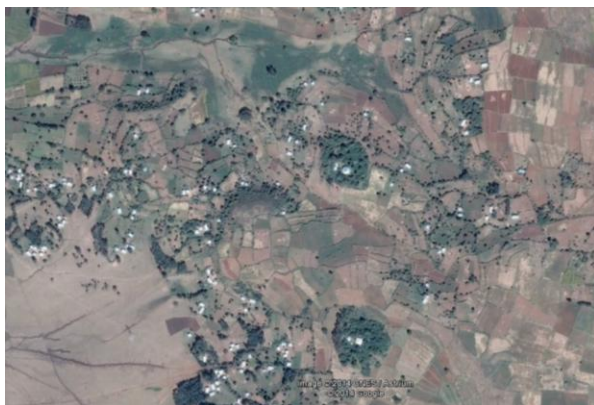
B. Adami Tulu, a small town near Lake Zeway



C. Hamusit, a small town near Lake Tana



D. Rural landscape. Around Addis zemen town (N. west)



E. Rural landscape in north west Ethiopia (near Woreta)



F. Rural landscape near Chench town (southern Ethiopia)

Fig. 2.8, A,B,C,D, Typical images showing small emerging towns following roads; source: Google earth
E,F, Typical image of rural landscape (north, south, central Ethiopia); source: Google earth

Gaining entry into the modern world posed peculiar problem for Ethiopia, problems that did not readily arise in the rest of Africa. Although colonial rule had exploited cultural diversity and authority to white supremacist advantage, its overriding mission was to abolish African traditions, institutions and identities. In contrast, the limited foothold of modern institutions in imperial Ethiopia served not to supplant but rather to strengthen the relics of a pre-modern past...For most of Africa, as seen in the ruling ideologies of the time, such as Negritude, liberation could be seen as becoming free from what is unmistakably alien and affirming what was deemed truly one's own. For Ethiopia, emancipation was a rather different matter of going against the grain, calling for a clean break from a political landscape and a public culture that deeply defined our collective self-identity (Eshete 2012).

Written reflections on the subject of modernization on the built environment in Ethiopia are rare to find. Elias Yitbarek and Fasil Giorgis, both architects, voiced their concern against the direct adaptation of classical modernism. Elias Yitbarek(2012), in his article entitled 'Reflection on the Urban Changes of Addis Ababa: Slums, Change and Modernity', criticized the strategy of the ongoing inner city redevelopment schemes and large scale infrastructure development which aims at modernizing the city by clearing slums. He emphasized that slums in Addis Ababa are only places of physical deterioration and should not be seen as places of social segregation and danger zones as the connotation implies. According to him they actually are the vibrant parts of the city. However, the urgency of political achievements calls for easy and hasty (uncritical) adaptation of European modernity resulting in clearing slums with all their crucial cultural fabric and genuine creative potentials. Fasil Giorgis (2012), in his article 'modernity and change in Addis Ababa', illustrated the danger of disposing the embodiments of cultural and historical artifacts(as in the case of architectural and urban constructs) for the unprocessed new, in the name of modernity. He underscores the need to rediscover and redefine modernity for the cities of Ethiopia, which has to be open enough to acknowledge local knowledge and also respond to local contexts.

Though academic discourses incline towards the need to search for a framework of modernization which can be responsive to local realities and local qualities – noting that the premises are not yet set, donor driven political dynamism and popular visions of development adhere to classical forms of modernity and modernization. For the disillusionment of both views though, European modernity, upon which these views are anchored to - either by adhering it as an absolute model or as a relative and adaptable model, is being referred to be in its own whirlpool. Observing the transformations of social principles and key institutions upon which European modernity is established; Beck, Bonss and Lau (2003) assert that a distinct second phase modernization is manifest - referring it as the modernization of modern societies. In their theory of 'reflexive modernization' they showed that almost all principles upon which modernity is established are challenged.

According to Beck, Bonss and Lau, the nation-state defined by territorial boundaries; the programmatic individualization; the assumption of the work/full employment/ societies; the control over nature as an endless resource for an endless growth and the perfecting of the control through the scientization of everything; and the principle of functional differentiation

(progressive specialization or societal calibration) are the major premises of the modernization project. Any challenge and problem emanating from these assumptions are considered contingent, and do not seriously undermine the first modern faith – that continuing along this line of development is the only way forward: towards increasing differentiation, growing complexity and an expanding control over nature (ibid:6). In the case of Ethiopia, neither such a distinctive faith-like social contract nor key rational pillars are established in any social or political apparatus. However, leave alone those nation states like Ethiopia, which were outside the map of the grand project of first modernity, those which have experienced the re-creation of societies through first modernity themselves, have to equally face the unpredictable side effects and its outgrowth such as globalization. Ethiopian physical and cultural landscape is confronted with a double layer of complex restructuring - to host the waves of modernization (classical or otherwise) and the reorganization power of globalization.

According to Tomlinson (2003), however, globalization is nothing but modernity's current direction (see Tomlinson 2003, Tyrrell 2003) and its main cultural direction of global development is mass communications and a technical-scientific-rationalist dominant ideology (Tomlinson 1991:141). Quite often globalization is naively and narrowly understood as an economic condition. But at the same time it has demanded nation states to act as facilitators who should be able to seduce global capital through the commodification of their natural, human and cultural resources hence demanding both environmental and cultural mutations. It demands the development of 'modern' (standardized, compatible, efficient) infrastructure and eventually demanding the homogenization of the built culture. Such an elongation of the project of modernization and the superimposition of its new directions seriously strains the cultural landscapes of countries like Ethiopia.

The current challenge of the modes of urban production in Ethiopia - particularly in Addis Ababa and other major cities - are exemplary displays of an exaggerated mismatch of the demand of the global culture (globalization and its capital flow) against the supply capacity of the local building culture which seem to get confused with the injection of unfamiliar infrastructural demands, architectural programs, standards, and construction materials – within the premises of unresolved trajectories of the modernization project. Such a challenge is obviously resolved, as Läßle (2014) pointed out, through a usual 'copy and paste' urban development schemes or generate informal settlements. Furthermore this new expectation is fueled by the increase in demand for livable spaces due to the staggering general population growth and a high rate of urban growth within the country which neither the first nor the second modernization theories considered as major premises. However, though Beck, Bonss and Lau exclusively and consciously bracketed out countries like Ethiopia, the concept of reflexivity, which takes the challenge of a continually changing system of coordinates, can be adapted to respond to rapidly changing realities in Ethiopia. The concept can be stretched to find possibilities of formulating 'other' modernities particularly in the context of the dynamic urbanization processes.

Reaffirming the relevance of some of the basic normative ideals that modernism posits and aligning with the reflexivity concept, Läßle (2014) proposes the possible reformation in the form of 'ecological modernity' so as to meaningfully redirect and qualify it for challenges on the global stage. He underscores climate change and global poverty as the two major problems which

demand a reinvention of cities under the framework of ecological modernism. This entails a search for a new city models based on new culture for urban mobility (referencing post-fossil - production and consumption) and the development of new forms of collective decision making and action. L  pple also projects that for the foreseeable future, the world will be faced with an unstable coexistence and mutual superimposition and penetration of old and new social and urban forms. However, newly urbanizing countries and regions such as Ethiopia and North East Africa, can take advantage from a lesser burden from old infrastructure and systems installed based on the first modernization project. They also have an advantage to critically evaluate and hence edit out some of the haughty and dangerous assumptions that the first modernism was founded on – be it about nature or culture.

In any attempt of formulating or reformulating modernization projects, which apparently encompasses the structuring or restructuring of cities, it is fair first to underscore that an arrogant overwriting of cultural and natural setups by the transplantation of the seemingly advanced ‘new’ can also be cruel and devastating. In such engagements, it is necessary first to understand the social and political contexts and the historical and normative foundations of existing social, economic and spatial configurations of settlement patterns – the task this research project targets to achieve (at least on the particular phenomena of urbanization around water bodies in Ethiopia).

Urbanization in Ethiopia

In its current adaptation, an urban center in Ethiopia is defined as a locality with more than 2000 inhabitants whose majority lives on trades other than agriculture. Accordingly, it is estimated that less than 17% of Ethiopians live in urban areas (CSA 2010) - but if towns with less than 10,000 inhabitants are discounted as urban, the proportion drops to 3% leaving the country as the list urbanized in Africa (UNHABITAT 2008). However, the country is witnessing one of the fastest rates of urban growth in the world, namely an average five percent per annum (UNHABITAT 2007:1). According to the World Bank report, the economy of Ethiopia has experienced strong and broad based growth over the past decade, averaging 10.9% per year in 2003/04 - 2012/13 compared to the regional average of about 5 %. Nevertheless, the reports from the CSA do not indicate any correlation between urbanization (neither positively nor negatively) and the economic development recorded – it just remained around the same figure since 1990ies.

Measuring urbanization in terms of spatial agglomerations of people in and near cities of 50,000 or more, shows that urbanization growth rates between the population census years 1984 and 2007 are much higher (between 8 and 9 percent) than estimates based on official definitions of urban (Dorosh and Schmidt 2010). Observations around major Ethiopian cities indicate that the phenomenon is faster and aggressive beyond the reports in many government documents. Addis Ababa, Bahr Dar, Awasa, Dire Dawa, Mekele are crossing their municipal borders. The expansion of Addis Ababa and Dire Dawa, as city states with definite borders, is demanding new legislative mechanisms from the federal level in order to guide the growth and harmonize it with its immediate neighboring communities. As recent as 2014, such attempts from Addis Ababa has become a cause for protests and unrest. However, according to the UNHABITAT

report, most of the growth manifests itself in the proliferation of small, mostly roadside towns or service centers whose principal role is mediation of local commerce and, more often than not, functioning as centers of public administration (UNHABITAT2007:1).

Finding literature on Ethiopian urbanization is difficult and hence referring to the larger perspective becomes a necessity as most theoretical works address the scale of the continent or in some cases a geographic region like Sub Saharan Africa. Published works related to particularly the spatial element of Ethiopian urbanization are also rare. Literatures which can be found on the medieval and antique cities of Ethiopia however focus primarily on what have been happening in the cities rather than the cities themselves - usually describing the political and religious events (see Munro-Hay 1997 on Aksum and 2002 on Ethiopian cultural assets, Mark Jarzombek 2007 on Laliballa, Garretson 2000, Pankhurst 1982 and 1985 on major cities, et. al). The two books by Pankhurst (1982, 1985) - entitled 'the History of Ethiopian Towns' - serve as the major resource books for research on towns in Ethiopia. However, these books - although a rare documentation of precious historical information extracted from various written sources - also fall short of providing valuable information on urbanization in general and the physical structures, processes and operations of the towns in particular. In general, researchers in the area of physical planning, urban design, and architecture who wish to examine the spatial, environmental and architectural elements of Ethiopian towns have little documentation on hand. The chance gets even worse in cases of towns other than Addis Ababa and few regional capitals. Even though the spatial and environmental dimensions still suffer from the lack of analytical and critical studies, growing number of articles related to current Ethiopian urbanization can be found in areas of anthropology, human geography, economics, public health and related social studies. In the area of spatial studies, however, PhD theses, compiled projects and few books have started to emerge filling the gap of the lack of documentation and critical evaluations of the built environment. From these PhD theses and publications the following deals primarily on the spatial elements: Elias Y. A. 2008, Genet A. 2012, Esayas 2000, Heyaw T. 2005, Wubshet B. 2002, for PhD theses and from published works Zegeye & Helawi (eds) 2012, Giorgis & Gerald 2007, Angelil & Hebel (eds) 2010 are to be mentioned. For obvious reason of difficulties in finding background materials, many of these studies also focus on Addis Ababa.

The most cited references on African and also Ethiopian urbanization are the UNHABITAT documents. According to these documents, Ethiopian urbanization is characterized as a low level but rapid urbanization - less than 17% urban and 5% urbanization rate - dominated by informal processes with low level of manufacturing sector development (UNHABITAT 2008). Among all the cities and towns, only 13 have population bigger than 100,000 inhabitants and Addis Ababa, the capital city, is a primate city with a population 10 times bigger than the second largest city Dire Dawa (UNHABITAT 2008). It also refers the prevailing majority of the urban structure as slum. 81.8 % of urban population in Ethiopia is considered to live in slum conditions (UNHABITAT 2008:103) - 99.4% in earlier reporting (Davis 2006:23, UNHABITAT 2003).

In a predominantly rural country like Ethiopia, the urban-rural synergy is supposed to be vital for urban development. The subsistence nature of the agricultural sector; the fragile market; and

the poor infrastructure of transportation have been the main reasons referred for the weak link. According to the CSA 2003 census, about 55.7 percent of the farming households in the country cultivate less than 0.5 hectares and about 80 percent of the farmers cultivate less than 1 hectare. Only 4.1 percent of the farmers own more than 2 hectares of land. The average size of holding is 0.81 hectare. In addition, the sector is characterized by fragmented farm plots. Plots are at some distance from one another with others' holdings in between. The average number of parcels of land per holder of the 0.81 hectare average holding is 3.3 plots (See CSA, 2003, Part I, pp 91-93, Zewdu and Malek 2010:11).

The particular characteristic of Ethiopian urbanization, which this research is focusing on, is its location in reference to altitude and major water bodies. Following the general population settlement pattern of the country, urban centers concentrate on highlands (see Fig 3) and it categorically ignored areas around large surface-water bodies. The very term 'Ketema' (ከተማ) which means a city or town in Amharic (the federal language of Ethiopia) refers a settlement on higher grounds. It was derived from the Geez word 'Keteme'— which means making a sign (kidanewold Kifle 1956:48) — particularly denoting a higher ground. The term 'ketema', which used to refer to military camp, first appeared in the chronicle of Minas (quoted on footnotes of Pankhurst 1982:95) also suggest a strategic high ground. The use was pronounced further in the campaign of Minilik II - particularly for the military camping towns in the southern Ethiopia, while the term 'medina' was used to refer the seat of the king. However, the federal language - Amharic, currently uses 'Ketema' for all levels of urban centers with no reference to altitude. Accordingly the various typologies of settlements are termed as: 'wana ketema'(capital city), 'ketema'(city), 'tenish ketema'(small city), 'mender'(village), 'yegeter mender'(rural village), 'geter' (rural settlement). Furthermore, since its genesis - being related to the temporary camping of the court of the king which brings together people from various backgrounds and regions, 'Ketema' has a distinctive nature of diversity. 'Ketema' thus is understood as a centre of a region where people of various origins and languages come together - considerable diversity and density (Kasate Berhan Tesema 1958/Amharic dictionary).

Though Ethiopia enjoys a relatively continuous and independent nationhood for more than at least two millennia, these centers ('Ketemas') could not grow roots to establish continuous urban culture and structure which can be paralleled with the established culture of governance. By the end of the second millennia, the country remained to be one of the most rural countries even in Sub Sahara African standards. The brief increasing processes of the concentration of diverse people in cities following the stability and consolidation of power by Emperor Minilik II in the late 19th and early 20th century slowed down in the 1970ies. Scholars refer the change of the land tenure regime and the intensified civil war as possible causes for the sluggishness of urbanization (see Crewett & Korf 2008, Rahmato 2004, also see chapter 3 for further discussion).

In order to deepen the discussion on the peculiarity of the locational preference of Ethiopian urbanization - particularly on the relationship between large (major) water bodies and the spatial distribution and pattern of urbanization, which is the main focus of this research project, it is necessary to zoom out and have a brief overview of the subject on a broader perspective.

2.3. Water, Water Bodies and Urbanization

Water is undoubtedly the most defining substance on the surface of the earth both as a body (volume) and as an element, which constantly moves in various ways. Even a human body, whose 60% is composed of water which has to be refilled regularly, is only a temporary station for water's endless motion (Tvedt and Oestigaard 2007:6). 'Water symbolizes the whole of potentiality: it is the *fons et origo*, the source of all possible existence ...water symbolizes the primal substance from which all forms came and to which they will return' writes the influential historian of religious ideas, M. Eliade (Eliade 1979: 188 quoted on *ibid*:1). Images of and ideas about water have been and are central in creation stories and in narratives about 'the end of the world', in rituals and *rites de passage*, in scientific theories about creation and evolution and as a seemingly unending reservoir for metaphors in languages all over the world (*ibid*).

Theoretical explanations on the relationship between water-bodies and urbanization usually focus on a single strand from their complex network of relationships – water bodies as the basic environmental element; water bodies as a source for biological needs; water bodies as the fundamental resource for agricultural and industrial civilizations; water bodies as a source/dumping-site and carrier of inputs and outputs from cities; water bodies as a spiritual and cultural focal point; water bodies as a land-use to qualify urban spaces, etc. These theoretical descriptions of the phenomena of the historic relationship between water bodies and urbanization falls under three possible categories of approaches: socio-political and economic, environmental and morphological, and socio-cultural and religious. This research employs these categories in the following two chapters in order to examine the nature of the relationship in Ethiopian urban setting.

Civilizations grew up around water bodies – on riverbanks, floodplains and in deltas. The understanding of and the ability to work with water resources and its natural cycles was one of the major factors which determined the success and failure of most civilization. The Indus River, the Mekong River, Euphrates and the Tigris, the Nile are all examples of rivers that have cultivated civilizations. According to Karl Wittfogel, the combination of hydraulic agriculture (differentiated from rainfall farming) and a hydraulic government which controls the water system with a single-center society constitute a hydraulic civilization. He listed ancient Egypt, Mesopotamia, India, China and pre-Columbian Mexico and Peru as hydraulic (see Wittfogel 1957). Wittfogel believed that the development of irrigation works in such areas led to the use of mass labor, to an organizational hierarchy for coordinating and directing its activities, and to government control for ensuring proper distribution of the water. Irrigation increased the food supply allowing larger numbers of people to agglomerate into towns and cities. Water, therefore, was instrumental to create an impersonal government as a distinctive and permanent institution and also towns and cities. Indus valley, Mesopotamian, Egyptian, Greek, Roman, and Aksumite civilizations were all characterized by their water management and hydraulic technologies. Be it for agricultural productivity through irrigation or urban water supply and sewer systems, these civilizations were engaged in advancing their water management skills.

In a more recent history, rivers served as the central organizing elements in the early days of industrialization of the western world. Adam Smith in his famous book *An inquiry into the nature and Causes of the Wealth of Nations*, underlined the role of rivers for the comparative advantage of England in its early success in industrial revolution by saying - 'Good roads, canals, and navigable rivers, by diminishing the expense of carriages, put the remote parts of the country more nearly upon a level with those in the neighborhood of the town. They are upon that account the greatest of all improvements' (Weightman 2007:43). Almost all of the cities which were the hubs for the early industrial and urban growth in Europe are twined with major water bodies: London and River Thames, Manchester and River Irwell, Paris and River Seine, and latter Rivers Ruhr and Rhine in the Ruhr valley in Germany, etc. While facilitating and supporting urban and industrial growth, rivers also affected and were affected by the course and form of the new urban era since the end of the 18th century. Within these developments, the relationship has assumed different forms. Most of these major rivers, which are considered by many as the back bone of both industrialization and urbanization, functioned as an inflow of themselves and other goods and as an outlets for outflows – with both possibilities of being a cause for devastation and being devastated (see Berles 2012:95-112). They functioned as transportation highways for goods and people, energy source and cleaning agent that guaranteed public, urban and corporeal hygiene (see Castonguay & Evenden 2012 for rivers in industrialization and urbanization).

Modernity has conventionally and typically been seen as mankind's conquest of nature. However, by only referring to water, rainfall pattern, river discharges and its devastation in the last 50 years, Terje Tvedt challenges authors such as Anthony Giddens(1989) who refers the industrialized countries as a 'society which lives after nature' - immune from the insecurities of natural disasters. Tvedt asserts that industrialized countries are definitely not 'immune' to the insecurities inherent in any water landscape; they never have been and never will be (Tvedt 2007:11). Nevertheless, he also confirms that modern scientific ideas about water and modern technology of water control allowed the development of large cities, the successful battle against epidemics, the irrigation of crops, and so forth (ibid).

Settlement implies water and water management. Water implies a series of connectivities between the body and the city, between social and bio-physical systems, between the evolution of water networks and capital flows, and between the visible and invisible dimensions to urban space (Gandy 2004:373). It is so basic and self-evident that it is seldom seriously considered (De Meulder & Shanon 2013:4). Water is a complex denominator for various physical and non-physical urban processes. It is not simply a material element in the production of cities but is also a critical dimension to the social production of space. Wherever and however man settles, in cities, villages or otherwise, it requires water sources to be organized, maintained, and managed (ibid). It assumes a much more pronounced position in cities directly related to surface water bodies implying both potentialities and challenges. Many studies and research reports, however, focus on phenomena on catastrophic consequences such as pollution, floods, draught, etc. In other words, on the impact of urbanization in downgrading the integrity of water cycle, water bodies and watersheds in urban and urbanizing areas and on disasters imposed on cities from the nearby water bodies (Fig. 2.10). As the world population continues to grow and

urbanize the question of access to fresh water resources and the way urbanization interacts to these fresh water resources generally becomes more critical. However, as obvious as the case might appear, the multi-fold relationship between surface water bodies (particularly lakes and rivers) and urbanization still lacks a proper attention it deserves in both academic and policy environment. Considering the pattern of urbanization around the world, the case is indisputably crucial.

Fourteen out of seventeen top megacities; like Tokyo, Mumbai, Saopolo, Newyork, Shanghai, are coastal cities. More than half of the population of the world today lives in international river basins, on the banks of rivers such as Ganga, Indus, Mekong, Zambezi, Congo, Niger, Euphrates and Tigris, Jordan, Danube, Rhine, Colorado, and Amazone. But No international river basin has a longer or more complex and eventful history of water politics than the Nile's. (Terje Tvedt 2004:3) The Nile and many other water bodies define the physical and cultural landscapes of Ethiopia - a country often referred as the water tower of North East Africa.

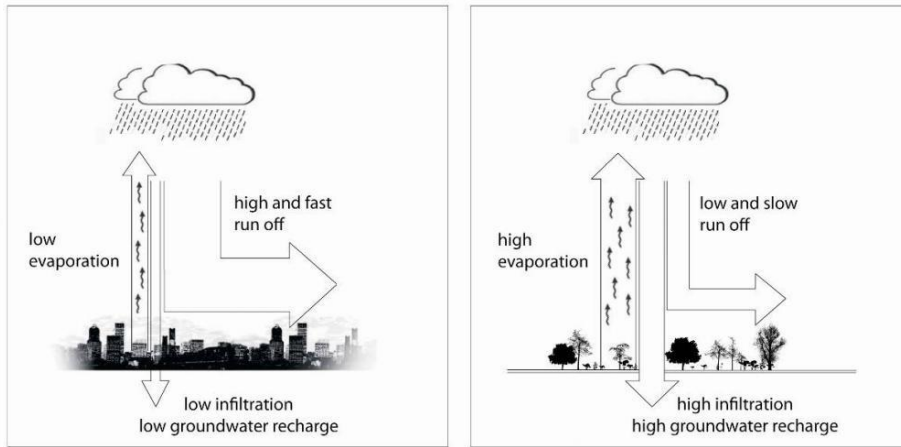
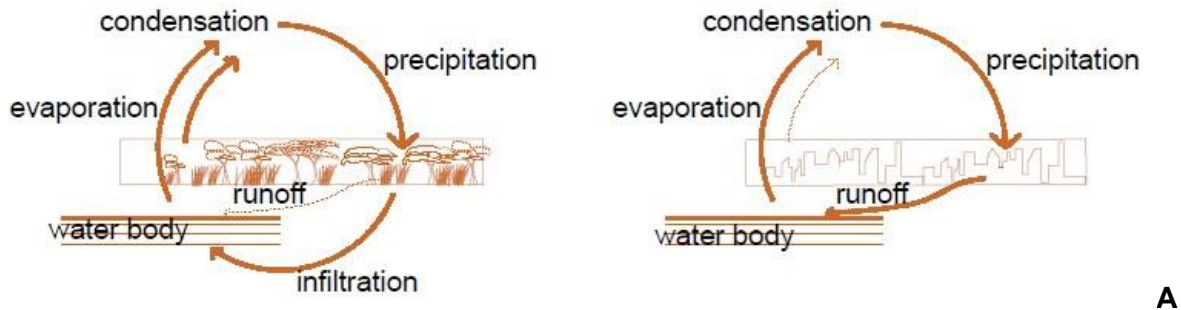


Fig. 2.10 A. water cycles in natural system (left) and in an urban area (right); B. Runoff, infiltration and evaporation rates in urban area(left) in comparison to natural systems(right) source: Hoyer, J., et al. (2011)

2.3.1. Ethiopian waters and urbanization

Many writers refer The Bible as the ancient of documents which indicates the relationship of Ethiopia and water-bodies. In its very first book Genesis - narration of creation - it describes the land of Ethiopia as a land defined by a river:

... And the name of the second river *is* Gihon(Abay): the same *is* it that compasseth the whole land of Ethiopia. (Gen 2:13 KJV)

The book of the prophet Isaiah describes its topography as formed by water forces:

Woe to the land shadowing with wings, which *is* beyond the rivers of Ethiopia: That sendeth ambassadors by the sea, even in vessels of bulrushes upon the waters, *saying*, Go, ye swift messengers, to a nation scattered and peeled, to a people terrible from their beginning hitherto; a nation meted out and trodden down, whose land the rivers have spoiled! (Isa 18:1 KJV)

Either influenced or inspired by this description, the landscape of northern and central Ethiopia is referred by many Ethiopian writers as a land destroyed by the waters of mighty rivers. Yakob Arsano noted and commented Demeke Metaferia's lamentation on the devastation of Ethiopian landscape and their settlement with water forces:

I noticed the absence of human beings and other animals, even monkeys, in that region of desolate hills. After having exposed their land to the ravage of water, they must have migrated to other parts of the country hundreds of years before the Prophet Isaiah was even born, to be called later Sidama, Wolaiyta, Kambata or [sic. Kafficho]. The places of the resettlement that Mattaferia mentions above are located in the south-central highlands of Ethiopia, as full-fledged administrative zones. Sidama, Wolaiyta, Kambata and Kafficho are designations for the geographical areas, as well as the corresponding nomenclature for the populations who inhabit these territories. The Guragae community of Ethiopia's south-central highlands can be included in the list of resettlers. Most of the clans of the communities ascribe their origins to northern Ethiopia. The present settlement areas of the ecological refugees caused by the destruction of the Nile head waters find themselves in the headwater areas of other river valleys. For instance, the Sidama are located in the headwater area of the River Ganale, while the Wolaiyta, Kambata, Kafficho and Guragae clans are located at the headwater areas of River Omo. The former river flows to the Indian Ocean via Somalia, while the latter drains to Lake Turkana along the Ethiopia-Kenya frontier. An interesting contemporary similarity can be observed in the hundreds of thousands of ecological refugees and resettlers who have moved from much of the remaining head water areas of the Abbay and Tekeze, taking their exodus to more downstream areas along the same river course or elsewhere in other lowland areas of the country. The past three regimes of Ethiopia commissioned large-scale resettlements of the ecological refugees. (Yakob 2004:74 quoting Demeke, 1994: 57)



Fig.2.11, A, B Northern highland landscape - (source:18,19, photo taken by the author 150km north-east of Addis Ababa at an altitude above 3500m.a.s.l., 2011)

In Ethiopia, as in all societies, there has always been a struggle to reduce the destructive impacts of water and increase its productive impacts. This struggle has intensified over the past century or so as the population has grown dramatically. Today, Ethiopia's development is seriously constrained by a complex water resources legacy and a lack of access to, and management of, these water resources (World Bank 2006). In characterizing Ethiopian water resources, the same document refers to two principal features, namely, natural and historical legacies. While large but seasonal, intensifying and unpredictable variability, poorly protected watersheds, and almost no investment in water storage define the natural legacy, the historical legacy is one of several international rivers, of which the Nile is the most important. Ethiopia provides 85 percent of the natural Nile River flow into Egypt (ibid). Moreover, this water flow has been the defining element of history in the region of North East Africa - sometimes bursting into conflicts (see Yakob 2007, Pankhurst 2000, Tefla 2000, Erlich et.al. on Erlich and Gershoni 2000, Bruce 1863, et. al.). According to Tefla, the Nile, the sea, and Islam were perhaps the most significant factors that played a role for a thousand or more years in the foreign relations of Ethiopia (Tefla 2000: 153). Water bodies have also been playing an important role in the national political processes - either as a separator or unifier. It also claims a center stage in religious and cultural spheres in Ethiopia. (The impact of the water politics and the cultural and religious perceptions of water on urbanization are discussed further in the next chapter.)

Literature on Ethiopian urbanization regarding to its relationship with water bodies and other natural resources can be referred as non-existence. And the majority of literatures on water bodies within Ethiopia focus on environmental challenges and if they mention urbanization, its usual reference is the negative impact of urbanization on the ecosystem. Richard Pankhurst, who pioneered to pen down the history of Ethiopian towns as indicated above, covers the major towns particularly since the middle ages to the early nineteenth century. Scanning through these books, except the port of Zayla - port of Massawa (present day located in Eritrea) - the mention of settlements around major water bodies were not considerably much. Even those, whose

physical nearness to larger water bodies was mentioned, they did not display any meaningful relationship with the water body to get the attention of Pankhurst himself and the earlier writers Pankhurst quotes as his chief sources - Francisco Alvares and James Bruce. In many of his descriptions of these towns near water bodies, the water body was used a geographic reference than an articulated resource. Among these few towns, Emfraz, a notable town built around Lake Tana in the 16th century was described as a town situated on a steep hill of considerable height on the eastern shore of Lake Tana whose houses built at the middle of the hill facing towards the west, enjoying a pleasant view of the lake (ibid:98). Another short lived town to be mentioned in relation to the lake was Wandege, whose location is indicated as near the southwestern shore of Lake Tana – serving as an imperial camp site around 1604. The most notable one among these short lived camp sites regarding the relationship with water was Gorgora, whose location near the lake, within a peninsula approached by land only from the north, assured the city of its security. The city of Gorgora was believed to have enough elevation to give it one of the healthiest climates but eventually the settlement suffered greatly from an epidemic of fever and the king accordingly moved his camp to a site with greater elevation somewhere to the north, to a place called Danqaz(ibid:106). Nevertheless, the most interesting note recorded about Gorgora is the use of the water body in the production processes of the city where the lake was instrumental in the transportation of building materials from the nearby Bay of Dabaza by reed boat or ‘tankwa’. The other city which the kings sought to have a garden comparable with European cities for which the site was chosen on account of a well-watered valley, but the settlement itself lay on a hill from which one could see the entire plain of Dambeya and much of Lake Tana was Azazo (Gennete Iyesus). The water body (the river), in which case was mentioned as a source for its established gardens, vegetation and fruit trees.

Other towns indicated in relation to water bodies include Dalbo, the capital of king Tona at the foot of a hill north of Lake Abaya, Konso, to the south of the Lake, a mountainous military camp overlooking Lakes Chamo and Abaya in southern Ethiopia. Most of these towns have disappeared or remained irrelevant in the recent urbanization processes of the country.

One of the few cities which seemed to sprang out from a need to appropriate a water body for economic purposes before the Italian invasion is Gambella - an inland port on the Baro river which came into existence in the early twentieth century as a result of Anglo-Ethiopian cooperation(ibid:245). The establishment of a commercial station at Baro was envisaged as a step towards the creation of an internal shipping service linking with Khartoum, and more generally western Ethiopia with the Sudan and Egypt. It was inaugurated in 1907 but it didn't show perceivable development for the larger part of the 20th century and currently the city serves as a regional capital of the regional state of Gambella with no noticeable attempt to reinstate its original trading intentions.

It is possible to conclude that, up until the 1960ies, when the first power station and commercial agriculture emerged, major Ethiopian water bodies were largely left aside - at best as religious sites and in some instances as a political currency. Finding a meaningful appropriation of large surface waters for agricultural or industrial use was a rare exception than a norm. However, even though major water bodies seem to lack significance in the urban development history of the country for the major part of the past two millennia, close observation to religious and

cultural practices, rural customary practices and major historic cities reveal important water based spatial organization examples.

>*The Holy water as an urban embryo*: One of the most eventful examples of the use of water-body with a character of an urban cell is the Holy Water ('tsebel'). In Ethiopia, Holy waters are water consecrated by the church as holy. Often times than note, springs, ponds, and sometimes head waters of rivers get such a status by the church. These waters, after being consecrated as holy, attract a mass of people who seek spiritual healing – becoming a focal point to generate a public space around them generating other supporting activities. Most holy-water sites develop a community of people who reside and operate almost permanently - functioning like a de facto micro town with activities ranging from commercial services like shops, restaurants, small hotels to social and community services including schools and obviously religious services as their core. In such phenomena water as a spiritual body functions as the central organizing element. Formations around these water-bodies are informal in both administrative and spatial structures.

>*Customary water use practices which influences rural settlement structures*: in localities where water is scarce, societies develop their own customary rules and institutions to guide the fair use of the vital substance - water. Particularly in dry pastoralist areas, such practice is expected often dictating settlement structures. The Borena's of southern Ethiopia lowland pastoralist inhabitants have one of the most elaborate water management and settlement guidelines. The terms and conditions of use of water wells is composed out of various variables such as who and where one lives, for what purpose should it be used, and the season and amount of water available. Developing and overseeing water sources are also a complex processes which is overseen by the clan elders with its special administrative structure (Tache 2000; Bassi 2005; Helland 1980 on Nassef and Belayhun 2012:10). These elders also decide on where in relation to the water source, inhabitants should and should not be allowed to build houses. In Afar (eastern Ethiopian lowland), grazing around River Awash in the dry season is delineated and managed by a leader's council of the pastoralists of the Afar (Getahun 2004 quoted on ibid:9). In the other pastoralist area – the Somali (south eastern lowlands), water points can be developed and controlled individually or by a clan among which operational modalities vary in various areas with different seasons. In highland Ethiopia, it is not uncommon to find small towns and localities being identified by the name of their water sources.

2.3.2. *Historic cities and water bodies in Ethiopia:*

The following overview into the historic cities of Ethiopia casts some light to the relationships of water bodies and urban centers in Ethiopia:

Aksum: the 72 springs and an artificial lake

For most of the first seven centuries AD, Aksum was the capital of what the archaeologist Neville Chittick has described as “the last of the great civilizations of Antiquity to be revealed to modern knowledge”. At its height in the third and fourth centuries AD, Aksum boasted great wealth, organizational power and technological sophistication. In the third century, Persian writer Mani classified Aksum among the world's four greatest kingdoms, along with Rome,

Persia, and China (UNESCO 2008). This capital city of the ancient kingdom was noted by many historians as a city full of springs, private wells and even an artificial lake. Water seems to have been abundant, as evident from a seventeenth century Ethiopian account, entitled the 'hagar wa-gabaza Aksum', i.e. 'of the city of the cathedral of Aksum's which states that the town had no less than 72 springs (Pankhurst 1982:76). There was in addition a lake – in fact an artificial reservoir – fed by water running down from the hills which was used both for the irrigation of nearby fields and the drinking of cattle (Camillo Beccari as quoted on Pankurst 1982:77). But its strength and success came by the very relation that the city had to the red sea through its port town Adulis. Accordingly, Aksum's location and expansion made it a hub for caravan routes to Egypt and Meroë and access to sea trade on the Mediterranean Sea and Indian Ocean helped Aksum become an international trading power. Traders from Egypt, Arabia, Persia, India, and the Roman Empire crowded Aksum's chief seaport, Adulis, near present-day Massawa.

Among many historical accounts which tried to reconstruct the city of Axum, Stuart Munro-Hay in his book 'Aksum - An African Civilization of Late Antiquity' has a section which elaborated the city from the perspective of water structure. He pictured it as a city with careful relationship with its water resources and actually carved out of its water structure.

"Aksum was built on gently sloping land which rose, north and east of the city, to two flat topped hills, now called Beta Giyorgis and Mai Qoho respectively... Between Beta Giyorgis and Mai Qoho runs the course of a stream, the Mai Hejja or Mai Malahso in its upper reaches, which rises on the eastern slopes of Beta Giyorgis. Further west another stream bed, that of the Mai Lahlaha, also descends from the top of Beta Giyorgis. Run-off from the Mai Hejja and down the flanks of Mai Qoho above the town is caught in a large excavated basin, officially called Mai Shum, but often referred locally to as the 'Queen of Sheba's bath'. This is said to have been dug by one of the later metropolitan bishops of Aksum, Samuel, in the reign of king Yeshaq in about 1473 ..., but may very well be of Aksumite origin, enlarged or cleared by Samuel, just as it has been again enlarged and cleared recently. The basin lies directly below the north-west side of Mai Qoho, and access to it from above is aided by a series of steps cut into the rock, which may also date back to Aksumite times. Butzer thought that there was evidence for an earth dam some 50 m. below the Mai Shum reservoir, and it is possible that much more water was caught or diverted in Aksumite times than today. Water was probably a very important element in the development of Aksum as the capital city of ancient Ethiopia. The name of the town itself is thought to be composed of two words, ak and shum, the first of Cushitic and the second of Semitic origin, meaning water and chieftain respectively This name 'Chieftain's Water' seems to suggest that Aksum could have been the site of a spring or at least a good water supply, and perhaps it early became the seat of an important local ruler." (Munro-Hay 1991:96)

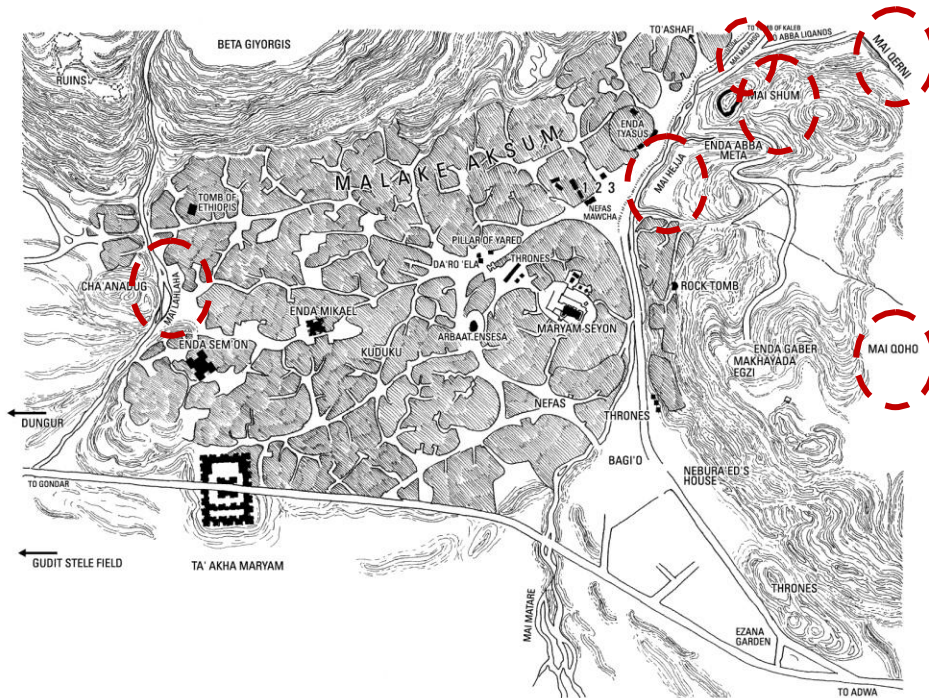


Fig 2.12. Undated map of Aksum, (note that 'Mai' means in the local language water – indicating water bodies or sources of water – marked areas) source: www.ancient-wisdom.co.uk

Lalibella: The peculiar case

Lalibella, beyond being a site for the world heritage rock hewn churches, is a rare example of an Ethiopian medieval city intentionally organized by a dictate of a natural water body. The old city of Lalibella is one of the holiest sites for the followers of Ethiopian Orthodox Christianity. The more than 11 rock hewn churches are interconnected by tunnels and open channels balanced around a crossing river called Jordan (Yordanos). River Yordanos, though dry most of the time of the year, was an impressive spine of the city which organized the physical and conceptual structures of the city. The river is much beyond the morphological force but also a conceptual spiritual core. But it indeed also is a functional - a biological need supply system. Mark Jarzombek challenges the normal reading of the city by suggesting another layer of the hydraulic organization. He argues that Lalibella was just as much a hydro-engineering marvel as it was a religious site... in fact, its hydro-engineering not only guaranteed the city's economic foundation, but was also an intrinsic part of its religious message (Jarzombek 2010). Even if little is known about the operation of the city as a political and economic center, the water-space binary is most articulate when compared with the other capitals of the Ethiopian empire. Jarzombek(2010)discusses:

Just as important as the question of institution-building was that of water conservation. Unlike Axum, which lay in a valley and where streams were diverted to create an artificial lake—the remnant of which is now nicknamed “The Bath of the Queen of Sheba”—the highlands were rugged and the valleys open to invaders. There was, for example, plenty of water in the valley rivers that flowed hundreds of meters below the

hill-top site of Lalibela. But a site by the river would not have been easy to defend, and this reason is often given as an explanation for the choice of the current site on the top of plateau. There was, however, another reason Lalibela picked this spot. Here, remarkably, at the very top, there was water.

At the center of the Libanos' design was a River Jordan, an artificially-created canyon placed between the two clusters of churches and flowing into a naturally-occurring seam between two hills. It was most certainly linked to a network of channels that distributed the water along the hillside farms. It is also clear that the architects in making the water tanks had to dig down to a particular level to guarantee water in the tanks during dry season, this being the determining factor of the design. This level established the depth of the excavation around the church, and thus also the scale and proportion of the building.

Almost all of the principal churches have a well or pool associated with them (fig. 3). In the wet season, these overflow and most of the water runs through specially-constructed channels into the River Jordan. In most of the square pools, papyrus grows on the surface. These pools serve a special religious purpose that is still enacted today. Infertile women—during a special ceremony—are lowered into the pool as a way to restore their fecundity. The papyrus symbolizing rebirth, the birth of Moses, and indeed the Nile River, adds to the symbolic charge of the pools. Bete Giyorgis, the famous cross-shaped church, has not only a pool of its own, but also a special east-oriented corridor that leads to a spring, the overflow from the spring going into a channel that leads to the River Jordan.

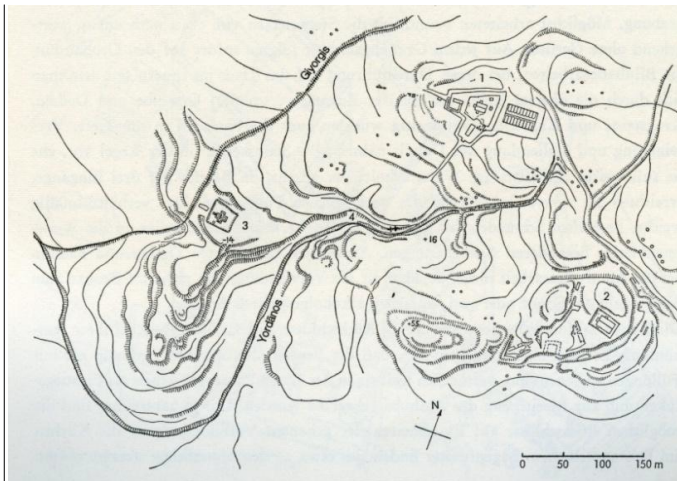


Fig 2.13. Lalibella: the churches and their connecting river and tunnels, (Source: Lindahl 1970)

Harar: the thirsty city

The walled city of Harar offers a classic medieval city structure. A fenced city with a wall called 'jugol' and with several controlled gates. Even if one often thinks of 'typical' Ethiopian history as a Christian history, Harar represents the other face, the quintessence of medieval Muslim Ethiopia, whose permanent center it became (Munro 2002:177). It is the longest standing permanent settlement in Ethiopia exhibiting many fold qualities which needs to be inherited in

translating culture, history and spatial orders into a town form. It exhibits - the impact of African and Islamic traditions on the development of the town's building-types and urban layout; an important interchange of values of original Islamic culture, expressed in the social and cultural development of the city enclosed within the otherwise Christian region. Such influences have been merged with traditions that relate to the inland of Africa and particularly to southern Ethiopia, giving a particular characteristic form to its architecture and urban plan. The social and spatial structure ('afocha') and the language of the people all reflect a particular and even unique relationship that they developed with the environment (UNESCO 2013). In the enclosed city of Harrar, the physical space is obviously a limited resource, hence high density in use, structure and spatial form is a basic characteristics. Narrow streets and compact houses with well-defined interior courtyards,

Water and sanitation has been a fundamental challenge for the town of Harar since its medieval times. Solid waste, be it from of humans and animals or kitchen wastes, used to be transported dry with a donkey (Zekaria 1994). There is no mention of a stream or a river in the town. Since Lake Alemaya (Haromaya), on which the city was dependent for water resources, dried away, the city is known for its sustained water shortage.

Gonder: *the city between the Twin Rivers*

The legend on the foundation of the city of Gonder, a city which was considered unique for its service as a permanent capital of the empire for more than 200 years, is intricate and full of mystic stories. However, the two rivers – Angarab in the east and Qeha in the west are believed to contribute for the decision of King Fasiledes to choose the location for his capital. As reported by many travelers, these two rivers coupled with mountains in the north and south provided a formidable fence around the royal camp. They also were used to refill the cisterns attached to the palace buildings and the bathing palace in addition to providing fresh water for the city and fishing ponds for the fasting season¹ (Munro-Hay 2004:115-121, Genet 2011:106,113). Other than their environmental and geographic importance, the rivers have influenced the everyday economic and political life in the city with a readable morphological impact on its cities development.

The sense of pride and confidence of its citizens towards their city is reflected in popular poems and songs – usually expressing strong belongingness which other cities have not yet achieved. Among the many songs and poems about the city of Gonder, Munro-Hay quoting from Doresse cites a poem showing the despair of a citizen for the fate of once a great city and its inherent advantages due to its peculiar location being free from fever (Malaria).

*O Gonder, of the beautiful buildings,
Gonder, hope of the poor as well as the great,
Gonder the inimitable, to which nothing can compare,
Gonder, who, maternal, satisfies all desires,
Gonder, where no fevers come,
Gonder of the lovely name; land of pleasure and delight.*

*O Gonder, house of Iyasu and the esteemed Bakaffa;
 Gonder, fairer than the City of David, the land of Salem,
 You who should have kept your splendor forever,
 Why have you, who did not deserve it, been destroyed like Sodom?
 (Munro-Hay2004:114)*

Located in the Qaha and Angereb river basins, and far enough from the mosquito infested lake Tana, the woodland was a perfect choice to make a city in the 17th century (Ibid:115-121).

Gondar and its Imperial court have introduced new urban and architectural spatial programs promoting an urban life including elements which introduced water as a public spatial use - water pool for swimming and ponds for fish. This was the time that architecture and its symbolic significance were acknowledged for the reconstruction and restoration of a nation. Furthermore, it was also employed as a tool to project an image of might and majesty which was an important element in the medieval political formulations. The major open space, the 'addebabi', outside of the palace was set for important events and smaller public spaces – usually shaded by a tree, halls (defined large spaces) were also introduced for public events intensifying the public life. Though it seems to have little antecedents from the earlier Ethiopian monumental architecture in visual and formal languages, it is obvious that the northern and eastern stone/rock culture (Aksum and Lalibella) and the incorporation of water bodies within the building complex(Lalibella) have contributed to its spatial, technical and material development of Gondarian architectural style. Scholars also agree that such architectural heritage is a gain resulted from a cultural exchange of medieval Ethiopia with its Western and Eastern contemporaries.

Church spaces were kept as traditionally known and almost no internal modification was produced to the standard internal three-fold divisions of Orthodox sanctuaries. The rectangular spaces in almost all castles were new both in terms of form and function (as a permanent palaces, other than church forms of Lalibela) and without precedents in post Axumite northern Ethiopia (Berry 1989:124), and must have inspired the development of later urban architecture other than the usual circular residential and church buildings. Such a building culture spanned for more than 200 years and affected relatively large area compared to its monumental predecessors. Roof terraces, watching towers, extruded balconies, extended gardens, swimming pools, sport fields, designed open air theaters, intentional open indoor and outdoor courts are few of the introduced spatial programs. However, the most noticeable elements are the pools, ponds and intricate architectural features which deal with drainage systems and water management.



Fig 2.14 A, Older maps of the city of Gondar (1938) showing river lines B. Public pool (Source: Bosio quoted on Riffkindy, D. (2011) images from author)

Addis Ababa: Hot-Springs - its foundation

After Emperor Menilik II settled on Addis Ababa after an extended war to establish stable government among the vast territory of Ethiopia, his newly found cities started to be based on comfort and accessibility of resources - primarily wood and water than military strategy. Nevertheless, the royal court and its palaces still needed to find the higher ground even in these new cities (see Zekra Neger 1950:1-2). Even though no water body seem to claim any prominence within the city's present urban assemblage, the present day location of Addis Ababa won favor in the eyes of the royalty due to its water bodies. One of the reason to leave the previous location for a capital – Entoto, which enjoyed a brief period of grandeur, considering it to be inconvenient for settlement as noted by Charles Michel and quoted by Pankhurst was water - 'exposed to the wind, difficult to access, without drinking water – the town was an impossible capital' (Pankurst 1985:177). Addis Ababa offered otherwise - natural hot springs, reliable water sources and comfortable climate. The city of Addis Ababa was also the first to experience the marvel of water engineering (ibid: 205-207). The successive master plans, which came after its foundation, have employed its various rivers for various purposes. However, the most obvious function which is observable today is a natural outlet for the city's various liquid wastes (See more on part II, Chapter 6).

City	City Popl. in '000 (CSA 2003)	Related WB with the city	WB size	Major uses of the WB	Major uses of the immediate space around WB	Prevailing morphological influence of the WB on the city	Remark
Axum	43	Springs, Rivers- Currently nonexistent	72 springs, reservoir	Drinking, irrigation	Currently no readable function	-	-
Lalibella	15	Yordanos river, artificial chunnels, pools as holy water attached to churches	Seasonal,	>Drinking >Spiritual spine of the city for the major churches >public bath and baptism	>Selected sites for spiritual assembly (churches) and processions and rituals - baptism	Strong influence: The historic rock hewn churches are organized based on a narrative adapted from the bible – centering Jesus Christ and His baptism on river Jordan.	River currently dry
Harrar	114	Haromaya lake at a considerable distance	Haromaya lake has dried out	Currently most challenged city due to lack of water	Land is used for agriculture	-	City suffers due to lack of water
Gonder	177	2 major rivers >Qaha and >Angereb	1 all season	>source for Drinking water >fishing >used to function as a protection	>small scale irrigation, washing and bathing grounds	Readable influence on the general set-up but less on immediate space formation. The two rivers act as a fence for the early settlement	Artificial ponds and pools were incorporated within the palace complex
Addis Ababa	2,900	>7 major rivers >many streams and springs	2 all season 5 seasonal, streams are seasonal	>streams for drinking > sewage line for household & industrial >public bath, cloth & car washing >springs as holy water and for public bathes and private pools, etc	>urban agriculture >urban green cover >sand and pebble mining >spiritual grounds > informal houses > swimming pools, recreations	>The topography of the city is constructed by the river networks. >Rivers have been used as boundaries >sites with hot springs were coveted sites for churches and palaces	See case study

Table 2.1: overview of historical cities and their relation with water bodies

2.3.3. Contemporary cities around water:

The handful of cities presently located on shores of major lakes and banks of major rivers are all relatively new. Over the 40 cities in Ethiopia categorized as major towns with a population of more than 30,000 only 6 are located on shores of major lakes or at the banks of all-season rivers (list of 40 cities from CSA 2007). Bahr Dar, Awassa, and Gambella are the three main cities associated with major water bodies which are getting into prominence both politically and economically. Founded in the 20th century, the three have become capital cities of regional states. In addition to these three major cities, there are only 3 more cities which are related to a sizable water body - Zeway (currently named as Batu town), Arbaminch and Bishoftu (formerly known as Debrezeit).

City	Popln '000 (CSA 2007)	Related Water body	Water body – city relationship			City –water Physiologic al relation	Remark on immediate shore / bank
			Economic	Socio-cultural	Political, historical		
Hawassa	135	Lake Awassa	>Fishery >Resort/hotel development >Agriculture >Agricultural research institute	Sidama cultural and religious activity	The city named after the name of the lake, Founded because of the lake for agricultural research around the water (Hawassa college of agriculture)	For long the lake has been seen as a danger - hence a spatial buffer was needed. Few hotels making use of the site.	Competition for water front has soared in the last 10 years. Rapid development of Hotels and resort facilities the shore.
Arba Minch	70	Lake Chamo & Lake Abaya	>Fishery;Tourism/ park; farm (fruits, crocodile), water technology institute			Topography Imposed a physical separation – linked visually.	immediate shore line is a reserved park, rapid resort development on higher grounds around the lakes
Bahr Dar	169	Lake Tana, River Blue Nile	>Fishery, Tourism, small scale urban agriculture, commercial agriculture/flower farms around the city; transportation	Sacred islands (monasteries and churches)	Islands as safe places for treasures of churches and kings	Bahr Dar means seashore; The two water bodies dictate the city morphology	Competition for water front has soared in the last 10 years. Rapid development of Hotels and resort facilities,
Bishoftu	104.3	Lake Bishoftu, Lake Hora, Lake Bishoftu-Guda, Lake Koriftu, Lake Cheleklaka.	>urban agriculture >resort hotels >water sports >agricultural research institute	Irecha** – biggest Oromo religious festival	Irecha, though a religious festival, is related to Gadda – a traditional social and political structure of Oromo people		Rapid development around the crater lakes - resort facilities hotels and private houses.
Gambella	42.4	River Omo	>Transport infrastructure		The city was founded due to the potential of the river	Defined by the river	
Zeway (Batu)	49.4	Lake Zeway	>fishery; flower farms within the city; small scale commercial agriculture; transport	Sacred islands (monasteries, churches)	Islands as safe places for treasures of churches and kings since medieval Ethiopia		Increasing commercial agricultural activity

Table 2:2 overviews of relatively young cities around water bodies

In general, water bodies near cities and urban rivers/streams are used for a variety of purposes in Ethiopian cities. The most observed common uses are: disposal of urban runoff - flood conveyance; open sewer or overflows from sewer systems; urban agriculture – both horticulture and animal husbandry; potable and non-potable water supply (for domestic or industrial use) including direct use for drinking water, bathing and hygiene; washing as a business (of cars and clothes); sand mines; grass harvesting; wood and bamboo harvesting; fishing and recreation activities like swimming. On a lesser extent some activities are gaining importance, such as urban space enhancement (aesthetic element), physiological comfort enhancement (element within a building compound or a city quarter), sailing, water sports,

etc. In dense cities like Addis Ababa, rivers - when flooding happens in the rainy season - also serve as a mining field of valuable materials in down-stream areas for a sizable number of the urban poor.

Notes:

1. Fasting season: seasons/days of fasting particularly for believers in the Ethiopian Orthodox Church where in some part of the country fish is allowed to be eaten as a fasting food.

Chapter 3

Forces which determined the prevailing urbanization pattern in Ethiopia and its relationship with major water bodies

As we have established in the previous chapter, urban centers and major settlements in Ethiopia are located on highlands away from major water bodies contrasting the general trend of world urbanization patterns. Moreover, most lake shores and banks of large rivers located in both highlands and lowlands have long been desolate or scarcely populated. The current capital city, Addis Ababa, and major historic cities and capitals are situated on highlands above 2000m with more or less similar hydro-social relations - distanced from major water bodies and rely on smaller springs (Addis Ababa - 2500m.a.s.l, Gonder - 2133m.a.s.l, Debre Birhan - 2,840m.a.s.l, Lalibella -2500m.a.s.l, Axume 2131m.a.s.l, Harar - 1885m.a.s.l). While Ethiopia is referred as the Water Tower of Africa with more than 70,000km² area covered with natural water bodies including rivers, lakes and associated wetlands (Wood and Talling 1998 quoted on Ayenew 2009), compared to any of its neighboring countries, the role of major water bodies in the formation of urban centers is insignificant. Lake Tana and the chains of Lakes in the Rift valley; and the multitude of large rivers crossing the country, including Blue Nile River, have little accounts in Ethiopian urbanization history, saving the few young cities mentioned on chapter two.

The comfortable and fertile highland climate and the relatively small population size are often referred as obvious reasons to contain the majority of Ethiopian population up in the highlands for the most part of the nation's history. Such arguments are extended to explain why water bodies in Ethiopia fail to impress kings and queens to establish their permanent cities. However, compared with the prevailing pattern of urbanization in the world which mostly exploits surface-water bodies, factors which forced Ethiopian urban settlements to assume a pattern seemingly unusual are multiple and interrelated. These forces which confined the majority of Ethiopian urban settlements on highlands, have also forced it to stay away from sites around large water bodies, which in a normal situation would have been the most appropriate and sought after

locations. The factors are discussed under three interrelated categories: environmental and geographic conditions, socio-political and socio-economic structures, and cultural and religious norms.

3.1 Environmental and geographic conditions

Climate and disease patterns: The current capital city – Addis Ababa, which is often taken as the culmination of the wondering court replacing Gondar as a permanent seat of the long serving dynasty, enjoys a comfortable and healthy climatic condition – a yearly average temperature of 18°C. As indicated earlier, one of the reasons for choosing the present site of Addis Ababa over Entoto (at 3200m.a.s.l.) - the previous site on the northern hill of Addis Ababa which was found to be terribly cold and windy - was its favorable climate (see Pankhurst 1985, Giorgis & Gerald 2007).

The relatively comfortable and healthier climatic condition (of the mid-highlands) was the most obvious reason to become the location for major cities in Ethiopia. This notion was widely accepted in almost all the discussions held¹ (organized for this research) and documents associated with the location of Addis Ababa, Gondar and Harar. These mid-highlands referred as 'Weina-dega' - a name indicative of climatic conditions - are also suitable for the rain-fed agricultural production of many of the staple crops in Ethiopia – particularly Teff and Barley (see Woldemariam 1984, Diamonds 1997).

Deltas and large surface waters are usually located in lower altitudes which are warmer and prone to diseases particularly malaria ('*nidad*'). As discussed earlier, almost all historic cities and capitals have distanced themselves from water bodies. However, Pankhurst quoted Alvarez on one of the rare experiments of an Ethiopian Emperors to build his capital on a lake shore. Emperor Susenyos (1606AD to 1632AD) tried to build his capital Gorgora - a city on the north-western shore of Lake Tana – but had to leave it and move to Danqaz, a site of greater elevation after the epidemic of fever in 1618 (Pankhurst 1982). In a similar but recent account, interviews and observations made on lake-shore sites confirm the same. Senior citizens interviewed on sites near Lake Zeway and Lake Tana shared strikingly similar story about the attempt and its challenge of settling near water due to mosquitoes and malaria. In both cases, according to the interview made with these elders² who witnessed the high days of the nationalization of land as participating peasants, there was a rush to build huts and work on agriculture near these lakes following the declaration that land is no more owned by its previous owners – the aristocrats. Even though the particular plots of land which were under discussion finally fell into state ownership for forest reserves and research sites, the informal settlement particularly in Bahr Dar - which part II of this research takes as a case study – developed from the similar informal claim from the reserved land. However, in both cases (Lake Zeway and Lake Tana) attempts of settlement were challenged by malaria and mosquito. While the settlement on the banks of Lake Tana sustained the challenge, the attempt of settlement around Zeway had to be abandoned. The reason for the different reaction to the same challenge came from the way the government reacted. Inhabitants who attempted to settle near Lake Zeway (particular in rural kebele Edo Gojjola) were peasants who were entitled to get a plot of land in

the redistribution process and finally had to be remobilized in the infamous Villagization Program³, while inhabitants who attempted to settle near Lake Tana (particular urban kebele 'shenbit – sar sefer') were urban dwellers who had no chance in the redistribution scheme. The lack of alternatives made the urban dwellers to stay and struggle with both the malaria risk and the illegal status from the city administration. 'Sar-Sefer' has grown into an informal urban quarter which still is referred as illegal, while part of the land near Lake Zeway in Edo Gojjola 'kebele' was redistributed to farmers which also has started to show urbanization tendencies (see details in part II for both cases).

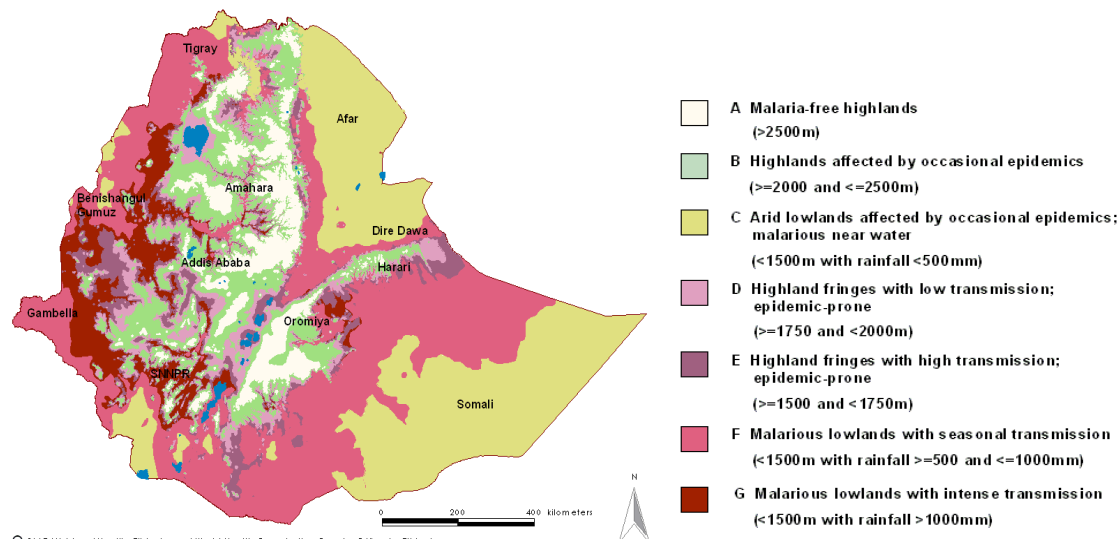


Fig. 3.1 Map showing spatial distribution of malaria. Source: Adapted from world malaria report 2007, MOH and WHO

Even though historical accounts of the disease distribution pattern was not possible to find, malaria, which used to be referred commonly as 'nedad', was the most feared disease for travelers through Ethiopian lowlands. Coordinated effort to fight Malaria was started in the 1950ies and finding older information was not possible. The long held understanding leaves highlands particularly above 2000m.a.s.l. as risk free. Even in the current system, because of a weak malaria disease surveillance system and the inability of the Health Management Information System (HMIS) to capture all necessary malaria related indicators, official estimates of the true burden of malaria in Ethiopia are still imprecise. However, overlaying the geographic distribution pattern of malaria; the spatial distribution of population map and topographic map, indicates a strong correlation amongst each other. The historical accounts of the attempts of kings to distance their courts from malaria infested areas and the failed attempts of farmers to establish their settlement near Lakes due to malaria also reinforce the notion that disease pattern has an important influence on urbanization pattern in Ethiopian urban past.

Ecological capacity (population versus natural resources): One of the factors which determined the particular location and the length of stay of the wondering courts in a given area was the availability of wood (for fuel and construction) and water (for drinking and hygiene). These wondering courts were mentioned as an environmental catastrophe and economic burden for

the areas of their temporary camping. It was reported by various travelers such as James Bruce and Francesco Alvarez that the few years of stay of a King and his court in one locality used to create a heavy devastation on the environment and also a heavy burden on the agricultural society of the area which had to support the court with supplies. However, prior to the population explosion and the subsequent catastrophic environmental disasters of the 20th century, the availability of enough wood and favorable small springs on the highlands had been offering enough wondering space throughout the vast highland landscape in the country. Even if there had been reports of draught and irregularities in these ecological zones pre-20th century, the degree and severity of it was not strong enough to pressure inhabitants to change the fundamental settlement patterns. Neither did it force them to look for permanent alternatives which could have required the development of sources of energy and water. Such requirements were fundamental for the last camping site - Addis Ababa - to be preserved as the permanent capital city. Minilik II had to look for forestation schemes and water system in order to secure energy, construction material, and water sources which ensures the growing demand for the growing population of Addis Ababa.

The lower population density – less than 10 million till the end of 19th century - coupled with enough natural resource (wood, water and fertile soil) and predictable seasonal rain were stable enough to rearrange settlements within the comfortable mid highlands.

Topography: River ways (gorges) on highlands are dangerously deep and water flows are rough - which makes the water difficult to tame and the immediate landscape around the river ways challenging to work on (see Arsano 2007). On the other hands, the low lands - where the water flow slows down, in addition to being disease ridden, are also prone to seasonal flooding. These natural challenges were conveniently avoided by remaining on the available highland planes as long as these planes could provide enough water, wood and fertile soil.

3.2 Socio-political forces and economic structures

Strategic location for security and control: After the decline of the Aksumite Empire (7th century AD), it is believed that the political center of the state moved southward, losing its urban character and acquiring new organizational features (Encyclopedia Aethiopica 2003). The decline of the Christian Aksumite Empire and its subsequent retreat towards the interior highlands is associated with the emergence and expansion of the Islamic empire for which the Aksumite lost its important coastal area including its trade posts and ports. Since then Ethiopia was encircled and begins nearly a thousand years of increasing isolation. Zegeye (2009), on his article 'the portrait of an isolated nation', argued that the elongated and continuous state of war (also fueled by environmental catastrophes) and isolation dismantled the urban culture and installed a distinctive settlement pattern characterized by temporariness. In the absence of relative permanence and associated administrative apparatus, the empire was forced to adapt new systems which required the monarch to be mobile in order to control and defend the large territory from the continuous external aggression (see Alvarez translated by Beshah 1966, Pankhurst 1986). It is assumed that the temporary encampments of the mobile monarch (wondering courts) have become the main blue prints for the formations of many of the cities in

the country up until the early 20th century. These encampments demand strategic locations for war which obviously favors higher grounds ('amba') with ample natural resources and headwaters. Even Gonder – the capital of the kingdom for over 200 years (1635AD to 1855AD), which was believed to mark the reemergence of permanence and urban character in Ethiopian polity after a millennia, was influenced by the 'ketema' logic in its location and operation. It served as the seat of the kings usually for the rainy seasons when campaign is not possible due to the overflowing of rivers. Generally, Lake Shores and deltas of big rivers were taken as less strategic than headwaters and hilltops. The selection of the site for the last capitals – Entoto and latter Addis Ababa - also displays the same logic – access to water for daily consumption and hilltop for security. Even if Addis Ababa latter was favored over the higher site of Entoto for its milder climate and hot springs, its many rivers served no more than border lines among properties of the chiefs and their soldiers.

Nevertheless, spaces (in and around water bodies) and isolated islands located in major lakes have been used for hiding and securing treasures of kings and churches in times of regional wars and large scale internal conflicts. They remained up to the present times as monasteries and sacred sites showing no further development - be it agricultural or any other urban production - than becoming a meager tourist destination.

Hydro politics and regional tensions: Rivers running from the highland of Ethiopia are also identified as one of the major causes for regional political tensions. Even though it is difficult to establish a direct link between the regional hydro-political tensions and pattern of Ethiopian urbanization, recorded negotiation over water resource among rulers of Ethiopia and the surrounding region particularly Egypt, which dated back to the Middle Ages, was full of nervousness. It reveals that news of attempts to use major water bodies by Ethiopian kings either for irrigation or any other was seen with resentment by regional leaders (see Pankhurst 2000:25-37, Arsano 2007, Tefla 2000), hence discouraging further attempts. Moreover, the tensions and consequent wars affected the stability of Ethiopia which in turn discouraged the appropriation of natural resources and related urban development.

Ethiopia's supposed ability to control the Nile flow through its natural right to use the water and thereby pressurize Egypt has been a political placard down the history of the region which has got a renewed translation in the current regional political episode. Down through history - particularly the Middle Ages - the assumed Ethiopian authority was for long a major international interest, creating pride for Ethiopians, fear for Egyptians, and hope and wonder for European Christendom (Tefla 2000). However, such a political positioning has coasted Ethiopia centuries of siege – cross boarder and internal wars and hence among the chief external conditions to shape and characterize the present stature of the country – be it economic or socio-cultural.

According to Pankhurst – Egypt was dependent for its material existence on Ethiopia and Ethiopia was dependent for its spiritual existence on Egypt (Pankhurst 2000) – referring to the fact that Ethiopian Christians used to get the 'Abun' or patriarch from Alexandria-Egypt until 1950 and most of the water of Nile goes to Egypt from the highland of Ethiopia. This mutual dependency was complicated since the 7th century –after the conquest of Egypt by the Muslim Arabs. There are historical incidents which indicate water as a counter currency to religion in

the negotiations between the two countries - where a Coptic Christian Ethiopia controls the head water of the Nile and the Islamic Egypt controls the Coptic center in Alexandria. In 831-849 and 1089-1090 when shortage on the flood of water was noted, Ethiopians were ordered to restore the stream by clearing the stream way or any mound. 1172-1212 the idea of diverting the Nile to pressurize Egypt has developed in the reign of Zagwe emperor Lalibela. This claim made by James Bruce was substantiated due to the fact that the Egyptian leaders collected a prodigious number of Egyptian Christian masons, builders, hewers of stones whom the leaders thought conspired with the Ethiopian kings. This notion also was strengthened because Egyptian Christians were chased out and had to flee to the south (most probably to Ethiopia) with whom they could get a refugee and was believed that they got the skill of using the water which could cause the lowering of the stream down to Egypt. Though, according to Panchrust, historians who claim that Ethiopian kings had tried to divert Nile or its tributaries have no believable grounds. But he states that traditionally the other king of Zagwe (Na'akuto La'ab) has confronted the Egyptians for failing to pay their tributes to Ethiopia by blocking the Tekeze – the main tributary of Nile (Pankhurst 2000: 28). The most serious attempt came in 1312-1342 in the time of Emperor Amdaseyon when the Egyptian Mamluk sultan, Al-Nasir Muhammad ibn Qala'un, was in conflict with his Coptic subjects and demolished several of their churches. The Ethiopian monarch reportedly dispatched an embassy to Egypt threatening its rulers with diverting the Nile. That apparently increased the Egyptian awareness that Ethiopia is the guardian of their life line. Conflict erupted though during emperor Sayfa Ar'Ad(1342-1371) son of Amda seyon, and emperor Dawit1380-1412(son of Sayfa Ar'ad) also emperor Yeshak(1413-1430). The Nile question became even more pronounced in 1434-1468 in the time of Zara Yaqob when the Copts in Egypt were again persecuted and an important church destroyed and the patriarch of Alexandria appealed for support from the Ethiopian rulers. The Ethiopian king sent a strong letter (according to Egyptian historians) to sultan Jaqmaq that reached Cairo in November 1443 threatening possible diversion of Nile.

All these show the medieval Ethiopia-Egypt political engagements, over the water used, to be balanced by the fact that Egypt controls the spiritual source while Ethiopia controls the water source. However, such a balance went off balance since 1959 when Alexandria gave up its position as the religious center of Ethiopia. In a workshops and discussions organized for this research, some extreme opinions were also observed in an attempt to answer why Ethiopian urban culture has less to do with hydraulic technologies. One of the forwarded opinions which took the center stage was the claim that asserts that Egypt has been using its Egyptian Church leaders to paralyze and discourage any development of hydraulic culture and hydraulic agriculture in Ethiopia. To substantiate this popular claim, proponents of this notion present three connected cases: 1) the Ethiopian Orthodox Church which has been the dominant and single religious and political center of the country(until 1974) had been ruled by Egyptian Archbishops appointed by Alexandria since its foundation in the 4th century up until 1959 a complete autonomy was gained; 2) The culture inculcated by the church regarding the use of water for development for so long was not a sharing of the hydraulic agriculture techniques which the Egyptian bishops were very much aware of, rather the opposite. 3) The accusations of Egyptian Coptic refugees who fled to Ethiopia by Egyptian leaders for their possible involvement in implementing irrigation techniques in Ethiopia indicate that the activities of the

refugees were monitored by the bishops. Opponents of this notion dismiss the case by arguing that Ethiopia never needed the hydraulic agriculture due to its reasonably dependable highland weather. However, for so long as the recorded stories of conflicts between the two nations goes, the water agenda claims the central position (see Arsano 2007, Elrich 1994, Elrich and Gershoni 2000). In a parallel account, both maneuvering natural water flows and digging the ground for water and using large water bodies were considered the work of the devil by the culture induced by the church which had been ruled from Egypt. Such oppositions were noticed from the church in the 19th century against King Minilik II in his attempt to install piped water and even further back when reformed monks in the 13th and 14th century tried to experiment on hydraulic techniques (Haile 2006) (see 3.3 for further relation with religious perception of water).

Land tenure and development policies: It is plausible to think that successive Land tenure systems in Ethiopia have contribution for the low level urbanization of the country in general and for the lack of an urban tradition which could make use of water bodies in particular. The Ethiopian empire (referring to the pre-1974 regime) accommodated a land tenure system that is described as one of the most complex compilations of different land use systems in Africa (Joireman 2000 quoted in Crewett, Bogale and Korf 2008). According to many critics, these land rights - including the post 1974 regimes - have been referred to as tightly linked with the exercise of power over the rural peasantry (see Crewett & Korf 2008, Rahmato 2004) which neither allowed the peasantry to exercise its free will to search for a better life in cities – discouraging urbanization – nor allowed it to fully engage with the land to maximize productivity through a more long-lasting investment (Rahmato 2009) like irrigation, soil and water management techniques. Particular to the post 1974 tenure regime, which is characterized by state ownership, both opponents and proponents of this regime agree that the system has played significant role in slowing down urbanization by tying farmers on the rural land (Adal 2001, 2002; Jemma, 2001 in Crewett & Korf 2008). Accordingly, development directions adapted at least in the last three political regimes share the same orientation of a strong affiliation to the countryside (Rahmato 2009) founded on agrarian economy which has little regard to urbanization in general and the appropriation of surface waters for production and habitations in particular. Various discussions with farmers on sites near water bodies, both in emerging settlements and in cities, confirmed the same.⁴ Prior to the 1975 nationalization, sites which are currently appropriated by informal development on the study sites, used to be owned by aristocratic families who reserved it for forest land. After nationalization, these sites either fell under direct state ownership or distributed to peasant associations and latter redistributed to individual small hold farmers. In all cases the land - water relationship remained largely unproductive. The following table reviews the different political regimes and the effect of their policies on urbanization around water bodies.

Political Regime	Broad Economic Policies	Major policies and their effect on agriculture and land	Implication on urbanization around water bodies
Monarchic Regime (1950- 1974)	Stimulating agricultural growth and promoting change in peasant agronomy Policies favours landlords and capitalist farmers (market economy)	>In the south, land equally distributed between churches, state, and local people. Granted more land to military and coup sympathizers; >Communal lands non-transferable >Promotion of Large and privileged farms in the 60ies.(both private and state farms) >Farmer's rent as high as 50 percent of the produce	>Land around water bodies was under church and aristocrats, >irrigation around water bodies flourished for a brief moment >new towns around water bodies flourished due to irrigation projects, power plants, etc.
Military Regime (1974- 1991)	Aligned with the Eastern Political block(Ally with Soviet Socialist Republic); and adopted command economy (central planning policies)	>Land reform: nationalization of private and church properties >Labor sales and mobility prohibited >Fertilizer import, distribution, and pricing controlled by government in 1984 >Agricultural inputs distribution controlled by public enterprises >No tariffs on import of agricultural inputs, but high tariffs on others >Cooperatives favored in terms of access to inputs and land.	>No commercial irrigation projects, >Few government irrigation projects which led into few settlements around water, >Controlled movement of people and farmers, Farmers can't leave associations,
Current regime (1991- present)	>Agricultural Development Led Industrialization (ADLI) was announced in 1992 >Political decentralization in 1992 >In 2002,Sustainable Poverty Reduction Strategy (PRSP) was introduced, >In 2010, Growth and Transformation Plan(GTP) launched	>Agricultural input market liberalized in 1992, while land remained public in the hands of the Government (no sale or exchange except lease and rent); >Agricultural input marketing is dominated by a few types of inputs; fertilizer and seed, still dominated by government or leading party affiliated enterprises (endowments) >promotion of commercial farming through land leasing >opening for international market by provision of large amount of irrigable land through lease	<i>Further discussion on table 4</i>

Table 3.1 Political regimes and major policies related to urbanization around water bodies

Trade and manufacturing: without question, Aksumite civilization was an urban civilization characterized by trade and manufacturing. The striving urban civilization of the Aksumite - exposed to extreme forms of aggressions and natural disasters, which made it to buckle, was replaced by a dominantly rural organization which pulled it into a verge of extinction and utter poverty. When the urban civilization was (terminated), so was the striving trade and craftsmanship and hence the processes of development. Cities are primary organs for both economic and cultural development. It is in cities that new goods and services are first created and hence trade (exchange) and manufacturing are the main foundational activities in cities (Jacobs, J. 1969:6). The long historical procession of the Ethiopian civilization - from an urban to a dominantly rural organization - can be taken as an exemplary case for Jane Jacobian '*cities first*' explanation of the correlation between cities and development. As explained by Jacobs, with empirical observations through history, rural and agricultural productivity follow the growth of cities (ibid:7).

The development of cities, hence trade and manufacturing, entails the demand and increase in the appropriation of water bodies. Cities ('ketemas') - created on the basis of encampments of kings - were primarily political centers based on taxations of the local peasant population. Having no permanent population (fluctuating with the seasons), and being neither a centre of handicrafts nor trade, the demand for natural resources in cities of Ethiopia ('ketemas') were limited to daily consumption - wood (for fuel and construction) and water (for drinking and hygiene). Consequently maximizing agricultural productivity through irrigation and adding values through handicraft could not hold roots. Donald Crummy argued that in the long and continuous dynasty of the Ethiopian empire, prominent cities after the fall of Aksum - like Lalibella and Gonder - earned their importance for their associations with royalty and the church rather than trade and handicraft (Crummy 2000:74, also see Pankhurst 1982, 1985 for roles of towns since the Middle Ages). However, why as in the case of medieval Europe or other civilizations, the religious and monarch establishments of Ethiopia failed to support the growth of trade and handicraft is the question which has to be further researched.

Market and Dietary habits: the dietary habits of the majority of Ethiopian population, which is directly related to altitude among many other factors (Woldemariam 1986:3, 15), though diverse and complex, is based predominantly on cereals and plants domesticated on the highland (Jared Diamonds 1997:386). The most important basic food crops - Teff, Wheat, Maize, Barley, Sorghum, Millet and Inset (ibid) - have been produced based on relatively consistent seasonal rain without a need to develop irrigation. Observation on current practices and interviews (made for the research with farmers with plot of land near water bodies) confirm that the seasonal rain had been dependable, easier and cheaper for the major cereal crops and prefer to use irrigation only as a supplement to produce vegetables. However, these farmers have also indicated that the absence of market for vegetables and fruits has been one of the major reasons not to further the production of irrigation friendly products (vegetables and fruits). Furthermore, the lack of storage facilities and infrastructure to transport products to main cities were also indicated as additional reasons for the underdevelopment of irrigation and water management techniques, therefore less use of water bodies.

3.3 Socio-cultural and religious norms

For more than 1600 years, the church has been a dominant center in Ethiopian social, economic and political organization (see Tamirat 1970). Due to its link with the 'divinely ordained' Solomonic monarchy, Christianity inevitably was the core world-view of the political elite and a defining element of nationhood in a historical sense. Islamic tradition has also been dominant in the low lands of the country as well as the neighboring nations since its dawn in the neighboring Arabian land. On the mainland, Islamic Sultanates were founded from the twelfth Century, and their rulers paid tribute to the Ethiopian kings, who since ancient times had claimed sovereignty over the lands up to the coast (Annink 1998, also see Erlich 1994). Even though Ethiopian Christianity focused particularly on monasteries usually situated on higher

grounds rather than urban cathedrals (Freund 2007), its role in shaping the cultural landscape of both the urban and the rural settlements is indisputable. Coupled with other localized traditions and customs, religious norms have played a significant role in controlling the possible expansion of urbanization and appropriation of water bodies. The following points indicate the same:

The culture of craftsmanship and trade: the absence of trade and manufacturing from urban centers in Ethiopia cannot be totally explained only through the political economy of the monarch system which was based on taxation. The association of manufacturing, artisanship and technology with witchcraft and 'evil'-spell have been the longstanding dominant cultural and religious norm in Ethiopia (see also Haile 2011, Zegeye and Helawi 2012, Kebede 1999). Many early 'modernizers' in Ethiopia have noted the open antagonism between the deeply traditional norms and modernization attempts in the early 20th century (see Zewdie 2000, 2002, Kebede 1999). The conflict between development proponent emperors against the conservative religious establishment - particularly Emperor Tewodros and Emperor Menilik II of the 19th century - is a common tale in Ethiopia. Associating crafts with evil spirits could still be observed through the spatial segregation of artisans and craftsmen particularly in small urban centers in highland Ethiopia (Heldman 1998). Trade and any idea of making money (generating profit) had been largely related to greed and worldliness (see Kebede 1999). For its own survival, the dominant religious establishment of the Christian highland which was unfriendly for trade and craftsmanship needed to be supplemented, though in a limited manner, by Muslims who introduced trade in and markets for new products, serving as pioneers intensifying trans-national commercial trade relations with countries outside Ethiopia, and also in common elements in the underlying cultural fabric of Ethiopian societies (Abbink 1998). Thus, it is plausible to assume that such cultural climate, which disfavors the most important engines of urban development - trade and manufacturing - has been one of the fundamental reasons for the sluggishness of urbanization. This can also be considered as a reason for the lack of an urban tradition which could enable an appropriation of natural resources (like water bodies) for value addition and the improvement of conditions of life.

Water bodies - holy for God: From a cultural and religious perspective, the understanding and conceptualization of water is as wide and varied as the waters themselves, which give a rich base from which metaphors, metonymies and reveries can express social matters or aspects of life (Tvedt & Oestigaard 2007). Though the contribution of churches for urbanization in Ethiopia needs further investigation, in both urban areas and rural settlements churches claim the most captivating natural objects - commanding locations, important water bodies and water sources (springs). Moreover, as indicated earlier, following the devastating religious civil wars of the Middle Ages, many islands and peninsulas in major lakes were used as safe places to hide church and palace treasures. Since then, these sites remained sacred sites reserved for monastic and church activities. In these areas cultivation and manufacturing activities are largely prohibited saving limited activities by monks and nuns. Observations on islands and peninsulas in Lake Zeway, Lake Tana, and Lake Wonchi confirmed that the longstanding culture of consecrating waters and sites around water bodies determines land use of the area. Discussions with priests and monks⁵ have confirmed that some water bodies and land within and around them are consecrated as holy where toiling and laboring for survival is restricted to only collecting the fruit of nature itself (collecting what nature gives) than maneuvering nature by

'toiling the soil' or 'exploiting the water' other than the modest need of the monastic life. The Zege peninsula in Lake Tana was noted as an example where agricultural activity is prohibited.

Other than the prominent church which dominated the highland culture, other dominant religious and cultural practices also claim water bodies as sacred. Lake Awassa in the south is a sacred site for Sidamma cultural and religious festivities and Lakes in Bishoftu are sacred sites for the most important Oromo religious festival and cultural event – 'Irrecha'.

Water bodies - controlled by the devil: Parallel to the belief in the sanctity of water bodies, the widespread belief which attaches water bodies with bad spirits can also be taken as one of the reasons for the ambivalent relationship between settlements and surface water bodies. The devastating forces of water bodies and the wild nature of its surroundings, which usually is claimed by outlaws ('Shiftas') and wild beasts, are referred to by current inhabitants for the development of fear and the association of the devil with such sites. The closer look into expressions in traditional and folk songs and prose reveals the same. According to Bairu Tefla, traditional Amharic songs and prose largely depict water bodies as places of bad spirits and death (Tefla 2000). Moreover, people who prefer to stay near water were regarded as lower classes or migrants. Examples are Woyto and Shenash people, who lived around Lake Tana and along the Nile river banks respectively, were believed to come from Egypt and Sudan on account of famine (see Yakob 2007, Tefla 2000). In Zeway the author witnessed the same classification of town inhabitants with social class. Recent interviews (2013/14) made with senior inhabitants in Batu Town (formerly known as Zeway) confirmed that people living near water were either homeless or those who are considered to have bad spirits. However, some argue that such groups are attracted to these sites due to the availability of free land ('bahirshesh mereat') for building shacks and cultivating vegetables without being bothered by the state or landlords. Others also mention the presence of churches in these sites which attracts the poor who are in search of donation from parishioners.

The contrasting functions of water bodies - as an abode of good and evil spirits – is best noted by Yakob Arsano quoting Virginia Morell:

Even today the river is given spiritual reverence, and belief in its healing powers is as strong. For instance, Virginia Morell more recently witnessed that "sacrifices and gifts are given to the springs of the Ghishe Abbay" (the source of Abbay discharging itself into the Lake Tana) (Morell, 2001: 26). For the local community, offering sacrifices to the spirits of the Abbay, known as Ghion (great spirits), is a tradition handed down from ancient times. The advent of the Ethiopian Orthodox Christianity to the area has not changed the attitude of the local inhabitants and their belief system and practice of reverence to the spirit of the source of the great river. The priests of Saint Mikael Church at Ghishe Abbay, for example, use the water as "tabal" (healing water). The clergy of the Church ritually pour the water on the faithful, having seated them nude (Morell, 2001: 88). The essence of the healing power and reverence to the river have transcended from old pre-Christian to the Christian belief system. Thus myth and poetry are reflected in the everyday experience of joy and suffering on the banks of the Nile. (Yakob 2004:72)

The author – being raised near water body and after a repeated visits and discussions with inhabitants - agrees with the note of Tom Boylston about Tana:

...At night the lake becomes the locus of threatening spiritual presence. I have often been told that people do not approach the lake at night, partly because it is dangerous and partly because anyone found to be doing so would be immediately suspected of sorcery, conducting illicit relations with spirits. In this part of Ethiopia the term Jinn refers specifically to harmful water dwelling spirits that certain sorcerers can manipulate. Just before New Year, by contrast, the entire lake becomes holy and so takes on the curative and restorative powers of any other holy water. It therefore becomes a focal point for the community in the run up to New year and its widespread symbolism of cleansing and renewal..... (Boylston 2012:61).

Conclusion:

The unique setting of Ethiopian urbanization pattern, which has been avoiding water bodies and deltas, challenges our common understanding of the history and norms of urbanization. Its uniqueness is embedded within the complex interplay of the above discussed forces which obviously would assume varied degrees of intensity in various period of the long history of the country. However, in any of the possible constellation and intensities that the variables have had, the product had been consistent – a settlement pattern and urban centers dominantly concentrated above the mid highland.

A possible breakup from such a strong norm – a norm which has sustained a long period of time - indicates a significant change within the forces which produced it. The next chapter, in an attempt to substantiate the hypothesis of emerging change in Ethiopian urbanization pattern, traces changes within the forces discussed above.

Notes

1. Interviews and various focus group discussions were made with scholars, senior citizens in 2011,2012 and 2013 on the logic of the locations of cities in Ethiopia
2. Discussions were made with 6 elders (residents near Lake Zeway – 4 of them active farmers) and 4 elders (residences and community leaders of the lake shore informal settlement) in Bahr Dar – see appendix for further reference on the discussion points
3. Villagization program was a government initiated resettlement program – see part II chapter 5
4. Discussion held with farmers near Lake Zeway and Lake Tana shows that it was not possible for them to try to move to cities because they neither can mortgage nor sale the land. According to them if once they abandon the land and move to cities they might lose their use-right once and for all. However, they all have similar position when it comes to their children. They want them to go to cities and pick another trade than agriculture. But again, due to a very slim chance of making life work in cities, they tend to send one or two of their kids (usually sons) to cities.
5. Discussions with priests and monks about holy water bodies were done in 2012 and 2013 in monasteries and churches in islands in Lake Tana and Zeway.

Chapter 4

Precursors of Change in Ethiopian Urbanization Patterns

Changes within the forces which determines urbanization pattern in Ethiopia

The ecosystem of the highlands with their fertile soil; relatively regular seasonal rain and reliable water sources (springs and brooks); favorable climate for farming; and relatively secured from malaria, tsetse and foreign aggression, have supported the farming population of the country for thousands of years. The nature and function of these conditions which determined the pattern of the highland settlement has been changing through the years. When these changes reached a critical point, they will cause a major shift in the way societies are organized in space and time. Tracing these changes - which have been occurring within the major conditions that determine settlement patterns in Ethiopia – is believed to demonstrate the causes of the emerging change in the pattern of urbanization in the country. However, this chapter focuses particularly on those changes which are correlated to the emergence of two unprecedented phenomena redefining Ethiopian settlement pattern, namely 1) rapid urbanization and 2) the new and unprecedented contest for the use of water bodies and the areas around them for habitation and production – in other words - rapid urbanization around water bodies.

Though diverse local and global factors are intertwined together in generating change in settlement pattern and rate of urbanization in Ethiopia, the staggering population growth coupled with the diminishing resources - such as fertile land and water - can be referred as the fundamental force. The phenomena of rapid population growth within a degrading natural environment itself calls for closer investigation, nevertheless, referring to the data of population growth discussed below, the emerging spatial reorganization and urbanization of the country can only be referred as late. Since the infamous famine of the 1970s was broadcasted worldwide, Ethiopia is known as a land of severe draught, recurrent famine and environmental degradation. As declared as the worst degraded area in the world (FAO1986), the highlands are challenged to support the ever increasing population. Environmental changes induced from both global and local forces coupled with population growth, political instability and policy failures are indicated as causes for the recurrent disasters. These changes imply a forced spatial reorganization of societies by challenging the foundations of the age long highland based settlement patterns. However, this study needs to limit itself into only tracing the changes within the forces which determines urbanization patterns and avoid the temptation of trying to answer why the changes have happened and are happening. For example, it takes *the growth in*

population as a change within the factors which determined settlement pattern than asking why the growth itself happened. Such investigations are indeed necessary for a wider and deeper understanding of the phenomena of change but the setting and limitations of this research could not be extended to investigate such questions. However, references are made to related studies when explanations are needed. Understanding changes within the major factors (following the discussion in chapter 3) will also help us to understand the tensions within the emerging change and establish a basis in order to project future orientations.

4.1. Change in Environmental and geographic conditions

Diminishing resources and growing population: Highly agrarian and densely populated - relative to its fragile natural resource base - Ethiopia appears to be a modern embodiment of the Malthusian prediction that unchecked fertility rates amid fixed land and water resources will lead to periodic famines (Headey et al. 2013). The stable availability of wood, water and fertile soil on the highlands is seriously devastated by natural and man-made calamities. Deforestation has been a defining phenomenon of the highland region for considerable length of time - losing an estimated forest area of up to 140 000 hectares each year (FRA, 2005). It has caused extended erosion of top soil and the loss of water sources (springs and smaller rivers). The ever increasing deforestation, soil erosion and associated problems of decline in soil fertility and loss of biodiversity have resulted in making livelihood improvement a very challenging task to countries like Ethiopia that are highly dependent on agriculture and natural resource product (Bekele 2008). Moreover, the consistent population growth without diversification of livelihoods is a formidable force to push the peasantry out from the overused highland sites. Both the 1984 (the first census) and the 1994 census reveal similar population growth rate, spatial distribution, and age structure. In both cases, the finding was a population growing at 2.9% per year, with a pyramidal structure (over 46/48 % population below 15 years of age) indicating high dependency ratio, high reproductive potential and hence high growth rate. Moreover the overwhelming proportion was rural concentrating on higher elevations - 77% above 1800m.a.s.l. (CSA 1984,1999, Rahmato 2008). The recent data shows that while the annual national population growth is 2.7%, the urban population grew with more than 5%. Referring to the general population, Ethiopia's population has quadrupled in the last 50 years from 18.4 million in 1950 to 82.8million in 2009 and projected to cross 150 million in just 30 years (DESA 2009). For a family of 7, the average farm land size in Ethiopia has decreased to 0.5 hectare in 2000(CSA 2009). Each year, the number of people increases, but the amount of natural resources with which to sustain this population, to improve the quality of lives and to eliminate poverty remain finite (WCED 1987) and to the worst diminish, complicating the challenge of sustainable development.

Demographic change is the major driver of land cover change: its primary and most direct impact is through opening new land for agricultural, settlement and infrastructural development (UN Millennium Project 2005a). Such a geometric growth of population and depletion of resources leaves no other chance than either to further intensify agriculture on the highland or a

resurgence of contest for fertile and water rich sites. Desalegn Rahmato quoting works of Jackson and his associates (Jackson et al. 1969) and Noel Cossins (1974) strongly argues that the peasants in these difficult highlands have exhausted their options (Rahmato 2008:31). Be it intensification or change in crops, almost all of their adaptive skills are tested with a density of more than 300-400 households per square kilometer in areas of the central and northern highlands which is increasingly fragile and inhospitable.

Climate and Disease pattern: Malaria is ranked as the leading communicable disease in Ethiopia ravaging inhabitants in low lands and marshy areas. It was among the ten leading causes of inpatient deaths among children less than five years of age. According to the FMOH, malaria was the leading cause of outpatient visits and health facility admissions in 2009/2010, accounting for 14% of reported outpatient visits and nearly 9% of admissions (MOH 2014). It was observed in visited sites around lakes that the annoyance of mosquitoes and other insects is a common challenge that settlements around still-water bodies (lakes, reservoirs and deltas with wet lands) have to struggle with. However, discussions with inhabitants and experts both at the Federal Ministry of Health and local health posts reveal that the routine of precautions is becoming manageable with the increasing accessibility of support systems to the remote parts of the country. The growth in awareness and expansion of the health service (ibid) are making the threat manageable. It is reported that the percentage of households in malaria prone areas with insecticide treated bed nets have already reached 100% (MOFED 2010:37).

Altitude and climate (rainfall and temperature) are the most important determinants of malaria transmission in Ethiopia. Current reports indicate that the altitudinal barriers are challenged showing a gradual expansion to areas and altitudes which used to be referred to as malaria free. Studies related to malaria prevalence and climate change indicate that the risk level to the traditional malaria free Ethiopian highlands is increasing (Alemu et al. 2014, Lindsay & Martens 1998, Nuwer 2014). This is attributed to the changing conditions of various factors which affect the breeding conditions of the vector insect (Mosquito). Currently, approximately 68% of the population of Ethiopia lives in areas at risk of malaria, from which the majority used to be malaria free. Being malaria free as a quality which distinguishes Ethiopian highlands from lowland is increasingly challenged.

The control of malaria in Ethiopia has a history of more than four decades. Initially malaria control began as pilot control project in the 1950's and then it was launched a national eradication campaign in the 60's followed by a control strategy in the 70's and evolved to the present day into a coordination of various partners into the fight against the disease (WHO 2014). According to WHO and FMOH, the opening up of the fertile arable lowlands and major river valleys for expanded agriculture and settlement, rapid growth of many urban centers and the general population increase are directly attributed to the achievements of the sustained and effective prevention programs by the government through the years which extends since the 1950ies. World Health Organization (WHO) has reported that Ethiopia is striving to achieve the Millennium Development Goals (MDG) in HIV/AIDS and Malaria prevention (UN 2013).

On the other hand, the hostile climatic condition of the low lands is matched with supporting technological inputs which are increasingly available. It was possible to observe that many buildings in emerging lowland cities (Semera, Arba Minch, Awassa, Awash, etc.) have installed artificial air conditioning systems. The economic and political interests created in these areas have forced inhabitants to explore alternatives in order to adapt the difficult climatic conditions.

Topography: Ethiopian highlands make up 60% of all highlands in East Africa, which is the home of 82.4% of all African highlands (Hurni 1990). Even though Ethiopian farming communities who have lived for centuries have developed methods to exploit the potentials of the highland to its limits through various traditional methods of intensifying agriculture and techniques of working on difficult topography, the challenge from the increasing density of rural population and the fragility of the environment is also deepening. Moreover, in most of the highlands, large river-ways are characterized by deep gorges which make it too difficult to be appropriated for hydraulic agriculture or habitation.

Even though these gorges of river ways are dangerously deep and water flows are rough for agricultural uses, new functions are emerging which can make use of the geography. Ethiopian government, in its GTP claimed to tap the hydropower generation potential of the country (MOFED 2010) – to which the country is referred to have one of the largest potential in Africa. Moreover, the booming tourism industry sees the natural water-cut landscape as resource to be explored. In both cases, the potential of otherwise neglected and difficult geography of water ways of the highlands are being rediscovered¹. On the other hands, the low lands - where water flow slows down, in addition to being disease ridden, are also prone to seasonal flooding. The availability of affordable mechanisms to control the dangers and develop the resources has started to make these sites the most sought after locations for large scale and small scale irrigation projects which in turn can be taken as a heralding of urbanization. Areas around water bodies in both lowland and highland are opening for utilization with their challenging topographic features finding ways to be transformed into advantages.

4.2. Change in socio-political forces and economic structures

Political stability and new organizational apparatus: Though many of the southern towns ('*ketema*') of Ethiopia were created with the same logic of military strategy by Minilik's army (see Pankhurst 1986), the centralization and stability of the kingdom by the end of the 19th century - after the battle of Adwa - heralded the beginning of the end of the camping capitals (*medina*) (see also Pankhurst 1985). It also signaled the emergence of a regional power which could effectively negotiate with neighboring principalities on territorial and resource conflicts - changing orientations into development of trade and infrastructure. After the establishment of Addis Ababa, the reinforcement of the central government through regional administrative systems and the beginning of the development of infrastructure of communication replaced the moving court and give way for a new urban scheme. Regional capitals and trade posts grew following the new administrative system and infrastructure lines of the then Empire. Addis Ababa became the last camping city.

Within this imperial regime, even though water bodies did not fall on spotlight for long, the brief development activity of the 1960s, which favored large scale commercial agriculture, opened doors for a brief moment to explore potentials of large water bodies (until 1974 revolution). The revolution and the civil war, which got intensified after the revolution and continued until 1991AD, disrupted the notion of political stability within the country, hence castrating any possible development endeavors. State farms and irrigation projects around large surface waters could hardly operate leave alone instigate urbanization or vitality for the surrounding rural villages. In this period, government initiatives to use water resources for hydraulic agriculture, energy infrastructure or urbanization were paralyzed by the lack of political stability.

The current relative political stability - particularly after the Ethio-Eritrean war which ended in 2000AD – can be referred as the corner stone for the sustained economic growth in the last 10 years. Moreover the decentralization through the federal administrative structure has also opened more opportunity for regional states to explore local potentials of their own natural resources particularly areas around water bodies within their boundaries. Cities on Lake Shores became strategic political centers. Accordingly - Bahr Dar, Awassa and Gambella, which are located on the shore of Lake Tana, Lake Awassa and on the bank of river Baro respectively, became regional state capitals, exposing the water bodies to wider uses of tourism, industrial activities and horticulture.

Considering the increasing desertification and temperature rise in the region, the importance of water bodies as an economic asset have become more pronounced on the entire region of North East Africa - claiming its traditional role of being the main political currency. Despite the longstanding hydro-political differences which continued to cast its shadow in the regional fragile political stability, the current Ethiopian government has steadfastly continued to develop its water resources to explore the long held potential. The ongoing political confrontation between Ethiopia and Egypt over the Grand Renaissance Dam (GERD) of Ethiopia and opposition over the Omo River dams (Gibe I, II&III) from the neighboring Kenya, however, are increasingly dealt with political negotiations targeting mutual benefits than armed conflicts. Such relative stability has increased the possibilities of water bodies to become more of a center of development. The large scale hydroelectric generation and massive irrigation projects are indications of the notion which also signify the potential of the creation of settlements around surface water bodies in considerable size and number.

In a parallel account, the instability of the whole region of North east Africa is impacting on the way human settlement in general and urban development in particular are organized around water bodies in Ethiopian. In 2014, Ethiopia has overtaken Kenya to become the largest refugee-hosting country in Africa, sheltering 629,718 refugees as of the end of July 2014. There are at present 247,000 South Sudanese refugees in the country, making them the largest refugee population. They are followed by Somalis (245,000) and Eritreans (99,000). Over the last seven months, nearly 15,000 Eritreans and more than 3,000 Somalis also arrived in Ethiopia (UNHCR 2014) running away from civil war and repressive governments. Most of the refugee camps are more than 20 years old and functioning as towns in their own rights – often referred as ‘refugee cities’. For the sake of practicality, such huge refugee cities are usually

established near river. (see figure 26 for the pattern of locations of serious of refugee camps for Somali refugees in relation to river Genale – a major river on the region.)

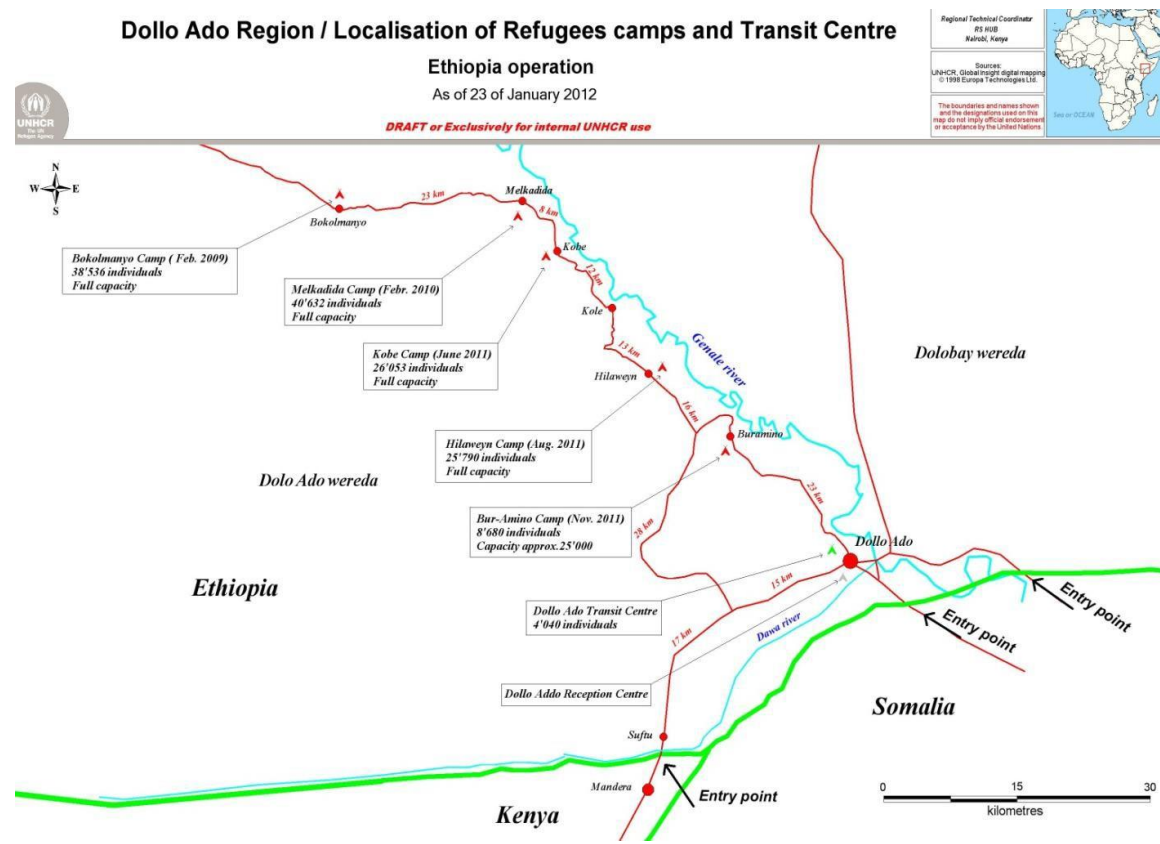


Fig.4.1. Refugee camps with semi-permanent structures along river Genale (source: UNHCR 2012)

Policies related to land and development: The subsequent changes of policies due to the 1974 revolution and 1975 land reform, which nationalized all land, and the 1991 regime change, which introduced ethnic federalism, created a new social and economic landscape throughout the country. The 1975 land reform obviously shunned down the mushrooming commercial agriculture which used to fuel the use of large water bodies and the creation of related urban and semi-urban settlements. Development policies in Ethiopia since 1950s generally target agriculture and rural development. The usual justification was that the country's chief and abundant resource are land and labor and that the great majority of people live in the rural areas and are agriculturalists. Within agriculture, the policy developed in the 1990ies focus predominantly on crop production of smallholder farms targeting on self-sufficiency in food. Industry and service were given limited attention and only a slight mention of urbanization. However, consecutive programs and policies have shown increase in covering other aspects of the peasant economy with extended areas of education and training, water harvesting and irrigation, marketing and micro financing and also restructuring cooperatives for collective actions (MOFED 2005). Consecutive policies and programs have shown increasing inclination to bridge the gap with other neglected sectors. The second poverty reduction program document, PASDEP (whose coverage extends from 2005/06 to 2009/10) shows a clear attempt to pick up the issue. It states that while the focus of much pro-poor development must inevitably

remain rural-based, urban development will play a more central role. The document goes on to note that the government is planning major investment in the urban areas to improve roads, markets, power, water supply and housing. Job creation schemes and support for small and micro enterprise are part of the new emphasis on urban development (MOFED 2006:161-162 quoted on Rahmato 2008). In attempt to improve living standards, community development and enable better access to basic services, the government has also planned to establish development villages (a massive program of villagization) with model villages envisaged to be built in all major regional states. Such programs indicate both the instigation of urbanization and the attempt to exploit arable lands with enough moisture (lowlands and water shed areas).

In a more pronounced step, the 2010 document of MOFED, which stated the GTP (Growth and Transformation Plan covering 2010/11 – 2014/15), aims at industrialization through the transformation of agriculture. Even if urbanization was still not taken as a major sector, the massive industrial and infrastructural projects with a committed promotion for commercial agriculture and urban infrastructure development can be taken as clear precursors to open a way for massive urbanization processes. Water bodies, on the other hands, are marked as crucial resources for strategic irrigation and heavy hydropower generation projects which also entails urban and semi-urban settlements. In its section which deals with Agriculture, the GTP document states:

In addition to promote multiple cropping, better adaptation to climate variability and ensure food security, the GTP will intensify use of the country's water and natural resources. Expansion of small scale irrigation schemes will be given priority, while attention will also be given to medium and large scale irrigation. Concerted effort will be made to expand water shade management and to carry out effective water and moisture retaining works. (MOFED 2010:23)

Despite the fact that the GTP document shies away from the concept of urbanization, it is possible to notice that all other recent development policies and the GTP itself encourage mobilization of people for resettlement with large scale spatial reorganization; infrastructure development for transportation and energy; diversification of economy by encouraging industrialization and large scale commercial agriculture indicate nothing other than urbanization. Moreover, the attempt to resettle people from dry and over-used areas to humid areas and the massive water related projects are elements which unprecedentedly pointing to urbanization of areas around water. The GTP plans to increase the percentage of land developed for medium and large scale irrigation projects from 2.5% in 2009/10 to 15% in 2014/15 (MOFED 2010:36). (The implementations of these plans are further explored in the next chapter).

Focusing on policies related to only land, many critics relate the infamous Ethiopian recurrent famine and utter rural poverty with land policies. Dessalegn Rahmato, the most quoted scholar on land and environmental policies in Ethiopia, revises the experiments of the last half century on rural development as follows:

After more than fifty years of programs of 'rural development' and considerable outlay of resources, and despite the change of governments and development ideologies, Ethiopian peasants are, in many ways, not much better off today than they were at the

beginning of the 1950s. True, there is a limited network of rural roads, some modern transportation, expanding education and health services in scattered villages, but the benefits of these pale into insignificance besides the colossal suffering endured by rural society during this half century. There have been five virulent famines, several silent ones, and numerous rural pandemics in these years in which perhaps up to two million people may have perished. Every year since the mid-1970s millions of peasants are officially declared to be facing hunger and recurrent mass starvation is avoided only because of emergency assistance provided by foreign donors. The country as a whole, and the countryside in particular, has become a museum of diseases, and millions of peasants suffer from malaria and cholera outbreaks, and the AIDS pandemics. All comparative measures of well-being employed by international agencies ...indicate the condition in rural Ethiopia are truly appalling, perhaps the worst in Africa. Independent assessments show that more than half the rural population lives in grinding poverty, with about a third considered destitute and standing on the edge of the abyss. Over these years, the loss of natural resources through soil erosion, deforestation, and other forms of environmental degradation, has gone on unchecked and on a massive scale. In brief, the last half-century has been a time of misery and unmitigated suffering for rural people. (Rahmato 2009:24)

Though land remained under state ownership in the post 1991 renewed tenure regime and the condition of the rural peasantry could not be improved as required, the policy which was adapted later to encourage investment allowed land leasing for private commercial agriculture. Total transfers from the late 1990s to the end of 2008 to both domestic and foreign investors reaches almost 3.5 million hectares according to the database compiled by MOARD (Rahmato 2011). The GTP has a target to avail more than 3 million hectares additional land for leasing for commercial farming in its time frame, the majority of irrigable lands being located in the low lands (MOFED 2010). In many of these appropriations, water bodies are the center of negotiations and are expected to reproduce water related semi-urban settlements. Moreover, industrial and service sectors have also targeted areas with open water source. While deltas and river waters are primarily targeted for commercial agriculture, lake shores are claimed for resort development. However, the majority of peasantry, who lives in central and northern highlands, is not in any way capable to compete for such resource rich sites. Unless a radical change occurs, the existing land tenure coupled with the fragile environment of the highlands leaves no other option for the peasantry than either the usual seasonal migration to cities when his fragmented and poorly serviced land is hit by the recurrent draught or informally appropriate sites with fertile soil and water.

On a more personal account, the author, as a participant, has witnessed the impact of land policies favoring investments on development projects around water bodies particularly since 2004/05. As an architect he has been involved in projects in both resort developments around Lakes and rivers and on housing scheme development for commercial farms around water bodies in various parts of Ethiopia. To name the few: the settlement scheme study for flower farm workers near the Koka reservoir and Koka River where at least 5 large private flower farms were active, which in its first phase, aimed to establish a semi-urban neighborhood around the river for hundreds of workers mobilized from the surrounding villages and small towns; and

resort development projects on the shores of Lake Langano, Lake Chamo, Lake Abyata, River Dedessa and River Nile. Some of these projects are being realized with an observable impact on the surrounding rural villages and water bodies. Similar commercial agricultural developments primarily by foreign investors have been also observed around Lake Zeway and Lake Tana attracting hundreds and thousands of young people.

Aspect of Land Tenure Policy	What the Law Says		Possible implication on urbanization around water-bodies
	Federal	State	
Acquisition of Land			
Ways to Acquire Land	-distribution, redistribution, donation, inheritance for farmers; investors can lease/rent	-not regulated by state	> creates competition for areas around water bodies among investors
Time Limit Size limit	-only investors have a time limit -Size Limit -farm plots must be at least a certain size	-not regulated by state -states and regions decide the minimum size (distinguished by irrigation status)	>encourages informal development around water bodies >Discourages possible entrepreneurship in areas defined as rural.
Residency Requirements	-no residency requirement: government proclamation applies to ANY rural land	-must be a rural resident of the region to receive rural land for free (contradicts federal law)	
Regional Differences		-"rural" residency requirement Somewhat relaxed in Amhara	
Transfers			>Restrict land use change
Permissible Transfers -	inheritance, donation to family, rent/lease to other farmers	-not regulated by state	>Transfer and rent is overseen by government (as observed on site)
Rent/Lease Restrictions	-only to other farmers/investors (rural or urban) willing to engage in agriculture, and for fixed period	-states decide on the time limit for rent/lease, and size of plot (varies by region); some states stipulate permissible use of rented land	
Acquisition of Land			Restrict land use change, discourages entrepreneurship,
Inheritance Restrictions	-inheritor must be regional resident, willing to engage in agriculture, and minimum size requirement must be enforced; in case of divorce, the land holder cannot transfer land if she/he earns more than the minimum salary of government employee; other than divorce, inheritance only applies upon death of land holder	-minimum plot size is dictated by irrigation status; rural residency requirement varies at state level for inheritance	
Donation Restrictions	-recipient must be regional resident and family member, willing to engage in agriculture	-rural residency requirement varies at state level for donation	
Redistribution and Consolidation			
Criteria	-only upon community agreement, except for irrigable land	-not regulated by state	
Size Requirement	-redistributed land must meet minimum size requirement	-states determine minimum size	
Consolidation	-land consolidation is "encouraged"		
Loss of Land Holding Rights: Results from failure to use and protect the land			>Restricts land in rural areas (around water bodies) to be used only for agriculture >Forces farmers to use land irrespective of condition on the ground, leaves no room for alternative use of land
Criteria	-federal provision exists for loss of land rights due to non-use or lack of protection; states decide the conditions	-states determine the specific Conditions -leaving land unused 1-3 years (varies) -non-farming activity/ income	

Table 4.1 Overview of current land tenure regime in Ethiopia and possible implication on urbanization around water-bodies. Source: Partly adapted from Zewdu, G. and Malek, M. (2010)

Considering the relationship between commercial agriculture, water bodies and urbanization, the current development can be comparable to the 1960s. In the period of 1960s to early 1970s mechanized large scale agriculture mushroomed on fertile Rift valley and Awash river Valley through both rain fed and irrigation agriculture (see Rahmato 2009). Coupled with the development of transport infrastructure, small towns associated with water bodies mushroomed – Meqi, Zeway, Awassa, Arba Minch, Wonji, Koka, Metehara, etc.. However, at a closer look - irrespective of their physical proximity and their economic tie through irrigation projects of the nearby commercial farms – the spatial and environmental relations of these towns with their respective water bodies can be referred as ambivalent. The expansion of these towns slowed down with the death of commercial agriculture after the 1974 revolution. Water fronts and the water body itself remained a dormant potential. In the surrounding rural ‘kebeles’, following the nationalization of land in 1975, the peasantry who were given the use right remained on subsistent farming demanding water for nothing further than basic use. Farms which remained under state ownership lost capacity and vision to redefine the relationship of the water body, the cities and the economic activity which tied the two. The current resurgence of commercial agriculture/horticulture/floriculture around major water bodies is changing the essence of the relationship.

Trade and manufacturing (Economic growth, global market forces and the emergence of industrialization): over the past decade, Ethiopia has achieved high economic growth, averaging 10.7 % per year (World Bank 2013). Deviating from the long standing development direction and coupled with the market forces of globalization, trade, manufacturing and urbanization are slowly taking center stage. Service - particularly hospitality and tourism - was encouraged through various incentives including land lease priorities and tax exemptions which helped the development of hotels and resorts around water bodies. In the last 8 years alone, it was possible to observe the souring contest for waterfronts around almost all major lakes. Though the rate could not be quantified due to poor documentation in government offices, intensified resort development around major lakes - Tana, Zeway, Awassa, Langano, Abaya, Chamo, Wonchi, and lakes in Bishoftu town - has been observed first hand by the author as a participant architect on development projects around these lakes and from discussions with relevant government authorities in various levels. While lake shores happen to attract hotels and resorts in addition to both formal and informal agricultural developments, rivers and deltas primarily attract agricultural activities including processing plants like sugar and textile factories ushering the development of sizeable settlements. The GTP – currently the governing development plan of the ruling party – encourages such industries by offering tax holidays and duty-free imported capital goods (MOFED 2010). The country is also opening up power generation for the private sector for the first time in its history (the African Report 2013) targeting to become a regional power hub and generate foreign currency in addition to bridging the wide gap in energy demand and supply within the country.

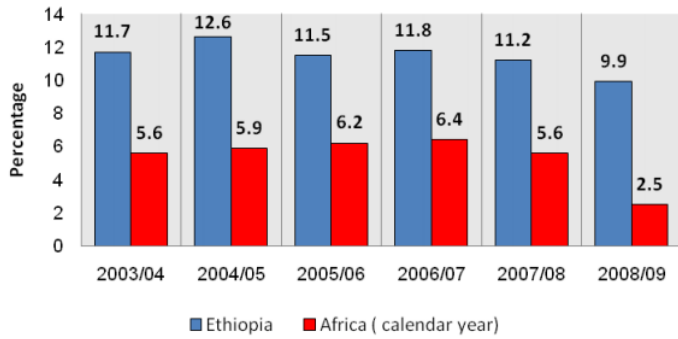


Fig. 4.3 GDP growth Rate comparison, (Source: the African Development Bank Group 2010)



Fig.4.4 Poster standing on the street of Bahr Dar celebrating the advent of industrialization. (Source: photo by the author Dec. 2013)

Dietary habits and market: Official reports and discussions with inhabitants near water confirmed the steady increase in the demand for vegetables and other irrigation-friendly products (see also Mariame and Gelmesa 2006, Wiersinga and Jager 2009). Fish demand has also shown a consistent increase particularly in the fasting seasons of Orthodox Christians (March-April full months and Wednesday and Friday in year round) (see Janko 2013). In addition to market generated from urban growth, the campaign by the government to promote healthy diet in the rural area, which favors vegetables and fruits, is believed to boost their demands (MOH 2014). The most surprising emergence in crop culture which also dominated production activities around water bodies is Khat (*Catha edulis*) - a rapidly expanding perennial crop grown for the production of leaves that are used as a stimulant. While its production is replacing cereal production and coffee in many parts of Ethiopia (Feyisa and Aune 2003), its excessive informal plantation using irrigation is mentioned as the main reason for the drying up of one of the important lake in the south eastern highlands – Lake Alemaya (see Lemma 2003 for studies related to ecological changes of Lake Alemaya). It was observed that most of emerging small scale irrigation and informal development around Tana (in and around the city of Bahr Dar) are related to the cultivation of ‘Khat’. Developments of markets for vegetables and ‘Khat’ - according to small hold farmers interviewed on site - have encouraged irrigation works which in turn encourage settlement and markets in the area.

4.3. Changes in socio-cultural and religious norms:

Theorists of modernization have argued that economic development brings wide range of changes in cultural norms. Even though some cultural values and norms are persistent, economic development is generally associated with shifts away from absolute norms and values (Inglehart and Baker 2000). The expansion of secular education and mass media play a decisive role in inducing and shaping new norms and values. In Ethiopia, a country which passed through a sustained economic and cultural isolation for more than a millennia, the sudden opening up in the early 2000s have caused an economic and cultural pressure which instigates multifold changes.

Technology and secular education: Satellite based wireless media including satellite TV have become the source of new imagery about better living even in the little villages in the countryside of Ethiopia. New technological advents which have infiltrated the small hold farmers have already claimed a position in the rural landscape imposing the supremacy of knowledge based modernity (ways of mobility, improved technological tools, chemicals for soil or pesticides, and bioengineered seeds). Even though these are the required desires from development proponents, the association of everything 'modern' and technological as a symbol of success and power induces a new behavior towards local values hence intensifying the pressure towards urban standards of living and the reorganization of the physical space.

According to the Ministry of Education of Ethiopia, the gross enrolment rate (GER) for primary education in 2012/13 was 124.9%. Universities are also expanding rapidly. In the last 10 years alone, the number of universities has grown from 2 to over 34. The ratio of enrolment of science and technology studies in universities to social and humanities sciences in 2012/13 was 74:26(MOE 2013) – showing a clear inclination of the country towards industrial development. Moreover, Technical and Vocational Education and Training colleges (TVET) are made the main pillars in the structure of Ethiopian education system. The GTP aims to increase the Net Enrolment Rate (NER) of pupils (1-8grade) from 87.9% in 2009/10 to 100% in 2014/15 and also boost Adult Education Participation from 36% to 95%. Such a massive turn towards education, science and technology challenges traditional norms which used to determine functions of socio-spatial organizations and the relationship with natural resources like water bodies.

The cultural perception of water bodies: Based on interviews and discussions with inhabitants living around water bodies on all study sites, it was possible to conclude that the longstanding perception of large water bodies as the abode of spirits is fading away. In these discussions, growing secular education, satellite TV and the increasing economic benefits from water bodies have been indicated as main reasons for the change of attitude. It was also possible to observe that the socio-spatial pattern which used to leave water fronts for the poor and segregated inhabitants is shifting dramatically making these sites the most expensive locations in cities. Both in cities around Lake Zeway and Lake Tana, informal settlements which claimed the least desirable sites of waterfronts are now facing resettlement due to appreciating prices. However, due to pollution and flooding challenges, the land value of river banks in Addis Ababa is still the least (EiABC 2011) which allows rural migrants and the struggling lower income groups to appropriate it informally for various small scale economic activities (see case studies in part II.)

After losing its long held land through the nationalization of properties in 1975, the Church (EOC) has also been forced to look for other ways of securing income. In recent years, it has started to involve in investments including real estate. In many of the church compounds visited in Addis Ababa and Bahr Dar, real estate development for commercial activities is mushrooming – indicating a major shift in the understanding of trade and development. Newly built commercial buildings within the church compounds in Addis Ababa and Port Michael in Bahr Dar - a commercial port and fish processing ground within the property of the church which is administered by the church - are cases illustrating the gradual but certain change of opinion within the church. Similarly, the association of shores and banks of water bodies with evil spirits seems to fade away with the increase in activities around them. Interviewed elders, who currently work and live around water, relate the belief with the fact that these areas were wild and filled with wild animals and outlaws which naturally made the area to appear dangerous and scary. Many of the current inhabitants who dare to occupy the immediate waterfronts relate its sanctity with its potential to nurture life. However, most of the interviewed priests, quoting holy books², still insist that water bodies can be home for either the sacred or the evil spirits. The majority of young people who were randomly invited for a discussion near Lake Langano, Lake Tana, and River Abay (Blue Nile) regarding the change of attitude towards water bodies unanimously agreed that both their parents and themselves see the lake differently than they used to believe about it. However, some of them also indicated that they still avoid going to the lake or the river alone particularly in midday and in the dark³.

Conclusion

Severe and sustained environmental degradation on the highlands; continued population growth (2.9%); relative political stability and reorganization of administrative structure; an average Economic Growth of more than 10% for the last 10 years; more than 5% general urbanization growth; industrial and infrastructural development favoring the exploitation of water bodies and their surroundings; emerging market forces including changes in dietary habits which encourages the use of water bodies; availability of technological inputs for easy use of water bodies; and observable changes in cultural and religious norms concerning living and working around water bodies and changes in ethical positions about trade and manufacturing are all major changes traced within the forces which determine patterns of urbanization in Ethiopia. Such reconfiguration of forces and factors imply a change in socio-spatial organizations. The condition in Ethiopia has been further complicated by the complex land regimes and political systems. However, in all the last three political regimes extended in the last 60 years, top-down resettlement programs have been experimented to address the pressure from the need of spatial reorganizations. Most of these programs have been strongly criticized from different corners and their effect on socio-political and economic systems has been studied by various scholars (see Woldemariam 1991, Pankhurst 1986, Rahmato, et. al.). As usual the effect of these massive resettlement programs on the general urbanization pattern of the country has never been studied. Similarly, the effect of massive and most of the time seasonal migrations of

farmers from the overcrowded and overused highlands to the low lands and also to urban centers is not studied - particularly with regard to the spatial patterns of urbanization. However, both the top-down resettlement programs and migrations are manifestations of the growing pressure by the changing forces which has been confining Ethiopian urban as well as rural settlement on highlands. Coupling the above discussed forces and factors with the global and regional rapid political and economic reconfigurations, it will be plausible to expect an even more massive urbanization particularly near water bodies.

Notes on chapter 4

1. The author had been involved in assessing sites for various private resort facility development on locations which otherwise are referred as remote. Common criteria sought by developers were spectacular land feature, appropriate topography for mountain hiking, wild life and rivers and any other water bodies.
2. Mathew 8:31. This verse and other similar verses from the bible were quoted several times in order to substantiate the belief that water bodies might be home for evil spirits.
3. On Dec.5-25 in Bahr Dar - Port Michael a group of young men and women(13 in number aged from 17-29, 5 male and 8 female) were engaged in a discussion with the author about living, working around Tana. 7 young people also engaged in a similar discussion on site next to Abay(Nile) bridge in Bahr Dar(6 male and 1 female). 5 and (in another informal discussion) 7 students from the Bahr Dar University also were engaged in similar discussion (the first group all male and the second all female). On January 5, near Lake Langano(case study site kebele), 17 people aged 14 – 45(all men) were engaged in a discussion about working, and living near lake Langano,

Discussion and Conclusion on part I

In the last three chapters three points are established: the prevailing pattern of settlement in Ethiopia (both urban and dense rural) being concentrated above mid highlands avoiding areas around major water bodies (chapter 2); the major forces which confined the settlements and urban centers on highlands (chapter 3); and changes in these forces which could imply an emerging new urbanization pattern (chapter 4). The table below revises the major points discussed especially in the last two chapters and indicates the possible implications on development around water bodies which are the subject of part II.

Category of factors	Major factors that determines settlement pattern	Conditions of factors which helped to confine settlements on highlands and away from water bodies	Change in the determining forces	Possible impact on urbanization around water bodies
Environmental and geographic conditions	Climate and disease patterns:	>Ethiopian Highland climate has been favorable for living and agriculture >lowland and areas around water bodies are prone to malaria and tsetse diseases and seasonal flooding.	>Highland is becoming exposed to risk due to climate change >increasing capacity to control malaria transmission >improving possibilities to condition indoor climate	Opens up risk zones for urban and industrial developments, In water bodies located on highlands, contest will intensify due to comfortable climatic condition
	Population and natural resources:	>relatively small population density , >relatively enough natural resources of wood, water and fertile planes on highlands >in areas where pressure was felt in terms of density, the environment was accommodative enough(the case of southern highlands)	>high density and rapid growth of population >unchanged livelihood but shrinking water and soil resources and unreliable climatic condition due to deforestation, over use, erosion, dried springs and small rivers on highlands.	New and resource rich areas will be targeted for resettlements and development, Schemes to redevelop and diversify will intensify – targeting water resources as a ready material
	Topography	>Water ways on highlands are deep gorges >Water flow is rough and dangerous >Enough highland planes	>possible to appropriate the topography for other industrial uses >highland planes are eroded and lost water and humidity	Hydropower generation, tourism and resort development, Forestation and soil conservation projects on river ways will encourage small scale businesses
socio-political forces and economic structures	Strategic location for security and control	>sustained war, aggression, unsettling geo-political conditions - need of security (higher grounds and formation of camps/ketemas) >System of governing large territory(wondering courts) – temporary cities on higher grounds	>Stability and centrality in political and administrative structure since 1890s, regional hegemony and less(controllable) rivalry among factions >Further provision through Federalism since 1991for decentralized structure and balanced development	>Stability opens up opportunities to look for economic opportunities which in turn expose resource rich areas >unregulated development due to unskilled and unorganized land administration and management in the lower level of government
	Hydro politics and	>continued and continuous war and conflict	>increasing political negotiations than	More concerted effort to develop water

	regional tensions:	>water has been an element of political conflicts	>conflicts > regional cooperation for mutual benefits	resources indicating more settlement around water bodies
	Land tenure and Development policies:	>political economy primarily based on tax from peasants than trade (discouraging the appropriation of natural resources for surplus production) >successive complex tenure systems – sites marked by the church, controlled by few aristocrats(till1974), tight government control after 1974 > prohibited development of fertile lowlands >development policies(mostly) downplaying trade and manufacturing	>Changes in land policies (land lease priority for commercial agriculture and resort) favoring development on resource rich areas. >Recent changes in economic policies encouraging activities around water(ADLI, GTP) >many incentives for investment in both agriculture and industry >expanding income inequality and increasing difficulty to access urban land for the poor(encouraging informality)	>reemergence of commercial farming and major irrigation projects, >development of infrastructure (transport and communication) opening accesses to water bodies >flourishing tourism industry – encouraging resort development
	Trade and manufacturing:	>sustained isolated economic geographies (limited inter regional trading connections) >agrarian economy based on subsistence farming >slow development in trade and manufacturing (less need for the use of water bodies –for transportation or other manufacturing input)	>increasingly open for global market (more so since 2000) >emerging internal markets for irrigation friendly crops (due to change in dietary habits	>development of export oriented processing plants related to large scale irrigation(sugar, textile) demanding settlements around water >vegetables, fruits and fishing activities intensifies
	Market and Dietary habits:	>Dominantly based on few crops >forced to develop other highland crops due to the increasing population and draught >lack of market for irrigation based products >low property value on sites around water in cities with water bodies – discouraging development around water	>changing dietary habits, increasing consumption of vegetables and fish >high property value around water bodies particularly Lakes. >still low value around rivers(in Addis Ababa)	>vegetables, fruits and fishing activities intensifies within communities and cooperatives will grows around water bodies
socio-cultural and religious norms	The culture of Craftsmanship and trade:	>derogatory attitude and names towards artisanship and traders >association of evil spirit with technical experimentation including hydraulic works	>changing religious and cultural positions on trade, development, >technology promoted through secular education and media,	Open for technological applications for addressing problems,
	Perception of Water bodies and areas around them	>island, important peninsulas and immediate sites around large water bodies claimed as sacred sites for churches and monasteries >believed to be dangerous for any other activities (sites of evil spirits)	>slowly changing views on use of sacred objects and sacred sites including water bodies >growing appreciation of sites around water bodies	Church opens up sites for mixed use development, implying pronounced appropriations,

Summary Table 1.1: determining factors and their change with possible indication of change in pattern of settlement in general and urbanization in particular

Two points characterize patterns of Ethiopian urban and dense rural settlement prior to mid 20th century: 1) The fact that the highlands have been the major support system for more than a millennia and 2) Major surface water bodies (major rivers and lakes) and sites around them have had little or no contribution in the formation of urban settlements. The sudden interest around the 1950s which encouraged the emergence of commercial agriculture and some urban centers around water bodies in mid 1960s were also noted as short lived due to a change in the political regimes in 1974. Assuming an observable shift towards water bodies, the central point in this part of the study therefore was to identify the forces which were responsible for the formation of the prevailing pattern and examine if there are changes within these forces which can be traced as reason for the currently emerging shift.

The study shows that the majority of the identified forces have shown considerable change creating an observable impact on the way societies relate themselves with water bodies. Some of the forces are still going through a process of change with a potential to speed up the appropriations of the fertile lowlands, deltas and the immediate areas around water bodies. Even though there were uncertainties concerning the time scale for a mass socio-spatial reorganization, all interviews and discussions organized for the research suggest that these areas are exposed to excessive appropriation which can lead to an environmental catastrophe. According to these discussions held in various places with various groups (see annex for the list), the intricate land tenure regime and complex administrative structure of the country are the only remaining barriers which hold the potential flood of contest for these sites. Regional urban development bureaus, land administration and environmental protection bureaus, Regional planning institutes (in the regional states of Oromia and Amhara), and local woreda and municipal land administration and environmental protection desks have all reported the same pressure from an extensive demand for sites around water bodies for various development projects. The only exception noticed was in the city of Addis Ababa in which the immediate areas around its rivers are valued among the least in the cities land value list. However, even in Addis Ababa, where the rivers are heavily polluted due to sewage and industrial wastes and downstream areas are dangerously flooded, the immediate areas are contested among inhabitants who are engaged in various small-scale informal businesses (see case study for detail).

There are overwhelming indications that shows the traditional pattern of settlement is being challenged and the new is emerging. If one follows the changes and project, the rapid urbanization will soon engulf the fertile valleys, river basins and sites around lakes following the development of infrastructure and large and small scale agricultural and industrial developments. Rapidly increasing appropriation of the lake shores for small scale irrigation, markets, and resort developments with associated informal development of habitation around lake Langano, Lake Abaya and Chamo, Lake Awassa, Lake Tana, Lake Zeway and Lakes in Bishoftu; increasing investments on hydropower generation and large scale irrigation projects with considerable density of workers habitations on the lowland basins of major rivers; and increasing informal appropriations of dangerous river banks for habitation and agricultural production in major cities like Addis Ababa have been observed as indicators of new territories for denser urban formations in Ethiopia. Obviously, these formations need to be guided with utmost care. Lake Haromaya, which dried up completely in 2011, and the reports of the

challenges from the increasing siltation of lake Awassa and Lake Tana due to the change in their catchment area which is believed to be caused by excessive deforestation and growing urbanization are also examples which alarms the danger of leaving the course of change unguided (see fig. 30).

Any major pattern change of settlements potentially unveils both challenges and opportunities. However, following the environmental profile of Ethiopia in the last 50 years, trends which imply further environmental risk impose serious concern. The current condition of the majority of the highland in Ethiopia, which is characterized as a degraded and ruined ecosystem, leaves the rest of the area as fragile - exposing them for perilous appropriation. With the forces discussed in part I geared to unleash urbanization around water bodies, major question related to spatial organization have to be appropriately and carefully answered. What *will be* and *should be* the form of the spatial organization in these areas?; What *will be* and *should be* the governing principles for spatial organization in various scales?; and what should be the guiding principles for spatial design in order to meet contradictory needs from the growing urbanization and the weakening reserves of natural resources. However, before trying to answer these fundamental questions, this research in part II takes up cases of urban manifestations around water bodies in order to understand the fundamental characteristics of the emerging urban form focusing particularly on the *nature* and *details* of physical space organization around water bodies.

Part II

(Chapter 5-7)

EMERGING PATTERNS: urbanization around water bodies



Introduction

Unleashing Urbanization around Water Bodies: A macro-level overview

Urban Manifestations – a micro-level study I

Informal settlements around water bodies within existing cities

Urban Manifestations around Water Bodies – a micro-level study II

Emerging informal urban manifestations around major water bodies in new areas

Discussion and Conclusion of part II

Introduction:

Before the arrival of hydraulic engineering, which abstracted the essence of water from the everyday cycle of life - by channeling, piping and bottling it, springs, rivers, lakes, water wells, and rain water were direct extensions of human metabolism in any form of human settlements. Though water seems to be abundant on the planet (the entire water resource of the world is estimated to be $1.4 \times 10^9 \text{ km}^3$ (Gross, 1987), the most part of human existence depends on fresh water supply which is less than 1% of the water available on Earth (Reagen and Bookins-Fisher, 1997). The fresh water of the world is obtained from the annual precipitation of about 10^5 km^3 (Gebre-Emanuel Teka, 1977) out of which Ethiopia's yearly share is estimated to be 110 km^3 (Ministry of Water Resources, 1997). However, 75% of this water is lost through the borders toward neighboring countries leaving behind 27.5 km^3 . On the other hand, since this water is not evenly distributed, arid and semiarid regions of the country are threatened by desertification (Environmental Protection Authority, 1998). In addition to the process of desertification, pollution is also reducing the volume of fresh water. However, Ethiopia remains to be one of the water towers of Africa – rich in fresh water.

Cities everywhere, the core of human civilization, are intrinsically rooted to this reality of water. Their physical spatial structures and their daily economic, religious, and cultural processes are directly linked with some form of water body. Water as a body and as an essential nutrient sustains almost all activities in human civilization: agriculture, aquatic life, industries, energy production, transportation, personal hygiene, the maintenance of the environment, etc. The limited pure (fresh) water, however, is a contested resource in many places. Particularly in North East Africa, the contest for water is expected to rise in the coming decades with the expanding desertification of the region. Furthermore, with the growing population and urbanization in the region, existing fresh water bodies are increasingly exposed to both formal and informal appropriations.

This part of the research (Part II) focuses on the spatial manifestations (based on empirical evidences) of change in the relationship of urbanization processes in Ethiopia and major water bodies. It includes three chapters - extending from chapter 5 to 7. On chapter 5, it highlights the orientations and potentials of the macro level undertakings in unleashing urbanization around water bodies. For this end, it overviews the direct impact of government policies and mega investment projects (both public and private) on urbanization around major water bodies. In line with the study in part I and the details of chapter 6 and 7, interviews and discussions conducted with various government levels focus on the same administrative regions, in addition to the federal ministry offices. On chapter 6 and 7, the study zooms-in to a micro level study to investigate urbanization pattern emerging around water bodies – in order to answer the second

main research question (What are the prevailing architectural and spatial characteristics of the emerging informal urban structure which is developing around major water bodies and what are the threats and opportunities within it?). Through multiple case studies in selected neighborhoods which are predominantly developed informally, the micro-level study attempts to understand the core elements of the process of spatial development in a neighborhood scale. It particularly focuses on the characteristics of the settlement structure (taking the settlement as a product) and production processes of the physical spatial assemblage in relation to livelihood productions taking place around water bodies. In other word, the prime subjects of the study are the characteristics of the products (as in houses and spatial structures) and its production processes under the context of their relationship with the water body at hand, while the object of the study are both the individual house and spaces and infrastructure used in common by the neighborhood. Hence, in operationalizing the main questions, the following questions are posed – what are the main livelihood activities that the sites are appropriated for and what is its relationship with the water body?; What pattern and form of spaces are generated and what are the main forces which determines the patterns and forms?; What material are used and how was it produced – in terms of forms of organization in labor and capital mobilization? How is the processes of physical space production and its current product (form) related to the water body? However, in addition to the physical dimension, it also addresses some basic questions about the inhabitants such as: who are the inhabitants (in terms of their background - from where have they come? Why have they come to the particular site and what is their possible plan for the near future concerning their usage of the site? The key concept which anchors the study in this part of the research hence is urban informality (as in *informal settlements and informal livelihood production activities*) and the commons (as in the use of common resources such as water and common spaces within the informal settlement).

Informality

Though the informality discourse is vast and still expanding, it was first introduced more than four decades ago - in the early 70's by the published work of Keith Hart 1973 and following the quick adaption and codification by international organizations such as ILO (1972). It was developed as a concept to frame analysis and policy-making (ILO 2013:14) referencing to those enterprises that fall outside the purview of laws establishing incorporated enterprises (Kanbur 2009). Since then, with a growing interest in the academia and policy analysis, the term 'informal' and 'informality' have been used with different meanings for different purposes. In Ethiopia, the CSA on its urban employment/unemployment survey, following the enterprise orientation of the use of the term, defines informality as household unincorporated enterprises without an account book that have fewer than 11 employees or no license (agriculture included) (CSA1994). Articulated discussions on the subject of informality have been deepening in the past two decade furthering its impact on policy formulations on both governmental and international organizations. Works on the (Self) organizations and common property regimes by Ostrom and the expansion of property rights by De Soto are examples which have deeper impact on policies around the world. In development studies, discussions about formality and informality have often revolved around issues of property rights where the value of secure

tenure and its link to poverty alleviation is emphasized or to governance where multi-layered governance system is emphasized (Ostrom et. al 2006 quoted on Alazar 2012).

Informality, particularly regarding informal settlements - is often understood as “a state of exception and ambiguity” or as “a dynamic that releases energies” (Roy, 2009 and Balmond 2003 quoted on Wade 2009). It may be defined as “a mode of production of space defined by the territorial logic of deregulation” or “a survival strategy and, as such . . . a way of evading or manipulating power” (ibid). However, in countries such as Ethiopia, where rural and traditional forms dominate, the ‘informal’, which characterizes the urbanization of rural landscape obviously is the norm than the exception; the ordinary mode of production which installs its own logic than that which is defined by any logic of deregulation. In existing urban areas in Ethiopia however, informal settlements are the only viable alternative for accessing land, services, job opportunities and social mobility for the urban poor who are the prevailing majority of urban dwellers. In global terms, the poor are the most significant producers of housing space (UN-Habitat 2003).

Different forms of spontaneous settlements, all types of illegal occupations, invasions, and squatter settlements are generally identified as informal (Hutchison Ed 2010:268). Other than landscape of “slums”, squatter settlements, and pavement dwellings, each governed by different forms of regulation, negotiation, and political barter which, according to Hutchison end (2010:421), are all considered as the spatial expression of the informal city, traditional/vernacular forms which do not respond to regulations and rules of cities are often considered as informal. Such gross identification of these varied settlements as ‘informal’ in academic and policy discourses could lead to inappropriate policy measures. For instance, Elias (2008) showed that in the city of Addis Ababa, where more than 80% of its inhabitants are usually referred to live in slums, what is referred slum is actually a dilapidated formal settlement and hence a precise distinction of use of terms is vital. However, the basic characteristics of informal settlements are generally referred to exhibit features such as: (1) lack of land tenure security; (2) lack of basic infrastructure (3) predominance of physically sub-standard dwellings; and (4) locations that are not in compliance with land use regulations and are often not suitable for development.

These characterization and associated discussions which aim at ‘fixing’ informality can be groups into two: 1) informality discussed in terms of its relationship with governmental and legal institutions 2) informality discussed in terms of its internal structure (see Alazar 2012). In both cases though, informal settlements are generally seen as problems and curative measures such as regularization and infrastructure improvement as well as preventive measures such as land policy and construction of social housing are often prescribed as strategies to tackle it (see UNECE 2009). Such perception of informality as a problem to be solved introduces a strong dichotomy between the formal and informal where the formal is taken as the measure of legal rightness and hence stability and rationality. However, several authors have argued against this dichotomy questioning the notion that the formal is a guarantee for stability (Roy 2005, Ostrom 1990, de Soto (1989, 2003), Guha-Khasnobis, Negandra and Ostrom 2007; Kanpur and Ostrom 2006; Scott 2008). Moreover, particularly regarding informal settlements, several authors have observed multiple qualities which display resourcefulness and creative responses in spatial

structuring and hence propagate it as part of a solution than a problem (Turner1985, Correa1989, Kellett & Tipple 2000, U-TT.Caves 2005, Brillembourg, 2006). Ananya Roy and Nawad AlSayyad (2004) have also indicated that urban informality actually is an organizing logic rather than disorganization, a system of norms that governs the process of urban transformation. Against the standard dichotomy of two sectors, formal and informal, they suggest that informality is not a separate sector but rather a series of transactions that connect different economies and spaces to one another (Roy 2005). The observation in the following four cases also display the formal - informal interplay seen as a continuum as suggested by Ostrom et.al (2006). Once informally claimed land and built houses get formalized through regularization but it again can go through another cycle of deformalization through informal land transfers and densification processes.

The major focus of this work, however, is to understand the mechanism of spatial informality – an informal shaping and reshaping of the built environment - and find ways of spatial design strategies to guide it. It subsequently relates spatial informality with livelihood production and social organizations. The study investigates the spatial pattern of the informal settlements around water bodies in relation to the livelihood productions activities which are based on the appropriation of common resources such as water and spaces. Hence, the conditions of access and rules of use of common resources are taken as a major defining element in the shaping of the spatial pattern.

The question of the commons

In the case of Ethiopia, where all land and water bodies are public properties and where individuals, corporations and cooperatives can only formally apply for a time defined use rights, governing the commons by default falls on the state. Many works, on the ‘tragedy of the commons’, from different fields have discussed the conditions and fates of such arrangements. However, it is the seminal work of Elinor Ostrom – *‘Governing the commons: The Evolution of Institutions for Collective Action’*(1990) that established, with rich empirical data, that neither the state nor the market is uniformly successful in resolving the problem of the commons. There are numerous examples within rural and urban areas in Ethiopia where the commons are destroyed due to dysfunctional system of control of the state or brutal over use by competing users. The obvious well publicized water related example are the disappearance of the Lake of Haromaya and the diminishing lake water of Abjatta in Oromia regional State and many other water bodies including the disappearance of various springs and the excessive pollution of rivers in Addis Ababa. Furthermore, in the state of rapid rural-urban transformation, where the formal structure of cities are too weak to govern the commons within the city and where migrants (from the rural area) have little or no orientation about the rules of use of the city’s common properties, the common within the urban centers are exposed to the usual ‘tragedy’. Either over control - as in the case of fenced public spaces - or vandalized or privatized public properties are common fates in large cities such as Addis Ababa. The issue of the commons within the urban areas needs a more focused investigation particularly within the current heightened rural-urban transformation processes. Though the focus here is urban informality in particular sites of higher ecological fragility, questions associated to the commons remains to be central and hence

attempts are made to describe the potentials and challenges facing the commons within these emerging urban manifestations. In all the cases though, at the local neighborhood level, conflicts in accessing land and water are governed by self-organized cooperatives and traditional forms of social organizations. However, it was observed that the mandates and interest of such forms of organizations is limited to a particular geographic area and certain problems such as equity and fairness. The challenge of the regional environmental complexities, such as water and material cycles, which by their nature are not contained in a specific geographic locality, demand a much more robust system which mobilizes both the small scale local organizations with the large scale regional and formal organization.

Case study site selection

Study areas are selected based on preliminary observation and these areas fell into three administrative regions – three on the two largest regional states (Oromia and Amhara) and one in the capital city - Addis Ababa city Administration. These areas selected for detail study of chapter 6 and 7 are grouped broadly into two based on the setting of the settlements. The first group which is covered in chapter 6 is informal settlements around water bodies within already existing cities (an existing urban setting). It targets settlements around river waters in Addis Ababa – the federal capital city, and Bahr Dar the regional capital city of Amhara Regional State built at the southern tip of Lake Tana. The second group which is covered in chapter 7 deals with emerging urban manifestation in rural areas in the rift valley at the shores of Lake Zeway and Lake Langano both in Oromia Regional State. Further detail descriptions of the case study areas are given in the respective chapters.

As the focus of the study is on the emerging change in the relationship between water bodies and urbanization, and hence, as indicated above, two categories of cases are taken: 1) within cities where water bodies and their fronts have long been avoided saving informal settlements and 2) outside of cities in newly emerging settlements showing urban characteristics. Accordingly two set of criteria were set to select particular sites for each category. The criteria set to select particular case study sites within cities are: location (preferably within the administrative boundary of the city and with active relation with the city core), active engagement of inhabitants with the water body in producing their livelihood, and showing considerable density in the setting of the built-up areas. Though not a supported (cultivated) urban structure in the mainstream processes of planning and development of cities in Ethiopia, such already established neighborhoods which are knitted with water bodies are assumed to exhibit the potentials and challenges in an urban spatial structure developed around major water bodies through an informal setup.

The criteria for selecting new settlements emerging around water bodies focuses on areas which manifest basic signs of urbanization: emergence of market; emergence of trades other than agriculture; located in the area formally defined as rural; showing a tendency of increasing in density; and the tendency of absorbing new inhabitants other than farmers of the area. In the pre-selection of sites, Lakes and rivers in lower altitude were identified. Accordingly; settlements around River Awash, Settlements along River Omo, and settlements around the chains of lakes

within the rift valley were selected. For practical reasons of logistics, ease of access for continuous observation, and prior knowledge of the area, emerging settlements around Lake Zeway and Lake Langano within the rift valley in the Oromia regional state were selected.

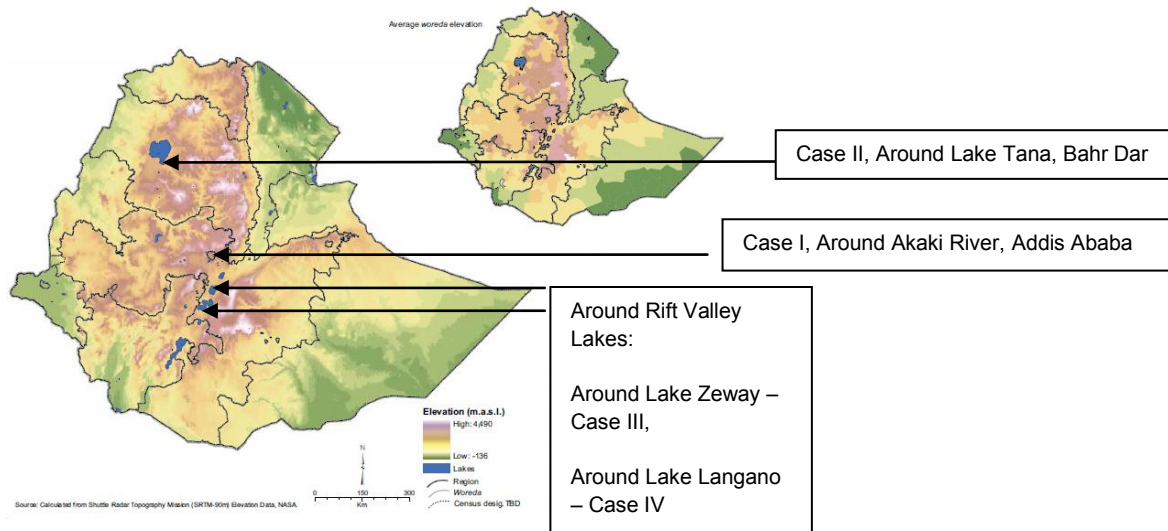


Fig. III.1 Case study site locations (*map source: Atlas of Ethiopia CSA 2007*)

Method

Methodically, the study adapts primarily a qualitative method of investigation heavily relying on open-ended interviews and on site observation within multiple case studies. However, basic surveys are taken in order to complement and reinforce information gathered through observations. These surveys are taken in a random survey in a defined study area. The four cases, which are presented on chapter 6&7, are not taken for comparison purpose but are employed to better understand the phenomena by extracting diverse or similar evidences from various contextual settings (see Yin 1994 for multiple case studies). The particular focus in chapters 6&7 is to understand the *nature and shaping process of the emerging informal spatial configuration* around water bodies. The various livelihood production activities created due to the proximity to water bodies are assumed to impact the configuration of space in both individual household level and collective neighborhood level. Hence, both individual and collective livelihood activities are considered and the scale of investigation is also limited in these two levels of spatial appropriations – house and neighborhood or individual and collective.

For all case studies (a total of four sites - two in each category), the research relied on close observation visiting the sites repeatedly in different seasons and in some cases staying within the site for an extended time while participating in the daily routines and attending family and societal activities. Even though the association with the sites (all of the four sites) extends much before the formulation of questions for this particular research project, repeated visits within the research time frame were necessary to focus inquiry and also to invigorate relationships and confidence with inhabitants. The researcher is indebted to many residents (both young and old) whose kindness made the learning processes enjoyable. However, interviews – usually open

ended discussions – with inhabitants and authorities within the hierarchy of both formal and informal structures supplemented the observations. It is necessary to note that discussions and questions related to land and properties are understandably difficult and sensitive among informal settlers. Particularly in the three study sites outside of Addis Ababa, where the competition for land around water is intensified in recent years and policies of the government also favor investment and investors, the uncertain condition that inhabitants are living in is clear. It was observed that inhabitants are already intimidated with inquiries about land tenure, productivity of their farm and the details of their socio-economic activities, which according to them, is all targeted to displace them from ‘their’ land. Hence, the most challenging part in conducting the research in these sites was building trust. Almost all earlier discussions were met with open reservation. In an attempt to establish confidence, the researcher needed to explain exhaustively that information will be used exclusively for research purposes. Moreover, it was necessary to use personal contacts with elders and community leaders in order to establish confidence. The researcher consciously avoided the usual requirement of getting a paper from government offices except in the case of Edo Gojoola rural Kebele (case III) where it was needed for practical reason of possible conflict and showed only whenever asked. In some cases, longer time was needed to establish a right understanding and confidence with inhabitants so that one can easily avoid riddles and irony.

The experience on the case study site in Addis Ababa is different. The immediate sites around rivers, particularly in the area of lower altitude of the city such as Mekannisa and kality, are used for urban agriculture. Due to the low demand for these sites (graded as the least in its property value list EiABC 2011), at the outset, the inhabitants seem to have less challenge from developers. However, those who were found on site, who are predominantly engaged on horticulture which feeds the majority of the city’s vegetable demand, are hustled from various researchers and city officials on the condition of their products which is exposed into sever pollution of the river water. Whenever the inhabitants see a camera targeting their vegetables, they would not hesitate to protest, reminding the documentary TV programs which challenged the health standard of their products. On the other hand they also are tired of the excessive research questions which they have been asked several times about flooding and health risks. The researcher could avoid redundancy of asking similar questions in the same area by plugging-in to another research undertaking by the researchers home-institution (EiABC) in order to access some of primary data collected from the same site in the same study period. The researcher have also participated in some of the workshops organized by the team and had a chance to interview experts in the team on matters of importance for this research. For this end, the researcher acknowledges the CLUVA – EABC team and their willingness to allow the researcher to plug-in his research question in the wider data collection processes. Nevertheless, it is necessary to note that the detail on-site-observation and discussion with inhabitant are the main information source for this study.

Scale

In order to address the phenomena from both an individual level and collective level, the case studies in chapter 6 and 7, as described above, are limited in scale in to two levels: a house level (individual action) and a neighborhood level (for collective works). However, it has been long recognized by architects, planners, social ecologists and geographers that neighborhood is a genuinely amorphous concept and defining it clearly in terms of spatial scale is a challenge (Lee et al., 1991; Guest and Lee, 1984; Logan and Collver, 1983; Coulton et al., 2001). 'Sefer' is a corresponding Amharic word for neighborhood however it was not possible to find a spatial delimitation method to define it. The research delineates the spatial scale based on the observation on each site and the responses from the inhabitants themselves particularly those who resides and works within their own neighborhood. Case study site II and IV have a clear geographic definition which is recognized by the inhabitants themselves but on Case study site I and III the physical delineation of a neighborhood is difficult to establish. On Case I the study focused on the immediate area following the water body and arbitrarily defining it by the road which is assumed to make a strong physical mark due to its size as shown on Fig. 6.1.10. It is necessary to note that social ties and collective activities are more complex than the physical marks. On Case study III, all the area developing between the major road and the lake within the specifically selected rural kebele is taken as a neighborhood (Fig 7.1.). It is necessary to note that similar development trend is expanding in the neighboring Kebele's following similar pattern.

Chapter 5

Unleashing Urbanization around Water Bodies: A macro-level overview

5.1. Background/earlier attempts

“where nothing ever grows / No rain or rivers flow / Do they know it’s Christmas time at all?”1984 BANDAID

In the last decade of the 19th century up until the first half of the 20th century, Ethiopia was mainly recognized as an established African state which defended its long held independence and national interests successfully against regional and international forces and conflicts. However, the second half of the 20th century has been a season in which the country was uncovered by the international media as a regional epicenter of manmade and environmental disasters. Recurrent famine, environmental degradation, civil war, soaring population growth, poverty, and internal and regional political crisis have become the cause for the loss of millions of human lives. It also has caused popular revolutions, imposed changes of governments, and generated reorganizations of the country and the region at large.

Some of the measures taken by subsequent governments to respond to these multidimensional challenges have imposed a lasting effect on spatial organization of people. It also redefined access and use of natural resources - particularly the appropriation of land and water. It can also be taken that the profound realities and measures taken to confront them have been the major determinant factors for the rate and pattern of urbanization and urban growth in Ethiopia in the second half of the 20th century.

According to Abate (Abate 1991 quoted on Golini 2001), the 1974 revolution and its 1995 land reform program can be referred as a juncture on the processes of recent history of Ethiopian urbanization. The reform provided incentives and opportunities for peasant and other potential migrants to remain in rural areas – discouraging rural-urban migration which used to be the chief cause for the rapid expansion (and growth) during 1967-75 period. After the land reform, (during the period of 1975-84) natural population growth may have been mostly responsible for urban expansion. In areas where emerging settlements around surface water bodies are particularly reviewed for this research, both in rural as well as urban areas, inhabitants living

and working on both formally and informally appropriated land refer the nationalization of land as a threshold for their current settlement structure.

Resettlement of people from draught prone area into areas with fertile soil and water has been one of the various programs applied to resolve environmental and social problems in all the last three governments of Ethiopia. However, the nationwide Villagization and Resettlement programs, which came after the revolution following the nationalization of land, can be considered as the most massive spatial reorganization attempt of societies in the modern history of Ethiopia. Though both villagization and resettlement programs, which extended in the 80s, are heavily criticized as a controlling mechanism of the rural population of the socialist regime, their official goals underlined the attempt to combat drought, avert famine, and increase agricultural productivity. While the resettlement program was believed to be the regime's long-term solution to the drought problem, villagization was the plan to transform rural society (Ofcansky and Berry 1991). Around 1.5 million people were relocated from the drought-prone highland areas of the north to the south and southwest lowlands, where population was relatively sparse and so-called virgin, arable land was plentiful. In the program of villagization, over 30million peasants were supposed to be uprooted and relocated into larger villages (with forty to 300 families, or 200 to 2,500 people). The plan aimed to give peasants a better access to services such as schools, clinics, electricity, fresh water and irrigation schemes and other effective use of water resources through centrally organized cooperative schemes. Moreover, improved economic and social services would promote more efficient use of land and other natural resources and would lead to increased agricultural production and a higher standard of living (ibid). In these large scale spatial reorganizations of societies, fertile and water rich lowlands were the primary targets for appropriations. In both cases, the proposed settlement patterns, though rudimentary in its planning –if implemented fully, could have ignited the growth of other trade, service and small scale cottage industries which eventually would have implied urbanization. However, these attempts were overturned even before the collapse of the military regime in the early 90s before it establishes any meaningful standing.

Attempts of voluntary resettlements of rural inhabitants from highland and environmentally challenged sites to lowland areas richer in soil fertility and water have resumed in the current government. The current resettlement schemes are also enforced under the pretext of collecting peasants into *development villages* and the need to reorganize land for large scale agricultural and other development related projects. Prior to the 1974 revolution, such large scale reorganization has resulted in the creation of urban settlements around water bodies. Cities like Zeway , Hawassa, Arbaminch (cities related to large scale agricultural projects), Gambella and BairDar (cities created due to transit projects); Wonji, Methahara, koka, and multiple corresponding small towns (cities created due to power generations and irrigation projects), etc., were initiated in the same manner. However, after the revolution, the sharp decline in commercial agriculture and large scale infrastructure investment left the initiated process stagnant. The current resurgence of infrastructural development and massive investment on commercial agriculture with the formal (government initiated) and informal reorganization of peasants imply similar potential for the creation of multiple small towns.

5.2. Government Policies, Strategies, Programs and Plans impacting urbanization around water bodies

General development policies and policies targeted to the development of particular sectors such as agricultural sector, water sector, industrial sector, environment, energy, urbanization, etc. affect the pattern of human settlement in general and the appropriation of sites around water bodies. Reviewing major policies and strategies in Ethiopia adapted since the nationalization of land (1974) in the light of their possible impact on urbanization is simply cumbersome. However, it is possible to notice that none of the policies developed considered/anticipated rapid urbanization – leave alone the particular phenomena of a possible emergence of urbanization around environmentally sensitive sites such as the case this research targets - areas around fresh surface water bodies. Potential challenges and opportunities associated with the urbanizations of such areas are simply forgotten. Moreover, urbanization and industry - sectors which are supposed to be directly related to the phenomena - have always been the most neglected sectors in policy formulations compared to emphasis given to agriculture and rural development as the central pillars of the country's development (see Rahmato 2008, Meheret 2001,2008). As a consequence, urban centers have been beset with a myriad of problems accumulated over the years, including organizational and resource constraints that have put severe limitations on the capacities of municipal administrations to efficiently deliver services and infrastructure (Meheret 2001 quoted on Meheret 2008). Both the long overdue National Urban Development Policy (2005) and the newly issued policy (Resilient, Green and Accessible Urban development Policy 2013) downplayed the actuality of rapid urbanization. Both focused on serving the core ideal of rural development through strengthening existing cities hence avoiding the question of urbanization per se in general and recognizing the emergence of new towns around environmentally sensitive sites in particular.

Strategies pertinent to industrial sector started to be formulated between 1950 and 1974. In this period, Ethiopia implemented three successive five-year development plans targeting industrial development based on the private sector (Admit Zerihun 2008). Industries following large scale agricultural investments related to water bodies mushroomed particularly in the rift valley (see chapter 4). Power generation, sugar industries and commercial agriculture contributed to the emergence of many cities like the ones mentioned above.

The central planning system of economic management which took over after the 1974 revolution frustrated the emerging industrial development by discouraging the private sector and instituting a state-led economic development strategy. The Ten-Year Perspective Plan which was issued by the socialist regime for the year 1985-1994 followed the same import substitution industrialization with its predecessor. However, it could not be realized owing to various factors. Hence, activities leading to urbanization around water bodies were largely stagnant in the period between 1974 -1991.

The central plank of the earlier development policy of the current EPRDF led government, which replaced the socialist regime without challenging its land tenure system, was that the country's overall development was to be agriculture and rural centered while the basis for the rural sector was to be agriculture-led development (Rahmato 2008). The justification was that the country's

chief and abundant resources are land and labor and that the great majority of the people live in rural areas and are agriculturalist (MOPEd 1993, FDRE 2001 quoted on Rahmato 2008). It latter adapted an agricultural development-led industrialization (ADLI) policy which continued to assume that giving priority to the agriculture sector in the short and medium term will create big domestic market and supply food and raw materials for the industry. Accordingly the Ethiopian Industrial Development Strategy which was published by the Ministry of information in 2004 pursues ADLI as its major principle claiming the private sector as its engine of development. The whole strategy was to improve productivity through new technologies and improved farming practices. It also called for a planned program of resettlement in rain deficit areas. Within the framework of ADLI, it issued two Poverty Reduction Program Documents (SDPRP 2002 and PASDEP 2006) in which subtle changes in the original policy and considerable readjustment of the strategy can be observed. Particularly the second document (whose coverage extended 2005/6 to 2009/10) attempted to address the earlier neglected sectors - urbanization and industry. In this period a renewed resettlement and villagization (referred as the establishment of development villages) was initiated and more than half of the originally planned 440,000 households have been relocated -

Critics of ADLI point out that the sheer neglect to urbanization and the development of other sectors left ADLI one legged - unable to instigate the development of small towns which can provide the demand for farm surplus, became centers of trade and commerce, provide off-farm employment to the rural population (ibid). The land tenure system, which remained similar with the previous regime, has also failed to provide peasant farmers robust tenure security playing its own role in discouraging urbanization. However, through its targets to create an enabling environment for agriculture-led industrialization, ADLI targets to exploit the rich water resources of the country and develop the energy sector primarily based on hydropower generation. Such a direction of industrialization which focuses on agriculture and water based infrastructure development flares up a demand for large scale water resources and sites around water bodies which also instigates settlement development. Though the current land tenure regime and its land administration system - particularly in the rural area - creates a favorable condition for large scale investment projects to claim a more settled use right, it has created uncertainty among peasants and contributed for a disengagement from a more permanent activity. Such uncertainties indirectly encourage informal development primarily on communally/publicly owned land.

Considering policies referring to water sector itself, the attempt to address the possible urbanization around surface water bodies can be referred as non-existent. Since 1956, when the first department for Water Resources was established under the ministry of Public Works and Communication to handle a multi-purpose investigation of the Blue Nile (Abay) Basin, water related policies refer to urban centers as end users. The water resource management policy (WRMP) which was issued in 1999 recognizes water as a scarce and vital socio-economic resource that should be managed on strategic planning basis with along vision and sustainable objectives (Tafesse 2008). In its objectives it also ensures the integration of water resource development with the overall economic development framework underpinning rural-centeredness as its core. However, its objective to have an integrated approach to water resource management similarly assumes municipalities (cities) as only end users. It has no

provision to consider the possibilities of water bodies as an integral environmental constituent of cities. In the same way, the National Water Sector Strategy published in 2001 and Water Sector Development Program (WSDP) which was published in 2002 continued in the same tradition of considering cities as only service seekers for water supply and sewerage –ignoring the possibility of the intertwining of urbanization and water bodies.

Though too early to evaluate its impact, the 5 year Growth and Transformation Plan (GTP 2010-2015), which was launched in 2010, can be taken as the most ambitious government plan. It targets to develop massive agricultural, industrial and infrastructural projects, which are believed to impose massive reorganization of societies and the natural landscapes. Among its large scale irrigation projects and massive hydropower generation plants, which target to use the country's major surface water bodies, some have already started to develop formal settlements related to these major water bodies (see 5.3). However, its targets to boost maritime transportation infrastructure ignored the potential of water bodies within the country – focusing only on international trade and port services.

Many of the recent national policies seem to indirectly encourage the mobilization of people to areas around water bodies - instigating urbanization around water bodies. Nevertheless, the possible problems associated with the creation of small or large scale or formal and informal urbanization around surface water bodies is still waiting to be addressed – a phenomenon which is observably on the rise. The manual prepared by the Ministry of Urban Development and Construction in 2012, entitled in Amharic - የውሃ አካላትና ዳርቻ ቦታዎች አያያዝ ማንዋል - which can be translated as 'Manual for handling water bodies and their immediate surroundings' is the single document issued from the government which attempted to address settlement activities around water bodies. However, the primary focus of the manual is limited to protecting water bodies particularly those which are within cities and falls short from addressing the phenomena at the scale of urbanization. The manual in its introduction acknowledged that water bodies are being increasingly polluted and sites around them particularly in Addis Ababa are least demanded for public and private investment projects and hence are exposed for informal appropriation primarily by rural migrants (MoUDCo 2012:5). It also listed population growth and the increasing urbanization as the major forces behind the increasing appropriation of the immediate surroundings of water bodies for settlement in cities.

The director and deputy director of the two regional urban planning institute (Amhara and Oromia respectively) interviewed for this research have confirmed that there is no policy framework or basic guidelines concerning the development of activities suggesting urbanization around water bodies. It was also possible to learn from particularly the Oromia Regional Urban Planning Institute that the institute is preparing a plan to establish a new town (referred by the deputy director as a tourist town) around the rift valley lakes based on the demand from the parliament of the regional state. However, both leaders of the respective institutes have expressed the urgent need of installing a regulatory framework in order to guide the emerging phenomena of urbanization around surface water bodies.

Box 5.1. Recent Development plans in Ethiopia: overview and possible links with urbanization particularly urbanization around water bodies. Source: Reconstructed from Dorosh, P. et al. (2011:45)

Sustainable Development and Poverty Reduction Program (SDPRP)

- Macro policy framework for growth and development , effective from 2002/03-2004/05
- Recognizes agriculture's leading role in social and structural transformation of economy towards urbanization and industrialization, i.e. based on ADLI
- SDPRP does not pay adequate attention to non-agricultural sector, urban areas, markets, and demand side of production
- The policy does not address neither rural-urban migration substantially nor possible urbanization of new areas.

Plan for Accelerated and Sustained Development to End Poverty (PASDEP)

- Successor of SDPRP, effective from 2005/06-2009/10
- Also pursues Agricultural Development Led Industrialization
- PASDEP reiterates the need to strengthen RULs; the policy itemizes rural sectors that require investment (rural roads, telecomm, general education and vocational training, small scale credit markets, rural electrification) but never addresses urbanization as an associated processes
- Like other policies, PASDEP does not address rural-urban migration substantially, and only in the light of problems associated with migration
- In terms of urban development, PASDEP is stronger than SDPRP, and unlike SDPRP it embodies the development agenda of NUDP (below) but again avoided urbanization as a phenomena

National Urban Development Policy (NUDP)

- Urban development policy, implemented in March 2005.
- NUDP embraces the following principle: rural development is the basis of, and also determines the direction and rate of urban development
- Operates on six core principles (strengthen urban-rural and urban-urban linkages, develop urban centers, reduce urban poverty and unemployment, community participation in development, partnership with private sector, decentralized urban governance)
- NUDP places clear emphasis on the crucial role of urban centers for rural development, and economic interdependence between rural and urban areas
- Urban Development Package (UDP) and Urban Good Governance Package (UGGP) were developed to facilitate the implementation of NUDP in both cases urbanization of rural areas was not addressed and no provision was made to guide newly emerging towns

Rural Development Policies and Strategies (RDPS)

- Rural development policy developed by the current government
- Places a strong focus on smallholders
- Focuses on enhancing combination of capital and labor through delivery of improved seeds, fertilizers, farm implements, and pesticides etc.
- RDPS is involved in expanding rural infrastructure, institutions and financial system
- Criticized for treating rural and other sectors independent of each other
- No provision for possible transformation of rural settlements into urban centers or even their link with urban centers

Participatory Demonstration and Training Extension System (PADETES)

- PADETES's objective is to increase food production via modern inputs, investment in rural infrastructure and technology transfer
- Like other rural policy guidelines, PADETES does not foster links between rural and other sectors particularly urbanization

Growth and Transformation Plan (GTP)

- Successor of PASDEP, effective from 2010/11-2014/15
- GTP concentrates on a locally driven economy and targets an economic growth of 14.9%
- GTP maintains agriculture as a major source of economic growth but it want to create favorable conditions for the industry to play a key role in the economy; it provides an expansion of infrastructure development (electricity production, railway lines and telephone infrastructure)
- Though the most ambitious plan, its urban dimension is conceived in order to serve the rural development goals.
- Massive appropriation of water bodies and their surrounding area but no attempt whatsoever to integrate possible urban proliferations

5.3. Major projects instigating settlements around water bodies

The dynamics for the re-emergence and surge of large scale commercial agriculture in Ethiopia can be related to two major forces: 1) The nature of the development policies of the current Ethiopian government which is strongly rooted on the agricultural sector, 2) the 2008 world food crisis which forced some countries and major companies to look for alternatives. Accordingly, Ethiopia is often highlighted as a country in which a lot of foreign land acquisition is occurring (e.g. Butler, 2010; Time Magazine, 2011; The Guardian, 2011a). Estimates of the extent of the land assigned for foreign direct investment (FDI) range from 600,000 ha (Cotula et al., 2009), 1.2 million ha (World Bank, 2010a), 2.9 million ha (Access Capital, 2010) and 3.6 million ha (Mousseau and Sosnoff, 2011, Bossio, D. et. al. 2012).

Increasingly, it is being recognized that land acquisition often equates to de facto water acquisition (Skinner and Cotula, 2011) and FDI is driven as much or even more by the need for water to produce food than by the need for land (Mann and Smaller, 2010; Woodhouse and Ganho, 2011 quoted on *ibid*). Though the land lease price, as it is formulated by the Ethiopian government, favors proximity to export outlet and availability of transportation infrastructure, it also considers availability of water for irrigation.

Large scale public and private irrigation projects around major rivers and lakes; large scale commercial farming in lowland planes - both rain fed and irrigation based; and medium sized horticulture and floriculture projects have shown a regular growth in the last 8 years. The development of these projects comes with the massive mobilization of labor and hence a creation of permanent settlements in low land planes.

Tendaho Sugar Factory, one of the major public investments, which covers more than 50 thousand hectares of land in Afar Regional State in eastern part of Ethiopia, was established in 2006. The Tendaho factory is expected to create job opportunity to more than 50,000 people and has already developed more than 17,200 housing units – a comparable number to medium size Ethiopian towns. To supply water continuously to the factory's cane cultivation field and make irrigable land to natives a dam (Tendaho Dam) with a capacity of holding 1.8 billion cubic liters of water is built (sugar corporation website). The Ethiopian sugar corporation is also expanding the existing sugar factories in addition to the development of eleven new sugar factories in different parts of the country on over 300,000 hectares of land. At completion of the factories the annual sugar product of the country which is currently 100 thousand tons is expected to grow to 3.25 million tons (ERTA2013,). These large scale sugar development projects alone are projected to draw a work force of more than 160,000 people.

Large scale commercial agriculture, horticulture and floriculture are also creating an unprecedented mobilization of labor and reorganization of settlements. Due to obvious reasons of finding large irrigable land, many of such projects concentrate on lowland plains. According to a study conducted by UNDP 10,224 agricultural investment projects have been registered for which 10.112 million ha was allocated between 1992 and 2011. Of these 8,298 are registered as operational (UNDP ETHIOPIA No.4/2013) mobilizing thousands of young labor force. The GTP promised to avail more than 3million hectares of land for commercial agriculture which is assumed to employ advanced technologies and irrigation techniques. In addition to the need to

implement appropriate water management systems for such large scale agricultural projects which are developing around water bodies, some of these establishments demand the development of their own workers settlements within their production area which will add another layer of demand in the way the water body is appropriated¹.

New large scale hydropower generation plants are the other major public investment which the government targets to achieve in the GTP. In its attempt to quadruple the hydropower generation capacity of the country from 2000 to 8000 MW, it has a plan to develop massive reservoirs on various major rivers – with a potential for other related activities. Earlier hydropower plant on Awash River – Koka in particular and its reservoir is known to be a major cause for the emergence of parallel activities which generated small urban settlements - sugar factories and horticulture activities and associated urban settlements around it. Koka, Wonji, Metahara, and Merti are some of the small towns associated with the hydropower plant and irrigation projects. The current massive investment on hydropower generation is expected to create series of reservoirs in various locations (Fig.5. shows a cluster of reservoirs in the Blue Nile Basin). According to the Ethiopian Electric Power Corporation (EEPCo), the largest reservoir will be on river Abay (Blue Nile), which is named as The Grand Renaissance Dam, creating an artificial lake with a surface area of 1680 sq. km and with both main dam and saddle dams total reservoir capacity of 74billion m³ at its full supply level (EEPCCO 2014). These reservoirs are also expected to become a hub of other related activities which - like in the case of their predecessors - are expected to encourage the development of urban settlements.

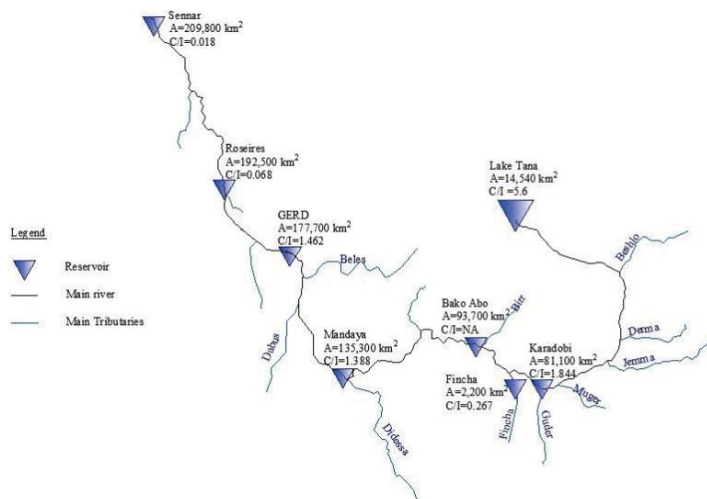


Fig. 5.1 Locations of multiple reservoirs along the Blue Nile, *source: adapted from Borji, 2013*

Reservoir name	Water storage capacity(X10 ⁶)m ³	remark
Lake Tana	28,000	Natural reservoir
GERD	74,000	On construction
Mandaya	49,200	planned
Karadobi	40,200	planned
Fincha	460	existing
Bako Abo	17.5	planned

Table 5.1 Reservoirs in the Blue Nile Basin, their water storage capacities compared with Lake Tana

5.4. Emerging formal – informal contest over water bodies

Unless heavily guarded, as in the case of military establishments, most large scale infrastructural developments in Ethiopia, since their construction phase, are usually accompanied by a parallel informal development around them. Small restaurants for daily laborers, local/traditional bars ('Tela' and 'Areqe bet'), shops for on-site consumptions, and even affordable rental rooms emerge with temporary looking structures around sites of new university compounds, large factory complexes, flower farms, resort sites, etc.(see fig. 5.1-6). Such informal developments usually grow to become permanent settlements. The play between these formal and informal developments gets complicated when the formal project projects occur on a rural land (land designated as non-urban) as the rural land administration system - as indicated on chapter 4 - has no mechanism to regulate or guide the informal settlement on farm lands.

Many of the small towns in Ethiopia developed after the Italian fascist invasion share similar genesis – informally grew following major roads. Such development of settlements is one of the most common phenomena defining the urbanization patterns of Ethiopia which is fueled by the current surge in infrastructural development. Discussions made with heads of Regional Urban Planning Institutes and other related government offices of both Amhara and Oromia Regional State for the purpose of this research confirmed the same². According to the heads and experts in these offices, the informal developments which are looming on rural land following major roads targets three things: an easy commercial outlet for agricultural products, an easy access urban services (or at least an easy connection to near bye urban centers), and a speculative investment of farmers based on an assumption that the road sides will eventually urbanize.

Although it was not possible to establish the rate of development based on quantitative data – as no public office have such a data of informal appropriations particularly on rural sites, all discussants agree that the speed of the appropriation of areas around water bodies is alarming and is expected to increase. The main points discussed as possible reasons for the constant growth of informal development are: irrigation opportunity for easy cash crop production; speculation based on signs of land contest by formal investor; and the continuous increase in the demand for additional agricultural lands due to population growth. However, these sites are also targeted by both politicians and investors for large scale investment projects which themselves demand complementary informal sector.

Notes:

1. The author was involved in projects related to the development of workers housing around irrigation projects

2. Various discussions with experts from the Urban Development, Housing and Construction Ministry of the FDRE, RUPI general director of Amhara Regional State and experts in the institute, RUPI deputy director of Oromia Regional State and planning experts, EPLAU bureau deputy head and experts of Amhara Regional State, were held between dec.2012-jan. 2015.

Chapter 6

Urban Manifestations – a micro-level study I Informal settlements around water bodies within existing cities

Introduction

This chapter covers two case studies done on settlements at the immediate surroundings of fresh surface water bodies within cities of Ethiopia. Two major cities, which are dominant in Ethiopian urban development discourse and also associated with water bodies, are selected – Addis Ababa and Bahr Dar (see fig. 6.1).

Addis Ababa, the capital city in which the first case study site is located, is a city whose foundation was rooted with stories of water. Though the current spatial structure of the city seems to ignore the special relation the city's foundation has with its water, the social, religious and economic life of the city is still dependent on its water bodies. Multiple springs and rivers articulate the landscape of the city. Immediate areas around most of the springs are claimed as holy water by churches from Ethiopian Orthodox Church (EOC) but areas around rivers are generally avoided by formal development due to pollution and flooding risks. These areas, particularly around rivers, are listed at the lowest end in the city's land lease price list - making them the least sought sites by real-estate developers and hence most wanted by less-fortunate inhabitants. Though activities vary with the varying topography of the city, sites around rivers are generally appropriated by a mixture of purely informal and conditionally formalized informal activities which generate livelihood means for many. The study takes a neighborhood as a case in the lower altitude of the city's southern corner where the water body and the inhabitants are believed to have a direct interplay.

The second case study site is taken from Bahr Dar, the capital city of Amhara Regional State. 7.2% and 3.8% of the land use of the regional state is classified as settlement and water bodies respectively (BoA, 1999). The agro-climatic zones include cold (above 2300 m.a.s.l.), humid and semi-humid (2300-1500 m.a.s.l.) and arid and semi-arid (below 1500 m.a.s.l.) (Adenew and Abdi, 2005). Though relatively new, the city has grown into prominence since the 1960ies when the then king wanted it to develop as his alternative capital city. Its very name means *Lake Shore* - signifying its strategic location on the exit point of river Abay (Blue Nile) at the southern

tip of Lake Tana - the largest Lake in the country. The city struggles to settle with the two major water bodies in Ethiopia - if not in North East Africa – Lake Tana and Blue Nile River. This young city seems to be on an active search to find a defining principle between its spatial development directions and the two major water bodies. Many of its master plans and local development plans developed through its young age have been trying to define this relationship. According to the city's municipality officials and regional planning institute experts, current development projects are taking shape partly based on these plans which got revised every ten years and partly based on swift decision of political leaders. In the last 10 years, unlike the city of Addis Ababa where sites around its water bodies are least sought, sites around Lake Tana in Bahr Dar have become most contested. In these contest, politicians and experts in the planning offices have set priorities in order to preserve the sites for larger investments who promise higher employment and tax. However, much beyond the control of the city's management and planning authority, enclaves of informal settlements around the lake are developing addressing problems that the formal decision making processes could not tackle in time. This research takes one of the older enclaves of informal settlements near the lake in order to understand the dynamics within informal physical space production processes. It examines the relationship between the spatial structure and the livelihood production activities which are assumed to be generated based on possibilities offered by the water body.

6.1. Case I. Mekanissa – on Akaki River banks, Addis Ababa

Box 6.1.1 > The shovel and the rented donkeys

'What we have is our shovels. These are our rented trucks' jokingly claimed one of the two middle aged men indicating to the four donkeys standing next to them. Worku and Sintayehu mine sand from the river bed and throw it to a higher ground. They sieve it lightly before filling it in sacks and load the donkeys to head to the main street following the narrow path uphill. While the donkeys struggle to climb the uphill with the heavy load of wet sand, the two men help the donkeys by supporting the load from the side. They know that it would be better to let the sand dry before transporting but they also cannot let it dry on an open field. They don't have any claim on any of the area – neither the particular location they identified to draw the sand from nor the upper ground they pile the wet sand on. They deliver the wet sand and sometimes its wetness serves as a mark of well washed river sand. Their usual customers are masons who work in repair works in the neighborhood but sometimes they also get orders from hollow concrete block (HCB) producers. If not mining sand, they also work as transporters of HCB to construction sites using the same donkeys.

Worku and Sintayehu are migrants from the rural area from the northern part of the country. They came to know each other and about sand mining while working as a daily laborer on the horticulture irrigation field next to the sand mine. Both of them have come to Addis Ababa two years ago leaving their families in their homes. They visit their families for major holidays but send money regularly. They hope that their family will eventually join them in the city.

Worku and Sintayehu are picking up skills in the construction industry in which they sometimes get a day job as assistants for masons. When asked about what happens to their agricultural land in the rural area when they are away, they respond with care saying – we usually give it for 'le-ekul' and our wives will oversee it (which is to say that they lease it to another farmer who works on the field for an equal share). However, when deemed necessary they travel back in crucial times to check on it. Both of them have managed to rent separate rooms of their own in the near by neighborhood. They save a great deal of their income and often cook their own meals. Whenever they return from visiting their families in rural area, they usually carry rations – a semi-processed dry food prepared by their wives.

When asked if they have attempted to build their own house around the area they are mining, two points they forwarded as a reason for not entertaining the idea: first the land is flooded in the rainy season, and second, the Kebele and the cooperative of farmers who are working on the flood plain would not allow them to have any piece around. However, both the kebele and the cooperative have tolerated their sand mining without demanding from them any payment. They claim that their operation is a petite one which harms no one. They also try not to interfere with the cooperative of vegetable producers or even individual farmers by avoiding irrigable lands and using only public access roads. Nevertheless, they also admit that sometimes they get threatened by neighborhood youth who demand money from them.



Fig. 6.1.1 sand miners on work (source: author's photo)

6.1.1 The city, its water and the site: an overview

The city and its water

Addis Ababa is a chartered city with a population estimated at 3.385million with annual growth rate of 3.8% (CSA2008) contains about 25% of the total urban population of Ethiopia. It is by far a primate city in the country with a population 10 times bigger than the second largest city Dire Dawa. It is conveniently located at the geographical center of Ethiopia (8°55'–9°05'N and 38°40'–38°50'E). The altitude of the city ranges between 2200m.a.m.s.l in the south-east to more than 3000m.a.m.s.l. in the north covering an area of 222 square kilometers (see Fig 6.1.1.1). Despite its proximity to the equator, Addis Ababa enjoys a mild, Afro-Alpine temperate and warm temperate climate. The lowest and the highest annual average temperature are between 9.89 and 24.6400c. The city rambles pleasantly across many wooden hillsides and gullies cut through with fast flowing streams especially during the rainy seasons from July-September (Fig.6.1.1.2).

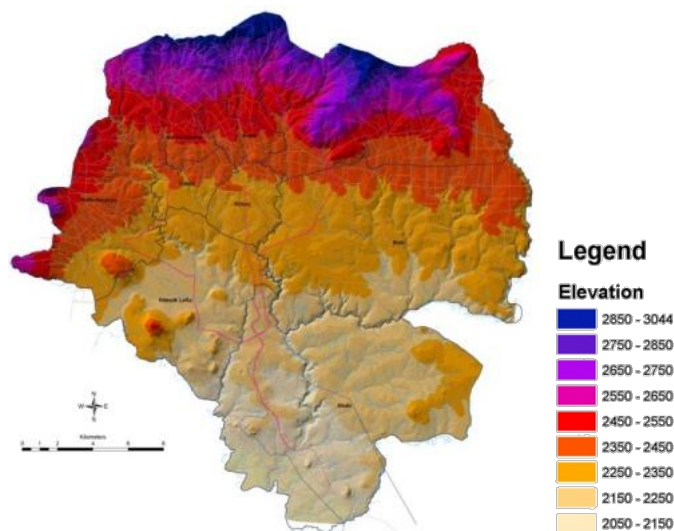


Fig. 6.1.2 Addis Ababa topography, source: CLUVA

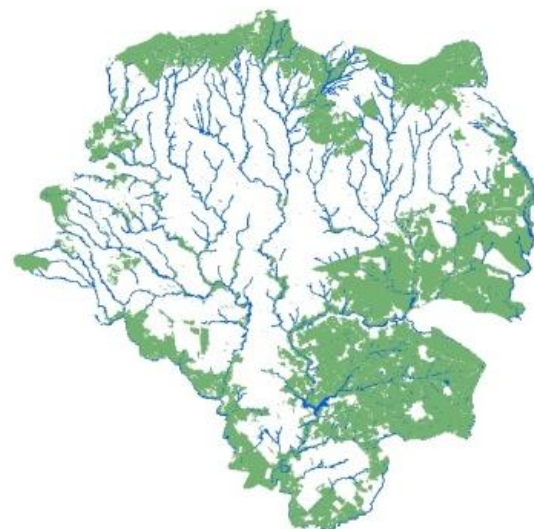


Fig.6.1.3 Networks of rivers and green cover(ibid)

Emperor Menelik II and his wife Empress Taitu, the Fil-wuha (hot springs), and the battle of Adwa are the three characters strongly associated with the foundation of Addis Ababa as the permanent capital of Ethiopia. Before the final settlement in Addis Ababa, four military camps (garrison towns) were used as capitals, namely: Ankober (1868-1876), Liche (1876-1882), Ankober and Debre-Berhan (alternatively) (1882-1884) and Entoto (1884-1887)(Akalou 1976 quoted on Elias 2007). Like his predecessors Menelik's headquarters and military camps were set up following his movements. The first known plan for Addis Ababa was the plan known as "the Taitu- Menelik Development plan" which was similar like the usual military camp of the king (See Fig. 6.1.6A).

Even though the formal planning and structure of the city do not seem to recognize water bodies as elements of the present day Addis Ababa, water bodies are at the center of both the city's foundation and its present day structure. The location of the city was selected by Empress Taitu

for the very reason of the presence of hot springs and the favorable climate. The hot spring ('Fil-Wuha'), which are located at the present day central Addis Ababa, remained to be the most important water body which defined the city in its earlier conception. It finally developed into a public bath in 1911 as noted by Pankhurst- 'A much appreciated innovation in Addis Ababa related to its water bodies in a city virtually without piped water, was the establishment in 1911 of thermal baths at Felweha (Pankhurst citing Mérab (1922. II,152); Mersé Òazen (2004, 162)). However, the city of Addis Ababa was also the first to experience the marvel of modern water engineering (see Pankhurst 1985: 205-207) in Ethiopia. In the early stage of its foundation, the city also attempted to use its waters for a no less exciting innovation, in 1911-12, was the harnessing of hydro-electric power from the Akaki river, with two 74 horse-power dynamos (Pankhurst 2009). Apart from these reports and the difficulties faced by the inhabitants of the city to cross the rivers in the rainy seasons, the rivers and streams of the city did not appear in earlier historical documents related to the city and its structures.

Addis Ababa does not have a prime river which can be referred as an organizing element for the city's various spatial and physical entities. However, the land of the urban area is divided by numerous valleys formed by seven major rivers and multiple streams running from north to south across various slopes (see Fig 6.1.2). Surrounded by hills (mountains) - the Entoto mountain range to the north, the Yarrar Mountain to the east, Mannagasha and Wachacha Mountains to the west - the drainage runs southward. Though the impact of rivers and its drainage patterns on the production of the city's spatial pattern is a topic yet to be studied, the topography with its considerable slope from north to south with an elevation difference of around 1000m (Fig.6.1.1) generates a rapid flow of rivers particularly in the rainy seasons. It also generated differentiated climatic zones within the city – leaving the northern part cold while the southern part of the city mild and relatively warm (Fig. 6.1.2).

Box 6.1.2 > we love the dirt...

Next to a dirty river, extends a beautifully kept vegetable garden extending to the backyard of raw of houses of mud. Women and men labor on these fields of cabbages, potatoes, carrots, Lettuce, onions, etc. Ato Mulat lives on one of the houses defining the vegetable field. He constantly checks on the level of water which runs through an open channel in front of his house and mends the mound of mud on his compound door. The water is channeled from an upper elevation of the river in order to be guided into the lines of irrigation fields by gravity. His house is the few houses remained between the channel and the irrigation field. A fence of thick 'Skenbeko' plantation protects the water from overflowing into his house. However, he admits sometimes the water breaks and over floods his compound. But what he fears is not the overflowing from the channel but the flooding from his rear side which comes when the main river is swelling on the rainy season. He has been out of his house and lost much of his properties more than once. His house is one of the few marked as dangerously situated.

' the land was originally claimed by my parents and I know how to live with the river. Even if the river is presented as a danger, it has been the main support system of our lives' he claims. His vegetable field extends from his backyard up to the river. He opens a small gate from the channel to guide the water cross his compound and reach his field. His wife also works on the field. Other than the field they have various herbs and fruits in their compound. He is the member of the cooperative which oversees their water use and negotiates with the government. He has all the paper documents but still falls short of title deeds. His particular house falls in a zone which is marked as green zone.



Fig. 6.1.4 irrigation field (source: author's photo)

The rivers also have adapted varied behaviors in different part of the city. In the northern part of the city, where the gradient is high, the rivers are rapid, rough and the valleys are V-shaped and deep. In the center and in the south where the gradient is low, the water moves relatively slow and it assumes a meandering way with a wider valley which leaves a flood plain for irrigation in the dry season but exposed to flooding in the rainy season. Accordingly river side activities are limited to the nature of the land form and the behavior of the rivers. In the north the river is cleaner and the river sides are rocky and deep. It was possible to observe people using the water for washing/bathing and sometimes transport it for household uses. Riversides are also appropriated by low income inhabitants for housing. In areas with low gradient, the river claims a wider plain which creates irrigable land and irrigation fields in the dry season. However, in the southern part, the rivers are polluted from the dirt drained to the rivers from across the city and the water is used primarily for agricultural activities. Currently, horticulture is the major activity on these plains which supports the city's vegetable consumption. 677 hectares of land is irrigated annually, on which 129,880 quintals of vegetables are cultivated (AACA 2014).

The Master Plan prepared by the Italians in the time of occupation tried to use the main rivers and the green surfaces around it as boundaries to create various sections within the city. Successive master plans which were prepared for the city after the Italian, by both international consultants and local experts, have correspondingly assigned the river networks as the generators of urban green area(See Fig. 6.1.3). None of the plans have considered the development of water bodies as a land use element or any other function which recognize them as an element in the city. Such neglect in recognizing the water bodies as an integral part of the city's physiology no serious attempt to appropriate and develop them properly. However, at a closer look, one can observe that water bodies in the city are intertwined with the social, religious and economic activities of its inhabitants.

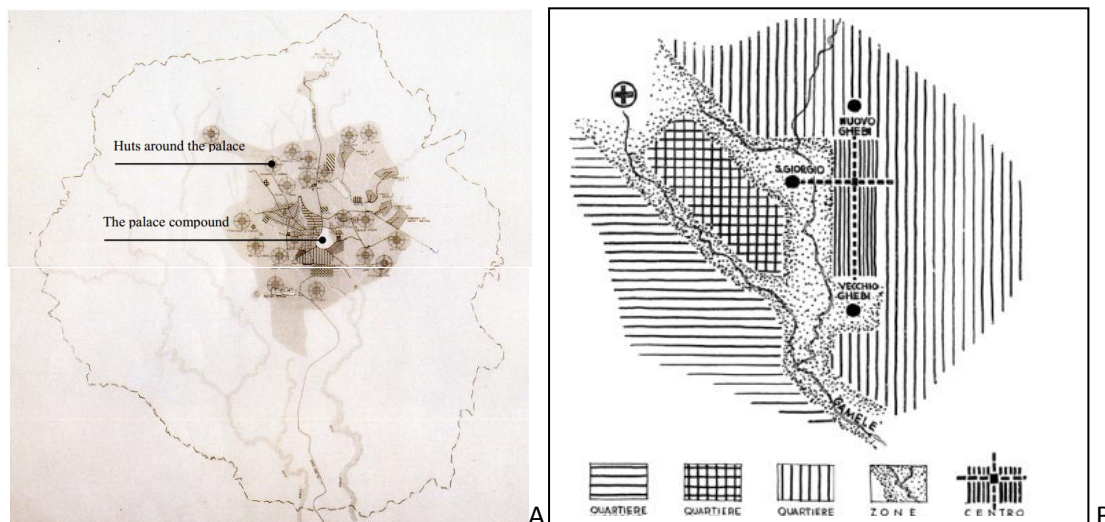


Fig 6.1.5, A. Taitu-Menilik development plan , B. Earlier landuse plan of Addis Ababa as proposed by Fascist Italy, (Source:ORAAMP 2001)

Many of the springs within the city are associated with the EOC churches where they are treated and used as holy water. Down the hill, the springs grow into rivers which functions as

open sewer. The pollution intensifies and the rivers become unapproachable. Irrespective of the few attempts by the city government to clean the river flow, the water bodies and their immediate bank have remained to be the backside door of the city. However, the neglect by the formal planning practice and city development trend have become a resource for the low income and marginalized inhabitants. After covering a walk following the full trails of the water path from the northern part of the city down to its southern tip, the author noted the following:

'The waters of Addis Ababa, when spring from the cracks of the earth, are received as holy. They are taken with reverence- believed to carry away the diseases of the city. Soon after, rolling down the hills, becoming a river, it loses its sanctity and itself becomes a disease - even before being enjoyed by children for swimming or by grandparents for its soothing sounds or by lovers for walking around. Within a diameter of the city, the very water people fight for a drop as holy, on upstream becomes a running cesspool upon which the city spits its dirt.... But, thanks for those who toil on its banks; once again its holiness is partially purged, at the lower end, with beautiful vegetable gardens.... ' Dec. 15, 2012

Settlements and houses

The Taitu-Menilik development plan organized the town with a number of camp like settlements assigned for military chiefs which were called *sefers*, a term which is now commonly used to name neighborhoods within the city. When the camp became more permanent the settlement was called a *ketema*, a term now used to indicate town or city (Elias 2007, See also Mesfin, 1976). This original settlement structure is believed by many observers as the most influential whose defining characteristics have sustained more than 5 consecutive master plans. The *Sefers*, with its single story 'chika' houses surrounding the chiefs house, without doubt, are still the main ingredient in the mental map of the inhabitants. It also is considered as the organization principle which determined one of the main spatial characteristics of the city – a city with less spatial segregation.¹

In 1994, of the total housing units 97% were non-storied (CSA, 1998) and 82% of the houses were built up of *chika*, (CSA, 1998). Currently, it is still estimated that the same proportion of houses are built of the non-durable *chika* construction (Mathewos, 2005 quoted on Elias 2008:73). According to Johnson (1974) the morphology of the city during the formative age was related, among other things, to the location of important places ("charged nodes") and the cultural traditions of the founders of the city. The centre of the original settlement was Menelik's palace located on a higher plateau surrounded by his immediate entourage (See Fig. 6.1.6). Next to the palace, churches, the compounds of the nobility, and the military leaders occupied important nodes. Surrounding these secondary nodes the followers of the military leaders settled around them regardless of the terrain and the availability of better location elsewhere. In the case of churches the clergy and other church servants inhabited their surroundings. Johnson observed circular concentric settlement patterns: 1) "clustered around a series of small nodes which are in turn clustered around larger main nodes" and 2) having "a series of radiating paths and routes connecting these nodes" (ibid: 84) (See Fig. 6.1.5.A.).

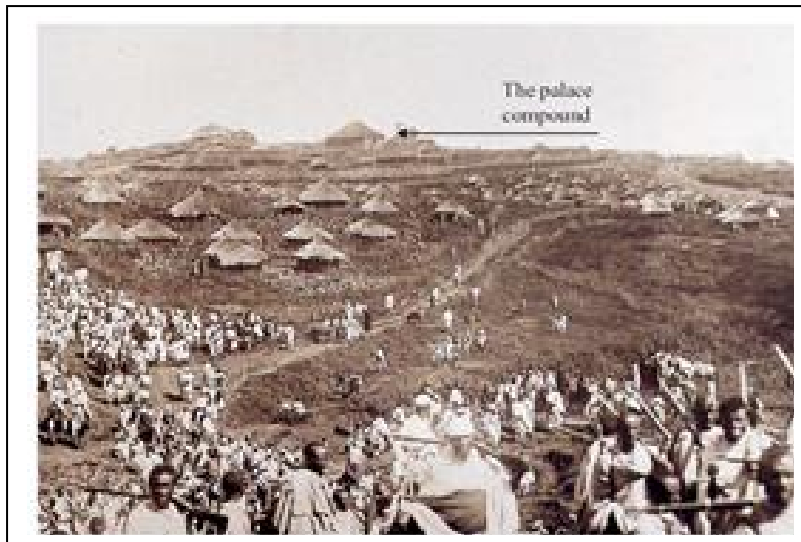


Fig..6.1.6 Old palace of Menilek II and its surrounding (source, adapted from Elias 2008:74)

These 'sefers' evolved from Sar-Biet (Tached roofed houses) and later replaced by CIS roofed 'chika' (mud) houses. Addis Ababa, since its beginning as a capital city, has passed through various land tenure regimes. Land in and around the city in Menelik's day had been allotted at the Emperor's pleasure. With the growth of the town, the erection of stone structures - and uncertainty as to the political future, the nobles pressed for greater security of tenure. Charles. Rey, a British businessman, reports (1927: 183-4) that when Menlik fell fatally ill 'a number of the big chiefs became nervous', fearing that a future monarch might dispossess them. They therefore persuaded the Regent, Ras Tässäma, to grant them title deeds, 'sealed in due form for their [hitherto] temporary possessions' (Pankhurst 2009). Title deeds were organized in the time of the last emperor – Hailesellasie, but the nationalization of all land in mid 1970s has changed everything. After the proclamation 47/1975, known as "Government Ownership of Lands and 'Extra' Houses" many of the houses fell under the government ownership. Due to poor management and lack of ability to maintain, the majority of the 'sefers' got dilapidated and are commonly referred as inner-city slums. Elias (2007:69), referred this non-planned old inner-city settlements, dominated by *kebele* housing and occupied by tenants with some tenure rights as one of the three groups of 'slums' prevalent in Addis Ababa. The other two, according to him, are: Informal peripheral squatter settlements built on vacant land with little or no infrastructure and with uncertain or no tenure rights. These are locally known as *chereka biet* – literally, "moon house", describing houses built over night (under the light of the moon) to escape the control of the government. The second are inner-city squatters with no tenure rights (*lastic biet*, literally plastic house: these are usually small pockets occupying parts of public parks, squares, vacant open spaces and as attachments to streets side fences. They are often inhabited by street children, destitute elders and beggars and sometimes dislocated families from the rural areas. Though the current massive inner city redevelopment program is aggressively replacing these dominant characteristics of the city, sites less desirable for development projects and mass housing programs are still intact (See Fig. 6.1.7)



Fig. 6.1.7 Typical 'informalized' settlement structures in Addis Ababa: A, 'Lideta' area; B, 'Arogew qera' area. (photo by author, Dec.2013)

Though the master plan of the City of Addis Ababa reserves 10-15m (in the inner city) and 100-150m (in expansion areas) from both sides of the river as a buffer, in the majority of the areas observed informal settlements have appropriated the reserved areas either for habitation or some sort of economic activities (see Fig. 6.1.8). According to studies, 90% of settlements around rivers in Addis Ababa are informal settlements from which 50% have temporary permit from kebele offices (MoUDCo 2012:21 quoting Eyob 2010).

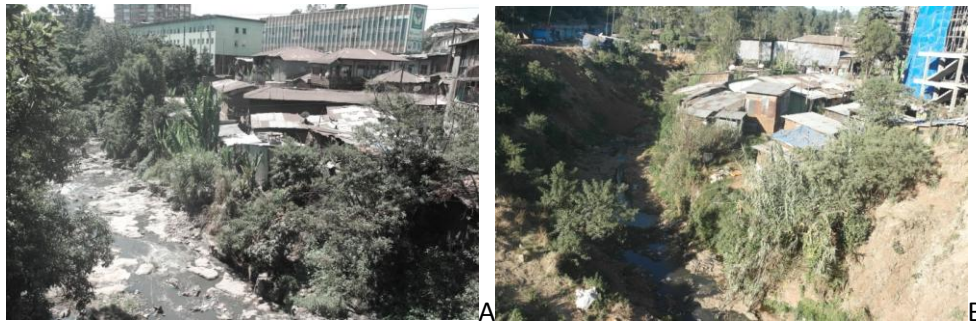


Fig. 6.1.8, Typical settlements around rivers in Addis A. Piasa area, B. Sedist-kilo (source: photo by author)

The study site: Mekannissa

Based on the criteria set for selecting sites within cities, three sites within the city's in varied elevation were taken. One on the higher grounds at the upstream area (northern border –in Entoto), one in the middle within the heart of the city (Pickoke area or Piazza area) and one on the lower elevation in the southern area of the city where the effect of the river is more pronounced (either Mekannissa or Kaliti area). After a preliminary observation on the similarities and differences and the scope and general objective of the research, it was decided to take one which is most representative in displaying both active interactions within the area of the active city center. Settlements around rivers on the northern part happen to have less dependency with the water due to the seasonal nature of the water flow and its strength. Moreover, due to its rough landscape, river banks are challenging for easy use. The Pickok and Piazza area river side settlements were also dropped due to their exposure to the distinctively radical inner-city redevelopment project of the city. The Piazza site was found cleared after the preliminary

observation was done due to the Basha Wolde Chilot redevelopment project. The Pickoke site was considered as a primary location but the tension among the inhabitants due to a new plan of the government to develop the site for a City Zoo development project have made attempts of interviews and discussions difficult with the prospect of the area to retain its current complexity with inhabitants actively engaged in the production of their livelihood is more unlikely. On the other hand, Kality river side, which is located on the southern tip, was dropped due to its low density and disengagement from the active daily routine of the city.

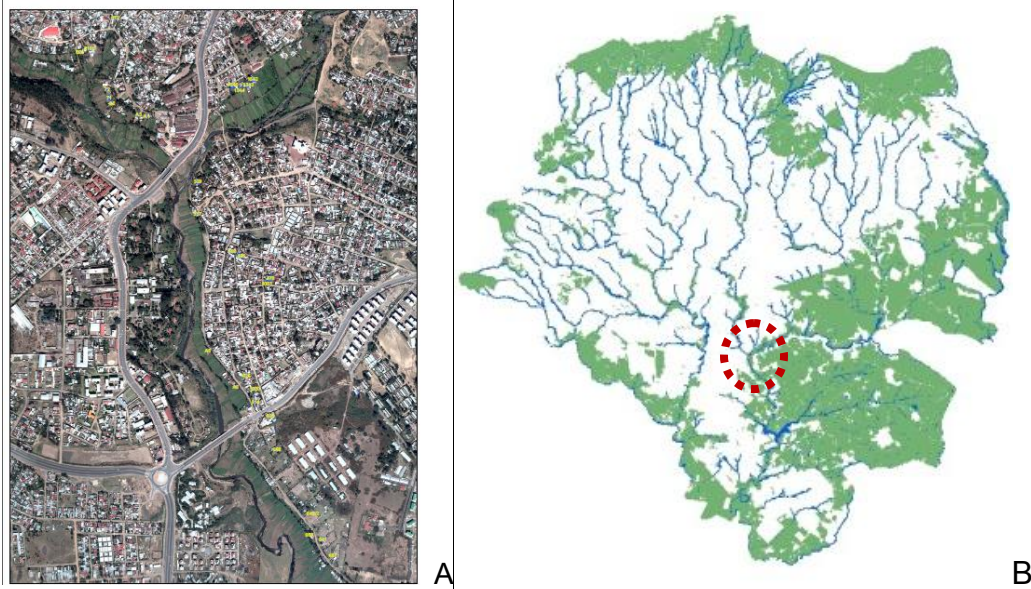


Fig. 6.1.9 A. Satellite image of the study site (source: EMA), B. location within Addis Ababa river network

Mekannisa is a vibrant area which comes back into life due to the upgrading of the connecting roads and the ring road (fig. 6.1.9). The particular study area selected is a neighborhood which increased its density through time. However, the agricultural activity predates the housing and formation of neighborhood as seen from maps and aerial photographs taken in various years (Fig. 6.1.10).

As the area is where the two rivers (Tinishu-Akaki and Teliku-Akaki) meet to continue their journey to the south, the impact of the water flow in both settlement structure and the everyday livelihood production is strong. The bulk of water in the rainy season; the flood challenges; and the amount of flood plain available for horticulture activity makes the relationship between the river and the community vibrant.

It was not possible to demarcate a particular area and define it as a neighborhood. Hence, the study assumed a larger area which is assumed to be affected by the river. The two major roads which physically define the area in the south and in the east -though new and irrelevant in defining the social and economic networks within the area - are taken as physical boundaries to limit the observation area. To the west, an arbitrary line is made following an internal but wider street.

Various local development plans have been developed and almost all have left the vegetable areas as they are and in areas where the vegetable farms are not active, the river is used only as boundary. According to the interview made with the experts who prepared the plan and reference to its details, the river was taken only as a boundary to a project site (Fig 6.1.10).



Fig 6.1.10, A. 1970-72 Map of the area (Source: SOFRATOP), B. 2012 Satellite image (Source: Google earth)

In the early 1970s, the area was vacant saving the Seminary compound and the irrigation field on the flood plains. Many of the informants who claimed to occupy the area before 1975 correspond only to agricultural practice than housing. The Seminary, which existed prior to the settlement, remained less dense compared to the growth in settlements in the eastern side of the river. However, the flood plains which are used for irrigation are kept almost intact.

It was also observed that almost all interviewed elders in the area identified themselves ethnically to be from a particular ethnic group from the highlands of the Regional State of SNNPRS (Southern Nations, Nationalities and Peoples – Gurage zone). The reason given for their migration was rural poverty and the decreasing land size in their original area.

For each variable out of 58 respondent		Freq.	%	remark
House hold head	Man	43	74	
	woman	15	26	
	Total	58		
Family size in a house hold	1-3	5	8.6	Including more than one family under a house hold.
	4-5	12	20.7	
	Above 5	41	70.7	
	total	58		
Main income source (livelihood)	Employed in private businesses	12		Majority are immigrant workers
	Self employed	26		Urban farming, livestock, small businesses, bars
	Government Employed	15		
	others	5		Income source unidentified
	total	58		
Household who uses urban agriculture as an income source	yes	49	84.48	Vegetable production and livestock are observed to be the main UA activities-both benefiting from the presence of water body. This doesn't show that urban agriculture is the main income source
	no	9	15.52	
	total	58	100	
Social association membership	ldir	57	100	All are members of either 1 or more associations
	lqub	15	26.3	
	none	-		
	Other associations	57	100	Religious, ethnic, professional, relatives association
	Total interviewed	57	100	

Table 6.1.1 basic socio-economic condition from a sample survey

6.1.2. Processes: Access, Development and Use of Land and Water

Access to land: Plots in the study areas are acquired by different times through different ways (see table 6.1.2.). Based on the map from the early 70s (Fig.6.1.11) which was based on aerial photography of 1970 (final field check on 1972), it is possible to conclude that except the vegetable irrigation plots, most of the housing construction came after the nationalization of land. Discussions with senior inhabitants of the area also confirm that in the monarchic regime, the flood plains were appropriated primarily by immigrants from rural areas while the rest of the area was controlled (owned) by the aristocracy. After the nationalization of land, informal housing construction picked up. Though documented evidences could not be found to confirm information gathered through discussions, it is plausible to conclude that the first informal appropriation of the site for housing constructions was made by the farming communities themselves. However, both formal and informal developments have continued to grow as shown in the subsequent aerial photographs and maps. Even though land was nationalized, informal purchases from earlier settlers and illegal densification of Kebele houses have been the main ways of land and house acquisition, the irrigation land on the flood plains is tightly controlled by cooperatives.

For each variable among 30 households		Freq.	%	remark
Tenure type of the house/compound	Private(own/family property)	44	75.86	Most of the privately owned houses and compounds are originally informally appropriated and then formalized (semi-formalized)
	Kebele	14	24.14	
	Rented from private owner	0	0	
	Leased/rented from government	0	0	
	other	-		
	total	58	100	
Means of Acquisition of land and legal status	formal	27	46.55	(most have secured kebele papers not title-deeds)
	informal	31	53.45	
	total	58	100	
year of building the first house in the compound	Before 1974	23	39.66	However, SOFRATOP image shows small number of houses on site(see fig. 6.1.9)
	1974-1991	20	34.48	
	After 1991	15	25.86	
	total	58		
Main reason for preference of the site	Access to irrigable land (for vegetable farming)	29		Members of farming cooperatives
	Cheaper land/housing price	15		Living in rental housing
	Chance	6		Living in kebele housing
	visual and environmental qualities	0		-
	Centrality and convenience	8		
	total	58	100	
Major uses of compound and house?	Only residence	21+(24)	77.6	(24) with sub rented rooms/houses, Spaces of residence also include various activities of non-commercial productions (food and beverage processing)
	Only commercial	0	0	
	Only production	0	0	
	Residence + commercial	11	19	Small shops, restaurants, bars ('Tela bet')
	Residence + production	2	3.4	Poultry/ livestock
	Commercial + production	0	0	
total	58	100		
Ways of participation in the decision making process on development and use of public infrastructure and commonly used spaces	Through participating in Kebele meetings	12/58		The kebele is increasingly taking over in decision making from cooperatives and associations. Few residences participate in kebele meetings
	Through cooperatives	33/58		All members participate
	Through social associations	30/58		
	No participation in any communal decision making	6/58		No reason was given
	Total interviewed	58		More than one answer was possible

Table 6.1.2 means of access to land and function for which the land is used and property developed

Access to water: Addis Ababa has succeeded in providing tapped water to 73% of its inhabitants (Fortune 2011). In the study area only 3.95% of the observed houses enjoy tap water in their house while the rest share the tap with other in their compound (79.3%) or from public tap(10.3%). Such accesses to pure water relegated the everyday use of river water for only certain activities. Except few houses which are located within the irrigation lines, houses do not claim to use the river water even for their backyard gardens. However, the major vegetable fields are completely dependent on the river flow. Few homeless people and daily laborers are observed using the river water for bathing, cloth washing and other daily activities.

Accessing the river physically is also a challenge. No proper (formally defined) pedestrian access path to the river line and no pedestrian bridge could be found in the study area. Foot /donkey paths and one major pipeline are used to access and cross the river (Fig. 6.1.12). Other than the irrigation fields, no other formal appropriation of the river banks neither for recreational nor production activities are observed. Small makeshift livelihood activities by daily laborers and homeless people like sand and recyclable materials mining claim pocket sites which are left from the irrigation fields.

The major livelihoods activity for which the river, its flood plains and the immediate area around (river bank) are appropriated for are horticulture, livestock and small scale rental housing development (see table 6.1.A for detail description of major and minor activities and table 6.1.B for daily interaction with river water).

A. Water sources and use				
Water source	Use/location	Freq.	%	remark
River water use	Drinking and kitchen	0	0	
	Washing	5	8.6	Shower/bath, clothes almost all use the lake at least ones a month
	Livestock	16	27.6	Those who have livestock use either the river water, or river side grass.
	Vegetable	33	58.9	Primarily on flood plain
	Other use	20	34.5	Not regular use - For daily use in times of water shortage, construction works, etc
	Total interviewed	58	100	More than one answer was allowed
Piped water source	In the house	2	3.45	
	In the compound	46	79.31	Shared also by rental rooms
	Public tap	6	10.34	
	Shared -Outside the compound	4	6.9	Shared from other compounds
	total	58	100	
B. Waste water treatment				
source	type	Freq.	%	
Toilet type	Pit latrine (dry toilet)	56	96.6	
	Flush toilet	2	3.4	
	total	58	100	
Surface and kitchen waste water drainage	Drained to the river	13	22.4	
	Drained to the street	25	43.1	Eventually drains to the river
	Drained to an open compound(backyard)	19	32.8	
	Drained to a septic tank	1	1.7	
	total	58		

Table 6.1.3 A., water access and use and, B. drainage and waste treatment



Fig. 6.1.11 water supply pipe as pedestrian bridge, Mekanissa (source: photo by author)

6.1.3. Product: the architecture of individual and collective spaces and its relationship with the water body

The architecture of individual houses (**IH**) is assessed and described through the following major points: spatial organization; use, size and shape of spaces; Spatial qualities (in terms of Spatial luminance, ventilation and appropriateness measured and reflected subjectively based on observation); and material used and technique of construction adapted.

Space structures at the neighborhood level(**NL**) and particularly spaces for collective uses such as markets, multi-use open spaces for play grounds, social gathering including funeral and wedding services, 'idir' and 'iquib' meetings are reflected on based on observation on an extended stay. In most cases and activities observed, the individual and the collective spaces overlap via multiple activities. Common spaces like neighborhood streets are often used for individual purposes like for food processing for household consumption clothe washing and drying, bio fuel production (charcoal production, drying dung of cattle for fire, washing and drying spaces), etc. on the other hand, what seems a private house in the evening serves as a restaurants and bars in the day time opening its front yard for the public.

6.1.3.1 Spatial organization and use

Spatial organization

IH: Spaces in all houses in the neighborhood are organized in a single story within a variety of compound sizes and shapes. A compound can have more than one house made from predominantly 'Chika' and corrugated iron sheet roofing (see table 6.1.1.). Constructing additional rooms continue based on the capacity and need of the owners. Generally, houses are detached types with varying compound sizes.

NL: Streets are defined with fences and sometimes with open channels which runs to the irrigation fields. Open spaces are not demarcated with any method of demarcation and most of the land which appear open, unused and unoccupied spaces are controlled by the kebele. Most of them await possibility to lease it for possible investor. The Woreda administration office has already demarcated unused spaces as possible plots for leasing. The new coble stone

pavement being introduced into the neighborhood streets makes a clear surface texture which gives a visual quality and hierarchy which otherwise is difficult to differentiate the public street from a semi private access road.

Spatial use

IH: The majority of the houses visited are used for residential functions with rooms available for rent. Rooms for rental services need to have external access door. However, household production including livestock production and food processing for house hold consumption are taken as part and parcel of residential functions. Compounds bordering a road are more likely to build a small shop attached to the fence with window towards the street.

Rooms are not usually distinctively designated for a specific function. Except in few cases with multi-room house, rooms (except the toilet) are multi-purpose spaces. In the dry season, main activities of the day happen in open spaces within the compound. As in many other Ethiopian household, food processing (preparation of ingredients up to cooking) happens within the compound. In many of the houses visited, toilets are dry pit latrines located at a corner within the compound.

NL: Roads and pathways are the common spaces. They also overlap with private open spaces with household activities overflowing from inside the house to the streets (common spaces). The narrow path-ways which can be read as streets, which assumes organic structures, venues all social events and also function as the extension of individual activities. Except for the office of the Vegetable Producers Cooperative and the largest 'idir' in the neighborhood, there are no spaces delineated for particular communal activities. As it is on a household level which does not strictly segregate spaces for various functions, the neighborhood is a more or less homogenous continuum of space. Spaces for production, commercial activities, living quarters, and social services and activities in the neighborhood level spread all over the neighborhood, though in small scale. However, little groupings of activities can be made based on proximity to water body and major path ways. Horticulture production, livestock(animal husbandry), plant nursery, and bio-fuel(from cow-dung) production are located on the immediate site next to the river line, while commercial activities like shops, small restaurants, and 'Tela & Areqie betoch' prefer frontage spaces on major pathways.

Space size and spatial form

IH: The majority of the main houses have a distinctive rectangular plan with an inclined CIS roof. Larger houses with corrugated iron-sheet roofs have an average height of 3m and are divided into two or three rooms (rectangular prisms). Internal spaces within the rectangular space are subdivided with light partitions and furniture. Other than the main house which usually has two to three rooms with an average total floor area ranging from 30-50 square meters, additions to the main house (rooms usually rentable) have an average area of 9-11square meters.

NL: other than the irrigation fields on the flood plains, which are geometrically organized with defined thin parcels running perpendicular to the river, other communally used spaces are organic and organized as a left over spaces. The main streets are imposed by the city and interior streets are negotiated and continuously evolving informally. Public passage ways

ranging from 1m to 3 meters are observed. However, main streets defining a block range from 3m to 10 meters with some irregular openings at crossing points (Fig. 6.1.13)



Fig.6.1.12. use and pattern of Communal spaces (sources: A, B, photo by author, C&D Satellite image source CLUVA, C -SOFRATOP)

Spatial quality (Spatial luminance, ventilation and appropriateness)

Within the study area, the conditions of the houses vary according to their particular micro-setting. The setting can be categorized into:

- A. Houses bordering the river (without a buffer in-between);
- B. Houses beyond the flood plain and with slum like neighborhood structure;
- C. Houses beyond the flood plain with relaxed neighborhood structure.

Though type A is the most common setting in sites around rivers in the city of Addis Ababa, few houses fall in this category in the study area. In such settings, houses have limited outdoor spaces and the organization of the compound for various activities is limited. Moreover, due to the bad smell from the river and the cycle of flooding risks, most houses use temporary extensions with recycled materials (see image gallery). Houses in such settings share similar interior space qualities of low luminance and poor ventilation with other slum structures of the city (see appendix for comparison).

Type B concentrates in the immediate area next to the flood plains. Houses also share similar interior spatial qualities but better outdoor spaces. They are easily accessed by roads of an appropriate size. This setting has a higher density compared to Type C and houses demonstrate a slum kind dilapidation due to poor physical structure; no sanitation scheme; and overcrowding.

Type C is usually a later development in the area and situated further away from the flood plain. Compounds are larger and houses are in better condition. Interior spaces are relatively better lit and ventilated. However, luminance and ventilation can be referred as low compared to developments further away into the major streets.

In all settings though, the outdoor is defined by bushes, shrubs and trees with minimum articulation on the landscape.

6.1.3.2. Material and technique

Materials: two types of material assembly can be observed which can be categorized as older house types and new ones. The majority, generally original (older) houses, are Eucalyptus log framed, CIS roofed Chika houses supported on the floor by stones collected around the river. HCB walled concrete framed houses with CIS roofing are the new trends. The following are the details of major building materials used on the houses in the study area:

>Walls:

Main wall: Eucalyptus log main structural frames and eucalyptus smaller logs fillings with 'chika' (mud+straw) fillings. Common wall finishing are mud plastering, cement mortar plastering/rendering, painting. Internal main partition walls are also constructed with similar material and technique as the external wall but with smooth plastering and often newspapers are used as wall papers. Moreover, some houses also use hard papers, fabrics and used plastic sheets as partition walls.

>Roofs:

Roof structure: Eucalyptus logs and sticks

Roof covering: mostly used/new corrugated iron sheet roofing and plastics cover in few extensions..

Ceiling: none mostly, fabric (in few houses), hard papers (card boards).

>Floor:

type 1(most common): compacted stones finished with cement screed

type 2(few) : Rammed earth finished with cow dung screed,

>Door/window:

Woden (stick) framed CIS surfaces

Recycled (used) wooden doors/windows (mostly)

Metal doors and windows (recycled or new) (emerging trend – newly constructed use it)



Fig. 6.1.13 images showing hybrids of material use in house construction in mekanissa (source: photo by author)

Based on their origin, most of the materials used for the construction of houses in the area can be categorized into three:

- 1) Produced on/around the site within the reach of human labor: 'shenbeko', wood (from eucalyptus tree), 'Chicka' (on site soil + 'chid'/straw), water, sand, pebbles, cow dung, 'sar' (grass for thatch roof)
- 2) Recycled elements from town: used corrugated iron sheets, used-nails, used- plastic sheets, used-doors/windows, HCB.
- 3) Purchased new materials: eucalyptus logs and sticks, Nails, corrugated iron sheets, HCB

House characteristics	category	Freq.	100%	remark	
House form of main house	Circular hut	1	1.74		
	Rectangular prism	57	98.26		
	total	58			
House type	Row houses	25	43.1		
	Detached houses	33	56.9		
	Storeyed houses	0	0		
	Total observed	58			
Number of rooms	1	1	1.74		
	2	8	13.79	Growing through the years	
	3	24	41.37		
	4 and more	25	43.1	Rentable rooms included	
	total	58			
Building materials	Main house roofs	CIS	57	98.26	
		Plastic	-		
		Thatch	1	1.74	
		mixed	-		
		total	58		
	Major walls material	'Chika'	51	87.93	(mud +straw applied on wood surface)
		HCB	4	6.9	Concrete block
		Stone or brick	-	5.17	Acacia wood
		mixed	3		Provided from construction sites from around
	total	58			
	Major floor	Compacted earth	22	37.93	
		Cement screed	36	52.07	Stone foundation with cement screed
		total	58		

Table 6.1.4. Housing condition

Technique and mobilization of labor: Most of the houses visited are built without an approved plan – improvising continually over a long period of time. In more than a quarter of the visited compounds, it was possible to observe new construction on the way for additional rooms.

Except the new additions, almost all houses are made out of 'chika' walls and corrugated iron sheet (CIS) roofing. In many compounds, CIS is also used as a wall material for additional service rooms (storage, toilet, kitchen, etc.). In such construction, skilled carpenters are employed for the main structure and semi-skilled² laborers can work on the 'chika' walls. In the more recent trends which adapt HCB walls and concrete frames, contracting fully or partially for masons and carpenters is becoming a common practice. For such cement-based construction,

either the owner himself with his children or paid daily laborers extract sand and pebbles from the river. Though material accumulation takes longer time and it usually is transported by rented donkeys, construction takes place at weekends and at evenings in order to avoid controllers from the Kebele administration.

Other than the Kebele, which has taken over in mobilizing labor and other resources in the construction of the newly paved neighborhood street, the cooperative represent the inhabitants in mobilizing works related to the irrigation and its fields. Most of the daily laborers observed being mobilized to work on irrigation fields (instead of landholders themselves) are rural-migrants who have a better knowledge in working on the farm field. The participation of 'Idirs' and other social associations in mobilizing material and labor for the construction of communally used spaces other than their respective spaces was not observed. .

Box 6.1.3 > we deserve more than this....

Million and Eshetu are in their early twenties – 21 and 23 years old. Put in their own language - they are done with their education – spending 12 years in school profited them almost nothing other than the ability to read and write. They have formed a two men team to harvest Shenbeko from the banks of Akaki River while living with their parents. Their clients are primarily those who need to strengthen their fences, build a shed in their courtyard, and craftsmen who weave Shenbeko to produce furniture. The dried Shenbeko can also be sold as fire wood. Even though the business is more of a casual makeshift, the two make some money to cover their daily expenditures. When asked if it is possible to claim a plot of land by the river and make harvesting Shenbeko their permanent business, they both disagree with a disapproving smile on their faces saying that they deserve a better job than that. However, they agree on the possibility of making a project which can be worked on and there are also few more young people who make money from harvesting Shenbeko.

According to Million and Eshetu, cutting Shenbeko can only be done on sites under the bridge and on the outer fences of the compounds of the neighborhood institution (on the west side of the river – opposite to the cooperative farming site). They have already marked their own access to the plantation and a small open space to store and prepare the cut shenbeko. In a lucky day, they might get two and three orders which can bring them up to 50 birr each. However, such days appear once a week and the other days can be barren. Their average weekly income is 150 birr per head. They admit that the kebele has never bothered them and no one has tried to demand tax or enforce any regulation on their daily routine.

Individual houses near the river or those which have open channels running by their fences use 'Shenbeko' plantation as their fence which functions as natural barrier and filtration against the dirty river water.



Fig. 6.1.14 'Shenbeko' filtration and guiding channel wall

6.1.3.3. The river, water cycle and the neighborhood

In the current spatial organization of a house (in a household level) there is little one can trace which makes the houses in the neighborhood different from houses somewhere away from the river. Attempts to exploit the potential offered by the water body or to address the challenges imposed by it through particular spatial layout are minimal.

Piped water is the major supply system for fresh water - supplemented in the rainy season by rain water harvesting in most houses. The water cycle in the courtyard of a family household and an extended household within the neighborhood is related with the river with only its output sewage line. Both surface water drainage and waste water disposal (saving toilets which usually are pit-latrines) from houses and compounds located on the riverfront are directed towards the river. Other houses direct the drain towards pathways and streets which in turn slopes down to the river. There are no purification systems to store or filter the disposal before it meets the river (Fig 6.1.13.A). Houses near the river, whose frontage or backyards is the river, use the irrigation channels to cultivate vegetables on their own courtyard.

The river side grasses, shrubs and bushes are also used for livestock and animal husbandry. 27.6% of the inhabitants (based on a random survey) have animals in their compound either for milk and meat production or for transportation business like donkey. The availability of grass and shrub fields around the river; enough by products from the vegetable production; and enough water are indicated as the main reasons to have a substantial number of inhabitants to adapt small scale animal husbandry to supplement their livelihood income. It is also noticed that the easy disposal of the liquid waste to the rivers from the barns is another attraction point which encourages the business.

According to elders of the neighborhood, the construction of houses in earlier times was mainly dependent on the river for its basic inputs: water, sand, pebbles, stone, grass, 'Shenbeko', and even wood. In recent times, sand, pebbles and 'Shenbeko' are the main resources sought from the river. Except the special plantation of 'Shenbeko' to withstand overflowing and sieve dirt associated with the overflowing (Fig.6.1.14), no other special construction detailing was observed.



Fig. 6.1.15 A. plantation to protect channels and river overflow, B. house hold and neighborhood drainage being channeled to the river without processing (source: photo by author)

6.1.4. External inputs: interventions of Government and Non-governmental organizations

Though river sides are considered as the least of sites sought for urban development in Addis Ababa (MoUDCo2012, EiABC 2012), they also are the most exposed sites for flooding and land slide disasters which made them to attract a lot of attentions from the city government and various NGOs. Furthermore, the river side urban agriculture (particularly horticulture) - other than being the main provider of vegetable to the city, has been the center of public attention due to the increasing level of river water pollution. Accordingly there have been a number of interventions made by various interest groups including the city government.

The city government, other than officially issuing master plans to direct the development of the city at large, it also produces Local Development Plans (LDP) which deals with detail organizations of spaces in a neighborhood level. Mekanissa is one of the areas for which LDP is prepared in 2006AD. The plan introduced important access streets and tried to rationalize existing organic parcels of properties. Moreover, it also proposes housing development in the area replacing the existing informal (slum) housing. Interview made with the then head of the Mekanissa Local Development plan³ revealed that the plan did not consider the river for any other purpose than a border line of the area in the study (see Apendix). According to the lead planner, even though enough socio-economic and physical data was collected, the planning process and the decisions made can be taken as top-down.

Flood protection projects by various NGO and the city administration has been implemented at various scales. Such projects and awareness building campaigns have been organized through the cooperation of the Kebele, the cooperative and other social associations like Idir. The cooperative of the vegetable producers and the neighboring MekanneYesus Seminary campus have set up a joint team to deal with government bodies on issues related to flood. The recent coble-stone pavement development is an example of the growing involvement of the city administration at the level of the neighborhood.

Summary:

In the lower elevation of the city of Addis Ababa, using the flood plains for horticulture is more feasible than appropriating them for settlement. In the higher elevations, the terrain demands otherwise – though serious and comprehensive ground stabilization measures is needed in order to use the river banks or regularize the existing informal settlements built on dangerous locations. However consistently the master plans suggest reserving the river banks for green infrastructure, settlements are growing at the banks of rivers in both the higher and lower elevations of the city. The river banks offer both job and cheap places of habitation for the rapidly growing urban population – particularly for rural migrants. Flood plains in lower elevation are primarily appropriated for urban agriculture while the riverbanks on the higher elevation where the water flows rapidly are appropriated for cheap housing.

The irrigation activity in Mekanissa is older than the settlement structure. Most plots are inherited from earlier use-right holders (The use-right is a temporary use-right issued and recognized by the Kebele) and most land holders employ rural migrants for daily labor work on their field. Those inhabitants engaged in irrigation have their own cooperative which deals with water management, reestablishing boundaries after the flood, marketing and issues relating their activity with the city government. However, there are also farmers who are not members of the cooperative but operate individually. Even though the irrigation activity in the area has a longer history than the settlement, it was not possible to establish its development in techniques and methods through time.

The neighborhood structure, the tools and methods (physical details, principles and social organization) to profit from the water body is rudimentary and dominated by makeshift activities. Mechanisms to confront challenges of flooding are also temporary, subtle and low cost. Even though inhabitants are not threatened with immediate resettlement plan - like their fellow urban farmers in Pickcock area⁴, the lack of tenure security is cited as a limitation for the development of a robust urban structure with sustainable livelihood production mechanisms.

The influence of the river on the details of the production of spaces and livelihood within the settlement, however, is indisputable. The following are major characteristics drawn:

>The seasonal movement of the river determines activities and land use reconfigurations. It dictates the major production activity within the settlement. In the rainy season, when the river swells it eats up the irrigation fields and only few mine the river for recyclable materials that it carries from upstream. In the dry season, the river offers a fertile land for horticulture, and bushes and shrubs for animals, and easier harvesting season for grass and 'Shenbeko' for various small scale trades (see table 6.1.5 & 6.1.6 and image gallery). The inhabitants who are engaged on the farm follow the cycle in appropriating both the buffer space and the swelling accordingly. The flood plain is free from any permanent structure.

>Though the urban scale and house level structures of spaces and building elements have little to signify the peculiar relationship of the settlement with the water body, building materials used and the majority of the livelihood production activities within the settlement are substantially defined by the presence of the water body (see table 6.1.5 & 6.1.6 for a complete summary).

>Single story Detached and Semi-detached Chika house (with used CIS roofing and 'Shenbeko' fencing) are the most common house types. Semi-skilled and non skilled labor is mobilized within the neighborhood and the owner is usually the lead builder. Materials used to be organized predominantly within the area except used elements like CIS roofing and wood from the city. HCB is the most used new material in the recent trend. Communally used spaces and infrastructure are negotiated either by inhabitants themselves (when it is at a scale of an extended compound) or through the kebele (when it is major spaces and streets). Irrigation fields and activities are dealt through a cooperative that the farmers have established.

>within the house and compound of the household or extended house hold (with rental rooms within the same house number), functions (activities) are not differentiated by space. However, on the neighborhood scale, the irrigation fields occupy the flood plains and commercial activities

prefer sites with frontages to the main pathways in the neighborhood. Households located nearer to the river tend to have livelihood activities related to the river, such as animal husbandry, and bio-fuel production, and 'Shenbeko' and house garden vegetables other than the irrigation fields.

>most of the original settlers are rural migrants from the central and southern highlands of Ethiopia. Rural poverty and the lack of enough farm land is cited as a reason for migration.

> A household livelihood is not based on a single income source rather on various activities done by all adult members of the house – most of the time directly or indirectly related to the water body. Building rental rooms is becoming the most sustainable source of income in the neighborhood.

> Risk related to flooding, water pollution and vegetable production activities have pulled the government and other NGOs to engage with the neighborhood and the cooperative. Flood protection walls, diversion channels, dams, awareness creation trainings on risks and climate change, and the development of internal roads are the major areas where the effect of the formal governmental and NGOs inputs are visible.

Notes

1. Chereka beit: documentary movie was published by EiABC (Bisrat & Felix 2012) showing the overnight production of the houses
2. skilled carpenters and semi-skilled laborers are labels which does not refer to formally educated and certified craftsperson. Though the recently opened TVET schools produce certified construction workers, the industry in both formal and informal sector gets its workers from on-site training.
3. Alazar Assefa (architect) was the head of LDP team Mekanissa developed in 1997
4. Pickcock urban farming site is reassigned for urban zoo project. Farmers and inhabitants of informal settlement are planned to be resettled

6.2. Case II: Sar-sefer and Port Michael, Shinbet Kebele, Bahr Dar, LakeTana shores

Box 6.2.1> *'I made this by my own hands...'*

'Thank God that he gave me strength, health and helping friends - I made this by my own hand! This is my palace – I wouldn't dream more' said 'Ato' Ayalew when asked about the possibility of moving into a new place. He migrated to the city of Bahr Dar from a small rural village near the city of Gonder. First he became a guard in a house of a distant relative and then he added another job as a guard in a government office. In a simple phrase he states the reason for his migration to the city – 'running away from poverty.' Except his age, which he couldn't tell the exact date or year of his birth, he speaks with great certainty and detail about how his house was shaped through the years. It seems that he knows the whole history of every element of his house.

After finding a job and getting married, he decided to find a place of his own in the city of Bahr Dar. Sitting at the corner of his cozy courtyard- near the entrance to his main room, and while watching affectionately to his grandson who is playing with a bucket of water next to his mother - the daughter-in-law - wife of his first son, Ato Ayalew speaks passionately about his fights to secure the plot on which the family was built on. His youngest daughter, who stopped her university education for a reason which could not be disclosed, is cooking lunch for the whole family of 12 in an open kitchen located at the corner of the courtyard defined by few sticks and an old plastic curtain. The two girls, who are both in their early 20ies, seem to go along well – they discuss about their plans in the afternoon. Ato Ayalew has three sons and two daughters among whom one daughter is married and left the compound, two sons are married and live with him in the same compound - for whom, he has built additional rooms sharing the same courtyard. One has two children and the other only one. When asked about how many souls share the compound, the counting reached 14 including two adapted children - a young man and his sister - whom Ato Ayalew has adapted after their parents, who used to be his neighbors, died due to an undisclosed disease. He also rented one room for a young single woman who is a teacher in the near bye elementary school. All the 14 souls share the cozy courtyard, one tap water point, an open kitchen and one pit-latrine. The tap water and the pit-latrine are the newest addition to the asset of the households who live around the courtyard headed by Ato Ayalew.

In effect 3 families, one single woman and a total of 14 people are housed in a continuous volume around a busy courtyard of 24 m² on the total site area of less than 130m².

Indicating with a hand gesture like circling the whole neighborhood, he continued 'these sites used to be covered by eucalyptus forest owned by aristocrats in early 70ies. After the revolution it fell under the government and became a desolate land, controlled loosely by few forest guards. It used to be wild and scary. No one would prefer it for building houses. One afternoon a friend told me that some men have started to acquire a plot in this area without going through the difficult process of getting a land from the government. I learnt the way and shared the case with my father-in-law. He encouraged me and promised to help. We planned the work carefully. One Friday evening, we came in the night with an ax, a shovel, and other hand tools.' With his face full of excitement and pride, and in a gesture to show his hands as the main tools and in a confidence showing the adventure of conquering land, he continued...

'We were in a rush and only in the first night we did two major things: cutting down trees to get wood and also to prepare the ground and we also tried to dig the ground to prepare mud. Getting soil was more difficult as the land was too strong – solid as a rock. Nevertheless, before the night was over we managed to get some soil and trees. We covered the land with grass and carefully hid the trees we prepared for the next day work. We thought that Saturdays were days when the guards would be relaxed and we could come early to start. So we came the next day, this time with buckets to transport water from the lake; robs to tie the wooden sticks together for a wall; and other materials we thought were necessary. Yes, the second night, we accomplished a lot and erected the circular structure of the hut and filled hastily with wooden stick while my wife and her father prepared the mud getting water from the lake in the light of the moon. At the down of the day, we covered the mud with grass but the structure was visible at least for the guards who casually roam around the forest. As we feared, the guards saw it and found out to whom it belonged and came to our house the same day. They ordered us to dismantle it immediately otherwise they threatened us with a heavy charge. We negotiated through another relative who knew the chief guard and finally settled by paying 25 birr.

Afterwards, unless for a show case they never bothered us and we also finished it hastily in two more nights. The small hut was covered with thatch roof and we moved in immediately – with no electricity, no water or no toilet. Water was not a problem as the lake is a few steps away; we used to use the lake water almost for everything. As it was a neglected area, no one bothered us for a longer time and many others followed our steps – most of them rural migrants. After a while we tried to mark borders among ourselves and those of us who came earlier happened to act as owners and we sale part of our compound for new comers. Some among us were smarter to claim wider compounds and could sale it later, or build more rooms to rent, but many never had a vision of such nature and we were content to get a room for ourselves. And so, the density grew until we even had to fight for access roads and spaces for social gathering – 'lekso'(funeral ceremony) and 'serg'(wedding feast). But as numbers grew, we immediately formed 'idir' and we often used the 'idir' beyond its mandate to discuss issues and mediate conflicts of our neighborhood. As we were operating outside the formal administrative structure of the 'kebele', we needed to form our own committee other than the 'idir' in order to deal with conflicts among ourselves and also collectively negotiate with various government bodies. This committee which we called 'Ye Sar Mender Newariwoch Mahber'(association of the residence of the 'Sar-Safer' neighborhood) also sets some rules to guide the construction of houses and use of common spaces like roads and open spaces.'

In extreme cases of conflicts, he said, 'inhabitants usually comply with the committee and positively respond to advises and decisions of elders. But more recently when we have more new comers who moved in due to relatively cheap rent prices, problems happen and in such cases we cooperate with the kebele and police force. '

When asked why the neighborhood is still called Sar-sefer he replied –'All houses were made of grass (thatch roof) and mine too. It was through the years that I changed it. In the beginning it was a simple one room thatch roof hut. And then I added another and slowly replaced the thatch with corrugated iron sheet. That was why the neighborhood, even if it has changed extensively through the years, is still referred as 'Sar-sefer' (grass-village).'

There are still some huts covered with grass, otherwise the majority of Sar-sefer is now made of mud walls ('chika') reinforced with wooden sticks, corrugated iron sheet roofing and in many cases recycled plastic sheets for wall and roof materials.



Fig. 6.2.a. Courtyard space showing the household head (source: photo by author)

6.2.1. Bahr Dar: the city, its people and the waters

Due to its location, the city of Bahr Dar has to compete for its presence against the more celebrated names of Blue Nile River, Lake Tana, and the monasteries on the islands in Lake Tana. Though the recent makeover of the city through polishing its streets and building hotels seems a keen attempt to emerge as a capable branded city, the city is still too far from establishing itself as an equal to these natural and historic sites. Nevertheless, Bahr Dar is probably the first to come to mind among the few cities in Ethiopia with strong relationship between water body and urban settlement. It claims both the largest Lake and the longest river of the region of North East Africa. It is located at the exit of the Abbay (Blue Nile) from Lake

Tana (at its southern tip) see (Fig 6.2.1) at an altitude of about 1820 m.a.s.l., at 11°36'N and 37°25'E. The name *Bahr Dar* signifies its location. Its literal translation from Amharic means Lake Shore.

According to the 2007 population and housing census, the population of Bahr Dar special Woreda which includes the Bahr Dar town and its surrounding rural Kebeles is 221,991 among which 180,174 live in the area regarded as urban. The population of Bahr Dar town proper is only 155,428(CSA 2007) with an annual growth rate of 6.1%. With a higher percentage of the youth, the population of the city shares similar demographic structure with the national population. Fifty eight percent of the population is in the age group of 15-64 years and 42% of the total population is below 15 years and above 64 years (CSA, 2006).

Originally the settlement was called Bahre Giyorgis. Travelers of the 19th century described it alternatively as a village or a town with an estimated population of 1200 to 1600 (Encyclopedia Aethiopica 442). Due to its strategic location to control the defining water resources of the Nile Basin, the area was contested among colonial powers. It was the British who first tried to appropriate the area in late 19th and early 20th centuries through various unsuccessful negotiations with Ethiopian rulers while both the French and the Italians also tried their ways. The area and the particular settlement on the site of the current city finally fell into the Italians occupation in 1936-41 with the rest of major towns and cities of Ethiopia.

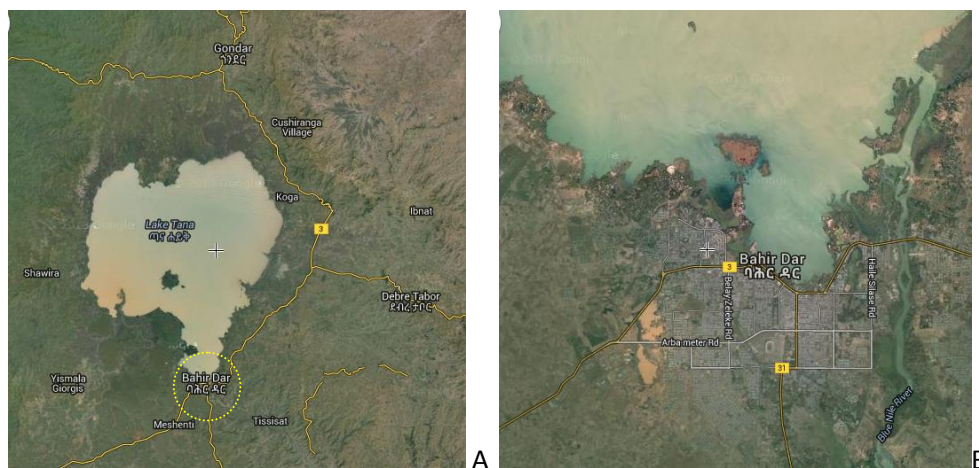


Fig. 6.2.1, A. Bahr Dar location at the southern tip of Lake Tana, B. Bahr Dar city with Tana Lake and Blue Nile River (source: Google earth)

In pre-Italian occupation, the settlement in the area was characterized by various traditional settlements, each of which is distinguished by the social position its members occupied. The 'kehenet' (clergy) and the 'balabat'¹ communities were the most important. In addition, three groups of tenant-craftsman communities, tanners, Muslim weavers and the Wayto stone-mill grinders lived on 'balabat' lands (ibid). The Italian occupation changed the structure of the settlement entirely. Abolishing communal family ownership of land, they instituted private ownership and demarcated land for residential and commercial zones and allocated particular land for administration, army and facilities like port and airstrip. A new settlement pattern emerged: an Italian camp, a Muslim community and a Wayto quarter. The lake was explored for

transportation and the city was connected with other ports and posts around the lake through motor boats.

The Italians also gave an administrative importance for the city by making it an administrative center of the Lake Tana southern territories. Moreover, they showed interest in developing the Lake Tana and Blue Nile basin agriculturally and of exploiting the water resource for hydroelectric power. After the Ethiopian government was reinstated in 1941, Bahr Dar remained as an important administrative center - first at a sub district level and then at a district level. The city was raised into a municipal level in 1945. In the beginning of the 1950s, it was considered as the best site to construct an alternative capital city for the country. The city went through a considerable make over after the beginning of the implementation of a master plan developed by German architects. Until recently, while the city grew beyond the major street, the space between the lake and the street was regarded as untouchable – only appropriated by churches, few government hotels and informal settlements. However, in recent development orientations, the space in-between has become the most contested area where hotels and major government offices are located. The contest also challenged the older established informal settlements. Current plans (IDP) reserves this ‘in-between’ space for special function (Fig.6.2.2.).

Since 1990s, particularly after becoming the capital city of the Amhara National State – the second biggest in the federation with a population of 17,221,979 inhabitants (CSA 2007), the city is experiencing a notable growth and expansion. Currently, it is organized in nine urban and nine rural Kebeles and three satellite towns, one leading municipality and one city council with a separated structure of political and municipal function.

The city has an approximated area of 42000 hectare of which 2258 hectares of the land is covered with water bodies and it accounts 17.2% from the total area of the land. 3842hectares of land is suitable for construction and the rest is unused land. Though it is situated at an altitude of 1800 m.a.s.l. with a general orientation of the slop towards Lake Tana and Abay River, the relative flatness of the topography is a challenge which facilitates flooding during the rainy season (Bahir Dar municipality strategic plan, 2004, Bahir Dar City Administration Magazine, 2004)

The monthly mean maximum and minimum temperature records of Bahir Dar in the year between 1978 and 2008 indicates that the highest mean monthly maximum temperature occurs in the months of April (30.9°C) and the lowest is in the months of July and August (25°C). While the mean annual average minimum temperature is 10.3°C.

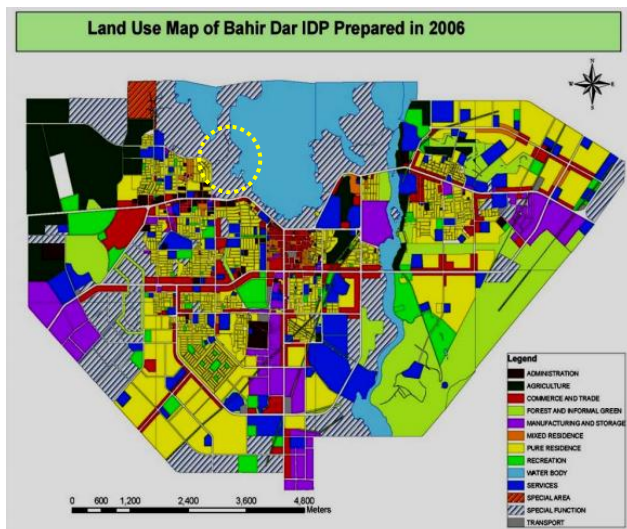


Fig. 6.2.2 Land Use Plan of Bahir Dar (source: IDP 2006), study area located in the dotted circle

The city and its water bodies:

Other than the churches' claim of the majority of the land around the water front in Bahr Dar area and its basic transportation with Tanquas (by both the monks and the Woytoes who manufacture the papyrus boats), the Italians were the first to formally connect the settlement(town) to the water by appropriating the water body for transportation. The Italians also attempted to use the vast water resources from both Lake Tana and Blue Nile River for large scale irrigation development which could have been affected the city economically. The first master plan prepared by the German architectural firm in the 1960s is the first which attempted to reorganize the emerging city and give it a lasting spatial structure. It also set the major framework which determined the way the city grew and related to the water bodies. However, its excessively formalistic approach avoided the traditional and non-formal settlements and practices around the water.

In the 1990s a Finnish design firm (DEVECON) in collaboration with the city municipality has developed a particular detail design for the partial water front. This particular design proposal made it to an implementation phase more significantly than any other plan proposal. However, the DEVECON proposal also relegates the details of informal developments and local activities overseen by the church.

Currently, according to the Bahr Dar city manager², the water front is the most contested and fast growing area of the city (see Fig. 6.2.3.). Since the end of the last decade, the demand for sites with direct access to the Lake from both small scale and large scale investment projects is intensified. The head of MSE of Bahr Dar city³ claimed that the number of MSE is increasing among them the demand for urban land is also increasing. Currently, there are more than 10,000 MSE enterprises organized and formally registered to get support under his office which require members to be residences of the city (which only demand to live for at least 6 months in the city). Among these legally registered enterprises the land demand of some is directly related to the water bodies. Enterprises organized to work on urban farming (horticulture, animal

husbandry, and fishing) and car washing services are the prime cases. Both the MSE head at the city municipality level and his representative at Shinbet Kebele (where the case study site is located) admit that the city gives priority for investment projects than MSE and hence small entrepreneurs tend to find access to the demanded land through informal means. Experts in the Regional Urban Planning Institute (RUPI) extends the case to the region and claim that the contest for land near the water body between small hold farmers and investors has become a similar phenomena all around Lake Tana and accessible areas around major rivers⁴.



Fig. 6.2.3 New formal resort hotel developments among the Lake Tana water front (source: photo by author)

Informal development along the lake

According to senior citizens and officials in the city, in earlier times people living near the lake were either those associated with the churches or marginalized groups like the Wayto. The Wayto, whom some regarded as refugees from Egypt and even from Israel, are referred as the first inhabitants of the Lake (Arsano 2007, Encyclopedia Atheiopica pg 1162). Other than using the shores of the lake for their livelihood (hunting hippopotamus, fishing, gathering of roots and more recently – women weaving baskets from Tana swamp grass and men weaving papyrus reed into fences, mats and thatch for temporary shelter, mine and hammer flat lava stones for grinding ('wofcho'), and employed as casual laborers) they are known for their knowledge of boat building and navigation.

With the rapidly growing population (more than 6% (CSA 2006)), the city is experiencing one of the fastest expansion in the country. According to the city manager, the urban growth is associated with rural – urban migration due to the increasing opportunity in the city. However, the demands of the growing population cannot fully be met by the formal processes and hence, according to the city manager, the city is experiencing tremendous informal growth both within its administrative boundary and its surrounding rural kebele's (see Fig 6.2.4 for informal expansion of the city and Fig 6.2.5 for informal livelihood activities).

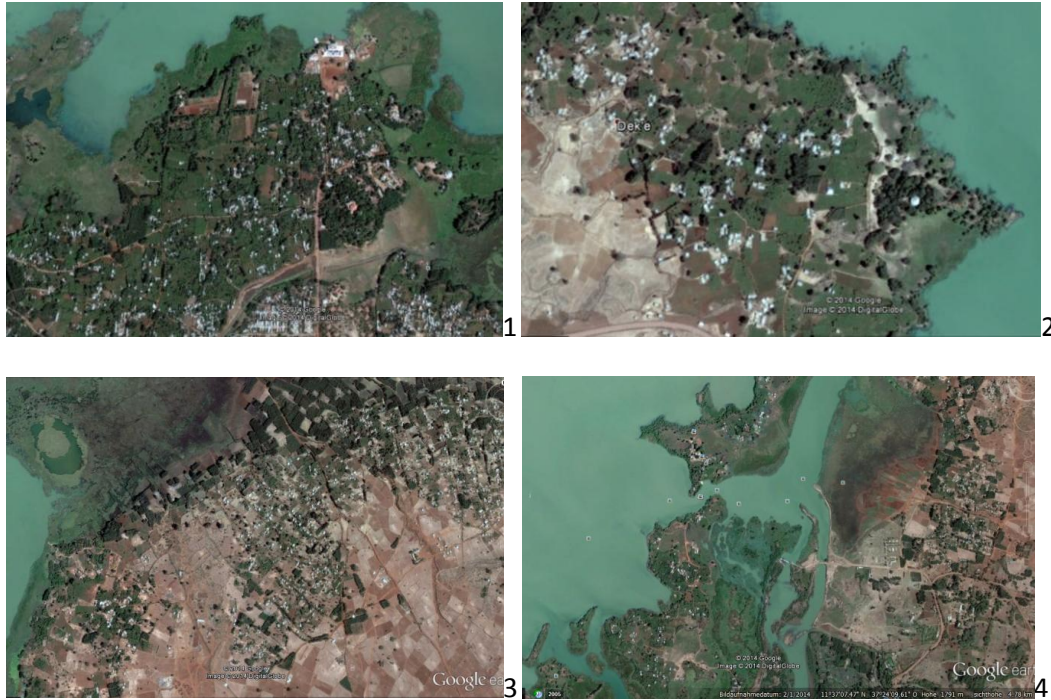


Fig. 6.2.4 | formal expansion of the city of Bahar Dar and its surrounding. 1. eastern informal expansion along the lake; 2. Dek'e – further east behind the airport; 3. Western expansion along the Lake; 4. Informal development at the mouth of River Blue Nile (source: Google Earth Dec. 2014)



Fig. 6.2.5 Images showing Informal livelihood activities related to the water body (source: photo by author)

The study site: Sar-sefer – Port Michael

SarSefer is a dense informal settlement which, according to the inhabitants, started in late 70s on what has been a forest land. Compared to the emerging growing informality, Sar-sefer is considered as one of the oldest informal settlements near water in the city of BahrDar (Fig. 6.2.6) apart from the traditional settlements of an indigenous group –the Wayto. Port Michael is a small semi-informal port owned and operated by the church located on an extended peninsula near SarSefer. The small Port is located within the property of the church but the name covers the surrounding area outside of the compound. Even though Sar-sefer and port Michael are located adjacent to one another, only separated by a pocket of forest land in between, the two areas are known distinctly in their own names. However, considering the physical proximity and interrelation, this study addresses them as one extended area - hence the name SarSefer-PortMichael. Many work their day job in Port-Michael while living in Sar-sefer. Major activities which involves many of the youth of Sar-sefer extends to the flood plains accessible from Port-Michael. The study area also includes the flood plane in between the settlements and the lake which otherwise is known as 'Bahrshesh-meret'⁵(see Fig.6.2.7, Fig.6.2.8). The area is located in the North western corner of the city within Shinbet Kebele – one of the 9 urban kebeles in Bahr Dar municipality with 15,606 inhabitants(CSA 2007). To its west, the main Hospital of the city is expanding claiming land from the neighborhood. To the east, it extends to the port-michael peninsula. Its border to the North and to the south are defined by the lake and the major gravel street leading to Church Michael respectively.

The narrow dusty pathways leads into the heart of the settlement which is an expanse of single story unpainted 'Chika' houses with walls sometimes covered with colored plastic sheets. Walking the pathways, the private and the public activities blur. Sar-sefer is one of the cheapest places in Bahr Dar to get a rental room. It is a hub of the low income and the economically marginalized society of the city.

Box 6.2.2 > *'i prefer to die here - surrounded by my family and friends...'*

Ato Shumet is the eldest in the area – one of the first settlers. He has been leading the neighborhood association for long enough to earn a reputation among the inhabitants of Sar-Sefer. Both young and old have suggested him as a more credible source of information about the neighborhood. He also is a leader of his own micro neighborhood within his compound. The thin and long compound houses 5 families and two single tenants – all in all more than 23 individuals, often with additional guests from rural areas visiting one of the families. Ato Shumet is constantly surrounded by his children and grandchildren. He has served in government offices for more than 40 years starting from the lowest possible rank to a modestly respectable position. Though he couldn't be sure of his exact birth date, according to what is registered on his Kebele ID he is 77 years of age.

He appropriated his current site in the early 70ies and all his 5 children and 6 grand children were born on the same compound. Like the other early settlers, he also had sold part of the site to newer settlers and built a number of single rooms for rent. Other than his government job, he used to supplement his income with vegetable farm in the plot he claims(informally) on the 'bahrshesh meret'(flood plain). Though he says that recently his attachment and dependence with the lake water has grown weak, he still believes that the vegetable farm in the dry season can be improved for a better use. The introduction of tap water; the increasing population in the area (making it difficult to find a reasonably wide area for vegetable farms); and the tighter control from the government against informal appropriation of land are the three major reasons he mentions for the loosening of the relationship with the lake water. He remembers the time when they were entirely dependent on the lake water for all their daily life routines and vegetable production.

The increasing rent price in the city has made building extra room more profitable than vegetable production. Though **he argues that building rooms and renting has become more profitable than growing vegetables, he gets irritated when referring to how** the neighboring new informal area is mushrooming due to the production of the dangerous plant 'khat'. His vegetable farm has not been used for the last two consecutive years due to irregularity on the movement of the lake (the lake did not recesses to offer them the flood plain).

His compound is a microcosm which can fairly represent the bigger neighborhood structure. Two parallel volumes define the narrow corridor type open space. There are lines of doors accessed from the open space. Some of them, including the main room which belongs to Ato Shumet, have internal partitions walls (without doors) dividing the spaces for various activities. Many of the others are plainly single room spaces, sometimes dividing the sleeping area with a simple curtain. Doors and windows are opened into the open corridor space where all major activities happen. At a single moment, one notices multiple activities happening in a way which seems unorganized - the space changing its forms and function spontaneously. Cooking, washing of clothes, taking a shower, food processing, coffee ceremony, children play ground, etc can happen simultaneously exploiting the open space as both private and public space. The houses are built with eucalyptus sticks as both framing and wall structure; mud (chika) as an infill for the walls; and corrugated iron sheets for the roof cover. The room which belongs to Ato Shumeye has a cement screed floor and a thin ceiling made out of clothes. Practically, everyone shares one toilet and one kitchen located at the opposite ends of the open corridor space. The defined kitchen with an open fire is primarily for 'injera' baking while other activities of the kitchen (cooking and processing food materials) happen in the main individual rooms or in the common open space.

Ato Shumet also claims that his original houses were all thatch roofed circular huts built by himself with the help of friends. So was the whole neighborhood. Through time, he replaced them with corrugated iron sheet (CIS) roofed rectangular rooms which kept growing until now.

Port-Michael flares in Wednesday afternoon and Sundays morning – the days when the boats arrive and depart from and to the islands respectively.



Fig.6.2.6 images from Sar-sefer and Port- Michael (source: photo by author, 2013)

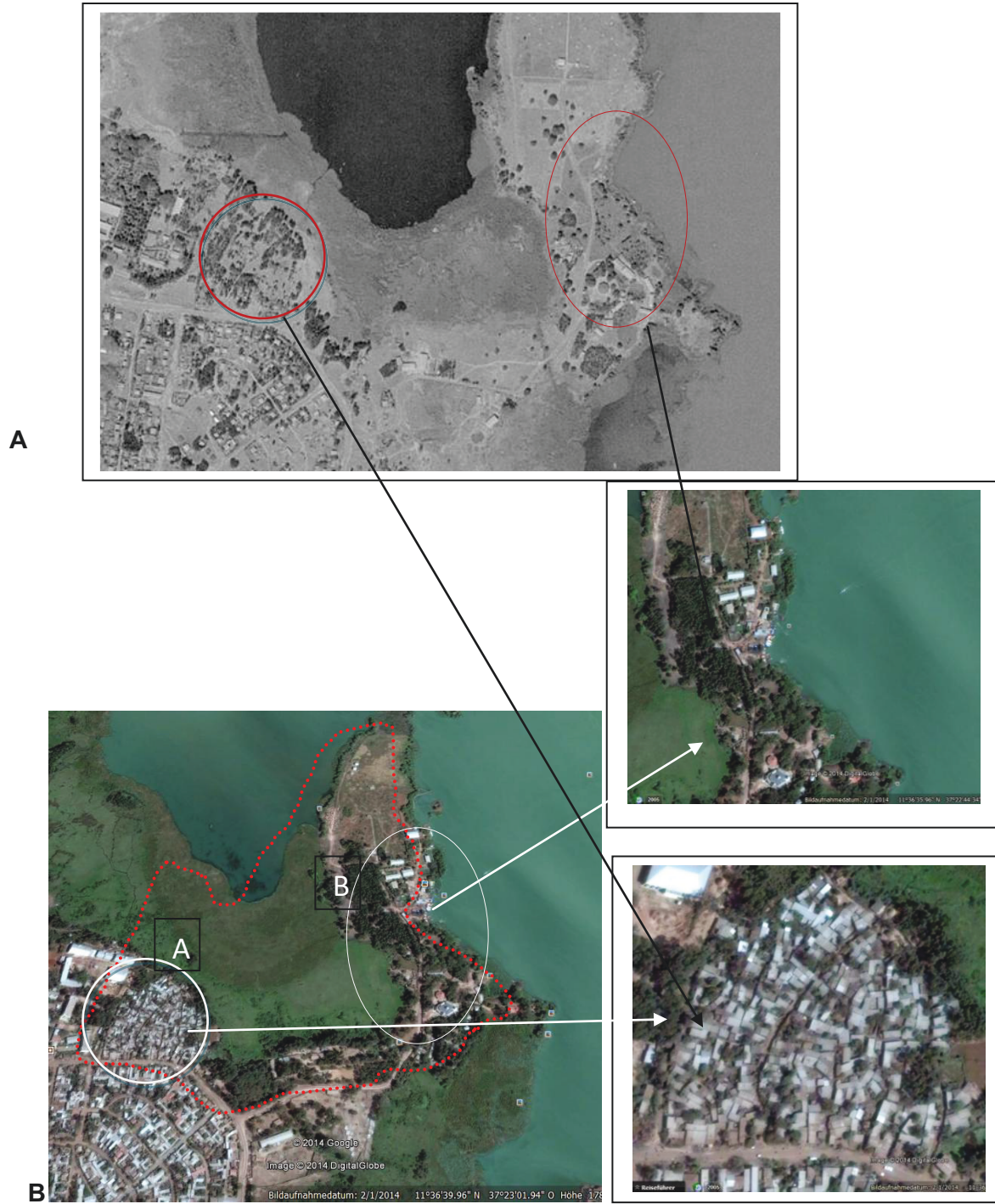


Fig 6.2.7.A.focus area in Bahr Dar city (source: adapted from EMA 1984AD); B. focus area – (A)Sar-sefer, (B) Port Michael (source: adapted from Google Earth Dec. 2014)



Fig. 6.2.8 general area under observation, the study area at the right end. (source: adapted from Google earth image, Dec. 2014)

For each variable among 30 households		Freq.	%	remark
House hold head	Man	21	70	
	woman	9	30	
	total	30	100	
Family size in a house hold	1-3	7	23.3	
	3-5	5	16.7	
	Above 5	18	60	more than one family in the same compound and under the same house number
	total	30	100	
Main income source (livelihood)	Daily laborer	12	40	Majority are immigrant workers
	Self employed	10	33.3	Urban farming, livestock, horse cart, bars
	Government Employed	6	20	
	others	2	6.7	
	others	30	100	
Social association membership	Idir only	20	66.7	All are members of either 1 or more associations
	Iqub only	2	6.7	
	Idir & iqub	8+	26.7	
	none	0		
	other	30	100	

Table 6.2.1 basic socio-economic condition from a sample survey

6.2.2. Processes: access, development, and use of land and water

Access to land:

Ways of land acquisition in the larger area observed can be categorized into the following types:

- A) Direct appropriation through squatting (on government lands or flood plains- 'bahrshesh meret') which otherwise is referred as 'yizota'⁶. (a claim of ownership which usually is supplemented with some sort of government related bills – land tax, electricity bill, etc).
- B) Appropriation through informal purchases from earlier informal settlers.
- C) Informal purchases from farmers who has a use-right
- D) Long term or short term rental contracts with formal or informal owners (private, government or organizations like Ethiopian Orthodox Church (EOC)).

In the case of the Sar-sefer informal settlement, type A and B are found to be the most common ways through which the current residences have acquired their plot while Type C is claimed in a less frequent manner. Type D is most common in St.Michael port as the majority of the land falls under the control of the church. However, interviews made with the city manager and the regional planning institute experts renders the fact that informal purchases from farmers (type C) is the most common way of acquisition of land around the lake in the new expansion areas in the east as well as the west side of the city.(see Table 6.2.2.1 showing most common acquisition type)

There are also temporary acquisitions for daily use where inhabitants appropriate sites for a day or a season upon which they do not claim ownership and do not mark their territory. Such a condition is common among daily workers who claim a site for their daily activity – commercial or production, and inhabitants of Sar-sefer who cultivate the 'bahrshesh meret' in the dry season. Such claims are tolerated; neither are they taxed by both the government and organizations like the church nor they are challenged by the neighborhood association. Activities done on sites which are temporarily appropriated are usually small scale.

The original informal appropriation of land has involved payment for guards who tolerated the 'chereka-bet' construction. The further densification happened through subsequent land transfer from earlier settlers to new settlers through informal transactions.

It was possible to observe that expansion areas in both western and eastern corners of lake side sites which are claimed by informal settlements are dominantly engaged in 'Khat' production. When asked about possibilities of appropriating further 'bahershesh meret', many of the inhabitants of Sar-sefer prefer to plant Khat than any other vegetable for the obvious reason of higher earnings.

Land acquisition and use		Freq.	%	remark
Means of Acquisition of land	My own(claimed) plot	24	80	Refers to informal appropriation
	purchase from private owner	2	6.7	Purchased from owner who first appropriated the site informally
	Lease from government	2	6.7	
	Inheritance	2	6.7	Originally informally claimed
	other	-		
	Total	30	100	
year of appropriation	Before 1975	0		Before the nationalization of all land
	1975 - 1991	18	60	Period of the 'Dergue' regime
	After 1991	12	40	The current government
	Total	30	100	Difficult to determine due to the legalization claim that the earlier the claim, the more chance the inhabitants have for formalization
Reason for preference of the site	Easier & cheaper access to land	8	26.7	Easier access(due to low cost and less control and hurdle from govt.
	Near water(resource for livelihood)	20	66.7	
	Near water body(climatic and visual qualities)	0		
	Presence of infrastructure	-		
	other	2	6.7	
		30	100	
Major uses of compound and house	Only residence	4+4	26.7	Owners residence + rental rooms Spaces of residence also include various activities of non-commercial productions (food and beverage processing)
	Only commercial	1	3.3	Not a commercial building(a rented space only)
	Only production	0		
	Residence + commercial	6	20	Small shops, restaurants, bars ('Tela bet')
	Residence + production	15	50	Workshop, livestock, vegetables
	Commercial + production	0	0	
	Total	30	100	

Table 6.2.2 Access and use of land

Access to water body:

The inhabitants' access to water body can be categorized into the following:

- A) Direct access - waterfronts (house + field on water front, or field only on water front)
- B) Indirect access for daily use (secured access through neighborhood associations)
- C) Access through water wells, channels and pumps which pulls water from the water body
- D) Free access points for daily activities

For the most part of the Sar-Sefer history, the lake was the source for every water use – be it for daily water consumption or livelihood production. However, since the introduction of piped water in Sar-sefer, its use for the majority of the inhabitants of the neighborhood has significantly reduced into few basic functions such as: Horticulture, livestock, bathing /washing of clothes.

Accessing the water body has little or no legal restriction but the limitation is imposed by the growing density and the control of the sites which has direct access to the water body. It was possible to notice that the type of the livelihood activities of households depend on their relative location from the lake shore. Houses with direct access to the water of the lake- either due to their house (site) location or because they have additional site for horticulture on the 'bahrshesh

meret' - have an activity directly related to the water, such as horticulture and livestock. Some, who could manage to drain the water through channels and by the digging of shallow hand-dug wells, are also observed being engaged in similar activities. Those further from the flood plains and nearer to the main pathways have little to do in their day to day activities, if not engaged with fishing and grass harvesting. Even though the access to water favors urban agriculture, having an extra room (rental house) has become the most preferred livelihood earnings in the area. The constantly increasing housing demand in the city has played a key role in shifting the land use from urban agriculture to building rentable rooms through densifying existing compounds. However, the increase in density has also required a solution for waste disposal. While Solid waste collection system is installed by the inhabitants themselves (through a neighborhood youth start-up group), liquid waste disposal is handled within the compound (see table 6.1.3.B).

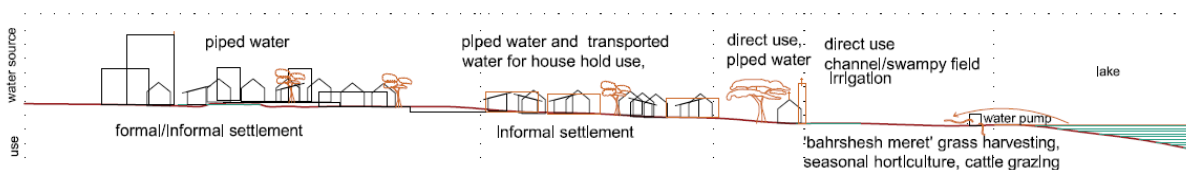


Fig. 6.2.9 Authors diagrammatic sketch showing categories of access to water body

A. Water sources and use				
Water source	use			
Lake water use	Drinking and kitchen	0		Use is dependent on relative location of the house/site of respondent. Among the respondents 5 are located on the water line(0- 3 houses away), 14 near the water line(3-6 houses away) and 11 further away(more than 7 houses away). Generally all respondents can be considered as located on the 100 meters range from the water line.
	Washing	8	26.7	
	Livestock	6	20	
	Vegetable	20	66.7	
	Other Production	3	10	
Extra plot on lake front	Yes	11	36.7	The average plot size 250m2 and all are used for vegetable farm
	no	19	63.3	
	total	30	100	
Piped water source within the compound	Yes	18	60	All in the compound, No in the house installed within the house
	no	12	40	
	total	30	100	

B. Waste water treatment				
source	type	Freq.	%	
Toilet type	Pit latrine (dry toilet)	29	96.7	Closed when full
	Flush toilet	1	3.3	Drained to septic tank
	total	30	100	
Surface and kitchen waste water drainage	Drained to the lake	5	16.7	Houses near the lake
	Drained to the street	7	23.3	streets slope to the lake (drainage towards the street ends up in the lake)
	Drained to a hand dug shallow well	18	60	The shallow open wells eventually drain out to the street and to the lake
	total	30	100	

Table 6.2.3 A. water access and use and, B. drainage and waste treatment

In both cases - of accessing land and water - communal interests are kept through the neighborhood association. In the time of discussion with the author, elders from the inhabitants remember the multiple struggles and fights among the first inhabitants due to boundary disputes and access blockages. Forming elders' council (later called neighborhood association) to mediate conflicts was mentioned as a crucial step to secure common interests. The neighborhood association would assign elders to look and mediate into cases of conflicts. It also developed basic standards to be followed by inhabitants. Whenever there is a conflict which explodes beyond the capacity, the association leaders are deemed to cooperate with the police from the administration of the kebele. However, elders appreciate that the inhabitants respect the rulings of the elders and they have not seen many difficulties which went out of control.

Box 6.2.3> Saida and Aklil

Saida Alemu Hussein is 19 and works as a cashier in a small fish shop in port Michael owned by her older brother. The main work of the shop is to buy/collect, clean, freeze, and sale fish. First it was founded to distribute fish to local restaurants but now it has expanded itself and sends even to Addis Ababa. Saida oversees the whole process. The company employs men and women from the area on a temporary basis. The women employees are usually for cleaning while the men are for unloading fish from the boats and loading the frozen and stacked fish to a truck. At its pick fishing season there can be up to 5 women cleaning and preparing the fishes and up to 4 men working in loading and unloading. The company operates in a single room as its office, storage and shop built as a temporary structure on the Church's property. Everything is made out of CIS and eucalyptus sticks (roof, wall, doors and windows) on the lake shore. A shed open to the lake extends from this single room space to provide a shaded space for boats to unload the fish and two tables for cleaning and preparing the fish (see fig. 6.). Both the defined office room and the cleaning shed have cement screed floor finishes. At its door, a tap water which serves the fish cleaning shed and other activities is located. The drainage from the cleaning tables is directed to the lake and the waste from the leftovers (fish parts) would be thrown back to the lake for the hundred of pelicans waiting. In the single enclosed spaces, there are at least five freezers and with them, the workers assemble for a coffee/tea brake.

At the afternoon brake, Saida's office would be filled with a lively assembly of workers sharing a tea. In one afternoon brake, the assembly was turned into a discussion provoked by the researcher. It was comprised of Saida, three daily laborers, three women who clean the fish, the driver of the fish truck, and two more from the boat workshop next to the shop. The discussion started after the researcher introduced his questions about the area, activities within it, its relation with the surrounding and the city. The discussion started when the question of the future of the area was raised. It quickly reversed into individual plans of the future. Saida, as a host of the informal assembly jumped in answering. She seems to have a simple plan about her near future – to go to the Middle East, particularly Saudi-Arabia as a house maid. When asked why would she desire to go while having a good prospect here in Bahr Dar working with her brother, she answers with a smile – ‘there, you can get more money and transform your life easily than here’. The reaction from the others was mixed but everyone pointed to Deribew, the driver. He was sarcastic – and with an ironic smile he brushed her with a simple statement – ‘*mengedun cherqe yargelesh*’ (may the road turn as smooth as silk for you!). Saida replied with a fierce but playful way indicating that his past failure in attempting the same cannot proof her dream wrong. Everyone seems to know what happened to Deribew who, according to an afterward discussion, was deported empty handed a couple of months ago from the Middle East. He simply revised it again with another prose – ‘*enen yaye yeqeta*’ - suggesting that he presents himself as a case to learn from. The talk in the room suddenly turned into the ongoing news about the crisis of Ethiopians in Saudi Arabia. Many in the room accused Saida for refusing to see facts and while being the most favored in the room - as the sister of the owner of the business – many faces showed an expression of disdain towards her stand. In defending her position but with a bright smile to loosen the spirit of the room she added – ‘because I openly speak what I think, you blame me, but I know many of you secretly agree with me’. Many in the room are residents of Sar-sefer who are dependent on the ports activity. They have witnessed an increase in activities and fish demand in the last few years. Some predict that the area would be transformed in to a hotel in the near future while others disagree stating that the area is under the church. Except the boat workshop workers who believe that their workshop would expand, others have little interest

in the upcoming fate of the area. Saida lives in the city and a 'bajjai'(a three-wheeler), which she has a monthly contract with, brings her in the morning and takes her back in the evening. She does not like her job in the shop but enjoys the company of the workers around. The shop pays a monthly renting price of 500 birr for the church. They have failed to secure a land with an access to the lake. They claim that the competition has become very difficult. Akilil who happens to be the youngest laborer and who seem to care less about the news on the media responded jokingly – 'you shall take me when you go'.

Akilil (Aklilebirhan) is 17 and has come from a faraway area around Lalibella. His original plan was to attend church education and become a priest. He was enrolled in the St. Michael Church School, next to Sar-Sefer. He has been living in student living quarter in the compound of the church which is located next to the lake in the swampy area. Students are required either to build their own little hut (with mud, stick and thatch roof) or share the existing with other students. The little village-like assembly of huts is spread over a defined compound next to the church of St Michael. The main hut in the village-like structure belongs to the monk who is the main teacher and leader of the village. The students have come from various corners of the country and they mostly are from rural areas. In this traditional church school, one has to spend 5-7 years before he seats for an examination for a position of a deacon or to continue to the next level. Many would start to work in the city in order to support themselves and some end up giving up their education for the day job. Akilil has followed the same trail. It has already been more than 3 years since he left his parents at the age of 13 and came to Bahr Dar in search of church education. His parents used to send him little food and little money to support him. He is the 4th in his father's house of 13 children. He doesn't complain if the monthly supplies from his parents fail to reach him. He seems to understand the difficulty in his father's house. Since one year, he first started to work in the informal port as a laborer in his spare time but since the last 5 months he has totally stopped attending church school and started to work fulltime. He boldly claims that he is making progress as a laborer comparing to the never ending study and the sacrificial devotion the church requires from him. He is the favorite laborer in the port particularly in the semi-informal fish cleaning and processing shops. He has bought a second hand mobile phone and sometimes calls to his father for whom he himself bought and sent a phone. However, he still sleeps in the little huts of the church informally knowing that he is not allowed to use the huts after he is dropped out of the school. He fears that sooner the priests will find out and expel him for which his immediate strategy is to rent a room with another friend in Sar-Sefer, which he thinks has a fair price. He also imagines having his own small plot somewhere in Sar-Sefer in the future.



A. location of fish market (source: adapted from Google earth); B. Akilil on duty (source: photo by author)

6.2.3. Product: houses and common spaces and the architecture of water use

The architecture of individual houses level (**HL**) is assessed and described through the following major points: spatial organization; use, size and shape of spaces; Spatial qualities (in terms of Spatial luminance, ventilation and appropriateness measured and reflected subjectively based on observation); and material used and technique of construction adapted.

Space structures at the neighborhood level (**NL**) and spaces for collective uses such as markets, multi-use open spaces for play grounds, social gathering, funeral and wedding

services, 'idir' and 'iquib' meetings are assessed. In most cases and activities observed, the individual and the collective spaces overlap via multiple activities. Common spaces (pathways and nodes) like neighborhood streets are often used for individual purposes like for food processing for household consumption, clothe washing and drying, storage of personal belongings, bio fuel production (charcoal production, drying dung of cattle for fire), etc. on the other hand, what seems a private house in the evening serves as a restaurants and bars in the day time opening its front yard for the public.

6.2.3.1 Spatial organization and use

Spatial organization

The continuous metamorphosis of spatial structures, relationships and organizations is one of the basic characteristics of the Sar-sefer neighborhood.

HL: In a house level, all spaces are organized in a horizontal single storey level with light partitions. Change happens temporarily or permanently with continuously changing functions and expanding family size. However, the general structure of the houses can be categorized as:

- 1) Courtyard type: majority of visited compounds have a small open space (courtyard) around which rooms are arranged- some well-defined and others lightly-defined spaces. Though courtyards have various shapes, they hold together the rooms around serving as the main service space. They usually (not always) signify the smallest household unit. (Rooms around are usually owned by one family or extended family).
- 2) Detached house with small compound: a house claiming a small compound around it usually defined by bushes and shrubs as a reserve for possible expansion. around itself as a reserve for future expansion.
- 3) Detached house without compound (free standing house)
- 4) Attached house with front or back yard
- 5) Attached house with shared external space (no own front or back yard)

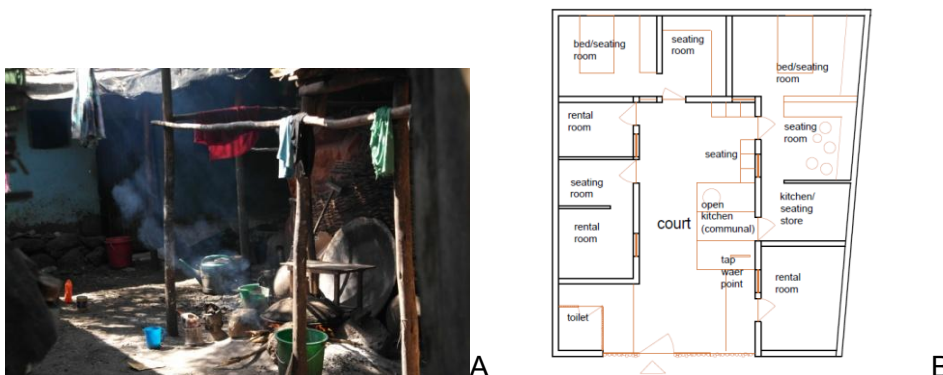


Fig 2.6.10 A. Typical courtyard (source: photo by author), B. Authors sketch showing typical plan (courtyard typology)

The above typologies can only describe a house in Sar-sefer temporarily due to the fact that houses mutate continuously due to new needs and growing demands.

The majority of houses in the neighborhood are single room houses related directly to an outside space for many of the activities of the day (either a courtyard space within a family control or a public space).

NL: As it is on a household level which does not segregate spaces for various functions, the neighborhood is a homogenous continuum of space rendered with mixed livelihood activities. Spaces for production, commercial activities, living quarters, and social services share the same space, without demanding segregation. Rearranging small movable elements continuously in order to fit into new functions is a common strategy of adapting spaces. 'Dinquant'(tent) is one of the movable spatial delineation means which marks the appropriation of a street or any sizable open space for a wedding or funeral service used by the 'Idir(s)' of the neighborhood. Sometimes it can also be erected for extended meeting of the neighborhood association also. Technically, all major communal activities are spread over the site. However, there is a slight locational advantage that some livelihood activities and communal activities demand (see spatial use).



Fig 6.2.11 a tent for temporary adaptation for communally used spaces (source: photo by author)

Spatial use

HL: In a multi-room house, except few rooms (main bed room, toilet), all rooms are multi-purpose spaces. Spaces for sleeping, seating, eating, food processing and preparation can share the same room. Recently the government has forced the inhabitants to install a toilet per a compound (Families with defined compound are obliged to have a toilet within the compound). In a household with single room, all functions can happen in the same room with toilets located outside to be shared by close neighbors. The majority of Sar-Sefer is a house with technically one room but partitioned with clothes to be referred as two room. The living spaces can also be adapted for commercial purposes like 'Tela biet', 'Areqie biet' and a restaurant or even a production space as a workshop for papyrus weaving or a chicken's house. A simple cleaning up, rearrangement of furniture and the light partition would do the adaptation. However, external spaces are extensively used for various activities (food processing, washing/taking shower, drying, coffee ceremony, cooking, etc). These external spaces can either be defined within a compound of a family or shared the public pathways and common spaces with the neighborhood.

NL: communal functions overlap with private open spaces with household activities overflowing from inside the house to the streets (common spaces). The narrow path-ways with organic structures, venues all social events and also function as the extension of individual activities. Business activities which demand customers - like restaurants and bars - flourish on the narrow

path-way which is considered as the main street of the neighborhood. Houses facing the main street which defines 'Sar-sefer' from the south have more shops which also serves customers from customers from the surrounding much more than the inner shops. Accordingly, many shops of dry wood, vegetable, cow dung, 'injera', and 'Tela & Areqie betoch'* are located on the outer street. The area facing the water body is loosely defined and protected from the water tides by denser green elements – bushes, shrubs and trees. The density of the settlement near the water front gets less due to the exposure to flooding risks and mosquito infestation. Livelihood activities such as horticulture, livestock production, horse cart workshops and barns, and 'kubet' production from animal dung show more intensity around the area nearer to water.

Be it for household consumption or for commercial purposes, spaces for production of food and beverage, spaces for workshops or any other production, restaurants, bars ('Tela' and 'Areqie' houses) are all embedded within the residential spaces.



Fig.6.2.12 images showing overlaps between private activities and public spaces (source: photo by author)

Space size and spatial form

HL: For obvious reasons of optimizing cost, most internal spaces visited are minimal. Apart from being lightly divided to provide privacy for sleeping space, it is possible to trace the geometric nature of internal spaces. Houses with corrugated iron-sheet roofs are rectangular (prism) with an average height of 2m to 2.4m while thatch roofed spaces are cylindrical with a conical roof structure with comparable height. External spaces within a compound are amorphous and organic. Though following the change of the circular huts to rectangular CIS roofed houses external spaces were expected to become angular, various elements stored in the compound makes the external space appear more amorphous. Piles of hay(grass), animal dung(for fuel), recycling elements to be sorted and used, and the hedges and shrubs make the external space more fluid than defined, and makes it difficult to read the geometric organization principle of the space. The spatial form also changes with the continuous adaptation processes with the injection of changing activities – be it an open fire for making 'injera' or the horse carriage parking.

NL: Roads and pathways have organic shapes with varying sizes. The neighborhood association has adapted standards of width for three hierarchies of pathways to be respected when inhabitants expand their houses. Minimum width of 1m, 2m and 3m are set for internal path ways only for pedestrian and donkeys, internal pathways leading to another compound allowing carts and 'bajaj taxi', and main pathways allowing a car for emergency respectively.

Transportation of goods within the neighborhood and to and from other parts of the city is organized using horse carts and donkeys. Though three- wheelers (Bajaj taxis) have recently

controlled the transportation business of the city, it is the narrow, organic and unpaved pathways within Sar-sefer neighborhood which makes them more relevant. Other than the Bajaj-taxis which made accessing Sar-sefer for emergency services possible, bicycles also fit well into the narrow pathways.

Spatial qualities (Light, ventilation and visual connection)

HL: Most internal spaces visited have limited access to light. Both natural day light through windows and artificial light points are minimal. Quite often, only one side of the house is free for opening windows and smaller windows are located only in one surface limiting the possibility of cross-ventilation. While houses with internal courtyards enjoy cleaner air and hence remain open most of the time, houses which face public path-ways prefer to close the window all the time resulting in darker interior space. Structure and sizes of openings are similar irrespective of location of the houses. The size of recycled windows and doors determine the sizes of openings. Even those which are located facing the lake do not use different opening size. Rather than the fresh breath from the lake and spectacular view, priority is given in controlling mosquito.

Coloring of interiors do not enhance the interior lighting condition. Other than cow-dung plastering of walls, which assumes a dark gray tone, the aged lamination of walls with newspaper pages and weaved papyrus sheets also contribute little in the lightening condition of the interior rooms. However, internal spaces are kept cleaner and as much of the daily activities are taking place outside, the indoor lighting and ventilation conditions play little importance in the routine of life.

Most colorful elements of the interior are the plastic utensils and clothes used for making light partitions. In some houses, some fixtures are developed from earth ('medeb' - a fixture for sitting/ sleeping and kitchen shelves).

NL: public spaces, such as streets and nodes, are direct extensions of the interior spaces of private houses. They are earthen and unpaved (dusty in the dry season and muddy in the rainy season). However, the continual spread of straw during transportation of food for livestock by horse carts from the lake side grass fields and the spread of kitchen waste water from private houses has created a semi-stabilized mud pavement. The streets are defined by exposed 'Chika walls' often covered by plastics and other fabric and rough stone piles used as external walls. The narrowness of the pathways is compensated by the short heights of the walls, which defines it, but again overshadowed by long trees which casts shadows- giving the public spaces intimacy. Furniture from the interior of the private houses and larger supporting stones of houses are often used as street furniture. The narrow streets and modest nodes are immediate extensions of interior spaces of private houses, which make them safe playing fields for children with the relative absence of fast moving objects like vehicles.

Box6.2.4> The open cafeteria

W/ro Hamelmal owns a small informal business – a cafeteria near the port of Michael. She pays 300birr per month for the church which allowed her to use the site on which she erected a temporary shed with plastics, used corrugated iron sheets and grass. A carpenter, who also is her relative, has helped her in erecting the structure and she filled the rest by her own. She used to be an assistant cook in one of the hotels in the city of Bahr Dar before she decided to start her own business. She lives in Sar-sefer in a single room rented from a family who lives in the same compound. The cafeteria serves late breakfast and lunch and her specialty is fried fish and fish soup which she prepares for the fishermen and all the other laborers around the port. She is confident that her small shack restaurant is getting noticed even by people from the city. Particularly on Saturday afternoon, customers both from the city and the fishermen make up a noticeable crowd around her shack for her famous fried fish and fresh fish soup. She cooks on an open fire located under an extended shed to one side of the cafeteria. Customers sit in the open field on wooden logs supported by stones. She has no one to help her except her two children who join her on Saturdays - her own 10 years old boy whose father has left her years ago and an 11 year old daughter whom she claims as a gift from the good God – to imply that she has adapted her when the parents died when she was around 6 years old.

In the very first few weeks, W/ro Hamelmal also tended to use the lake water for cleaning utensils and clothes. However, she has stopped to use the lake water after finding the sewage from the new fish processing cooperatives spoils the water. Now she uses it only when the tap water from the church runs out. She shows a bitter face when asked about the renting condition and its price. But she knows that she cannot fight with a party which she cannot even understand its nature. Her restaurant (shack) is located on a small open pocket in front of the port by the side of the pedestrian street leading to the peninsula. Next to her shack, a group of young people (an informal cooperative) prepare a freshly cut grass for transportation and sale in the city. Even though they use the space regularly they do not pay a rent for the church. In the evening, a daily laborer - a migrant from rural area - sleeps inside for free while also guarding her belongings.



Fig. 6.2.c. A. The cafeteria on duty (source: photo by author), B. location (source: adapted from Google earth)

6.2.3.2. Material and technique

Materials: The original Sar-Sefer houses were all thatch roofed ‘chika’ huts. The name ‘Sar-Sefer’ (village of grass) itself signifies the same. Through the years, almost all of the main houses are transformed from thatch roofed circular ‘chicka’ huts into a corrugated iron sheet (CIS) roofed ‘chicka’ houses. However, there are still few huts with thatch roof where almost all materials including its finishing were gathered from the immediate surroundings. Few CIS roofed houses have also upgraded the floor finishing with cement screed and strengthened the foundation of the main house with stone linings. The majority of the houses in Sar-sefer share the following building materials for the major building elements:

>Walls:

Main wall - Wooden stick framed mud walls with animal dung fillings stone pilings, CIS.

Wall finishing – animal dung plastering, ‘Satera’ lining, Papyrus carpet wall lining, used-plastic sheet

Internal partitions walls – ‘Satera’ weaving, used plastic sheets, used paper cartons

External light walls (non-load-bearing) - Satera’ weaving, used plastic sheets, used paper cartons, life plants and shrubs

The structures of most external walls are exposed after losing their mud cover either due to rain or left as it is. It is common to notice a supplementary covering with papyrus weaving or used-plastic sheets against rain.

>Roofs:

Roof structure - Eucalyptus logs and sticks

Roof covering -Used corrugated iron sheet roofing, used plastic sheets, ‘Satera’ (weaving sheets), thatch, grass, weaved papyrus sheets.

Ceiling – weaved papyrus sheets, ‘satera’, clothes and used plastic sheets

>Floor:

Structure 1- Rammed earth, finished with cow dung screed, ‘satera’carpet, used-plastic sheet carpet, papyrus carpet,

Structure 2 - compacted stones, finished with cement screed and papyrus carpet

>Door/window:

Wooden framed corrugated iron sheet surfaces

Wooden (stick) framed cloth/plastic sheet surfaces

Recycled (used) wooden doors/windows

Metal doors and windows (recycled or new)



Fig. 6.2.14 commonly used building materials (photo by author)

Generally, based on their origin, most of the materials employed for the construction of houses in ‘Sar-sefer’ can be categorized into three:

- 1) Produced on/around the site within the reach of human labor: ‘Satera’, weaved papyrus sheets, ‘Chicka’ (on site soil + ‘chid’/straw), eucalyptus logs and sticks, water, cow dung, stone, ‘sar’(grass for thatch roof)
- 2) Recycled elements from town: used corrugated iron sheets, used-nails, used- plastic sheets, used-doors/windows
- 3) Purchased new materials: Nails, corrugated iron sheets,

According to the inhabitants, other than the status symbol, the CIS roofed rectangular house types are more flexible for incremental construction and also are better against fire hazards which challenges dense thatched roofed neighborhood. It also suits better to use the available small spaces more resourcefully and it also rent better.

Technique and mobilization of labor: the majority of the original structures in Sar-Sefer are built by residents themselves. It took them couple of days and done through the nights and weekends. The rudimentary hut construction needed little guidance from elders and it needed no nailing. However, the current Sar-sefer houses are built with a wooden frame and corrugated iron roofing. A carpenter ('Anatsi') usually from within the neighborhood is needed at least to work on the frame structure and the roofing. The wall fillings with eucalyptus sticks and 'chika' and sometimes animal dung are made either collectively by a 'debo'⁷ in a day or two or in a slow process by the family's themselves. What makes the construction of houses near the Lake easier is the availability of water, straw, cow dung and sandy soil on site. However, some residents complain about the sandy nature of the soil on site which makes it difficult for 'chika' construction.

In the construction of the thatch roofed huts, both materials and technique can be organized on site. Being next to the Lake makes the mobilization of materials easier. For CIS roofed houses though some materials (nails and CIS) have to be purchased – usually from second hand market - and a skilled labor (with basic knowledge of carpentry) is necessary. In both cases, once the main structure is erected the infillings are usually done by the family through time. If everything is organized by the family, they can mobilize the neighbors for a quick fix or otherwise take time by themselves to first fill in from the interior and slowly work on the exterior. It is not uncommon to see houses on the processes of construction being used (half –finished structures being used for daily activities without the proper wall construction).

House characteristics	category		Freq.	100%	remark
House form	Circular hut		1	3.3	Earlier houses were all circular huts
	Rectangular prism		29	96.7	
	total		30	100	
Number of rooms	1		9	30	
	2&3		14	46.7	
	4 and more		7	23.3	Rentable rooms included
	total		30	100	
Building materials	Main house roofs	CIS	23	76.7	
		Plastic	2	6.7	
		Thatch	1	3.3	
		mixed	4	13.3	Part of the roof of the main house is covered with another material (plastic, thatch,
		total	30	100	
	Major walls material	'Chika'	26	86.7	(mud + wood)
		Wood only	1	3.3	
		mixed	3	10	Plastic + 'Chika'+ 'tirar'
		total	30	100	
	Major floor	Compacted earth	28	93.3	
		concrete	2	6.7	Cement screed
		total	30	100	

Table 6.2.4. Housing condition

6.2.3.3. The Lake, Water Cycle and the Neighborhood

In the current spatial organization of a house (in a household level) there is little one can trace which makes the houses in Sar-sefer (near water) different from houses of informal settlements somewhere away from the water. Attempts to exploit the potential offered by the water body or to address the challenges imposed by it through spatial layout are minimal. However, rudimentary mechanisms are installed to protect the houses from the overflowing lake and the running surface drainage which takes the pathways as a channel in the rainy season. Raised stone podium for houses nearer to the lake, barriers of mud, piles of stone and shrubs; special plantation against mosquito; and ditches to channel surface drainage into the lake are major details which can be observed in examining houses particularly nearer to the Lake (Fig. 6.2.15B). Solid waste from the neighborhood reaching the Lake is minimum. Most of the solid waste is consistently reused. The remaining daily solid waste is collected twice a week by a neighborhood youth organization and deposited to be burned.

Despite its recent introduction, piped water is a supply system of fresh water for almost all households. Some inhabitants are still dependent on Lake water for various household activities other than drinking (see table 6.2.3.A). Interviews with senior inhabitants and committee members of the neighborhood association revealed that before the abrupt densification many enjoyed an agricultural land which used to extend from their house to the lake. However, the more inhabitants the neighborhood attracts, the more disconnected every house has become from the water body. Currently, those at the edge, whose frontage or backyards is the marshy land, cultivate vegetables on the dry season – when the lake subsides to give them drier ground. However, working on such a land (on ‘Baheshesh meret’) is not limited only for those who are at the edge rather more so to those earlier settlers whose houses are cut off from the direct access to the water due to the growing densification. In the latter case, there is no direct physical connection between a house and its vegetable land. The earlier settlement structure of Sar-sefer, according to senior inhabitants, was like it is now in the emerging new informal settlements in the eastern and western extension area of the city. In these areas (see Fig. 6.2.4) individual households irrigate their compounds with water from the Lake either through direct channel or a shallow hand-dug well within the compound.

The other activity other than for vegetable farming, which affects the water cycle considerably, is animal husbandry. Many of the settlers have animals in their house either for milk and meat production or for transportation business like horse cart (‘Gaary’). Cattles for milk and fattening, small scale poultry, and horses share the water from the Lake. Except for the chickens, cattle and horses are guided to directly use the lake water and grass field on the ‘bahreshesh meret’ (flood plain). Horse carts were the major means of transportation in the city before they were kicked out from the central area of the city by the new sensation of the city - ‘Bajaj’ three wheeler cars. However, the carts still operate in the periphery and in areas where there are no paved ways. They also extensively operate in transporting goods within the city and from the port (goods from islands, dry wood, grass and papyrus) to the city. Sar-sefer is known for the density of horse cart business owners. The availability of grass field nearby and enough water is indicated as one of the reasons why horse cart business concentrated in this particular area.

The drainage (liquid waste) from the animal barns, which usually are concentrated on the water fronts, is directed to the lake.

Few houses harvest rain water from roofs in the rainy season for domestic uses. Both surface water drainage and waste water disposal from houses and compounds located on the lakefront are directed towards the Lake. Other houses direct the drain towards the pathways and streets which in turn slopes down to the lake. There are no channeling systems to store or filter the disposal before it meets the lake. Quite recently, toilets for every household are enforced by the government in line with the governments' campaign of basic hygiene for all. Almost all toilets in Sar-sefer are dry pit latrines which usually are located at corners in a compound or common open spaces. When they are full they are sealed and another pit latrine is prepared.



Fig. 6.2.15 houses nearer to the lake (source: photo by author)

6.2.4. External inputs: interventions of Government and Non-governmental organizations

The leaders of the neighborhood association and the general Sar-sefer inhabitants seem to accept the fact that their future is divorced from Sar-sefer site. Interviews made with leaders and inhabitants reveal that all know that the value of the site they are living on has appreciated so much that they cannot afford to fight for it. 'The game is over' - one of the leader declared in the interview – 'and we have no option other than negotiating on the compensation – even for that we have no voice.' The other leader of the neighborhood association puts forward what he called two modest points of demand:

- 1) a fair compensation (land with cash to build their houses)
- 2) a promise to keep the social structure(to be moved together)

Due to such an environment of uncertainty, according to the leaders, works with long term effect have not been taken up neither by themselves nor by governmental or non-governmental organizations. Interviews made with the management of the municipality also confirmed that no upgrading or infrastructural development work is planned to be done within the neighborhood. However, three interventions are mentioned by the leaders which aimed improvement of the neighborhood: introduction of tap water, electricity and the introduction of communal toilets. According to officials in Shinbet Kebele, the city manager and the leaders of the neighborhood association, the involvement of the city administration is restricted only to administrative issues than infrastructural development due to the fact that the site is reserved for larger investment project and the inhabitants have to be relocated. However, through and with the neighborhood

association, the kebele has become more involved in Sar-sefer for security and safety and more recently on the formations of youth association, and cooperatives for Small and Micro Enterprises (SME).

Summary:

Sar-sefer is completely informal and Port Michael is semi-informal (livelihood activities are informal but land is controlled by the church). Both Port-Michael with its inter-play of the informal with the formal, and the self-organized Sar-sefer can be taken as a first generation urban vernacular emerging around a water body in Ethiopia. The primary reason of the appropriation of the site of Sar-sefer was housing – in search of cheap and unwanted sites by the low income and economically marginalized group. As it is new and emerging, the development of tools and methods (both physical details and principles and social organization) to profit from the water body at its door is at its infancy. Its mechanisms to confront challenges from mosquito and flooding are subtle and low cost. Due to the uncertainty of its tenure on the site, long term and concerted efforts are restrained. However, it is clear that the influence of the lake on the details of the production of spaces and livelihood within the settlement is indisputable. The following are major characteristics:

>The seasonal movement of the shoreline is one of the determining phenomena in the seasonal land use reconfiguration. It dictates the major production activity within the settlement. When the lake recedes in the dry season, it offers fertile land for horticulture ('bahershesh meret'), grass land for animals, and easier harvesting season for grass and papyrus for various small scale trades (see summary table II and image gallery). When it swells back (comes forward to reclaim its position), it brings fish into the shores for easy fishing. The informal settlement seems to follow the cycle in appropriating both the buffer space and the swelling accordingly. The buffer space is free from any permanent structure – except for some horse den in the dry season. Life style and the market in the city also seem to respond to the rhythm. In the fasting season⁸ which falls in the pick of the dry season, the demand for vegetables increases while fish is excluded from the table.

>Though the urban scale and house level structures of spaces and building elements have little to signify the peculiar relationship of the settlement with the water body, building materials used and the majority of the livelihood production activities within the settlement are defined by the presence of the water body (see summary table I for a complete overview).

>Single story Semi-detached Chika house (with used CIS roofing, used plastics and papyrus/bamboo carpet as a wall cover) is the most common house type. Skilled and non-skilled labor is mobilized within the neighborhood) and the owner is usually the lead builder. Materials are organized predominantly within the area except few used elements from the city and wood (currently) from the islands through Port Michael. Common spaces are negotiated, based on set rules and standards, through the neighborhood association.

>In both house scale and neighborhood scale, functions (activities) are not differentiated by space (mixed and distributed through the site).

>Most of the original settlers are rural migrants from around the region. With an increasing density (continues densification of housing), the neighborhood currently is one of the major providers of cheap rental rooms for the low income group of the city. However, it was also noticed that the densification processes has been restricted to the ground level and now slowing down due to the notice given to the inhabitants of possible relocation by the government (site is reserved for investment project).

>Building rental rooms is the most sustainable source of income in the neighborhood. However, a household livelihood is not based on a single income source rather on various activities done by all adult members – most of the time directly or indirectly related to the water body.

> External formal input from the government and NGOs is negligible except collaboration in issues related to security and safety.

Notes:

1. Balabat: landlords in the Imperial land tenure regime
2. Bahr Dar City Manager at the time of the research work was Ato Kidane Misikir (interviewed on Dec. 20, 2013)
3. Head of Micro and Small Enterprises promotion (MSE) of the city of Bahr Dar interviewed was Ato Tegared Zerihun (interviewed on Dec. 11, 2013) and
4. Interviews made in RUPI (Dec. 11, 19, 20)
5. 'Bahershesh meret' is a land retrieved when the lake retreats in the dry season.
6. 'yizota' is a claim of ownership which usually is supplemented with some sort of government related bills – land tax, electricity bill, etc.
7. Debo: a collaboration among neighbors or relatives to work on a house – adapted from collecting harvest in farming community
8. Ethiopian Orthodox Tewahido Church is the dominant Christian denomination in the area. There are various regular and special fasting seasons imposed by the church. The major fasting season of the church ('hudade') falls in the months of March and April (close to two months). Though there is a strict exclusion of all animal products from food in the fasting season, the case of fish is different from region to region. In the region of Bahr Dar, fish is largely avoided.

Summary table 6.1.1. The spatial implication of informal livelihood production activities near Tinishu-Akaki River, Mekannisa - Addis Ababa

Activity – water body	Major livelihood activities	intensity	Major products and services	Spatial demands location, form and size	implication on water body and challenges	remarks
Directly related to water body	Horticulture	MCA	Vegetables, Herbs	Carefully parceled flood plains on the river banks, Parcelation has a slender rectangular geometry against the perpendicular to the river line, Plot size varies ranging from.....m ² tom ² ;	Pollution from upstream affects process of irrigation as well as vegetation	Natural slop and gravity is still the main tool but diesel pumps are becoming common practice
	Sand mining	LC	Small scale sand and pebble mining, sieving sand, transportation with donkeys	Temporary storage sites on the bank, access roads, loading/unloading, display and shops for pebbles and decorative rocks	Controls the siltation	Usually done by new immigrants to the city, sometimes dangerous in the flooding season
	Livestock production	LC	Cattles Sheep	Near the river for ease sewage disposal (barns are drained easily to the horticulture fields and eventually to the river).	Unregulated drainage,	
	Poultry	LC	Chickens eggs	No special demands for sites near water. Size depends on scale of production. Many households have chickens for egg within their house	-----	
	'Shenbeko' /grass harvesting	LC	'Shenbeko' cutting, transport	River banks temporary storage and processing (see fig. 6...)	Unregulated harvesting challenging hydro-ecological balance.	Increasing number of youth,
	Shenbeko based production	LC	> weaved Shenbeko sheets('Satera') >furniture production	Sites near the river and near main streets for furniture production,. (See Fig.6.)	-----	Rudimentary skills of basket making,
	Recyclable waste materials fishing from the river	LC	Plastic bottles, wooden objects, anything of reuse or recyclable potential	Temporary storage and cleaning space on the bank, access for loading and unloading	Plays an important role in cleaning the river from major materials	Usually done in the rain season and often dangerous (Fig....)
	Recreational activities	LC	>small parks, seating areas	Rainy season and months after it, young people spend time around the river. Seating spaces and pedestrian access	Opening access enhance cleanliness	River banks are backdoors and currently unpopular except for few young people
	washing service	LC	City cars(taxis, trucks and private cars) wash, clothes washing service	Parking Deck and vehicular access to river banks, Washing decks for clothe washing, drying fields	Use of detergents and oil from cars in conflict with horticulture practice and riverine ecology (sometimes reason for conflict)	Car washing is dominated by young men and cloth washing by young women
	Open shower	LC	shower for day laborers and homeless youth	Defined bathing area with semi-filtered pond for shower	Use of detergent against riverine ecology	Sometimes dangerous
Indirectly related to water body	Animal dung processing	LC	Collection Baking	Preparing animal dung for fire (as charcoal), demands a space for baking and sun drying.		
	Food processing, restaurants	CA	'injera' restaurants	spaces near main streets and alleyways; enough open spaces for food processing; preferred if accesses from two sides;	Fresh and cheaper vegetables; Wood and animal dung availability for 'Injera' production	Vegetable produced on river side's hardly end up on restaurants near bye.
	Local alcohol production and bars	CA	'Tela', 'Arekie' Local bars	Ordinary houses near the main alleyways Open spaces(preferably at backyards) for production activities Near(associated) with livestock barns	Easy drainage to the lake but not used river water	
Not necessarily related to water body	Shops, groceries, small bars, workshops	CA	Daily consumables	On main streets and alleyways		Similar to other neighborhoods(a mix of activities within the city)
	Employed/self employed workers in the city	MCA		Rental houses and access for transportation		
	Rental services	CA	Rental houses/rooms	Cheap single room rental houses in the neighborhood attracts young and low income workers from the city; independently accessed rooms or rooms with access to toilets/kitchens are more demanded	Increasing density produces more waste which in turn affects the river water	

Note: Houses around rivers are dominantly in poor condition. No fish production, no attempt to create ponds for fish production was observed. Explanation was the pollution level. Generally, activities vary going down the stream from the upstream to the lower stream

Summary table 6.2.1: The spatial implication of informal livelihood production activities near Lake Tana, BahrDar, Sar-sefer- Port Michael

Activity – water body	Major livelihood activities	intensity	Major products and services	Spatial demands location, form and size	implication on water body and challenges	remarks
Directly related to water body	Horticulture	LC	Vegetables, Fruits, Herbs 'Khat'	'Bahresh meret', compounds with direct access to lake water, compounds with indirect access (well) to Lake water; compound size ranging from 4-5m ² to 500m ² ; vegetation areas have various forms and sizes.	Unregulated water access/use impose serious challenge, production of Khat have proved to be excessively water consuming	Pumping water is becoming common practice in neighboring informal settlement but not observed in the study area
	Livestock production	CA	Cattles, Sheep, horses	Near the Lake for ease access for grazing and water. Also barns are drained easily to the horticulture fields and eventually to the lake.	Unregulated grazing, drainage,	
	Poultry	CA	Chickens eggs	No special demands for sites near water. Size depends on scale of production. Many households have chickens for egg within their house	Fish processing byproducts used as inputs (fish bones)	
	Fishing/fish processing	CA	Fishing Fish cleaning/processing	Near the lake(on shore) boat sheds, fish cleaning and processing sheds and storage facilities(see fig.6...);	Waste is thrown back to the lake but often picked by birds.	Currently, fishing and fish processing is handles by cooperatives
	Papyrus/grass harvesting	CA	Collection (papyrus, grass). transport	Near lake (on shore) storage and loading/unloading decks (see fig. 6...)	Unregulated harvesting challenging hydro-ecological balance.	Increasing number of youth
	Papyrus/grass based production	CA	>boat building >carpet weaving >furniture/household utensils production	Near Lake for boat building, production related to papyrus and other grasses from the lake are organized in both on lakeshore sites and offshore. (See Fig.6.)	-	Papyrus boats ('tankua') are built by Wayto people. Vital transportation to and from the islands
	Wood collection (fire wood/ construction wood)	CA	Fire wood collection and transport; Processing Wood for construction	Lake shore open field storage, processing (sale-loading and unloading),(see fig.6.)	Unregulated collection of wood from the islands	
	Tourism/tourist services	CA	>tourist guides >bed and breakfast >restaurants(fish)	Tour to and from islands of Tana, Open/semi-defined spaces for fresh fish dishes,	More community based care for the well being of the shore	Increasing trade for the youth of the area, no low cost facility (B&B)is available
Port related activities	CA	>boat operators >daily laborers >logistics(horse carts) > small storage	Boat dock (loading–unloading deck), storage facilities, work as laborers and transporters (operator of hors-carts /bajaj) when boats arrive twice a week	More community based care for the well being of the shore		
Indirectly related to water body	transport	MCA	'Garri' (horse/donkey-cart)	Workshop for cart making Horse fields and barns near the lake	Horses are better off near water and grass fields	
	Local alcohol production and bars	CA	'Tela', 'Areakie' Local bars	Ordinary houses near the main alleyways Open spaces(preferably at backyards) for production activities Near(associated) with livestock barns	Easy Water source and fire wood, bye-products are easy to sale for livestock	
	Food processing, restaurants	CA	Fish 'injera' restaurants	spaces near main streets and alleyways; enough open spaces for food processing; preferred if accesses from two sides;	Fresh and cheaper fish and vegetables; Wood and animal dung availability for 'Injera' production	
	Church services	LCA	Working in the church Binding book, copying books, book shops	Near churches(St. Michael church) or on the pathway to church; related to church school and church services;	Church services are obviously related to water body – other than Michael church, many churches are on lake shore and on the islands.	
	Animal dung processing	CA	Collection Baking	Preparing animal dung for fire (as charcoal), demands a space for baking and sun drying.		
Not necessarily related to water body	Shops and groceries	LC	Daily consumables	On main streets and alleyways		Indicates that the demand for cheap housing the prime driver for the growth of the informal settlement near Lake Tana
	Transport in the city	LC	'Bajaj' three wheelers	Workshops for maintenance washing services near lake water	Washing produces oiled water	
	Low income jobs in the city	MCA	House maids(common among women) Guards(common among men) Low paying jobs	Cheap single room rental houses in the neighborhood attracts young and low income workers from the city; independently accessed rooms or rooms sharing external space with free access to common toilets/kitchens are more demanded	Increasing density produces more waste which in turn affects the Lake water	

Note: the study focuses more on the area than the people. The major question was to find out the major activities for livelihood production within the study area. The study is compiled after a repeated visit and candid discussions with inhabitants and those who were found working within the area. Not all workers are residences of the study area. Some come to work while living in other parts of the city of Bahr Dar.

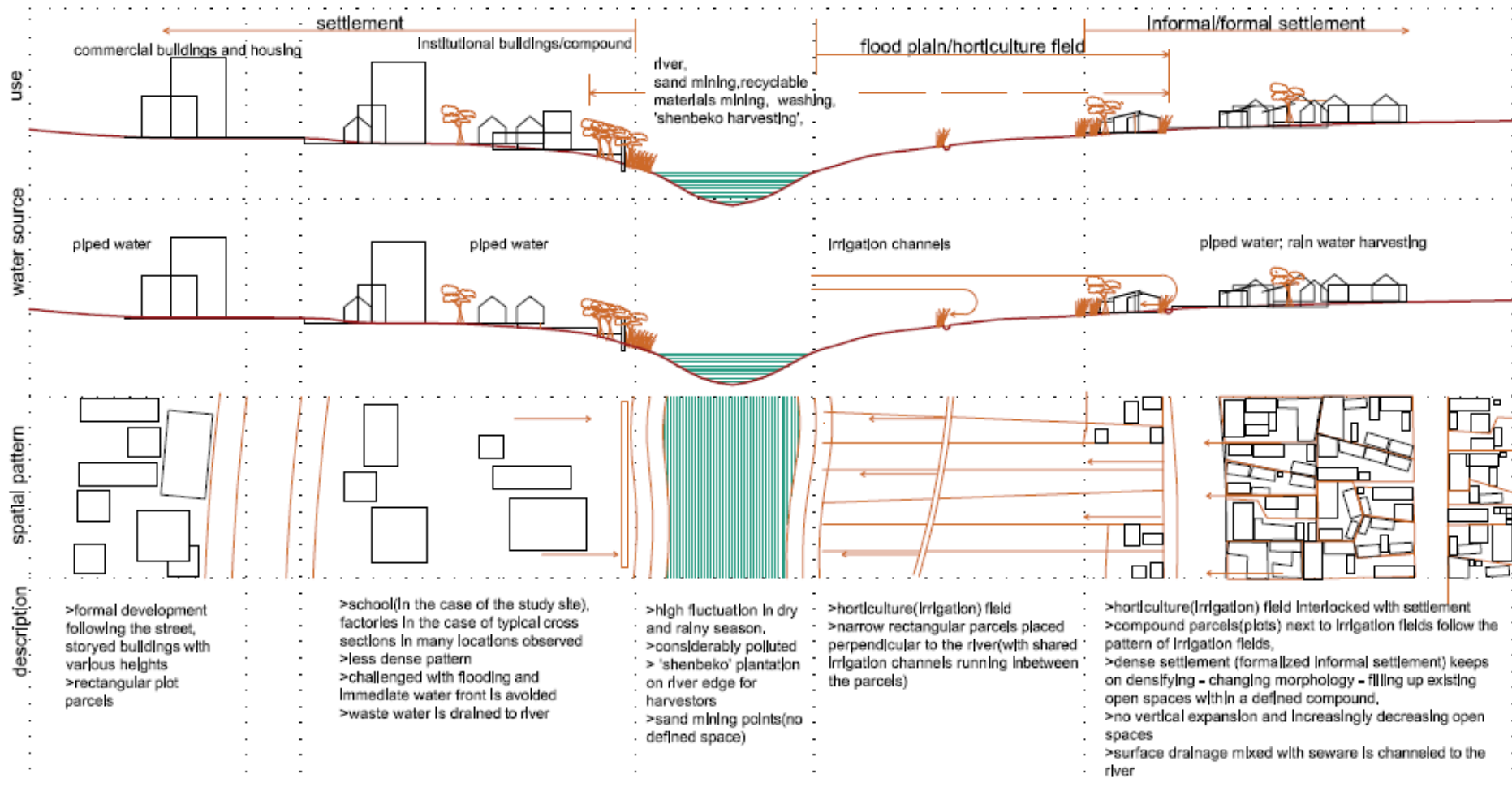
Summary Table 6.1.2. Process and Products: Characteristics of emerging informal urban patterns around Tinishu- Akaki River, Mekaniissa, Addis Ababa

Scale	Processes			product			Water cycles vs water body relationship
	Land Acquisition	Construction/production	uses	Location (in relation to water body)	Spatial organization, form and size	Main Material and technique	
Individual houses/ private spaces	<p>Acquisition of Land for farming and a Plot for house building: >'Yezota' (mostly 1960s and 70s) – originally acquired through inheritance. >transferred 'yezota' through purchases(with local contract) from original settlers >Rental from original settlers</p> <p>Preference of site >inheritance (no preference); easy access to land (cheap, dangerous site -not contested land); due to water body – easy access to water and irrigable land; cheap rental prices</p>	<p>Material collection >on site materials: sand, stone, soil, water >around site: 'Shenbeko' >Purchased from city or collected as waste: straw, wood, nails, CIS, building elements(doors/windows) Labor mobilization >free assistance from relatives and friends; >paid skilled labor (carpenters, mesons) Assembling processes >No building permit: main structure were built former times with less restriction on building materials; extensions are 'moonlight- houses'; continuous improvisation</p>	<p>residential spaces >owners residence >For rental service</p> <p>Houses with commercial activities >shops >restaurants and bars</p> <p>Household production activities >Workshops >Food and beverage, crafts(mainly 'shenbeko' weaving) >Gardens (vegetables and herbs) >Livestock and poultry (chickens, cattle, sheep)</p>	<p>Clear zoning of farm and housing within an individual compound Farm next to the river, house next to the street.</p> <p>Houses facing alleyways and streets have more opportunity to open shops and restaurants/bars.</p> <p>Food/beverage near streets: crafts near main street; gardens, livestock near river</p>	<p>Compound structure >Detached house in a small compound >Attached house with front or back yard >detached house with backyard horticulture field extended to the river >>varying compound sizes</p> <p>House >single story space(most common) >double story densification starting on houses nearer to streets >rectangular prisms with CIS roofing >varying room sizes (a range of 6 to 15m² for main rooms) > an average of 2-5m² for service rooms (toilets and kitchens)</p>	<p>Roofs and ceiling >CIS roofing with Eucalyptus frames >plastic cover roofing Walls and wall finishing >'Chika'(mud + wood frame) >HCB walls(plastered and un-plastered) Floors and floor finishing >cement screed Foundation >Stone foundation Windows and doors >Wooden window/door frames >CIS sheets</p>	<p>Water inputs: piped water from municipality, rain water (rainy season). Minimum rain water harvesting. Majority of the toilets visited are dry toilets(few with water flashing used), some toilets are attached with river, surface water and surface drainage is directed to the river with rudimentary open channels.</p>
	Common facilities and common spaces	<p>securing space for communal use >Government intervention by imposing minimum standards for pathways, Collective horticulture fields >(cooperatives)</p>	<p>procedure of decision making and implementation: >Basic standards imposed by city government >follow up of implementation regarding spaces in the neighborhood by the kebele and regarding horticulture fields in association with cooperative leadership. >implementation of upgrading of internal roads and dams against flooding by NGO, neighboring institutions, cooperative leadership and kebele resolving disputes in usage and development affecting common spaces, >involvement of 'kebele' and police is sought in case of extreme violation of norms</p>	<p>Roads/path ways >main pathways for pedestrians and cars >children play ground, >social gathering (Fig....)</p>	<p>Major pathways run parallel to the river (from main road towards the lake).</p>	<p>Major arteries are reasonably straight while internal pathways are meandering >standard width is achieved in main arteries >public spaces are unarticulated leftover spaces,</p> <p>An organic form of space carved as a connection of leftover spaces from river ways, house buildings, irrigation fields and pathways/roads. Wider streets also serve the same purpose.</p>	<p>Roads are treated in different level. Asphalt road, coble stone road, compacted earth and untreated road; some special drainage and channels along the NGO intervention for flood control) (individual uncontrolled small channels crosse roads to drain sewage to the river)</p>
<p>public open spaces >Social gathering spaces >cooperative office, Funeral association houses</p>				<p>Distributed throughout the neighborhood; Pockets around rivers allowing sand and scrap metal miners; un-irrigable areas between farm and river</p>			
<p>market >sheep market, vegetable and plant market, chicken market, with temporary bars, tea rooms and restaurants</p>				<p>Near the river on un-irrigable part of the bank, not organized(makeshift appropriations)</p>			
<p>Other infrastructure >waste disposal >water supply >fuel/electricity</p>				<p>Liquid waste (from kitchen and surface runoffs from workshops) is drained to the river, most individual and collective pit-latrines are drained to the river. Dry waste is also dumped to the river</p>			
<p>Neighborhood security >kebele within neighborhood and cooperative policing on the vegetable field</p>				<p>>The river and its slope functions as a fence</p>			
<p>>Natural fences with earth dams, shrubs and 'shenbeko' plantation, >'Shenbeko' plantation serves as dams and filtering waste</p>							
conclusion	<p>>original settlers have older documents >land is acquired through transaction outside of formal processes but usually endorsed, >services are acquired through government offices(Water, electricity, etc) taken as a sign of recognition >many settlers have receipts of payment for land tax which often is taken as an evidence to claim use-right</p>	<p>Construction is a never ending process; Material and labor is informally organized; Construction feeds local businesses(weaving of 'shenbeko', sand mining, recycling building materials)</p>	<p>Interchangeable and flexible. Spaces in Private houses are not divided on functional lines. No particular function is assigned for common spaces. Common spaces are also used for private activities (as long as it is not permanent claim).</p>	<p>Clearer zones (river, vegetable farms on the flood plain, houses, roads).</p>	<p>Space form and structure of individual houses changes through economic changes. Usual one is from 'chika' single story to HCB single story and then double storey, increasing density; Common spaces lack proper definition.</p>	<p>Materials change/replaced when family's economic status change: From CIS door/window to wooden or steel framed door/windows From earth flooring to cement; From 'chika' walls to HCB walls; From earthen foundation to strengthening it with stone</p>	<p>Direct drainage towards the lake. Considering the neighborhood itself, it produces minimum waste(solid waste) and recycles much of the waste on the river.</p>

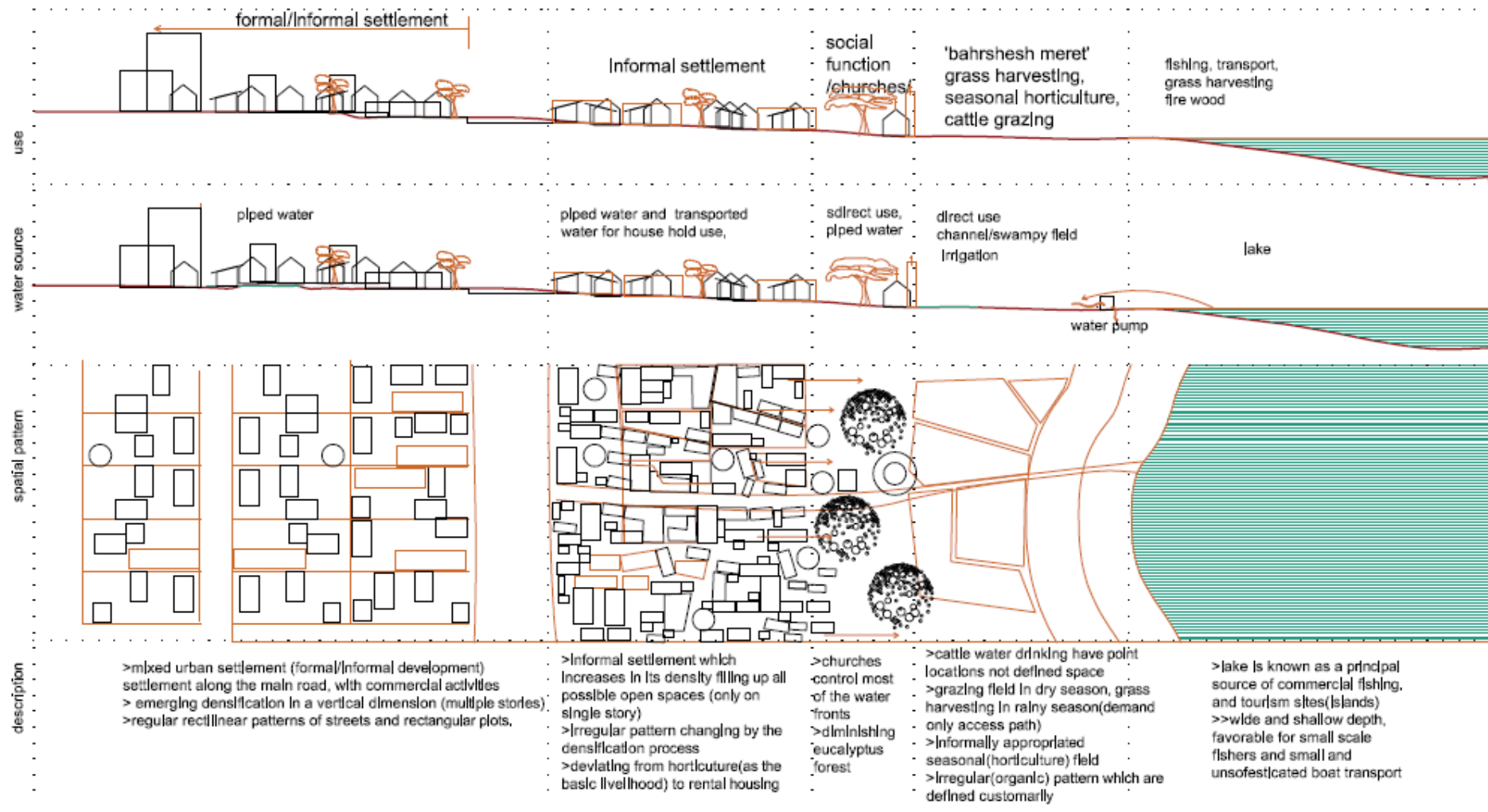
Summary Table 6.2.2. Processes and Product: Characteristics of emerging informal urban patterns around Lake Tana, the case of Sar-sefer-Port Michael.

scale	Processes			product			Water cycles vs water body relationship
	Land Acquisition	Construction/production	uses	Location (in relation to water body)	Spatial organization, form and size	Material and technique	
Individual houses/ private spaces	<p>ways of acquisition</p> <ul style="list-style-type: none"> >'Yezota' (mostly in early 1980s) – originally acquired through squatting. >purchase (with local contract) from original settlers >Rental from original settlers <p>Preference of site</p> <ul style="list-style-type: none"> >easy access to land (cheap, dangerous site -not contested land) >due to water body – easy access to water and irrigable land >cheap rental prices 	<p>Material collection</p> <ul style="list-style-type: none"> >on site collection: Grass, papyrus, stone, wood, soil, water >around site: wood, >from city(purchased or collected as waste): nails, CIS, plastic sheets, building elements(doors/windows) <p>Labor mobilization</p> <ul style="list-style-type: none"> >free assistance from relatives and friends >'debo'(neighborhood reciprocal collaboration) >paid skilled labor <p>Assembling processes</p> <ul style="list-style-type: none"> >moonlight house(fast night work - structure) >continuous improvisation 	<p>residential spaces</p> <ul style="list-style-type: none"> >owners residence >For rental service <p>Houses with commercial activities</p> <ul style="list-style-type: none"> >shops >restaurants and bars Buildings only for business are emerging following the shore <p>Household production activities</p> <ul style="list-style-type: none"> >Workshops >Food and beverage, >crafts >Gardens (vegetables and herbs) >Livestock and poultry (chickens, cattle, sheep and horses) 	<p>No particular zone, Earlier settlers preferred to stay away from the water due to mosquito and flooding</p> <p>Houses facing alley ways and streets, Emerging new houses and sheds following the shore line in Port-Michael area</p> <p>Food/beverage near streets; crafts near main street; gardens, livestock and workshops of 'Gari' near water body</p>	<p>Compound structure</p> <ul style="list-style-type: none"> >Detached house in a small compound; Attached house with front or back yard: attached and detached Houses around a courtyard -private courtyard and common (collective) courtyard >varying compound sizes <p>House</p> <ul style="list-style-type: none"> >single story space; circular huts (earlier houses of Sar-sefer – with thatched roof); rectangular prisms with CIS roofing >simple sheds and open spaces >room sizes (a range of 6 to 12m² for main rooms); an average of 2.5-4m² for service rooms (toilets and kitchens, but kitchens are usually shades -not defined spaces) 	<p>Roofs and ceiling</p> <ul style="list-style-type: none"> >CIS roofing;Thatch roofing; Soil roofing; plastic cover roofing <p>Walls and wall finishing</p> <ul style="list-style-type: none"> >'Chika'(mud + wood frame) >Animal dung, >plastic sheets, papyrus sheet >'Satera'/papyrus sheets <p>Floors and floor finishing</p> <ul style="list-style-type: none"> >earth with animal dung plastering; stone with cement screed finishing <p>Foundation</p> <ul style="list-style-type: none"> >compacted earth; stone with cement screed <p>Windows and doors</p> <ul style="list-style-type: none"> >used window/door, CIS sheets 	<p>Water inputs: piped water from municipality, rain water (rainy season), Lake, wells. Minimum rain water harvesting, Careful and minimum spending of fresh water, all toilets are dry toilets(no water flashing used), surface water and surface drainage is directed to the lake in rainy(with rudimentary channels from houses near the lake and via path way assisted by rain from the upper section of the neighborhood).</p>
	Common facilities and common spaces	<p>securing space for communal use</p> <ul style="list-style-type: none"> >Government intervention by imposing minimum standards for pathways, > though neighborhood association to negotiate among dwellers in order to secure area for common use 	<p>procedure of decision making and implementation:</p> <ul style="list-style-type: none"> >Basic guidelines developed in association with municipality >follow up of implementation by neighborhood association committee. <p>resolving disputes in usage and development affecting common spaces,</p> <ul style="list-style-type: none"> >Arbitration through neighborhood association and elders, >involvement of 'kebele' and police is sought in case of extreme violation of norms 	<p>Roads/path ways</p> <ul style="list-style-type: none"> >main pathways for pedestrian, Horse carts and cars >children play ground, >social gathering (Fig....) 	<p>Major pathways runs north south (from main road towards the lake).</p>	<p>Standard widths for roads adapted by the neighborhood association committee in association with the Kebele administration.</p> <ul style="list-style-type: none"> 2m: internal pedestrian ways 3m: internal roads for pedestrian and 'Garry' 4m:main artery also for cars <p>Major arteries are reasonably straight while internal pathways are meandering</p>	<p>All roads are not treated except the main artery(4m road) which is compacted earth, No special drainage and channels along the pathways (pathways act as surface drainage)</p>
<p>Open spaces</p> <ul style="list-style-type: none"> >Social gathering spaces >Neighborhood hall (Funeral association house with an assembly hall/shed) 				<p>Pocket open spaces are distributed throughout the neighborhood, Neighborhood hall located at the edge near the main road</p>	<p>An organic form of space carved as a connection of leftover spaces from house building and pathways. wider streets also serve the same purpose.</p>		
<p>Church</p> <ul style="list-style-type: none"> >also functions as an event space for activities which do not disturb the church 				<p>Near the lake</p>			
<p>Other infrastructure</p> <ul style="list-style-type: none"> >waste disposal >water supply >fuel/electricity 				<p>Liquid waste (from kitchen and surface runoffs from workshops) is drained to the Lake, both individual and collective latrines are dry toilets.</p>			
<p>Neighborhood security</p> <ul style="list-style-type: none"> >in a rare coincidence of insecurity, inhabitants patrol in shifts being overseen by the committee of their association 				<p>>The water body functions as northern boundary and fence</p>			
conclusion	<ul style="list-style-type: none"> >land is acquired and transacted outside of formal processes, but services are acquired through government offices(Water, electricity, etc) taken as a sign of recognition >many settlers have receipts of payment for land tax which often is taken as an evidence to claim use-right 	<p>Construction is a never ending process; Material and labor is informally organized; Construction feeds local businesses(weaving of papyrus, 'shenbeko', grass harvesting, collection/processing of wood, recycling building materials, animal dung, etc)</p>	<p>Interchangeable and flexible. Spaces in Private houses are not divided on functional lines. No particular function is assigned for common spaces. Common spaces are also used for private activities (as long as it is not permanent claim).</p>	<p>In earlier settlement structures of Sar-sefer and Port-Michael, houses of worship and their facilities (churches and priests huts) were located nearer to the lake than houses of residential and commercial functions. However, the last few years have shown increasing density towards the lake and residential houses (both informal and formal) are already informed that the area will be cleared for investment (business).</p>	<p>Space form and structure of individual houses are constantly changing. However, the change from circular individual thatched roofed huts (rural housing typology) to rectangular houses with CIS roofing is the major defining change. Due to the increasing density, common spaces lack proper definition and they also overlap with private properties. Increasing Density does not yet force vertical stacking/all houses are single story)</p>	<p>Materials change/replaced when family's economic status change: From thatched roof to CIS(further by installing ceilings); From CIS door/window to wooden or steel framed door/windows From earth flooring to cement; From 'chika' walls to HCH walls; From earthen foundation to strengthening it with stone</p>	<p>Minimum waste, minimum water use, direct drainage towards the lake.</p>

Summary table 6.1.3. Overview sketch showing: land use; water source and appropriation; and spatial patterns on a sample strip of case study site near Tinishua Akaki River(Mekannisa)(source: developed from Authors field sketch).



Summary table 6.2.3. Overview sketch showing: land use; water source and appropriation; and spatial patterns on a sample strip of case study site near Lake Tana, Bahr Dar, Sar-sefer – Port Michael (source: developed from Authors field sketch).



Chapter 7

Urban Manifestations around Water Bodies – a micro-level study II Emerging informal urban manifestations around major water bodies

Introduction

The rift valley cuts through the vast Ethiopian territory from south to north-east contributing its share for the creation of various ecological zones in the country. It is a part of the Great East African Rift, which is the largest, longest and most prominent features of its kind on Earth, stretching for nearly 5,600km from the Red Sea in to the mouth of Zambezi River in Mozambique. The part in Ethiopia contains one of the lowest depressions on earth – the Dalol depression in Eastern Ethiopia. However, the Central Ethiopian Rift valley, in which the two case study sites covered in this chapter are located, is characterized by a chain of lakes and wetlands with unique hydrological and ecological qualities. In particular, the Zeway – Shala Basin which is a closed basin with a catchment area of around 13,000km² out of which 1,443km², is covered with permanent open water body, is home of Lake Zeway, Langano, Abijata, shala and many small lakes and swampy areas (Ayenew, 1998 quoted on Ayenew 2009:16). There are also numerous rivers feeding and connecting the lakes and marshy lands.

Traditionally, the majority of the valley is regarded as ‘kola’ (hot and dry climate) and believed to be exposed for malaria and other epidemics which makes it less favorable for settlement. Nevertheless, within it, the relatively higher grounds have been populated for long and continuously contested among ethnic groups for agricultural lands (see Fig. 7.1 for the rift valley and its lakes).

Though the rift valley is home of the most renowned archeological and anthropological sites, historical evidences for the pre-20th century use of any of the vast water resources within the rift valley for urban civilization or any other systematic appropriation has not yet been established. Except for Lake Zeway and its islands, which were used as monasteries and safe treasure houses for church and imperial treasures, little is researched and known on other water bodies

and their usage through history. On the other hand, one can always find communities, tribal groups and people associated with these lakes and rivers – like the Zaela people of the islands of Lake Zeway, who are believed to be migrants from the northern highlands and remained as custodians of the church properties hidden on the islands against the destructions of civil wars in and before the middle ages. However, organized irrigation and other systematic uses of large water bodies which gave rise to the formation of urban settlements around these water bodies within the rift valley are recent phenomena.

As discussed on chapter 5, the recent growth in agricultural, manufacturing and tourism sectors coupled with the pressure from the rapidly increasing population growth target areas with readily available fresh water resources. Hengsdijk & Jansen notes the following in their paper entitled - 'Agricultural development in the Central Ethiopian Rift valley':

Increasing population pressure and economic developments put an increasing claim on the precious fresh water resources. Until recently, water from the lakes mainly supported agriculture and commercial fishery, domestic use, industrial soda extraction and recreation, while the lakes and surrounding wetlands supported a wide variety of endemic birds and wild animals. Recently, large-scale foreign and national horticulture and floriculture enterprises have been settling down in the area thanks to suitable climate conditions (high radiation, appropriate day-length, cool night and high daytime temperature, favorable humidity), availability of land and labor at low costs, favorable investment conditions (e.g. tax exemption), shorter distance to the European market than competitors (Kenya and Ecuador) while logistics and handling facilities are rapidly improving. These enterprises also claim part of the limited water resources for irrigation and processing purposes. In addition, it is expected that the agricultural development will attract people from other parts in Ethiopia, resulting in new settlements and associated domestic water demand. In addition to water quantity aspects, also water quality aspects will be increasingly at stake as a consequence of agricultural developments and settlements in the area, and the input use (pesticides and fertilizer nutrients) associated with the production of high value agricultural crops like vegetables and cut-flowers(Hengsdijk1 & Herco 2006).

This chapter includes two case studies focusing on newly emerging urban manifestations from the other end of the spectrum – predominantly self-organized informal settlements. The first (Case study III) takes an emerging small scale irrigation activity which is becoming a focal point for vegetable market and possible agricultural processing on a farming community around Lake Zeway in the rural kebele of Edo Gojoola. Few years ago, the irrigation fields on the shores of the lake were dormant and there were almost no houses for any kind of activity by the side of the road. In the last 10 years, vegetable production has picked up and the road is increasingly becoming a market corridor. The number of people attracted to the area, as workers from highland areas or young entrepreneurs who wish to work on vegetable production, shows dramatic increase. Farmers are continuously pressured to lease or exchange their plots around the lake. The second case (case study IV) takes a rapidly growing 'informal' settlement near Lake Langano following the expanding tourism and resort hotels development in the rural kebele of Delu –Haregama within Arsi Negele Woreda. Both cases are located in Oromia Regional State in which water bodies, wetlands and settlements cover less than 1% of the land-use of the regional state (Terefa et al., 2002 quoted on Bossio, D et al 2012). The questions and structure of the study are similar with that of chapter 6.

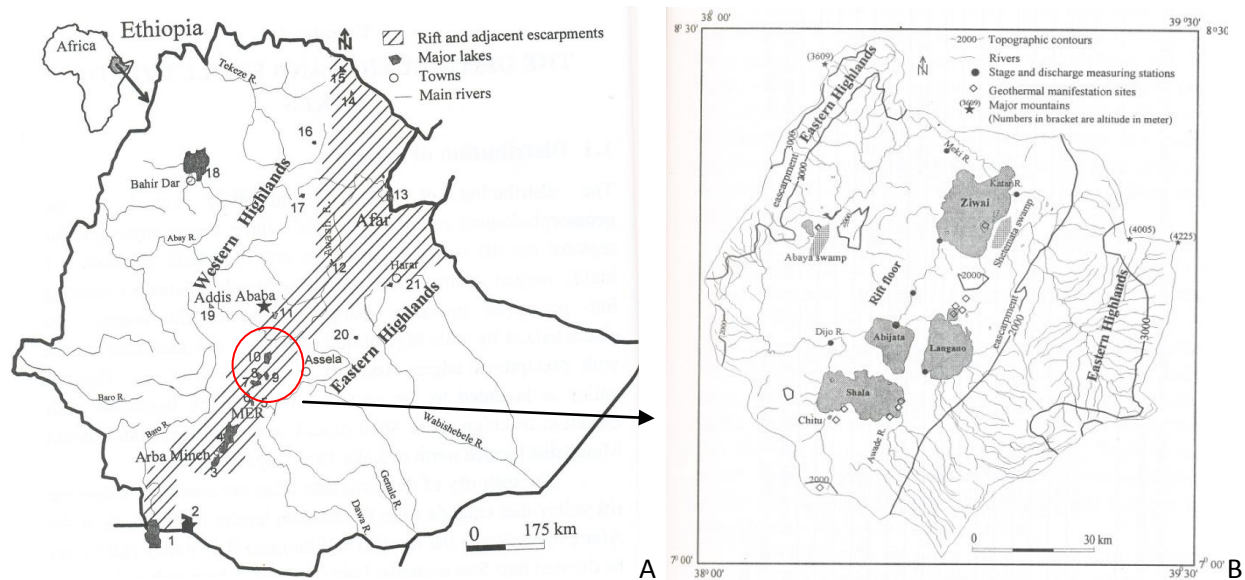


Fig. 7.1.1 A. The Rift valley and Locations of Ethiopian lakes (1-21) and rivers B. Lakes in Central Rift Valley (source: Ayenew 2009:2,17)

7.1. Case III: Edo Gojoola kebele, Lake Zeway shore, Oromia

7.1.1. The Area, The Lake, and The people: An overview

Among the central rift valley lakes, lake Zeway and its surrounding is known for its fish production, large scale irrigation projects and natural beauty. It is also adorned with multiple islands and stories of Ethiopian civil wars in the Middle Ages. The flower farm and horticulture attached to the lake water resources are known much before the current resurgence of the business. The Lake has a surface area of 440km² with a shallow average depth of 5 m. The main input to Lake Zeway comes from the Katar and Meki rivers and direct precipitation. The main outputs are evaporation, discharge via the Bulbula River and groundwater leakage through faults and paleochannels (Ayenew 2009:86). Recent studies indicate that the pumping rate for irrigation is increasing claiming that abstraction of water for irrigation to become among the main outputs.

The major town directly associated with the Lake is Batu (Zeway). With its current population of 50,000 the town is an important node whose major urban corridor is the Addis Ababa – Hawassa road. In the previous regime, the town enjoyed a brief period of importance as a center of an Awraja (district). Most of the economic activities in the town are directly or indirectly related to the Lake. However, the spatial structure of the city has been ambivalent to the reality of the lake water for long. Until recently, there were little or no economic appropriation of the immediate water front within the city, except for grazing fields and petit horticultural activities by the urban poor. Interviews and discussion with both officials in the town's administration and senior citizens reveal that the waterfront and the surrounding area have become the most contested sites sought by Hotel and resort developers.

Other than the major irrigation projects to the south of the town of Batu, small scale irrigation activities, mushrooming following the shoreline of the lake, are seeking stable access to the water resource. These rudimentary agricultural activities with their loose village like assemblies are rapidly growing in density and imposing their presence through their vegetable produces. The activities claim the main arterial road (Addis Ababa – Hawassa) as their commercial corridor and diversify their activities accordingly.

Box 7.1.1 > Have seen it all!

'I was around when it was a deep forest under the control of landlords of the imperial time - it was full of wild beasts. I was around when the bad news of the fall of the emperor was on the air and afterwards when the land was taken away from the aristocrats. I was around when few of our friends attempted to build their huts near the water and fell sick due to the bad spirit of the lake. I was around when the Dergue collected us into camps (sefera) and reserved the area for agricultural testing and training ('serto-masaya'), and I was around when the Dergue was falling and the land was reclaimed by farmers. And we got it through the redistributed and it started to give us fruits. And now we build houses and shops and sometimes lease it for others when we fall sick or tired. Our children have become smarter to work on it and get money. Sometimes they prefer the vegetable farm than going to school' said Ato Geleta Wako, a 76 years old man, pointing to his youngest son - Temesgen - to underline his last sentence. He is among the few farmers who dared to build their houses nearer to the water than the rest of the inhabitants of the kebele. His age has helped him to witness all the transformation of the site in the last three political regimes – the imperial regime, the Dergue and the current Federal reorganization. Ato Geleta still manages his two farms – the crop and vegetable fields. Among the 9 children, only two has left to the city - the others live from the land. The sons also work as fishermen other than farming.

Tamesgen is his last son - now 16years old. He has stopped attending school after finishing attending the elementary school. The reason according to Temesgen is the distance. In order to find a high school he has to travel every day to the next town but his father does not accept the excuse. He says his son has stopped school because he started to get money from the vegetable farm, fishing and working as a broker for the emerging shop around. But, though laughingly, Temesgen defends his argument saying that the transportation is the case - pointing its cost and the time he is spending every day. Moreover, he also mentions the lack of electricity for studying through the night and be competent with students from the city. His dream is to open his own shop for both vegetable and fish.

Ato Geleta's house is located by the side of the main road to the lake side. In between the lake and his house, his crop and vegetable field extend up to the marshy land which in the dry season he appropriates. The first portion near his house which has a higher elevation is for a rain-fed crop field while the lower part, which is easily water fed by a motor pump, is for vegetable. His house at the end of the long slice of land depends on the hand dug well for the everyday water consumption. The house has transformed through the years. The main house is now a typical 3 room 'chika' house with corrugated iron sheet roofing while he still retains a thatch roofed tukul by its side. He has also constructed rooms in a row for his sons and leased his front field for the emerging vegetable shops. He has a hand dug well in his compound



Fig. 7.1.2 Temesgen and their new water pulley (source: photo by author)

The site: Edo Gojoola rural kebele

According to the chairman and vice chairman of Edo Gojoola Kebele ¹, private and small scale agricultural activities based on irrigation started after the fall of Derg regime (1991AD).. Particularly after 2008AD, the irrigation activities have intensified and houses started to appear on the sides of the main road. These houses were installed as shops for vegetables produced at their backyard on the land stretching to the lake. Through time, the need for cafeteria and other shops are emerging when the road side business is taking roots. The major activities observed on the lake shore other than horticulture are: papyrus harvesting, soft wood harvesting, grass harvesting, sand mining and fishing. All these activities are not recognized by the government. The *kebele* inhabitants also use the lake water for their cattle and other uses as an open source.

The Kebele office record states that there are 535 households in the Kebele with a total population around 2500 inhabitants. The Kebele has no record of the floating population comprised of daily laborers from the surrounding villages and towns and workers in the emerging vegetable farms coming from faraway places. The kebele is located between the town of Batu (formerly known as Zeway) and Abossa on the main road connecting the capital city to the southern part of the country.



Fig 7.1.4 A. Kebele's office, B,C, & E emerging street side shops, D. common water access for cattles on a marshy land (source: photo by author)

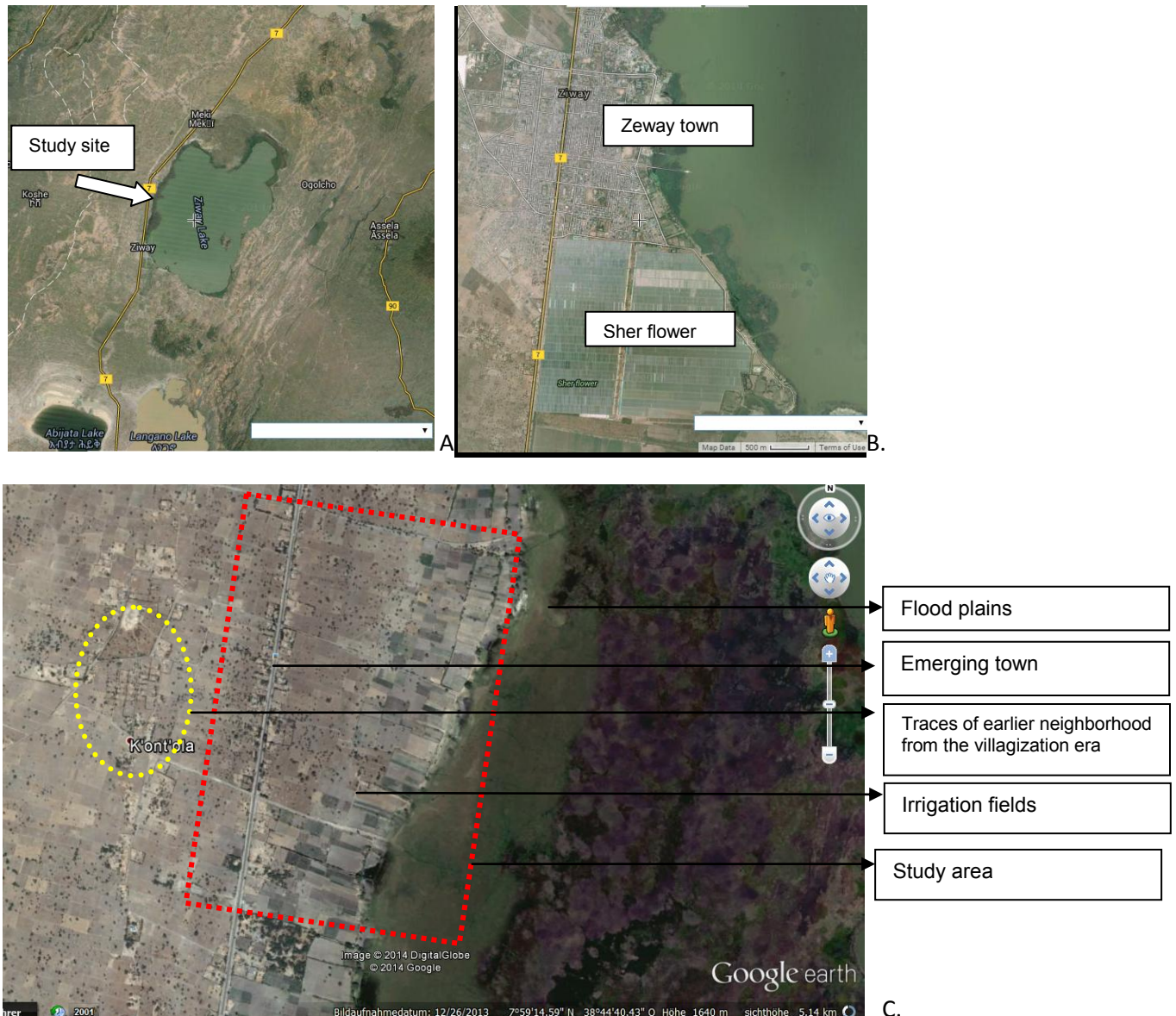


Fig. 7.1.5. A, Zeway Lake, and location of study site B. neighboring town Zeway (Batu) and its flower farms , C. location of the study site with site of previous settlement of Villagization (source: adapted from Google earth)

The coupling of the road and the lake (presence of the road not far away from the lake) is cited as the main reason for an increased interest of commercial and production activities which is pushing the area from a loose village into a small urban cell. The proximity of relatively large towns (like Batu) where transportation of fresh products is easy, if availing them on the street fails to sale, is also one of the reason mentioned for the stable market access for the booming vegetable production.

Increasing number of investors ask for access into these sites as gathered from the zonal office in Adama². For small size and midium size projects, negotiation on compensation with the farmers and elders of the area is a prerequisite. However, people coming from cities find easier ways to negotiate with farmers through elders and relatives to settle a possible arrangement to work together (Ye-ekul)³. In such arrangement, vegetable farms demand labour particularly for

the harvest collection season. Hundreds of young men, particularly from the southern highlands, migrate to these areas in search of a day job. The vegetable farm can be harvested three and sometimes four times a year which imply a continuous presence of workers – creating a growing market for housing for workers, shops and restaurants near the road. Potential for small scale vegetable and fruit processing, and fish markets are also showing an emergence.

For each variable out of 23 respondent		Freq.	remark
House hold head	Man	18	
	woman	5	
	total	23	
Family size in a house hold	1-3	3	
	3-5	7	
	Above 5	13	more than one family under a house hold
	total	23	
Main income source (livelihood)	farming	13	Crop fields, vegetable farms and livestock.
	fishing	3	Few Young adults. It is also an additional activity for many
	Self employed	5	Laborers on vegetable fields and vegetable market, charcoal production, etc..
	Government Employed	2	Government employees also have irrigation work with farmers('ye-ekul')
	total	23	
Social association membership	Idir only	-	Practice not common in the area
	Iqub only	-	
	Idir & iqub	-	
	none	0	
	other		

Table 7.1.1 basic socio-economic condition from a sample survey

7.1.2. Processes: access, development, and use of land and water

Except for the flood plains (of the lake), communal access points of water for cattle, and fishing, all plots are registered on a Cadastre in the Woreda office under individual farmers land. The flood plain is used seasonally by farmers as extensions of their farms for primarily vegetable farms. According to the Woreda office for environmental protection and land administration⁴, production activities on flood plains are usually informal and are undocumented. Permit has never been demanded and production is also not taxed.

The redistribution of the plots in the area under the current government was conducted based on the use pattern of the previous regime. Accordingly the land was subdivided among those who were using it under a cooperative. However, everyone is informed that the use-right can be terminated and an alternative land can be allocated (with compensation) when the government finds it necessary.

In accessing land, investors who wish to develop the area for either resort or vegetable irrigation have to pass through a long negotiation and permit processes. It usually involves the government representative from the zonal or regional bureau (if the investment is major), the

farmers on site, the kebele representative and the representative of investor. Such negotiations are expected to reach on an agreement on what the investor can offer as a compensation for the farmers on site and the kebele other than the regular land compensation standard of the area calculated based on a yearly productivity of the land. However, much of the compensation calculation does not include the advantage of the freely available water resources.

The author has witnessed some difficult negotiations which left some investors disappointed. Such redistribution and replacement usually demand a larger and deeper discussion. Most of the area which has direct frontage with the lake is distributed to those farmers who used to work on collective irrigation project as a cooperative during the Derge Regime. The area, which can be irrigated easily by small water pumps, can be accessed through negotiating with these farmers. A part of the land within the study area is reserved under the government as a research field.

Ways of land acquisition in the area observed can be generally categorized into the following types:

- A) use-right Inherited from family, (distributed after nationalization of land and redistributed after 1995).
- B) Direct temporary informal appropriation through expansion or squatting (on government lands or flood plains).
- C) Informal lease from farmers who has a life time use right
- D) Long term or short term lease contracts with the government by negotiating on farmers (current occupants) compensation.

Type A and C are found to be the most common ways through which the current occupants have acquired their plot while type B and D are emerging means due to the growing interest in the area. However, interviews made with the Woreda and Zonal land administration and environment protection offices and experts in the regional planning institute confirms the fact that informal leases from farmers (type C) is the most common and growing form of acquiring land primarily for small scale agricultural activities while type D is prominent for large scale investment projects around the lake(see Table 7.1.2.1 showing most common acquisition type)

For each variable out of 23 respondent		Freq.	remark
Means of Acquisition of production/irrigation land	Mine/my family property*	12	*Refers informal appropriation
	Leased from farmer(formal/informal)	9	Some deals are done through the government (formal) others are done through elders (village contract –informal). All claim formality.
	Lease from government	2	
	total	23	
Means of Acquisition of land for commercial/residential spaces/houses	Own land /family land	4	Use-right for agriculture and farmers house. No building regulation for houses and commercial buildings on rural land
	Leased from farmers(formal/informal)	15	
	Leased from government	1	Cooperative shop
	Informal appropriations	3	Street sides and lake shores
	total	23	
Time of appropriation	Before 1975	0	All land is appropriated after 1975 and redistributed post 1995
	1975-1991	8	Difficult to determine the appropriation of leased land and activities on these leased land.
	1991-present	15	
	total	23	
Main reason for preference of the site	Not their preference but allocation(by the gvt) and through family	7	Majority of farmers indicated that they are there originally because of land allocation. But they prefer it now because of the water resource.
	Near water body(as a resource for livelihood production)	11	Most inhabitants are not owners of land
	Near water body(environmental and visual qualities)	0	
	Presence of infrastructure	5	Major road helped to boost commerce
	total	23	
Major uses of compound and house	Only residence	3	Owners residence Spaces of residence also include various activities of non-commercial productions (food and beverage processing)
	Only commercial	2	Not a commercial building(a rented space only)
	Only production	0	Production include processing of agricultural produces for sale
	Residence + commercial	11	Small shops, restaurants, bars ('Tela bet')
	Residence + production	7	Workshop, livestock, vegetables
	Commercial + production	0	
	total	23	

Table 7.1.2 Means of access to land and function for which the land is used

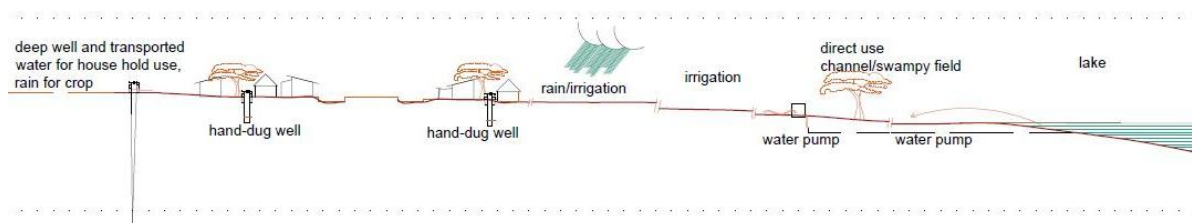
Access to water body: Access to water body can be generally categorized into three:

- A) Direct access - waterfronts (house + field on water front, or field only on water front)
- C) Indirect access through water wells, channels and pumps
- D) Free access points for daily activities (secured access through customary rules)

While channeling and pumping the lake is the main water source for the major agricultural production activity of the area – vegetables, hand dug wells (sometimes newly introduced mechanical lifting systems as in Fig. 7.1.2,(see also Fig 7.1.6) are usual sources for daily water use.



A



B

Fig 7.1.6 A. Recently introduced water pumps, B. a cross section diagram for water appropriation techniques across the study site (source: A, photo by author, B. Adapted from Authors field sketch)

A. Water sources and use

Water source	Use/location	Freq.	remark
Direct Lake water use	Drinking and kitchen	0	
	Washing	23/23	Shower/bath, clothes almost all use the lake at least ones a month
	Livestock	17/23	All who have livestock use the lake
	Vegetable	13/23	All who have plots accessing the lake
	Total interviewed	23	
Extra plot on lake front for direct lake water use	Yes	13	The average plot size 250m2 and all are used for vegetable farm
	no	10	
	total	23	
Hand dug well	yes	16	
	no	7	
	total	23	
Piped water source	Yes	0	
	no	23	
	total	23	

B. Waste water treatment

source	type	Freq.	remarks
Toilet	Pit latrine (dry toilet)	23	Closed when full and another is dug
	Flush toilet	0	
	total	23	
Surface and kitchen waste water drainage	Drained to the lake	0	
	Drained to the street	0	
	Drained to an open compound(backyard)	23	

Table 7.1.3 A., water access and use and, B. drainage and waste treatment

Box 7.1.2.> 'Our cooperative has failed'

Ato Dima Gemedra is a farmer who has a vegetable farm by the lake and crop farm on the other side of the road. Currently, as his motor pump is broken, he is working as a guard for a private commercial farm leased from another farmer. He used to be a member of a 40 members farmers' cooperative founded under the previous regime to cultivate vegetables based on the lake water. The government provided the land and an NGO provided a loan for buying a pump and seeds. The cooperative worked for several years but due to mismanagement and lack of proper saving schemes it couldn't survive hard times. Members decided to dissolve the cooperative after paying back the group loan. However, they retained the land and subdivide among themselves with the approval of the rural land administration and also agreed to use the pump in turns with a monthly contribution fee of 80 birr until it was broken few years ago. This was how Ato Dima ended up in having two of his farm fields – vegetable farm near the lake, and his normal crop field. However, he is considering to lease the vegetable field which he says is not exploited well. He says that he has been approached by some people from the city who wanted his plot – some for vegetable fields and others for simple house near the lake.

Like the other elders in the area, Ato Dima also remembers the time when the area was covered with forest and wild beasts. Leave alone settling and farming around, they would not dare to take their cattle for water after 4pm. He takes it partially as an achievement that people, their houses and farms are taking over from the wild beasts and scary forest. Except the rare sight of hippopotamus in the lake and few hyenas at the dusk of the day, he says 'cattle and people have overtaken the lake shore'.

His house is located near his crop field on the other side of the road. His vegetable field is located by the lake. When asked why he chose to built on the other side than on the site where there is water and beautiful scenery, his answer is mixed with a laughter remembering the failed attempt of the post revolution which left many sick.



Fig. 7.1.3 'Ato' Dima on his irrigation field (source: photo by author)

7.1.3. Product: individual and collective spaces and the architecture of water use

The architecture of individual houses (**IH**) is assessed and described through the following major points: spatial organization; use, size and shape of spaces; Spatial qualities (in terms of Spatial luminance, ventilation and appropriateness measured and reflected subjectively based on observation); and material used and technique of construction adapted.

Space structures at the neighborhood level (**NL**) and particularly spaces for collective uses such as markets, multi-use open spaces for play grounds, social gathering are reflected on based on observation on repeated visits. In most cases and activities observed, the individual spaces are articulated by a loosely defined compound which inscribes all individual activities while activities which can be regarded as collective are restricted into the compounds of the school and kebele office (Fig. 7.1.4.A.)

7.1.3.1 Spatial organization and use

Spatial organization and use

HL: In a house level, all spaces are organized in a horizontal single storey level with light partitions. Change happens temporarily or permanently with changing functions and expanding family size. However, the general structure of the houses can be categorized as:

- 1) Detached house with large compound with storage spaces and livestock barn.
- 2) Attached house with shared external space (no own front or back yard as most of these houses are built as a rental houses on farmers compound which faces the main road. These rental houses are usually used as shops and small cafeterias facing streets and use the streets as their front yard. The structure implies the development of a linear city following the main street).

The majority of houses which have compounds of their own have two or more separate structures within the compound – a rectangular CIS roofed ‘Chika’ house and a thatched roofed circular hut. The hut is a single room structure which usually is the earlier family house now designated for the livestock while the CIS roofed house is the new addition as the family house. Some families add more separate structures for sons when married. Main houses (CIS roofed houses) usually have two or more rooms defined with the same structure (Fig. 7.1.7.).

In a multi-room house, all rooms are multi-purpose spaces. Spaces for sleeping, seating, eating, food processing and preparation can share the same room. Toilets are located far away but within the compound. Main activities of the day happen in the backyards or front yards of the main house (food processing, washing/taking shower, drying, coffee ceremony, cooking, etc). Except small kitchen garden at the back yard of the main houses observed in few houses, gardening and horticulture within the compound is not observed.

NL: major streets (pedestrian and cattle pathways) are clearly identifiable against fenced compounds and private irrigation fields. The Kebele and the Woreda have market these streets as public infrastructure and appropriating those results in confrontation with Kebele leaders. The streets are running perpendicular to the lake and the main road.

The increasing demand of vegetables in cities has played a key role in shifting the land use around the lake from rain fed crop field to irrigation fields for vegetable production. However, such a shift with the presence of the main north-south road played a role for the emerging commercial activities around the road.

Communal activities are organized in either of the following spaces:

- >in the near bye church and mosque (when the issue has social and religious connection),
- >in the compound of the elementary school (when the issue is government related),
- >under the large fig trees at the edge of the flood plains (children play grounds, informal gatherings of elders, etc.)

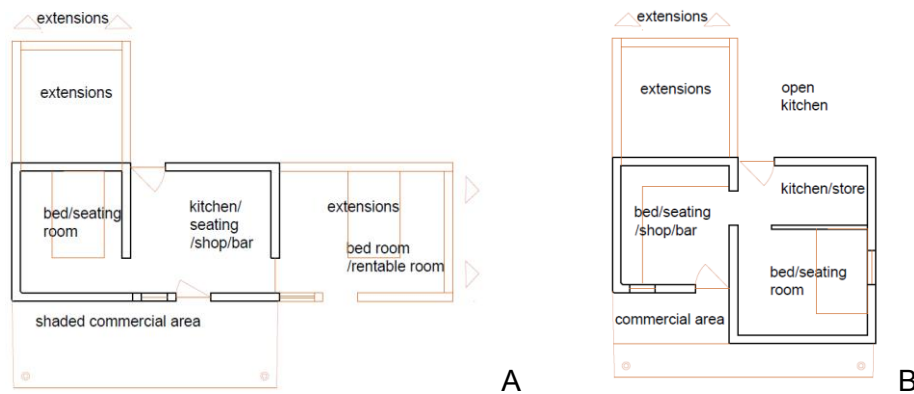


Fig. 7.1.7 A & B typical house types - general spatial organization (source: sketch adapted from authors' field note)

Space size and form:

HL: as indicated above, there are two distinct typologies of houses - circular huts and rectangular 'Chika' houses with varied sizes. Size of CIS roofed rectangular houses are determined by the number of CIS sheet the farmer can buy, thus displaying his capacity. The vegetable market is cited as the source of wealth for the increase in CIS roofed houses.

Larger houses with CIS roofs have an average height of 3m and are divided into two or three rooms (prism) while cylindrical thatch roofed spaces have an average height of 2 - 2.3 m at the connection of the wall with the roof to 3.5 - 4 meters at the pick where the central pole stands. Internal spaces within the cylindrical space are subdivided with light partitions and furniture (Fig. 7.1.7).

In detached houses with larger compounds, external spaces are loosely defined for kitchen activities and cattle. The space near the main gate or the back door is appropriated by the women of the house for food preparation while a separate space is defined for containing the cattle in a day - particularly calves and donkeys. It was not possible to determine why the location of these spaces varies from house to house. Piles of hay (grass), animal dung (for fuel), and the hedges and shrubs characterize external spaces. Building of additional rooms on houses with larger compounds do not necessarily follow a certain pattern but houses with frontage to the main road follow the road side to build rooms for rental services for shops.

NL: Main access paths to the lake and most of the narrow paths dividing individual irrigation fields are more or less straight lines. However, foot paths within the emerging housing area are organic. The main street (dusty road) was originally cattle's path to the lake and recently upgraded (widened and defined) to accommodate vehicular access to the lake front for loading vegetables and possible sand mines. Currently, both herds of cattle marching to the lake for water and smaller trucks for vegetable loading use the street. Though the main street leading to the Lake water has a varied width in different area, its average width is around 4m. Due to the nature of shrubs used to define compounds, it was not possible to precisely guess the dimensions of internal paths. Publicly used spaces on the flood plains and under the large fig trees are not defined and hence difficult to quantify their size. However, in the relatively dry

season, the field between the irrigation fields and the wetland (lake part) which can be appropriated for both private (informally) and various public or common activities including children play field can vary from 70-150 meters. These fields become wet lands in the wet season (starting mid-Jun till mid-September) leaving only 10 to 30 meters of relatively drier fields which can be appropriated for activities.

Spatial qualities (luminance and ventilation):

HL: interior spaces in both cylindrical huts and CIS roofed rectangular rooms are dimly lit (often dark). Both natural day light through windows and artificial light points are minimal. Interior surfaces generally remain unpainted or plastered by animal dung contributing for the diffuseness of the interior lighting conditions. In rectangular houses, even though openings are minimum, due to openings (doors/windows) in opposite surfaces (sides), which remain open (particularly doors) during the day, the interior spaces are well ventilated. However, the ventilation of cylindrical huts is limited to the breathing capacity of the roof cover and little openings in the walls particularly on the connection between the cylindrical wall and the conical roof. Many of cylindrical spaces observed are not intact and hence openings and cracks in the walls allow air movement. Structure and sizes of openings are similar irrespective of their location in relation to water body. Houses which are located between the lake and the street prefer facing the main road.

NL: open spaces on the flood plain which are used for communal purposes, particularly in the dry seasons, are shaded with large fig trees with grass blanket. The space used for children playfield is also comfortable for its purpose – well covered with grass. However, the natural setting of both the space under large fig trees and play fields are exposed to dangers imposed by insects and snakes. The corridor space around the major street (north-south road) is found to be well suited to the emerging street commercial activities. However, it also is dangerously exposed to traffic accidents. Other communally used spaces (around streets within the neighborhood, within the compound of the elementary school and the Kebele compound) within the neighborhood are loosely defined and unarticulated.

7.1.3.2. Material and Technique

Materials: The original houses dispersed on the landscape are thatch roofed 'Chika' huts. In the last few years (according to the inhabitants) the CIS 'Chika' houses are becoming more popular - which are also taken as a sign of development and wealth. The two prototypes share the same material ('Chika') for the wall but have their distinctiveness in their geometry and roofing materials. The majority of the houses in the study area share the following building materials.

>Walls:

Main wall – Wooden (acacia) stick framed 'chika' (mud+straw) walls, with animal dung fillings

Wall finishing – animal dung plastering, 'mud plastering – (for both typologies)

Internal partitions walls – 'chika' walls, used plastic sheets,

External light walls (non- load-bearing) - used plastic sheets, life plants and shrubs

>Roofs:

Roof structure - Eucalyptus logs and sticks (for both typologies)

Roof covering –New CIS roofing (for newly built houses), used plastic sheets for shop verenda covering, thatch/grass/ for huts.

Ceiling – usually none

>Floor:

Structure 1- Rammed earth, finished with cow dung screed, used-plastic sheet carpet,

Structure 2(rare but new) - compacted stones, finished with cement screed and papyrus carpet

>Door/window:

Wooden framed corrugated iron sheet surfaces

Woden (stick) framed cloth/plastic sheet surfaces

Recycled (used) wooden doors/windows

Metal doors and windows (recycled or new)

Generally, based on their origin, most of the materials employed for the construction of houses in the area can be categorized into three:

- 1) Produced on/around the site within the reach of human labor: wood (from acacia tree), 'Chicka' (on site soil + 'chid'/straw), water, cow dung, 'sar'(grass for thatch roof)
- 2) Recycled elements from town: used corrugated iron sheets, used-nails, used- plastic sheets, used-doors/windows
- 3) Purchased new materials: eucalyptus logs and sticks, Nails, corrugated iron sheets,

In terms of materials, the presence of the lake seems to have less contribution in the building processes of the area. The use of lake sand, various plants and soft woods associated to the lake are not tapped in the emerging building activity yet. Water and grass are the major building materials associated with the Lake. However, the already diminishing acacia forest is exploited as the main material source for 'Chika' wall construction.

Technique and mobilization of labor: All original structures – cylindrical huts - are built by residents themselves. Both materials and labor can be organized locally. The rudimentary hut construction needed guidance from elders and it needed no nailing. However, the current CIS roofed houses are built with a wooden frame and corrugated iron sheet roofing. A carpenter ('Anatsi'), usually from the town of Batu (Zeway), is needed at least to work on the frame structure and the roofing. The wall fillings with Acacia sticks and 'Chika' and sometimes animal dung are made either by daily laborers or in a slow process by the family themselves.

Construction processes on rural sites enjoy extended time schedule and an absence of any regulation.

House characteristics	category		Freq.	remark
House form of main house	Circular hut		3	Earlier houses were all circular huts
	Rectangular prism		18	
Number of rooms	1		5	
	2&3		13	
	4 and more		3	Rentable rooms included
	Total		21	
Building materials	Main house roofs	CIS	18	
		Plastic	-	Many commercial houses are covered by plastic sheets but not referred as the main room
		Thatch	3	
		mixed	-	Many commercial houses are covered by mixed surfaces but not referred as the main room
		Total	21	
	Major walls material	'Chika'	19	(mud + wood)
		Wood only	1	Acacia wood
		mixed	1	Many extensions have mixed materials: Plastic + 'Chika'
		Total	21	
	Major floor	Compacted earth	19	
		concrete	2	Cement screed
		Total	21	

Table 7.1.4 Housing condition

7.1.3.3. The Lake, water cycle and the neighborhood

In the current spatial organization of a house (in a household level) there is little one can trace which makes the houses in the area (near the lake) different from the other houses in the rural kebele. Attempts to exploit the potential offered by the water body or to address the challenges imposed by it through particular spatial layouts are minimal. The current appropriation of the site is focused on exploiting the lake water and its fertile flood plains for livelihood production. Other than the irrigation activity growing in the area, the neighborhood is linked to the Lake water through its animals. The prevailing majority of the inhabitants of Edo Goojola have cattle in their house - either for milk and meat production or for transportation. The animals are guided to the grass field on the flood plain and to a defined drinking point. One of the major observable traces which display a spatial significance is the age long cattle paths which relate the earlier village to the water body. These pathways are still kept serving as a major structuring geometric elements of the area.

Even if, some inhabitants, who have no hand dug well in their compound, still draw water from the lake, the water supply and waste water disposal from the everyday household activity of the majority shows no dependence and on the Lake water. Almost all toilets in the rural Kebele as well as the emerging settlements near the water body are dry pit latrines which usually are located at corners in a compound. When they are full they are sealed and another pit latrine is prepared. However, due to the sandy nature of the ground, no toilet has been reported to be full

(see diagram for house level water cycle and lake relation). No considerable waste water disposal is observed being guided to the Lake.

Two direct threats can be observed on the relationship of the emerging neighborhood and the Lake. The first is the impact of the increasing use of the acacia forest for building material which aggravates the already severely damaged forest of the lake surrounding. According to elderly inhabitants of the area, the lake surrounding was covered by forest which was home to various wild animals. Deforestation inflames surface runoff and erosion, leading to siltation in addition to the direct impact it has on the natural water cycle. The second is related to the livelihood activity of inhabitants of the emerging settlement - particularly small hold irrigation by pumping water from the lake. Other than the direct threat that it imposes due to the unregulated water pumping, use of fertilizers and pesticides damages the aquatic ecology of the lake.

7.1.4. External Inputs: design/planning inputs and interventions of Government and Non-governmental organizations

Neither in the discussion with the Woreda office of environmental protection and land administration office nor group discussion with farmers and inhabitants on site, no recent intervention or external assistance regarding to spatial organization was reported. In the neighborhood and household levels, design and development (construction processes) are handled without any external input in the form of rules and regulations or in the form of technical assistances. The access road to the water point itself was an original footpath developed due to years of cattle path. The first and last attempt of top-down structuring of the physical space for habitation in the area was done in 1978AD in the program called villagization. Traces of regular structures of parcels across the road – with enough distance from the malaria infested water front - is still visible (Fig. 7.1.5.). Most of the current use-right holders of the irrigation fields are members of the then kebele Farmer's Association.

Currently, as the site falls under rural land, spatial organization regulations (architectural design standards, building bylaws or neighborhood layout regulation) are not required. And as reported on the Woreda level, there are no governmental and nongovernmental organizations currently involved on related works in the area. However, inputs related to water and settlement like health and hygiene are regular subjects of both governmental and nongovernmental interventions. The campaign against malaria epidemic did not target the construction of houses and layouts of neighborhoods rather focused on the provision of mosquito nets ('angober') and avoidance of ponds and marshy areas. The continuous campaign has been reported as successful in both local and federal levels. Some farmers have expressed confidence that settling around the lake is easier now than before. Moreover, inputs from governmental and non-governmental organizations have been noticed on the area of irrigation trainings; in introducing water pumps for irrigation; and water wheels for hand dug wells.

Summary

Even though inhabitants are not threatened with immediate resettlement plan due to large scale commercial farms, due to the growing interest on lands around water bodies, farmers are conscious of a possible contest to the land which they currently have a use-right. Furthermore, the increasing population is demanding more land particularly on the fertile plains near the lake. Such uncertainty has created ambivalence to work for a more permanent arrangement. The current settlement structure can be referred as 'a neighborhood on the making – a rural-urban hybrid'. The unsettled land tenure (farmers lack of security on their use right of land) makes the planning and investment on their land to be ambivalent and temporary. The tools and methods, adapted (physical details, principles and social organization) to profit from the water body and the main road, are rudimentary.

Small scale vegetable production, based on irrigation, is the major livelihood activity which also generates other related activities. It can also be taken as the main activity which determines the spatial organization pattern at the neighborhood level. Farmers with sites near the street are attracted into the business of building rental houses by themselves or by leasing a portion of their site to shop owners who build their businesses based on the horticulture production. The construction of houses around the street for shops is intensifying. Other livelihood activities, which are common in the area, such as fishing, grass-harvesting, animal husbandry and sand mining, demand only access to the Lake but not a defined area for production attached to the lake. The area is also demanded for resort hotel development due to its scenic qualities, however, no concrete claim and investment is observed.

Though the building (house/compound) level spatial organization and material usage of the development do not show significant difference from developments far away from the Lake, the linear plot parcels extending from the Lake shore and the specific open verandah type of shops on the emerging commercial street are the main characteristics of the area.

Single story Detached Chika houses (with used CIS roofing and plastic coverings) are the most common house types on the road side development. Semi-skilled and non-skilled labor is mobilized within the area. The owner is usually the lead builder when the house (or the addition) is a Tukul (hut). When it is a CIS roofed house, carpenters are needed from the near by town. Materials used to be organized predominantly within the area except used elements like CIS roofing and wood – both from the city. Older structures are being replaced by CIS roofed houses

Interior spaces are not strictly defined and differentiated for functions. Fixtures, furniture, and light partitions are used to mark various activities within the same space. The sleeping area has a distinctive mark with its newly adapted mosquito net (angober) – a small tent space within the house. However, within the compound, the rural-urban hybrid activities claim different structures. Most of the households visited have at least two houses – one with CIS roofed 'Chicka' house and the other the traditional thatched roof hut. The original living house, the hut, is usually changed to become a barn. On the neighborhood scale, the irrigation fields occupy the space between the emerging commercial street (with houses) and the lake.

Though building details and processes are too hasty and are simply imported from the near by towns, the influence of the lake on spatial dimension of livelihood activities within the settlement is indisputable. The following are major characteristics drawn:

>The seasonal movement of the lake adds up the flood plain for cultivation. The flood plain is under the government control and the Kebele can act against anyone who tries to appropriate it. However, inhabitants are informally appropriating it.

>No communally used spaces are consciously structured. The cattle paths (towards the lake) are used as access road for pedestrians and vehicles. The flood plains and the immediate space after the wetland (in dry season) and the water line (in rainy season) are left as grazing fields, grass harvesters and children play ground. The lake side fig tree shades are used for communal assemblies.

>Most of the seasonal laborers in a pick season of vegetable harvesting or crop harvesting come from the southern highlands. In previous times, they used to build temporary sheds on the field, currently however; they require cheap rental houses around the neighborhood.

> Risk related to malaria epidemic has decreased considerably and inhabitants have already developed confidence to work and live around the Lake. However, nuisance of mosquito infestation and biting is a challenge to face.

>Disputes on irrigation works are dealt through the Kebele or the cooperative that the farmers have established (the cooperative in recent years have grown weak – according to both members the Kebele and its own members).

> Involvement of governmental and nongovernmental organizations related to water body and spatial reorganization is minimal. The top down support noted are: support to create cooperatives; provisions of loans for purchases of water pumps; support to finance mechanical water puller from a hand dug wells within individual compounds; and basic trainings related to hygiene and health.

The increasing density (population in the specific area) implies increasing need for housing, energy, and water. It imposes an increasing appropriation of the already scarce acacia forest - as the main building material ('Chika' house) and as fuel wood and charcoal - and increasing pumping of the lake water for irrigation. The area, which - according to inhabitants who witnessed the transformation through the years - has already suffered deforestation, is further exposed to aggravated deforestation and excessive usage of water threatening the natural water balance of the lake. Such unregulated use of water for irrigation can be a possible cause for a disaster as seen in other lakes like Haromaya ⁴ in the same regional state. however, authorities in both the Zonal and Woreda office have acknowledged that the area is not exploited to its potential but also are concerned about both the lack of clear regulation and the growing demands for land near water bodies from both the rural community and from investors. Experts at the zonal office of environmental protection and land use administration in Adama and Woreda desk⁵ believe that even the existing related regulations and rules at both federal and regional levels could not be implemented due to the lack of capacity. According to them,

the appropriation of the Lake water and its surrounding has increased dramatically in the past 5-6 years. The three main activities identified as the major contributing factors are: increase in major agricultural projects, increase in small hold irrigation activities around the lake, and the rapid growth of cities (urban growth and urbanization around the water body). Referring to the nearest town to the study site in which discussions held with the office environmental protection and land administration, experts say that the waterfront which few years ago used to be the list sought area is now completely occupied by developers who claimed to develop hotels and recreation centers. They also noted that the demand for sites related to the lake from developers of both resort hotels and irrigation projects are rapidly expanding to the surrounding rural Kebeles. Even if both the experts in the Woreda and the zonal offices do not disagree on the demands and trends of development, they expressed their fear on the lack of capacity to lead the development both in terms of implementing the existing regulations and in generating innovative technical abilities which can bridge the demand with the fragile resource.

Notes:

- 1 Ato Kedir Adem and Ato Muata Kulea (chairman and vice chairman of kebele edo Gojoola interviewed on Dec 2013)
2. Discussion and interview with representative of Zonal office for environmental protection and land use administration in Adama held on Jan 2014)
3. Project sizes (small size, midium and large) are classified customarely and not attached to a defined rule. Large investement projects access land through the federal or regional government levels. Smaller projects need to deal with farmers and elders by themselves(sometimes with woreda official representatives). 'Ye-ekul' (can be translated as - *for equal share*)is a type of arrangement where the farmer leases his farm land for another farmer to share the produce equally. Such arrangements work when projects are smaller and dealings re done with a single farmer. The farmer may or may not agree to contribute labor or other inputs.
4. Lake Haromaya is a lake in Oromiya regional state which dried away completely in 2010 completely due to an aggressive use of irrigation.
5. Ato Nigussie D. - experts at the zonal office of environmental protection and land use administration in Adama , Ato Amino Namisso - expert in charge of the desk at the Woreda office and currently at the municipality of Batu town and other experts were interviewed in Dec. 2013

7.2. Case IV: Delu –Haregama lake side, Lake Langano shore, Oromia

Box 7.2.1 > 'a better future'

With the help of his 11 years old daughter and his wife in the back yard, Kedir attends his guests in his half covered cafeteria. His regular guests are young men who work in one of the hotels recently finished or construction workers in those which are under construction. Other guests include drivers for tourists, daily laborers, fishermen, and sometimes farmers from the surrounding. He serves tea, bread, soft drinks and Khat particularly common in the afternoons. He has to travel to the nearest city Arsi Negele for supplies once in a while or ask the drivers of the hotel cars to fetch him what his little cafeteria needs.

The nameless cafeteria of Kedir, who is 35 years of age and a father of four, is located ironically opposite to the main gate of one of the largest resort hotel in the area – Sabanna Resort. Between the two, a dusty road leads into another large resort hotel under construction. He was a school teacher in the near bye rural elementary school before leaving it to work in construction. After working in one of the emerging resort hotels for two years – first as construction worker and then as regular hotel employee, Kedir noticed the demand of cafeteria for workers and budget holiday makers. He bought the plot from another farmer (mentioned as a relative*) and built his house and cafeteria. The frontal side of his compound which faces the main street leading to the resort hotels is used as the cafeteria, while his house extends to the backyard. His plan is to expand his cafeteria into a budget hotel with bed rooms and restaurant targeting budget travelers.

His semi-defined cafeteria space is well ventilated for the hot and dry climate of the area. The three sides of the rectangular space is defined by half-high low walls with plastic curtains covering the other half against the dust from the street. One of its walls is the external wall of the remaining house where one notes the closed window appearing on the wall as a wall painting and the door leading to the next room. It has a shorter height than the usual houses with mud floor covered partially by plastics carpets. Kedir waters the floor and the area around the front door time and again – which helps to cool the room. Though the whole house is made from soil blocks, it is plastered by sand and cement from the outside so as to upgrade its appearance to match the expectation of a cafeteria.

The involvement of Kedir in the construction processes of the resort hotels have helped him gain fair experience and also helping friends to finish his house with a corrugated iron sheet roofing. He is convinced and hopeful that more tourists and holiday makers to the neighboring high-end resort hotels means more customer for his low-cost cafeteria too. He also acknowledges that there are many advantages that the big hotels are rendering already – like the cleared access road from the main asphalt road. He also hopes that they will soon benefit from the electric energy line under construction, ground water development and other infrastructure and services coming near to them due to the hotels. Kedir seems to be convinced that a better future awaits himself and his four children even if easy access to the lake is becoming increasingly difficult.



Fig. 7.2.1 Kedir's street side bar (Source: photo by author)

7.2.1. The Area, The Lake, and The People: an overview

The area is known neither for its rain fed agricultural production nor for its irrigation due to the Lake. It is rather known for its expanse of acacia forest, which grows thinner every year due to primarily charcoal production for household energy demand, and the scenery of large number of livestock marching towards the lake for water. Though in Lake Langano area only two hotels have been the centre for recreational activities for over 40 years, the past 15 years have shown a sharp increase in tourism and resort hotel development. The larger area including Lake Shalla and Lake Abijiata (Fig 7.2.3), the national park (Abijiatta-Shalla national park), and various hot springs related to the lakes, have become the focal point for the emerging tourism industry in the area. Acknowledging its economic potential, the regional institute of Urban Planning of Oromia, according to its Deputy Head¹, is on the way to prepare a development plan for a new town in the area to respond to the increasing tourism activity.

Among the three closely tied lakes, Lake Langano - popularly referred as the golden Lake due to its light brown color - is most popular by tourists from far and holiday makers from around the area. Being free from Bilharzias (Schistosomiasis) unlike almost all other fresh water lakes in Ethiopia and being situated in a relaxingly warmer climate, makes it a popular choice for recreation. Moreover, there are a variety of wildlife and a huge variety of birds which serves as the other resource for the growing tourism activity in the area. In a move which looks like a race, many rich people and institutions have secured their own summer houses through both formal and informal means. The lake has a surface area of 230km² and a maximum depth of 46m with a catchment area of 1600km². It is drained by the Hora Kallo river which emptied into the adjacent Lake Abijiatta. According to Ayenew (2009:86), other than its catchment, lake Langano gets refilled by an underground discharge river from lake Zeway making the four lakes an interconnected hydro-Ecology (Fig. 7.2.3).

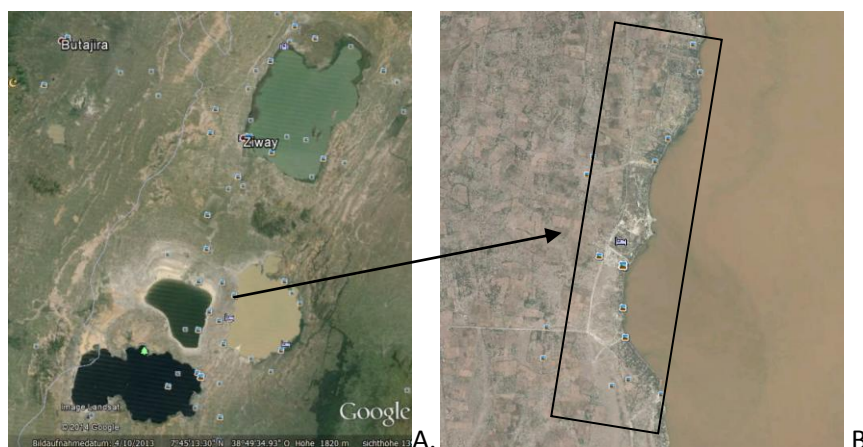


Fig. 7.2.3. A. The four lakes, B, Area increasingly appropriated for resort development (Sources: adapted from Google earth image)



Fig. 7.2.4 Images showing road side billboards and construction of some of the rapidly developing resort hotels around Lake Langano. (Source: photo by author 2012- 2014)

The study site

The study area focuses on the predominantly spontaneous development around the lake instigated due to the growing resort hotel developments following the Langano lake shore. The particular site is located in the rural kebele of Delu-Haregama within Arsi-Negele Woreda of Oromia Regional State. The neighborhood is sporadically developing on farm land centering the activities created due to the resort hotel development. It is approximately 2.8 kilometers off the main North – south road, accessed by a gravel road - previously cattle-path Street upgraded to serve the group of resort hotels. As the study is targeting to study the how and why of the development structure, and the neighborhood is an emerging one, it was not necessary and possible to precisely delineate the area. However, as it is shown in (Fig. 7.2.5.) observations and interviews were concentrated in the area indicated.



Fig. 7.2.5 images of study site – A. Emerging resort hotel development site and accompanying informal settlement; B. Access road, C Ariel view of emerging lake side development (source: A. Google earth image, B&C Photo by author)

For each variable out of 17 respondent		Freq.	%	remark
House hold head	Man	15		
	woman	2		
	Total	17		
Family size in a house hold	1-3	2		Including more than one family under a house hold.
	4-5	5		
	Above 5	10		
	total	17		
Main income source (livelihood)	Employed in private businesses	8		In resort hotels
	Self employed	7		Working as tourist guide, fishing, operating own shop/bar/restaurant, charcoal production
	Government Employed	2		Near bye elementary school
	others			Income source unidentified
	total	17		
Household member who is active in sand mining	yes	8		Sand mining is observed to be the main activity among the youth in the area benefiting from the growing construction in the area and also in other cities.
	no	7		
	total	17		
Social association membership	Idir	7		All are members of either 1 or more associations
	Iqub	5		
	none	-		
	Other associations	7		Religious, ethnic, professional, relatives association
	Total interviewed	17	100	

Table 7.2.1 Basic socio-economic condition from a sample survey

7.2.2. Processes: access, development, and use of land and water

There are two parallel developments going on in the study area which predominantly was a crop field and wood land (acacia): the resort hotel development based on predominantly formally leased land and small scale businesses and housing development on farm lands predominantly acquired through informal transactions from farmers who have use-rights. Resort hotels have claimed the immediate water front while the small scale businesses and housings occupy the area behind the resort development extending to farming land (see Fig. 7.2.6)

Communal access points of water for cattle are reserved and demarcated by the Woreda land and environmental protection office. However, the Woreda office officials have acknowledged that no attempts were made to reserve land for any other communal activity near the lake. They also noted that the 50 meter buffer zone between the lake and individual plots set on the regulation is not being respected by private developers who are targeting the sandy beach as their main resource. Almost all resort hotels have claimed the beach and demarcated it as part of the hotel compound – making access difficult for the locals as well as free holiday makers.

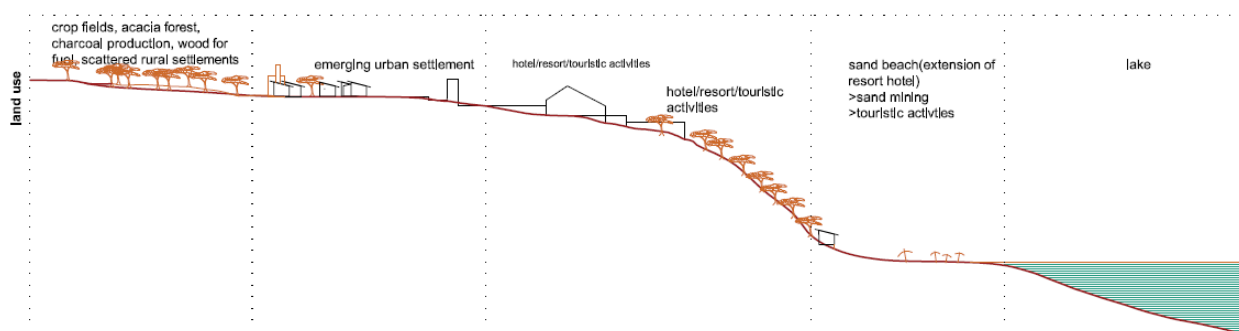


Fig 7.2.6 Diagrammatic sketch showing the emerging land use pattern

Farmers whose plots (either wholly or partially) are claimed by investors are entitled to get compensation based on a guideline imposed by the government. However, the officials in the Woreda office for rural land and environmental protection claim to know that many transactions are done informally. According to them, many of the informal development around the resort hotels are primarily by farmers who got compensation money who desire to build houses for rental services. The author has also witness the process of negotiation while he was working as an architect for a resort project in the area.²

Experts interviewed at the Woreda level in Arsi Negele Woreda, expressed the increasing complexity of land acquisition and informal development. The expert who spoke in behalf of the head for environmental protection and land administration office³ said that though almost all lake shore (water front) are claimed, not all of them have started construction. Some are speculators and due to the intensity of the demand, it also has become a favorite case of corruption stories in the area.

Access to land: Ways of land acquisition in the area observed can be categorized into the following:

A) Long term or short term lease contracts with government by negotiating on farmers (current occupants) compensation – usually done by resort hotel developers.

B) Family farm land (legal use-right), redistributed after nationalization of land and redistributed after 1995.

C) Short term or long term Informal lease/purchase from farmers who has a life time use right – done by informal settlement inhabitants and high end private vacation house owners.

Type A is the most common way through which much of the resort hotels in the area have acquired land. Type B and C are found to be ways that many of the small scale construction other than the resort hotels in the area have acquired land through. While attempting to understand the processes of land acquisition possibilities, the author was offered plots to purchase from farmers particularly for vacation house. Moreover, interviews made with the Woreda and zonal land and environment protection offices and experts in the regional planning institute confirms the fact that informal leases from farmers (type C) is the most common and growing form of acquiring land for small scale business activities and housing (see Table 7.2.2.). After acquiring a plot through negotiating with farmers, the new settlers have to be members of the rural Kebele – processes which also require informal dealings.

Temporary acquisitions for daily use and squatting were not observed in the study area. However, it is worth mentioning that the area was known for illegal settlements due to the devastating squatting in the neighboring Shalla-Abijatta national park after the fall of the Derg regime.

For each variable out of 20 respondent		Freq.	%	remark
Means of Acquisition of land	Mine/my family property	6		Refers family use-right ownership
	Leased from farmer(informal) usually referred as from a relative	11		Deals done through elders (village contract –informal).
	Lease from government	3		Resort hotels - deals for compensations fr farmers are done through the government (formal) - All claim formality.
	total	20		
Time of building	Before 2000	2		
	After 2000	18		
	total	20		
Main reason for preference of the site	Family land	5		Farmers or children of farmers indicated that they are there originally because of land allocation. But they prefer it now because of business opportunity.
	Near working place(hotels), business possibility	15		
	Easy access and near water body(visual and environmental qualities)	3		Resort hotels
	Presence of infrastructure	7		Major road helped to boost activity
	total	-		More than one reason was allowed
Major uses of compound and house at the time of survey (other than resort hotels)	Only residence	5		Owners residence Spaces of residence also include various activities of non-commercial productions (food and beverage processing)
	Only commercial	3		Shop and resort hotels(3)
	Only production	0		
	Residence + commercial	11		Small shops, restaurants, bars ('Tela bet')
	Residence + production	1		Poultry/ livestock
	Commercial + production	0		
total	20			

Table 7.2.2 Means of access to land and function for which the land is used

Access to water body: Among the local inhabitants, the arrival of piped water (on a communally used water point) has reduced the relevance of the lake water into few uses: for livestock and bathing. Even though easy access to the lake is increasingly limited, obvious and customarily known access lines and points are still protected. The Woreda Rural Land and Environment Protection Office also claims to secure such access points by reserving path ways between resort hotel boundaries. However, to meet the demand of accessing the lake from the increasing population of the inhabitants of the emerging settlement and also from people of the nearby cities has little chances left. Almost all water front areas within the perceivable distance in both sides of the study neighborhood are claimed already or reserved for investment.

Unlike other emerging lake side settlements, attempts of accessing lake water by channeling or from the underground through hand dug wells were not observed. According to discussions with inhabitants and experts in the Woreda, various reasons were noted as a reason for a lesser attempt of appropriating the water other than using it for livestock. The salty nature of the lake water, the topography of the area (the water body is considerably lower in elevation than the agricultural fields), and the excessively sandy nature of the soil near immediate lake area are the major reasons mentioned which make the water less desirable for small scale agricultural or house hold uses. Hence, until recently, both the livelihood production of the inhabitants of the area and space production culture has been loosely related to the Lake. In the newly emerging neighborhood, however, the direct use of lake water is increasing. The prime uses are construction (by transporting it by donkeys), livestock, bathing and washing of clothes. The Lake is also a resource base for fishing which grew with hotels developments); sand and pebbles for the construction activity both in the emerging neighborhood and resort hotels; and touristic activities such a birds watching and tracking which created possibilities for additional livelihood activities for inhabitants of the rural Kebele.

A. Water sources and use

Water source	Use/location	Freq.	remark
Direct/indirect use from Lake water	Drinking and kitchen	2	Transported by donkeys(second visit after a year from the interview was made, respondents have already started to use fresh water from a communal water point)
	Washing	14	Shower/bath, clothes almost all use the lake at least ones a month
	Livestock	11	Not all interviewed have livestock but all who have livestock use the lake
	Vegetable	2	
	Total interviewed	17	More than one answer was given
Extra plot on lake front for direct use	Yes	5	3 are resort hotels, 2 are farmers who leased their water front plot to expatriates as summer house
	no	16	
	total	20	Including 3 resort hotels
Hand dug/deep well	yes	5	
	no	15	
	total	20	
Piped water source	Yes	3	Resort hotels who have private deep wells
	No but uses communal water points	15	Earlier Shares from hotels, currently shares from a common water point
	no	2	Uses the lake and sometimes
	total	20	Including 3 resort hotels

B. Waste water treatment

Source	type	Freq.	remarks
Toilet type	Pit latrine (dry toilet)	17	All house except resort hotels. Closed when full and another is dug
	Flush toilet	3	Resort hotels(2 are operational)
	total	20	(3 are resort hotels)
Surface and kitchen waste water drainage	Drained to the lake	0	
	Drained to the street	0	
	Drained to an open compound (backyard)	17	In the present intensity and location, no chance to be drained to the lake
	Drained to a septic tank	3	Resort hotel, higher chance to run to the lake if not monitored
	total	20	Including 3 resort hotels

Table 7.2.3 A., water access and use and, B. drainage and waste treatment

Box 7.2.2 > 'I don't need an open window to see the lake'

With his colored teeth, one can guess easily that Bassisa Amin is a local from the area. The excess fluoride in the waters of the Rift Valley used to make a mark on those who are born in it. He hopes that the new water line which is drawn from the south-western highland area will make a difference for his children. He, like the others, claims that the land on which he built his house and his shop belongs to his relatives who shared him for a reasonable price. After a while of closer discussion, he reveals that it is to say he purchased it through a negotiation through relatives. He is 24 years old and already a father of 2 children. He owns a small shop which he opened a year ago to sale Khat, soft drinks, cigarettes and other small daily consumables for the inhabitants and workers around the emerging neighborhood. His small shop is built at the corner of a larger compound facing the street leading to the main resort hotels. The freshly installed electricity, few days old, makes him to proudly post an advertisement for cold drinks – an indisputably demanded drink in the hot and dry area.

The small shop (2m by 3m by 2,5m box) is made up of soil blocks and roofed by corrugated iron sheet. It has a small overhang to where one gets a shed from the scorching afternoon sun and chew 'Khat' while watching the cars which fills the air with dust while passing - carrying tourists and holiday makers to and from the resort hotels. Some of them stop for a while to ask for Khat, cigarette or a bottle of cold water. Bassisa claims that he himself has built it with a help from a friend who works in the nearby construction site. His house behind the shop is a 3 room house constructed from 'Chika'. Though one can see the golden lake behind his house, his house opens no window to it and his compound is dry, dusty and with no green element – a stark paradox with the background water body. When asked about why the house is ambivalent to the view and why his compound is so dry while being near such a lake, his answer is simple – 'I don't need an open window to see it and I also don't need to see it every time because i grew with it, i have been drinking it, swimming and bathing in it and so were our cattle. They have always been drinking from it. The city people like to see it because they see it once in a while. For them it is like a distant relative, but for us, who lived all our lives with it, it is a family – i see it without opening my eyes'. However, he acknowledges that it is his failure and laziness to carry water from the lake which left the compound treeless.

Even though his shop is 1 year old, he started working in the area three years ago as a construction worker. His ambition is to provide milk and egg for the hotels – starting a small poultry and have milk cows. He assumes that he has his wife and his brothers to mobilize. The growing number of visitors to the resorts means more possibilities for him.



Fig 7.2.2 Bassisa's street side shop

7.2.3. Product: the architecture of individual and collective spaces and its relationship with the water body

The architecture of individual houses (**IH**) is assessed and described through the following major points: spatial organization; use, size and shape of spaces; Spatial qualities (in terms of Spatial luminance, ventilation and appropriateness measured and reflected subjectively based on observation); and material used and technique of construction adapted.

Space structures at the neighborhood level (**NL**) and particularly spaces for collective uses such as markets, multi-use open spaces for play grounds, social gathering are reflected on based on observation on repeated visits. In most cases and activities observed, the individual spaces are articulated by a defined compound which inscribes all individual activities while activities which can be regarded as collective are restricted into the mosque and school compounds.

7.2.3.1 Spatial organization and use

Spatial organization

HL: All houses in the emerging neighborhood are single story houses in a variety of compound size and shape. A compound can have more than one house made from 'Chiika'. The first block is done to secure the land after being negotiated with the previous owner. Constructing additional rooms continue based on the capacity and need of the owners. Generally, houses are detached types with varying sizes. Those houses built facing the main street leading to the major resort hotels target business activities and are situated on the boundary so that their shops and cafeterias make use of the street (Fig. 7.2.7.).

NL: streets are not clearly demarcated and difficult to differentiate borders between individual territory of farm land and public streets. Other than the main street leading to the major resort hotels, which is roughly marked and cleared by the cooperation between the Woreda Rural Road Authority and the resort hotels, internal streets are negotiated among farmers and inhabitants. There seem to be no communal open space except the spaces by the side of the main street. The neighborhood seems to grow based on the parcels of plots subdivided and availed by the farmers. Most of the land which appear open - unused and unoccupied - are plots which could not be used for farming due to problematic soil but it is under the use-right of farmers. Most of them await possibility to lease it for possible investor or home builder.



Fig. 7.2.7 street side commercial activities

Spatial use

HL: Many of the houses visited are mixed use. Though primarily residential, they target commercial activity to support the income of the household, either by making extra rooms for rental services or using one of the rooms as a shop or a cafeteria. In a multi-room house, like other low-income residences, all rooms are multi-purpose spaces. Spaces for sleeping, seating, eating, food processing and preparation can share the same room. Main activities of the day happen on outdoor space within the compound at the backyard or front yards of the main house according to the position of the house in the compound (shadowed open spaces are desirable for outdoor activities). Food processing (preparation of ingredients up to cooking), washing clothes and taking shower (if done within the house rather than on the lake), drying, coffee ceremony, cooking, etc) are some of the main activities happening outdoor. Toilets are usually located at the furthest corner within the compound.

NL: Except the mosque, which according to inhabitants is a recent addition, and the school compound, no communal spaces for social services are reserved. Currently the street, the school compound, the mosque and unfarmed open lands are used for social gatherings. Neither the community nor the officials within the Woreda administration office noticed any attempt to reserve spaces for communal uses.

Space size and form

HL: The majority of the new houses have a distinctive rectangular plan with an inclined roof (see Fig. 7.2.8.). There are still few thatched roof huts but the majority is covered with CIS roofing. In both typologies, size of spaces varies according to the capacity of the owner and purpose of the room. Size of CIS roofed rectangular houses are determined by the number of CIS sheet the inhabitant can buy. Larger houses with corrugated iron-sheet roofs have an average height of 2.5m and are divided into two or three rooms (rectangular prisms) while cylindrical thatch roofed spaces have an average height of 2.0 m at the connection of the wall with the roof to 3.5-5 meters at the pick where the central pole stands. Internal spaces within the cylindrical space are subdivided with light partitions and furniture.³

NL: While the main street leading to the resort hotels is straight dividing the emerging neighborhood with the resort development (Fig. 7.2.3 & 7.2.5), internal streets are organic. The main street (dusty road) was originally cattle's path to the lake and recently upgraded (widened) to accommodate vehicular access to the resort hotels and to the sand mine sites. Currently, both herds of cattle marching to the lake for water, trucks for sand transportation, and cars to resort hotels use the street. Due to the nature of shrubs used to define compounds, it was not possible to precisely guess the dimensions of internal public passage ways.

Spatial qualities:

HL: Interior spaces are dim in cylindrical huts than the CIS roofed rectangular rooms. In both cases, both natural day light through windows and artificial light points are minimal. However, the outdoor is starkly bright in the day and controlled brightness is a desired quality than availing daylight. Interior surfaces in the emerging neighborhood are plastered and painted resulting in a better interior light condition than the traditional huts of the area.

Obviously, in the warm climatic region, the interior spaces of the CIS roofed houses are warmer and suffer from the lack of ventilation. Most of the houses are built on boundaries forcing them to have windows only on one face of the house. The minimum opening sizes situated only on one side contributes its share for the lack of cross ventilation. The linear layout of rooms within the compound itself does not help in creating a larger shaded courtyard for outdoor activities. The lamination of the 'Chika' walls with extra sand and cement also hampers the breathing quality of the 'Chika'-only walls. Almost all houses have an overhang over the front surface protruding from the main structure aiming to cast extra shade over the openings – an attempt to control excessive brightness.

Though the ventilation of cylindrical huts is limited to the breathing capacity of the roof cover and little openings in the walls particularly on the connection between the cylindrical wall and the conical roof, the interior climatic comfort is observed to be better than the rectangular CIS roofed spaces. However, the emerging settlement avoids any adaptation of thatched roof and huts except in the tourist centered main buildings of resort hotels (see Fig 7.2.8C&D).



Fig. 7.2.8 A, B, C & D new rectangular houses in informal neighborhood and hut shaped hotel buildings (source: photo by author)

7.2.3.2. Material and technique

Materials: Houses dispersed on the landscape in the area which used to be thatch roofed circular huts are changing with CIS roofed rectangular houses. Few houses are built on adobe but houses in the emerging settlements dominantly use 'Chika' walls with Acacia sticks and CIS roofing. The majority of the houses in the study area share the following major building materials:

>Walls:

Main wall: Eucalyptus log frame and acacia wood fillings with 'Chika' (mud + straw) fillings (see Fig 7.2.9.)

Wall finishing: mud plastering, cement mortar plastering/rendering, painting

Internal partitions walls – 'Chika' walls, used plastic sheets, animal dung plastering,

>Roofs:

Roof structure: Eucalyptus logs and sticks

Roof covering: New/used corrugated iron sheet roofing for rectangular houses; used plastic sheets for shop verandah covering, thatch/ grass for cylindrical huts.

Ceiling: fabric (in only few houses)

>Floor:

type 1(most common): Rammed earth finished with cow dung screed, used-plastic sheet carpet,

type 2(next step in improvement) : compacted stones finished with cement screed

>Door/window:

Wooden (stick) framed CIS surfaces

Recycled (used) wooden doors/windows

Metal doors and windows (recycled or new)

Based on their origin, most of the materials used for the construction of houses in the area can be categorized into three:

- 1) Produced on/around the site within the reach of human labor: wood (from acacia forest near bye), 'Chicka' (on site soil + 'chid'/straw), water, cow dung, 'sar' (grass for thatch roof)
- 2) Recycled elements from town: used corrugated iron sheets, used-nails, used- plastic sheets, used-doors/windows
- 3) Purchased new materials: eucalyptus logs and sticks, Nails, corrugated iron sheets,

In terms of materials, the presence of the lake seems to have less contribution in the building processes of the area. Sand, water (transported by donkey) and grass are the major building materials associated with the Lake. However, the acacia forest, though diminishing, is the main source.

Technique and mobilization of labor. As the majority of houses in the study area are CIS roofed rectangular prisms, the basic frame structure and roof covering are made by carpenters who are easily available from construction sites of the resort hotels. But inhabitants and relatives contribute labor. Filling the wall with acacia woods and 'chika' is usually left for inhabitants or daily laborers. Plastering of external walls also demand skilled labor which also is readily available.



Fig. 7.2.9 various building materials and techniques of construction employed in the informal settlement (source: photo by author)

House characteristics	category		Freq.	remark	
House form of main house	Circular hut		1		
	Rectangular prism		16		
	total		17		
Number of rooms	1		0		
	2&3		12		
	4 and more		5		Rentable rooms included
	total		17		
Building materials	Main house roofs	CIS	16		
		Plastic	-		Usually for extensions
		Thatch	1		
		mixed	-		
	total		17		
	Major walls material	'Chika'	11	mud +straw applied on wood filling	
		Mud blocks	5	Mud+straw	
		Mixed	1	Acacia wood+CIS+mud	
		Hollow concrete block	1	Provided from construction sites from around	
	total		17		
	Major floor	Compacted earth	11		
		concrete	6		Stone foundation with cement screed
	total		17		

Table 7.2.4 Housing condition

7.2.3.3. The Lake, water cycle and the neighborhood

The elevation difference (due to topography) and the location (due to the presence of the resort hotels in the middle) make the position of the emerging settlement safer against flooding. Compared with the resort hotels, it also is less disturbed by the nuisance from mosquito infestations. The spatial organization of houses (in a household level) and layout of the neighborhood shows no special characteristics which can differentiate it from houses and layouts from other neighborhoods in the nearby towns. No special attempt is observed to exploit the potential offered by the water body or to address climatic and other challenges imposed by the presence of the lake. Instead of the Lake, the resort hotels and the road leading to them are the focal points in the layout structure of the emerging settlement.

Even though it is believed that the increasing CIS roofed houses will increase surface runoff, there was no indication to link the liquid waste produced from the settlement with the Lake. Considering the dry and relatively hot climate, almost every drop of liquid waste in the neighborhood dissipates within the compound – being used as surface cooling or reused extensively. All houses within the settlement have no water pipe running within the house. They all use dry toilets (pit latrines) – minimizing the liquid waste discharge.

As the community around the study site is a farming community, predominantly dependent on livestock, the main use of the Lake water, which can be observed daily, is for animals. However, the livestock asset is not yet linked with the demand for animal products from the resort hotels. Among the interviewed, 2 inhabitants have said that they have plans to establish small scale poultry and livestock for milk production.



Fig. 7.2.10 A. Neighborhood Street, B. water transport system from the lake, (source: photo by author)

7.2.4. External Inputs: design/planning inputs and interventions of Government and Non-governmental organizations

Neither in the discussion with the Woreda office of Land and Environmental Protection nor in the group discussions held with farmers and inhabitants on site, no recent intervention or external assistance regarding spatial organization in the informal settlement was reported. In both the neighborhood and household levels, the construction processes are handled by inhabitants without any input from governmental or non-governmental organizations. No rule, regulation or guidelines were introduced to the settlement. The access road to the resort hotels, which currently is functioning as a spine for the emerging settlement, was an offset from an original foot (cattle)path developed due to years of cattle herd's path to the drinking point at the shore of the lake.

As the site falls under rural land, spatial organization regulations (architectural design standards, building bylaws or neighborhood layout regulation) are not required. Moreover, as reported on the Woreda level, there are no governmental and non-governmental organizations currently involved on related spatial organization works in the area. However, inputs related to water and settlement like health and hygiene are regular subjects of both governmental and non-governmental interventions. The current introduction of piped fresh water and electricity to the 'Kebele' is examples of a growing acknowledgement of concentration of population in the area.

Summary

The emerging informal settlement in 'kebele' Delu–Haregama is an outcome of the growing resort development. The livelihood activity of its inhabitants hence is related to the Lake through the activities created by the resort industry. The settlement is developing behind the chains of the resort hotels which separate the settlement from the lake. Due to the increasing lake shore land claims by the expanding resort development, free access points to the lake shore for inhabitants and farmers from the surrounding is getting limited. While the hotels get access to land with the help of the government, almost all of the emerging informal settlements are developing on farm lands by informally purchasing or leasing plots of land from farmers. Furthermore, private vacation houses are also developing as the third types of settlement which also are accessing land through informal arrangements with farmers.

Main livelihood activities for which the emerging informal structures are shaped for are: low cost rental houses for workers in the hotels, low cost rental rooms for budget holiday makers and hotel guest accompanying workers (like drivers), small shops, café and restaurants, necessary agricultural supplies for the resort hotels, sand mining (not necessarily related to only the resort development), fishing, charcoal production for fuel for the inhabitants, and tourist guiding. Houses are developed on farm lands by farmers themselves to be rented out or by those who are employees of the resort hotels on plots informally purchased from farmers. Fishing, guiding tourists and small scale agricultural activities are supplementary activities directly related to the lake.

Inhabitants have purely functional relationship with the water body (livelihood of inhabitants are linked directly or indirectly with it. Except resort hotel developers, no inhabitant (in the informal settlement) has come to claim land for its environmental or visual quality.

Inhabitants of the informal neighborhood do not face threats of immediate displacement from the current site they have appropriated. However, they possess no legal document and registration which assures their legal property claim on the land upon which their house is built. Some have managed to get registered as rural inhabitants through the farmer who sold them the land.

In order to secure construction permit, developers for resort hotels are demanded to submit environmental impact analysis in addition to the architectural and engineering documents. However, in all Woreda, Zonal and even Regional (state) levels, the capacity to crosscheck and review these documents and also review the construction processes is limited. In the Case Study site, where resort hotel construction is the central activity, no guiding master plan or design guideline has been enforced. Moreover, informal settlements are exempted from any regulation due to the fact that the land is a rural land where construction by farmers does not require responding to building bylaws.

Details of building form, spatial configuration – both on a building scale and neighborhood scale, and construction techniques do not show characteristics particular to the area. However, the construction of houses enjoys access to special building materials such as grass, acacia wood, soft wood, water and high quality lakeshore sand. Single story Detached Chika houses (with CIS roofing) are the most common house types followed by HCB walled houses (Fig. 7.2.9).

Skilled and semi-skilled labor is easily shared with the resort hotel development. Non-skilled labor is primarily contributed by the owner, his family and friends. Materials are organized predominantly within the area except elements like CIS roofing and eucalyptus wood – both from the city. Some materials –like HCB and eucalyptus logs, etc. - are also observed being shared or reused from the resort hotels construction sites. If the dominant house (material) type continue to be ‘Chika’ – based on wooden structure and filling, the demand for acacia wood filling for walls (Fig.7.2.9) will continue to increase consuming the already dying acacia forest in the area.

The increasing population implies increasing housing and energy needs which will impose an increasing usage of the surrounding already threatened acacia forest (for charcoal and main building material for Chika houses). This implies a direct threat to the water body through both heightened erosion which increases siltation and affecting the general rain water cycle.

Except for the resort hotels whose massive discharge of liquid waste is projected to affect the lake, the contribution of liquid waste from informal settlement, at its present density, which can affect the water cycle of the lake, is insignificant. However, the increasing population and density will have an effect in both usages of lake water and drainage discharges.

Limited and indirect involvement is observed from governmental and nongovernmental organization of the development of the informal settlement particularly in the provision of clean water and electricity.

Notes:

1. Under the law, land is a public property and cannot be sold. Purchases are handled informally under various pretexts. Almost all houses built in the study area claimed to be done by farmers and current users only claim to be a relative to the owner.
2. ‘Ato’ Mohamed Hamda Waqo- deputy director of Regional Urban Planning Institute of Oromia
3. Lake Langano is increasingly appropriated for resort hotels. The author, as an architect, was commissioned to design a resort hotel project in 2005 in which he participated through the negotiation processes of acquiring a land lease agreement. The project was not realized due to the failure of the developers in acquiring the legal lease agreement.
4. Ato Belete Workineh: The expert who spoke in behalf of the head for environmental protection and land administration office of Arsi Negele Woreda
5. Measurements were taken arbitrarily in order to support information from inhabitants

Summary table 7.1.1 The spatial implication of informal livelihood production activities near **Lake Zeway, Edo Gojoola Kebele** in Adami Tulu-Jido-Combolcha woreda,

Activity - water	Major livelihood activities	intensity	Major products and services	Spatial demands location, form and size	implication on water body and challenges	remarks
Directly related to water body	Horticulture/ agriculture	MCA	Vegetables, fruits and Herbs Maize	Near the lake (the land between the main road and Lake Zeway), thin rectangular parcels of land perpendicular to the lake front (preferably having a direct access for pumping water) with varying plot size. Three levels of plot types: direct users with channels, plots which pump and plots which dig wells.	without any regulation for pumping and irrigation size, further site dig wells	individual farmers land used by the farmers themselves or developers from city leasing land from farmers.
	Whole sale stores/shops	MCA	Fruits and vegetables	Sites on the lake side of the main road, stores with open shades for vegetables and fruits display,	Increasing market due to the proximity with the main North-south road encourage more business posts following the road	Emerging activity claiming road side sites implying an informal linear town development
	Sand mining	MCA	Sand and pebble mining, sieving sand, transportation with donkeys	Temporary storage sites on the shore, access roads, loading/unloading, display and shops for pebbles and decorative rocks	Controls the siltation	Usually done by the youth of the area,
	Livestock	MCA	Cattles, goats and Sheep	Clear access to the lake shore with defined drinking point for livestock (fig. 7.); Individual livestock are kept in barns within individual compounds	A long tradition in the region and over population of livestock has been a reason for contesting for grazing area and water.	
	Fishing/fish processing	MCA	Fishing	Open access to fishing, no special decks and points	A new access point for fishing	Currently, no processing of fish;
	'ketema'/grass harvesting	LC	'Ketema' and grass	River banks temporary storage and processing (see fig. 7...)	Unregulated harvesting challenging hydro-ecological balance.	Increasing number of youth, less culture of processing of various grass types into crafts
	Papyrus	LC	>boat and other furniture building	Near Lake for boat building, production related to papyrus and other grasses from the lake are organized in both on lakeshore sites and offshore but less common compared on the study site than the other shores of the lake	-	Production based on lake shore plants is not common
	Soft wood based production	LC	> stools production(...) carved at the lake side for sale >furniture production	Sites near the lake and shops (open shades) near the road (See Fig.7.)	-----	Rudimentary skills of working with very soft woodg,
	washing service	LC	Car wash, clothes washing service	vehicular access to lake shore,	Unlike flowing rivers, the still water and its organisms can get easily affected by oil and gas from car washing activities	
Indirectly related to water	Animal dung processing	LC	Collection Baking	Preparing animal dung for fire (as charcoal), demands a space for baking and sun drying.		Predominantly House hold consumption
	Poultry	LC	Chickens eggs	No special demands for sites near water. Size depends on scale of production. Many households have chickens for egg within their house	----	House hold consumption and market on the road
Not necessarily related to water body	Shops, groceries, small bars, workshops	LC	Daily consumables	On main streets and alleyways		Similar to other neighborhoods(a mix of activities within the city)
	Employed/self employed workers in the city	CA		Rental houses and access for transportation		
	Rental services	LC	Rental houses/rooms	Cheap single room rental houses in the neighborhood attracts seasonal workers on farms	Increasing demand for water supply and sewage disposal	

(MCA)Most common activity: the everyday activity repeatedly observed as a major means of livelihood production; (CA) common activity: activities observed repeatedly acting as a supporting (secondary) livelihood production; (LC) less common activity: observed as once or twice as a casual and seasonal activity to earn money.

Note: the study focuses more on the area than the people. The major question was to find out the major activities for livelihood production within the study area. The study is compiled after a repeated visit and open discussions with inhabitants and those who were found working within the area. Not all workers are residents of the study area. Some come to work while living in other parts of the near bye city. Almost every activity is related directly or indirectly to the water body.

Summary table 7.2.1 The spatial implication of informal livelihood production activities near Lake Langano, Delu Harengama kebele – Lake Langano in Arsi-Negele Woreda,

Activities – water body	livelihood activities	intensity	Major products and services	Spatial demands location, form and size	implication on water body and challenges	remarks
Directly related to water body	Agriculture/Horticulture	MCA	Maize as a major crop; Vegetables – emerging production due to development of hotels	Rural agricultural production with fields around houses; However, horticulture is developing in small scale in private courts due to the emerging market; horticulture is dependent on well water than pumped water from lake due to the salty nature of the lake	Pumping water is becoming common practice for the emerging hotels but not observed in the informal neighborhood	Vegetable production is less common among farmers in the vicinity.
	Sand collection	MCA	Major activity (famous sand type)	Access (also vehicular) to lake shore for sand loading, reserved storage area	Positive though small scale in balancing the situation due to deforestation	Increasing activity due to the increase in demand of the particular sand type from the lake
	Livestock production	CA	Cattles, goats & Sheep	Cattles are a common element of the house hold in the emerging neighborhoods and guided to the lake shores once a day for water; clear access to lake and reserved area for cattle drinking	The salty nature of the water and its soil is sought for cattle herders. Possible conflicts with the increasing resort activity	The emerging resort hotels offer market for livestock production culture
	Fishing/fish processing	LC	Fishing/ Fish cleaning/ processing	Emerging activity due to the growing resort hotel development	Lake Langano is not known for its fishes.	Currently, fish processing is handles by hotels, increasing activity due to increasing number of resort hotels (in particular areas of the lake due to the nature of the lake).
	Papyrus/grass based productions	LC	>boat and other furniture building	Near Lake for boat building, production related to papyrus and other grasses from the lake are organized in both on lakeshore sites and offshore but less common compared to zeway and Tana Lakes.	-	Production based on lake shore plants is not common
	fire wood collection & charcoal making	MCA	Fire wood collection and transport; charcoal making	Hidden ovens and storage sites	Ecological challenges due to deforestation	Deforestation is reported as the single most reason for ecological imbalance in the region
	Tourism/tourist services	CA	>tourist guides >bed and breakfast >restaurants (fish)	Guiding Tourist (bird watching, hiking, lake beach resorts), Identified track routs, bird watching locations,	Can create a more community based care for the well being of the shore. Can also cause pollution.	Increasing trade for the youth of the area, no low cost facility (B&B) is available
	transport	LC	>boat operators/cooperatives for budget holiday makers on the lake	Boat dock (loading–unloading deck), storage facilities; work as laborers and transpoters (operator of hors-carts /bajaj) when boats arrive twice a week	Can create a more community based care for the well being of the shore	
Indirectly related to water body	Poultry	LC	Chickens & eggs	Hotels are offering market		Increasing demand from growing hotel
	Local café/Khat houses	CA	Tea houses with Khat saloons	Ordinary houses near the main alleyways Shaded open spaces;	Khat(a water consuming plant) is being introduced to local market and attempts have been observed to grow it locally	Increasing service business particularly tea and khat (suiing in the relatively warm climate of the lake region), such services are not welcomed in hotels and can only function in informal market.
	restaurants	LC	Fish restaurants	spaces near the street leading to hotels, with open spaces for food processing at the back yard	-----	Targeting resort related budget travelers and low income travelers accompanying hotel guests(drivers, daily laborers on construction sites, other employees of hotel and guests)
	Employment in resort hotels	MCA	>daily laborers in hotel construction; Working in the growing hotels industry	Neighborhood developing around hotels,	-----	
Not necessarily related to water body	Preparing rental rooms	MCA	Cheap rooms for rental services	On the main road leading to resort complexes	-----	Targeting resort related low income travelers accompanying hotel guests(drivers, daily laborers on construction sites, other employees of hotel and guests)
	Shops and groceries	CA	Daily consumables	On main streets leading to resort complexes	-----	

(MCA)Most common activity: the everyday activity repeatedly observed as a major means of livelihood production; (CA) common activity: activities observed repeatedly acting as a supporting (secondary) livelihood production; (LC) less common activity: observed as once or twice as a casual and seasonal activity to earn money

Note: the study focuses more on the area than the people. The major question was to find out the major activities for livelihood production within the study area. The study is compiled after a repeated visit and open discussions with inhabitants and those who were found working within the area. Not all workers are residents of the study area. Some come to work while living in other parts of the nearby city. Almost every activity is related directly or indirectly to the emerging tourism industry in the area.

Summary table 7.1.2 Process and product: characteristics of emerging urban pattern around water in rural areas, around Lake Zeway, Edo Gojoola Kebele

scale	Processes			product			Water cycles vs water body relationship
	Land Acquisition	Construction/production	uses	Location (in relation to water body)	Spatial organization, form and size	Material and technique	
Individual houses/ private spaces	<p>ways of acquisition >family farm land, redistributed after nationalization of land and redistributed after 1991; purchase parcels from farmers unofficially (with local contract); leased from farmers(overseen by the govt. office of the Woreda); informally squatted (few cases) Preference of site >business opportunity due to the emerging lake shore irrigation and road side shops of vegetables.</p>	<p>Material collection >on site collection: Grass, soil, sands, wood, water; mud brick; preparation (sandy soil + straw + sun dried); around site: wood, sand >purchased from city: nails, CIS, cement, plastic sheets for sheds of street side vegetable shops, used building elements(doors/windows) Labor mobilization >free assistance from relatives and friends; paid skilled labor(carpenters) Assembling processes >normal construction takes place with little or no interference from government body(rural land administration);houses used immediately(finishing which takes longer time happens while in use)</p>	<p>residential spaces >owners residence including food processing, harvest processing, storage and livestock shed.; no rental service was observed</p>	<p>Informal construction is concentrated near the main road connecting Addis Ababa with Zeway (Batu) town, between the lake and the emerging settlements are the irrigation plots Attempts to settle on the lake shore were discouraged by mosquito infestations.</p>	<p>Compound structure >Detached house in a compound >Attached houses with back yard stretching for vegetable farms >varying compound sizes House >single story space; circular huts (common house type); new rectangular prisms with CIS roofing (increasing in number), simple sheds and open spaces for shops, café and 'khat' saloons.(increasingly emerging on road side) >room sizes (a range of 9 to 20m² for main rooms); an average of 3.5-4m² for service rooms (toilets and kitchens, but kitchens are usually shades -not defined spaces)</p>	<p>Roofs and ceiling >CIS roofing, Thatch roofing(for huts); Soil roofing; plastic cover roofing(for shop shading) Walls and wall finishing >mud blocks; Animal dung, paints Floors and floor finishing >earth with animal dung plastering; stone with cement screed finishing Foundation >compacted earth, stone with cement screed Windows and doors >CIS sheets/metal</p>	<p>Water inputs: Individual hand dug wells for household consumption and vegetable garden; Pumped water from the lake for irrigation farms; Rain water for major crop production; Lake water for washing and bathing; Minimum spending of fresh water, all toilets are dry toilets (no water flashing used), surface water and surface drainage is naturally drained to the lake via natural valleys. Waste (from kitchen and animal barns) are used in the gardens of vegetation.</p>
			<p>Houses with commercial activities >road side shops with shades for vegetable (onions, tomatoes, cabbages) >small café and 'khat' saloons</p>	<p>Houses facing main street ,</p>			
			<p>Household production activities >Food basic processing and beverage; Gardens (fruits vegetables and herbs); Livestock and poultry (chickens, cattle, sheep and horses)</p>	<p>Food/beverage near the main street; crafts near main street, houses between the road and the lake usually have their gardens at their back for vegetable production</p>			
			<p>Roads/path ways >main road -north – south main artery, is a market place; access road to the lake side is shared by pedestrian, animals, donkey carts and cars</p>	<p>Road runs North-South, Major pathway to the lake side runs perpendicular to the road and the lake shore. Pathways are not yet negotiated(difficult to cross private boundaries.</p>			
Common facilities and common spaces	<p>securing space for communal use >cattle routs, drinking points, access points for swimming and fishing and grass harvesting, and grazing fields are secured and protected by inhabitants of the area as common grounds; >no standard is imposed on collectively used spaces; > no neighborhood association yet but community is member of the rural kebele.*</p>	<p>procedure of decision making and implementation: >individual dealings with farmers, >rural road authority deals only with the access road to the kebele office(not related to Lake side); resolving disputes in usage and development affecting common spaces, >Arbitration is through elders of the area and the kebele (which treats conflicts as conflicts among farmers), sometimes, woreda experts are invited,</p>	<p>Open spaces >fields around the water are used for children playing grounds, assemblies, some religious festivals</p>	<p>Open spaces at the lake shore; Loosely defined and unclaimed left over spaces by the side of the street.</p>	<p>Standard width for main access road (highway) is adapted by the rural road authority. No organizational attempts to enforce any standard within the emerging neighborhood; An unattended and undefined space from pathways and frontal yards of houses on the street of commercial activities.</p>	<p>The road leading to the lake shore is not treated; The main road(North-South artery) around which the neighborhood is emerging is the major federal road which is expected to expand; The road side drainage gorge creates a gap/distance between the highway and the road side emerging houses.</p>	<p>Water cycle follows the natural routs from open spaces Common spaces and fields operated by cooperatives drain naturally to the lake.</p>
			<p>No religious building on site however, a mosque and a church near bye</p>	<p>In the nearby village</p>			
			<p>Other infrastructure >waste disposal; water supply; fuel/electricity Neighborhood security >no security threat observed yet, rural kebele is responsible for security</p>	<p>Dry waste is minimal and liquid waste from kitchen is drained into the garden, surface runoffs from roofs and compounds are naturally drained towards the lake, both individual and collective latrines are dry toilets.; Biomass is the main energy source,</p>			
			<p>Conclusion (remarks) After the nationalization of land (1975), and its redistribution after 1991, land for individual use in the kebele can be acquired in three ways: >through either a tight lease from farmers who have use-rights overseen by the government ; > through informal arrangements done through local agreements mediated by elders; > squatting on land which is reserved for grazing or road side space; services like pipe water and electricity are not available</p>	<p>**Construction permit is not required and Construction usually is a never ending process; Material and labor is informally organized; Construction is emerging as a local business creating informal micro-enterprises for soil block making, collection/processing of wood, recycling building materials, animal dung, etc. As a way of improvement, materials such as CIS, HCB (for more high-end use), Nails and wood and skilled labor (masons and carpenters) are also imported from city. *Rural land administration lacks mechanism to guide emerging urban cells within rural land**</p>			

*new settlers have to be registered formally as farmers or dependent on the farmer who leased his/her land use right. **The rural land administration proclamation makes it difficult to address informal development on rural land.

The term 'informal' is difficult to use in relation to houses built on rural land without the presence of a formal title deed which allows farmers to develop their site.

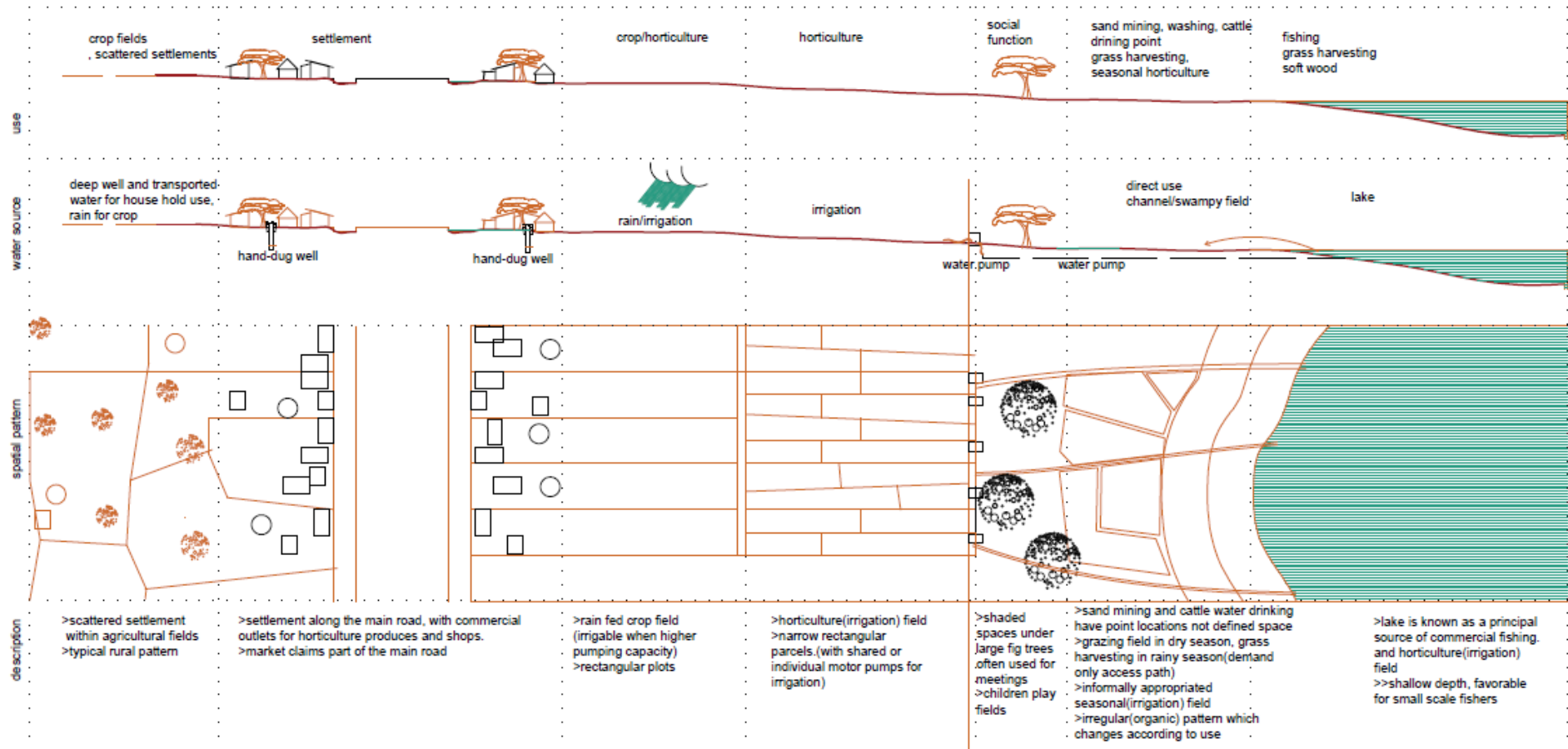
Summary table 7.2.2 Process and product: characteristics of emerging urban manifestation around water in rural areas ; Lake Langano, Delu Harengama kebele in Arsi-Negele Woreda.

scale	Processes			product			Water cycles vs water body relationship
	Land Acquisition	Construction/production	uses	Location (in relation to water body)	Spatial organization, form and size	Material and technique	
Individual houses/ private spaces	<p>ways of acquisition</p> <ul style="list-style-type: none"> >family farm land, redistributed after nationalization of land and redistributed after 1991 >purchase parcels from farmers unofficially (with local contract) >leased from farmers(overseen by the govt. office of the woreda) >informally squatted (few cases) <p>Preference of site</p> <ul style="list-style-type: none"> >business opportunity due to the emerging resort devlpt. >due to water body – easy access to water and irrigable land 	<p>Material collection</p> <p>On site collection: Grass, soil, sands, stone, wood, water</p> <ul style="list-style-type: none"> >mud brick preparation (sandy soil + straw + sun dried) <p>Around site: wood, sand</p> <p>Purchased from city: nails, CIS, cement, plastic sheets wood, used building elements(doors/windows)</p> <p>Labor mobilization</p> <ul style="list-style-type: none"> >free assistance from relatives and friends >paid skilled labor(carpenters) <p>Assembling processes</p> <ul style="list-style-type: none"> >normal construction takes place with little or no interference from government body(rural land administration) >houses used immediately(finishing which takes elongate time happens while in use) 	<p>residential spaces</p> <ul style="list-style-type: none"> >owners residence Including food processing, harvest processing and storage >rooms for rental service <p>Houses with commercial activities</p> <ul style="list-style-type: none"> >shops and café/restaurants and bars >'khat' saloons <p>Household production activities</p> <ul style="list-style-type: none"> >Food, beverage, crafts >Gardens (fruits vegetables and herbs) >Livestock and poultry (chickens, cattle, sheep and horses) >Workshops 	<p>Informal settlements of low income groups are zoned away from water fronts, hotels and summer houses occupy the water front; Earlier settlers preferred to stay away from the water due to deadly malaria (mosquito).</p> <p>Houses facing main street which leads to resort complexes,</p> <p>Food/beverage near the main street; crafts near main street</p>	<p>Compound structure</p> <ul style="list-style-type: none"> >Detached house in a compound; >Attached house with front or back yard; varying compound sizes <p>House</p> <ul style="list-style-type: none"> >single story space; circular huts (earlier houses of farmers – with thatched roof); new rectangular prisms with CIS roofing; simple sheds and open spaces for bars, restaurants, café and 'khat' saloons; room sizes (a range of 9 to 20m² for main rooms); an average of 3.5-4m² for service rooms (toilets and kitchens, but kitchens are usually shades -not defined spaces) 	<p>Roofs and ceiling</p> <ul style="list-style-type: none"> >CIS roofing; Thatch roofing >Soil roofing, >plastic cover roofing <p>Walls and wall finishing</p> <ul style="list-style-type: none"> >mud blocks, Animal dung, paints <p>Floors and floor finishing</p> <ul style="list-style-type: none"> >earth with animal dung plastering >stone with cement screed finishing <p>Foundation</p> <ul style="list-style-type: none"> >compacted earth, stone with cement screed, Windows and doors >CIS sheets/metal 	<p>Water inputs:</p> <p>Communal water points(water wells), No piped water(on going negotiation with resort hotel owners to share piped water).</p> <ul style="list-style-type: none"> >Rain water collection in (rainy season), >Lake water for everyday use <p>Minimum spending of fresh water, all toilets are dry toilets (no water flashing used), surface water and surface drainage is naturally drained to the lake via natural valleys.</p>
Common facilities and common spaces	<p>securing space for communal use</p> <ul style="list-style-type: none"> >no involvement of Government body in imposing standards within the emerging neighborhood; >mobilization of resort developers for main street with rural road authority for the main road, > no neighborhood association yet but community is member of the rural kebele *** 	<p>procedure of decision making and implementation:</p> <ul style="list-style-type: none"> >individual dealings with farmers, >rural road authority deals only with the access road to the resort hotels; <p>resolving disputes in usage and development affecting common spaces,</p> <ul style="list-style-type: none"> >Arbitration is through elders of the area and the kebele(which treats conflicts as conflicts among farmers), sometimes, woreda experts are invited, 	<p>Roads/path ways</p> <ul style="list-style-type: none"> >main access road leading to resort hotels is shared by pedestrian, animals, donkey carts and cars) <p>Open spaces</p> <ul style="list-style-type: none"> >Social gathering spaces and religious festivals <p>Mosque</p> <ul style="list-style-type: none"> >a mosque is already built and functions <p>Other infrastructure</p> <ul style="list-style-type: none"> >waste disposal >water supply >fuel/electricity <p>Neighborhood security</p> <ul style="list-style-type: none"> >no security threat observed yet, rural kebele is responsible for security 	<p>Major pathways runs west east towards the lake and turns to run parallel to the lake dividing the neighborhood with the resort development. Access line continues towards the lake for cattle drinking point.</p> <p>Loosely defined and unclaimed (left over) spaces by the side of the street.</p> <p>In the emerging neighborhood (not related with the Lake)</p> <p>Liquid waste (from kitchen and surface runoffs from workshops) is drained to the Lake, both individual and collective latrines are dry toilets. Water is shared from one water point; Electricity is being installed by formal government company but Biomass is the major fuel</p>	<p>Standard width for main access road is adapted by the resort hotels temporary association with the Kebele administration.</p> <p>No organizational attempts to enforce any standard for neighborhood development</p> <p>An unattended and undefined space from pathways and frontal yards of houses of commercial activities.</p>	<p>All roads are not treated except the main access road which is compacted earth, (No special drainage and channels along the pathways - pathways act as surface drainage)</p>	<p>No infrastructure for surface water control and management(drainage channels, flood protection barriers, etc); No hard surfaces on pathways and private compounds; Slope towards the lake is often high;</p> <p>Water input: lake water transported by hand, rain and hand dug well, Output: no liquid output from the informal neighborhood reaches the lake by surface.</p>
conclusion(remarks)	<ul style="list-style-type: none"> >land for resorts development is acquired and transacted both within government control and outside of government formal processes, Land for housing is usually transacted informally; >electricity is offered for informal settlers through the previous land owner(use-right holder), piped water in not available >farmers with proper title deeds (see fig.7...) certifying their use-right can enter into leasing deals through the woreda. 	<p>**In rural areas, no construction permit is required. Construction is a never ending process though; Material and labour is informally organized; Construction feeds local businesses(soil block making, HBC trading, collection/processing of wood, recycling building materials, animal dung, etc)</p> <p>*Rural land administration lacks mechanism to guide emerging urban cells within rural land</p>	<p>Spaces in Private houses are not divided on functional lines. A commercial and household production activity takes place within the same space typology. Dry toilets are dug far away from the main house. No space is perceived as collective or common other than the main street and the Spaces by its sides.</p>	<p>Observed zones starting from water body: Resort hotels/rich summer houses - street – informal shops and café –informal houses – farm land/acacia forest land.</p>	<p>Space form and structure of individual houses are constantly changing. Farmers houses (originally on site) changes from circular individual thatched roofed huts (similar to other rural housing typology in the surrounding) to rectangular houses with CIS roofing . Due to the loose density, common spaces lack proper definition. (all houses in the informal development area are single story)</p>	<p>Materials change/replaced when family's economic status change:</p> <p>From thatched roof to CIS(further by installing ceilings); From CIS door/window to wooden or steel framed door/windows</p> <p>From earth flooring to cement; From mud brick walls to HCH walls; From earthen foundation to strengthening it with stone</p> <p>The main peculiar material, however, is sun dried mud block</p>	<p>Minimum waste, minimum water use, surface water direct drainage towards the lake. Least worry about flooding (due to considerable difference in altitude and slope - land feature), high worry is on malaria and water born diseases</p>

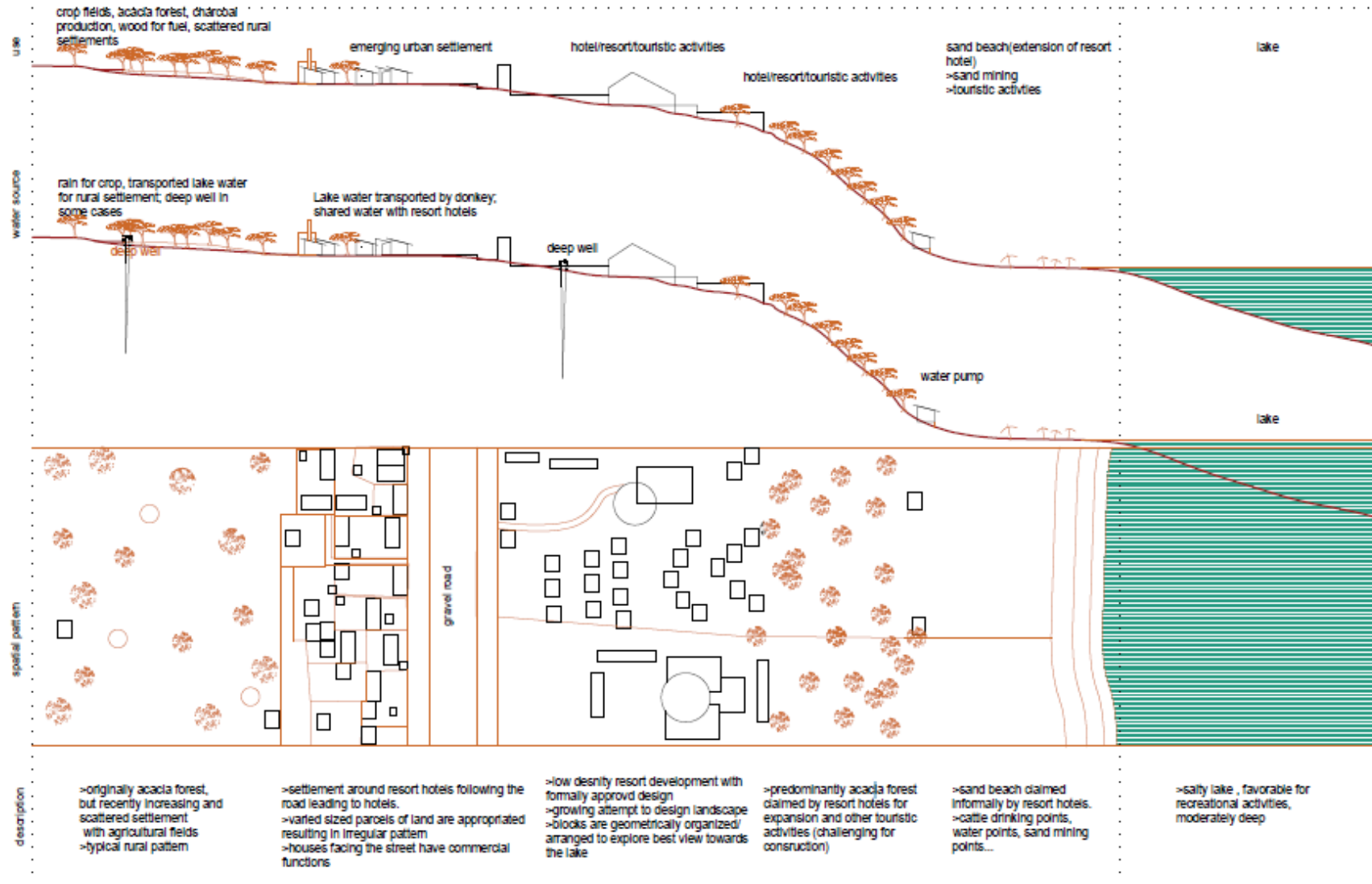
*new settlers have to be registered formally as farmers or dependent on the farmer who leased his/her land use right. **The rural land administration proclamation makes it difficult to address informal development on rural land.

The term 'informal' is difficult to use in relation to houses built on rural land without the presence of a formal title deed which allows farmers to develop their site.

Summary table 7.1.3. Overview sketch showing: land use; water source and appropriation; and spatial patterns on a sample strip of case study site near Lake Zeway (source: developed from Authors field sketch).



Summary table 7.2.3. Overview sketch showing: land use; water source and appropriation; and spatial patterns on a sample strip of case study site near Lake Langano (source: developed from Authors field sketch).



Discussion and Conclusion of part II

All four cases; the overview of government policies and programs; and general observation around many other lakes and rivers affirm the fact that the demand to appropriate water bodies and areas around them in Ethiopia shows a dramatic increase. It also is rapidly assuming an intensity of a contest among various sectors and groups.

In the first two cases, where settlements around water bodies within existing cities are reviewed, difference is observed in the intensity of contest. Though in both sites the contest to appropriate sites around water bodies - by both formal and informal sectors - are observably increasing, sites around lakes within boundaries of cities are sought by developers (formal development) more than sites around rivers. Such a case is well displayed particularly in the case of Bahrdar - a city associated with both the largest lake and the longest river. The shores of Lake Tana are much more contested than the banks of river Nile. River banks, as also displayed in the case of Addis Ababa, are still considered as risky and less attractive by developers. The majority of the inhabitants who are taking risks to appropriate these - otherwise dangerous sites - are low income inhabitants of the city and rural migrants.

In the last two cases, however, where new areas (predominantly rural sites) are studied, settlements manifesting the beginning of urban centers are emerging from the interplay of rural inhabitants and urban entrepreneurs. In both cases (Case III and IV) it was possible to notice that the rural inhabitants in the area are subjected to an increasing pressure to look for additional resources and new trades for a more reliable livelihood production due to population growth and diminishing land size and fertility. However, the necessary skills and market to appropriate large water resources and its immediate surrounding site are offered by entrepreneurs from cities. In Zeway, it was small scale irrigation for horticulture production which first was promoted by entrepreneurs from cities working on fields leased from farmers. The practice and the market network was quickly taken over by the rural inhabitants themselves leading to the establishment of permanent commercial outlet within the area rather than transporting produces to cities. In the case of Langano, it was again the urban entrepreneurs from cities who introduced businesses related to leisure activities which ignited the surrounding rural inhabitants to venture into various related activities. Other than livelihood activities, architecture and its processes are also transported from the near by cities to these rural sites. The way space is organized (arranged and articulated) and the way buildings are made (material used, technique applied and labored mobilized) are adapted from the near by cities.

The new skills, techniques created in cities and also demands from cities are the central forces which push the creation of new activities and hence new trades in rural areas, and eventually the growth of another urban center – affirming Janes Jackobs assertion about the city's primacy in the evolution of civilization (see Jackobs 1969). However, the dual land administration system of the country, which treats urban and rural lands differently, prohibits these interplays and interdependencies.

Almost all informal appropriation around water bodies are directly or indirectly related with livelihood production activities. The prevailing livelihood activity is horticulture production with irrigation, followed by rental housing (real-estate), animal husbandry, material mining (sand, grass, wood, etc) and livelihood activities related to tourism and leisure (see summary tables 6.1, 6.2, 7.1, and 7.2). The spatial characteristics of these 'informal' settlements vary according to the type of dominant activities and the particular physical characteristics of the area. As observed in the case study I and III, irrespective of being within the city or in newly appropriated area in remote locations, or around a flowing river or a still water of a Lake, the spatial pattern created due to the irrigation activity shares the same pattern. In both cases, long strip if plots are parceled among individual farmers who share the irrigation water ways. In one end, the water body defines the strip, while in the other, a residential house also serving as a commercial outlet of the produces. However varied the age of the settlements are, in both neighborhood and single house/compound level, the spatial organization in all case studies show temporality in technique and material usage, and flexibility in spatial use pattern. Though, there are minor variations in some additional materials and techniques of adaptation, basic building materials are similar in all cases. The predominant materials used in all sites are 'Chika' for walls (mud mixed with straw applied on wooden filled surfaces) and iron sheets for roofing. Finishing materials for wall and flooring show minor variations in accordance to particularities of the site. Materials generally are readily available within the compound or within the vicinity (transported by human/animal labor) except CIS roofing and nails which have to be purchased as new or used.

In all cases, densification for habitation is limited to a single story. Attempts of exploring vertical growth are limited due to insecurities on land tenure and the association of storied construction with high end materials, expensive skills and permanence (in other words, the lack of skills and techniques of storied construction with readily available materials). The increasing demand for more houses - as observed in all case study sites – implies the appropriation of more areas for habitation - which in turn challenges the existing livelihood production activity (in the case of horticulture) by consuming more land and also challenges the natural water cycles by increasing laminated surfaces which blocks the natural course of water cycle.

Except the case of Langano (Case study IV), flooding is a primary risk. The lack of legible response through design/construction details of houses and neighborhood layouts show the lack of tradition in managing the seasonal risks associated to the fluctuation of water levels. However, the seasonal fluctuation of the water bodies is well responded with the pattern of livelihood activities.

Similarly, except in the case of Addis Ababa (Case Study I – considerably a highland location), the challenge of Malaria epidemic has for long been a major factor preventing the appropriation of the area. Though the current advance in controlling the epidemic has opened up opportunities, the nuisance from mosquito and other insects are still observable challenges. In case studies 3&4, the challenge is avoided by building the houses at a considerable distance from the water front line. In these two case study locations, which are also in rural area, such distancing is also augmented by religious and cultural influences. However, in both cases, the courage of appropriating the immediate water front was first introduced by entrepreneurs from urban areas.

The appropriation of the immediate water front - even in a more risky topography - is observed in case study I and 2. In both cases such appropriations are squarely associated with the low-income group. In Addis Ababa, the religious and cultural influences, which discourage the appropriation of these sites, are diluted due to the mix of people (from various parts of the country) and the sheer need for easily accessible land. In Bahr Dar (location of case study 2), which is a city with a much more homogenous society than Addis Ababa (in terms of ethnicity and culture), the appropriation of the immediate water front has long been reserved for certain social groups – either for segregated social outcastes or for the lowest groups in the income hierarchy or for monasteries. The current contest for sites directly related to the water body is an emerging phenomenon. Similar inclination is also observed in many of the other cities which are associated to water bodies (Bishoftu, Zeway, Hawassa, Arbaminch, Wonchi, etc).

Both rural migrants (targeting water bodies within cities) and rural inhabitants and entrepreneurs from urban areas (targeting new rural areas around water bodies) operate with little or no prior experience in managing the challenges of working around large water bodies. Other than the general lack of urban tradition in Ethiopia which is grounded on the complex interplay of natural cycles of water bodies and manmade urban systems, the emerging settlements suffer from the lack of any regulations and guidelines which safeguards both the inhabitants and the natural environment. Furthermore, they are operating in an uncertain setting (due to uncertain land tenure) which limits their efforts to look for a more resolute and permanent venture.

With these empirical realities as a background, the following points can also be underlined as additional gaps pausing challenges on urbanization in Ethiopia in general and in areas around major water bodies within the country in particular:

>The lack of proper understanding on the general processes and states of urbanization in Ethiopia and its relationship with the dynamics of the physical environment.

>the lack of proper documentation and monitoring on settlement related activities in rural areas in general (due to dual land administration systems) and particularly around water bodies in rural areas.

>the lack of regulations to guide urban development around environmentally sensitive sites particularly major water bodies,

>the absence of planning and design tools, guidelines and standards which are informed by an urban tradition which is grounded on the experience of managing the complex interplay of natural water cycles and manmade systems (urban systems).

Such gaps pose challenge not only on a single sector of urbanization and its processes but also on the general well-being of environmental, economic and social transformations which the country is experiencing.

Part III

(Chapter 8-10)

Designing the Informal: Spatial design guidelines for the emerging urbanization around water bodies

Findings and implications
Recommendations: Designing the 'informal'
Further Research Issues

Introduction

Urbanization, as a defining phenomenon, and fresh water, as one of the most essential and contested environmental resource, will remain to be the two most important issues to dominate global sustainability discourse. In both issues though, Ethiopia stands at a defining moment in its history.

Regarding urbanization and the subsequent socio-spatial and environmental transformations, this research asserts that the country is at the threshold to enter into an urban explosion which will be dominated by informal development. While these informal settlements are growing sporadically around major infrastructure lines and major natural resource sites such as water bodies, the formal urban development schemes of major cities struggle to find a feasible direction to follow and model to adapt. All major cities are currently crowded by rural migrants in search of jobs primarily in the construction industry. These cities are growing at the rate of 8-10% (Dorosh and Schmidt 2010) while excessively challenged with lack of capacities to provide basic inputs such as water, food, decent housing and energy (UNHABITAT 2008).

Water bodies and their hydrological systems, in the other hand; represent the last line of the remaining ecological reserves of Ethiopia. After losing the highland soil fertility and forest cover in the last century at a rate which is referred as the worst in the world, major water bodies and areas around them represent not only the remaining reserves but also a back bone structure to the stability of natural water cycles and soil/material cycles. These sites have never been appropriated for centuries for any meaningful economic and physical scale – neither for agricultural nor industrial and urban related projects. Though the focus of this research is on the emergence of the appropriation of water bodies and its immediate surrounding for urban development, it is also plausible to claim that Ethiopia in general is at its threshold regarding the exploration of potentials of its water bodies in various sectors.

These historic unfolding (urban explosion; general escalation of a need to appropriate water bodies; and the combination of the two - urbanization around water bodies) imply both potentialities - another cycle of environmental catastrophe, or a possibility to a progressive reorganization of the bio-physical and social systems. To seize opportunities in all cases though (urbanization, hydraulic technology, urbanization around water bodies), the recommendation chapter articulates more on the potential benefits of Ethiopia's late coming – (its backwardness) as its main premise. Some additional points are also identified as constituents of the premises upon which the set of forwarded recommendations are founded on:

Privilege of backwardness and the 'law of the handicap of a head start': the very fact that Ethiopia has been isolated from active and continuous interaction with other countries, which dragged its technological and economic progress 'backward', can be claimed carefully for its benefit. The country can make a jump. The idea that -history makes 'leaps' -has been accepted by various authors for a very long time (Linden 2007). Listing some of them Linden notes:

'Over a century ago Lewis H. Morgan (1818–81) suggested that societies can skip over stages. Nikolai Chernyshevski (1828–89) concluded: 'History is like a grandmother; it loves the younger grandchildren'. Thorstein Veblen too described in his book Imperial Germany and the Industrial Revolution (1915) how 'several generations' had developed machine technologies during the Industrial Revolution in Britain at the cost of 'large and long experience and argumentation', which the Germans had subsequently taken over 'in definite and unequivocal shape' – a transfer involving 'no laborious or uncertain matter' (Linden 2007: 145–165).

However, it was Jan Romein who famously coined the 'law of the handicap of the head start' in 1937 to describe the advantage of a fresh start of backward countries (see Linden 2007). The privilege of backwardness, that this recommendation claims to articulate, states that a 'backward' nation/institution can, under certain conditions ('economic and cultural capacities of the country/institution'), appropriate technical and other gains from an 'advanced' situation without going through the intermediate stages that the advanced nation/institution did have to go through (ibid). This privilege encompasses all technological and organizational innovations.

The challenge, obviously, is to identify the good in both the new and the existing and blend them with a minimum negative consequence. Bad copies either import an already failed system or often overwrite the good within the existing systems and create further complication than solving problems at hand. Urbanization in Ethiopia in general and its turnaround near major water bodies have the luxury of not repeating both wrongs and costly experiments of others. However, it also equally demands reflective re- inventions of systems.

Privilege of nature (demography, climate, and natural resources): considering urbanization as the defining phenomena of the country, there are key natural and historical settings in Ethiopia which one needs to underscore as privileges. Some of the major ones are: a relatively conducive climatic condition in many parts of the country which demand less energy and less defined space to support human habitation; rich natural environmental resources such as solar radiation, fresh water (multiple rivers and lakes), relatively vast land and other untapped resources; the current low level but higher rate of urbanization; and young population (44% less than 15 years of age and 20% between 15-24 years of age - a total of around 65% of the population being less than 25 years of age).

Risks and consequences of inaction: key challenges which confront any future oriented progress in Ethiopian urbanization trajectories are also considered as a push factor. Issues such as: environmental degradations (soil erosion and degradation of its fertility which leaves the rural/agrarian population at risk); the persistently increasing population (expected to reach 174million in 2050 demanding more agricultural land which leads into more deforestation); the uncertainty of global and local economic systems which often leaves local population at a risk of food insecurity; and change and struggles within the cultural and religious norms are also situations which demand a timely response.

The prosperity of nations, claims UNHABITAT 2010 report, is intimately linked to the prosperity of their cities. No country has ever achieved sustained economic growth or rapid social development without urbanizing. According to the UN findings, countries with the highest per capita income tend to be more urbanized, while low-income countries are the least urbanized (UNHABITAT 2010:18). If these conflicting and rapid changing processes are seized to be guided through bold and innovative reformulations, Ethiopia can indeed be a show case for new and robust urban models which effectively steers both bio-physical and social systems for the better.

In order to establish this optimistic claim, this part (Part III) of the research presents both the summary of findings and recommendations. While the findings of the research, summarized in chapter 8, exposes the challenges and opportunities observed in part I and II, the recommendations proposed in chapter 9 attempts to formulate ways to address them. The recommendation, following the structure of the general study, addresses both the macro and micro levels through policy framework proposal and spatial design/planning and implementation guidelines respectively. In both cases though, the proposed recommendations primarily targets to facilitate a complementary link between rehabilitation of natural systems and urbanization processes. It is firmly founded on the notion that urbanization holds the key for both future progress of the country and the utterly needed rehabilitation of its physical environment. The last chapter, Chapter 10, identifies further research areas vital to the understanding and projections of urbanization around water bodies in Ethiopia.

Chapter 8

Synthesis of Findings and Implications

The central challenge that this study underscores is the conflict in the rapidly increasing population within a degrading environment. It implies a need to find a balanced way to explore sensitive natural resources for the production of livelihoods while rehabilitating the environment. However, the trend observed is the opposite - a clear indication of an increasing concentration of people to exploit the last resort – the fragile but basic natural reserves of fresh water bodies – but without a strategy put in place to regenerate the environment. The general trend observed through the review of history in the last century has shown that a higher concentration of population without a proper urban configuration has led to a disastrous exploitation of the highland forest cover of the country – leaving the highlands of Ethiopia as one of the most environmentally degraded areas of the world. Addis Ababa was a historic case which was survived only through an effective reforestation schemes which demanded the introduction of the fast growing eucalyptus tree into the local ecology. The current movement towards the more sensitive reserves – the water bodies which already are suffering from the deforestation of their catchment area – both formally and informally, would simply lead into a more pronounced destruction of these ecological reserves. The usual option, which is floating around, is to obstinately protect the environment from any human intervention. The emerging urban settlements around these sensitive sites, which this research explores, imply the possibility of condensing the sporadic and scattered rural settlements into few but dense urban structures which can be guided to develop into an urban system to address the problems of both the increasing population and the degenerating environment.

To reiterate, the following were the main questions addressed in the two part study which also are further operationalized by detail questions:

>What were the locational rationales for the dominant highland based urban tradition in Ethiopia which distanced itself from major water bodies; and what are the possible causes and observable evidences to its current change?

>What are the spatial characteristics (activities, relationships with water body, physical patterns of space use, materiality, etc.), threats and opportunities of the emerging urban pattern which are developing around major water bodies?

The third is a normative question which seeks ways to guide the emerging informal urban development around water bodies as a sustainable socio-spatial transformation. It is addressed in the next chapter in the form of recommendation. However the findings in the two part study are discussed as follows.

8.1. Concerning pattern change in Ethiopian urbanization and its implication

Ethiopian settlements have been mainly concentrated for so long on the highland plateaus. It is also characterized as a predominant rural settlement. The study has highlighted that both the long standing pattern - dominantly highland based rural settlement - and its main determining factors are rapidly changing. Aksumite civilization, which marked Ethiopian civilization from the 1st Century AD until the 7th, was referred as an urban civilization centering at the city of Aksum with its extended harbor city Adulis. However, with the decline of the Aksumite civilization, the Ethiopian empire receded into an agrarian age concentrating on the highlands. The intricate historic forces which shaped its long run highland based rural civilization are multiple and are discussed under three categories: environmental and geographic conditions; socio-political forces and economic structures; and socio-cultural and religious norms. Nevertheless the socio-political and environmental forces can be underlined as the main factors behind its long standing pattern. The regional geopolitical reconfiguration, which was marked particularly by the rise of Islam which took control of the low lands and the Red Sea strip, cut off the Aksumite from international trade and weakened and pushed the empire deep into the inland. It left the empire engaged on a defensive war from the inland highlands (as preferred strategic locations) for the subsequent 13 centuries. Moreover, the lowland plains and areas around major water bodies, being infested with malaria and other waterborne diseases, could not compete with the safety and security of the highlands which for long was known for its mild climate with reliable water sources. What was flourishing in Aksumite civilization – urban civilization and advancement related to water bodies (trade and manufacturing) – has been dropped off as the empire deepened into rural structure which later developed religious and cultural practices which reinforced the abandonment of water technologies and related activities. The sustained reconfiguration created a peculiar rural settlement and culture using the highlands for far too long which exposed the environment for heavy degradation and also left the country as the list urbanized in the world (Fig.8.1). Nevertheless, sufficient manifestations are underscored to exhibit the emergence of a rapid and historic change in Ethiopia towards an urban civilization.

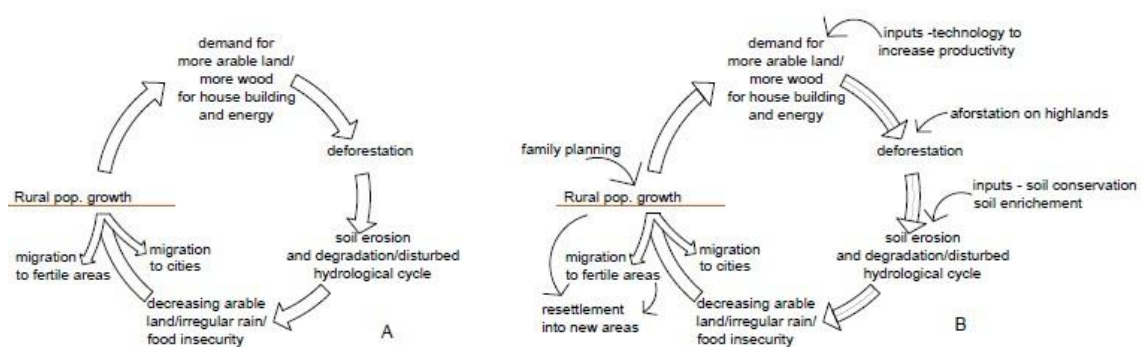


Fig. 8.1 A, Steady localized disaster loop, B. Intervention attempts falling short of urbanization strategy (see Fig. 9.1 for recovery loop where urbanization is adapted as a strategy)

The staggering population growth with the deteriorating highland environment is identified as the major force behind the emerging change and its subsequent socio-spatial reconfiguration. It produces an enhanced urbanization concentrating in areas unexplored earlier - around resource sites such as major water bodies and fertile low lands. The close reading of the phenomena reveals that the shift is further charged by interplay of multiple changes in almost all dimensions of factors which enforced the longstanding pattern. The review of historical backgrounds and the current political and economic circumstances which defines the phenomena, also implies that the historic shift is taking place within a peculiar contextual setting which defies major theoretical descriptions of African and even regional (Sub-Saharan) urbanization trends - hence demanding a particular reading.

The study also underscored that the phenomena of change which implicates rapid urbanization in the country, is not well recognized by the current political processes and hence not adequately supported by formal policy instruments. Official government policies and development programs address urban areas as supportive structures for rural development. The view which takes urbanization as a problematic phenomenon rather than a central force which determines the country's future is prevalent.

The multifold processes observed in the research indicate that the increasing urbanization is occurring through both *rural-urban migration* (into main cities) and the *concentration of scattered rural settlements* into relatively denser informal settlements which concentrate around infrastructure lines and key resource sites. However, the disposition of the state controlled land tenure and its dual land administration systems (particularly of the rural land) makes both the migration and the condensation processes too complex to guide and hence contributing for sporadic developments. These sporadic developments - particularly in areas which demands ecological sensitivity, if remain unguided, imply severe challenges. If guided, though, they equally imply opportunities which can be tapped for a comprehensive and accommodative process of urbanization.

Moreover, the urbanization process in Ethiopia is often perceived as radical shifts from an agrarian age to industrial and then a jump to informational age, from predominantly an oral culture to print culture and then with no time to digital culture, from an exclusive localized closed rural culture opened into an urban connectivity which is driven by a forceful global market culture; from a religion based secluded and hierarchical relation to international media induced secular and pop culture; etc. However, what could be observed on the ground is more of a continuous reconfiguration of processes due to interactions than simple successions - juxtapositions than replacements - where interfaces between the various processes produce multiple opportunities. These simultaneous occurring of urban development processes challenges policies and practices which often are founded on the theory of the succession of distinct stages of economic and urban development.

The following are the summary of the possible implications of the changes and the dynamic reconfigurations categorized under three groups:

Environmental implications (natural aquatic and hydrological systems)

Development ultimately depends on the natural ecosystem. The intensifying urbanization around water bodies primarily affects the aquatic system. Pollution; excessive use of water and related resources; and deforestation further affects the hydrological system and hence the general ecosystem around water bodies which in the case of Ethiopia, as indicated earlier, is the last resort natural reserves. Most of these challenges originate from sources which spread far beyond the immediate areas around water bodies. Pollution in rivers and lakes, for instance, represent a problem originating from a much broader geographic area stretching from the local settlements to the region and beyond. At the local level however, the pressing demand for building materials and fuel-wood for the emerging urban centers and the expanding (unregulated) use of water for irrigation have a direct and immediate impact on the ecosystem by furthering the effects of deforestation and general imbalance in the hydrological system. They imply faster run off and siltation, lower evapo-transpiration, and lower infiltration (causing irregularity in ground water recharge). The ecosystem, exposed to extended imbalances, leads to a possible environmental catastrophe – this time not of the highlands but of the lowlands and ecologically sensitive reserves such as wetlands and areas around water bodies.

The current reconfiguration, if properly guided, however, can also imply possibilities to address pressing challenges of environmental degradation and population growth. Densification of habitation and intensification of agricultural production can be explored further for an efficient use of land, water, and material resources. It also offers the possibility of coordinating environmental rehabilitation and diversification of trade.

Socio-political and socio-economic implication

As the existing statuesque persists (regarding land tenure regime and dual land administration systems), settlements formed based on an informal land appropriation and transactions demand a new form of societal organizations. The formal government structure (Kebele/rural Kebele) fall short of the capacity to address the complex interactions, needs, and interests of inhabitants of the informal settlements. While Kebeles in urban areas see the informal neighborhood within themselves as a temporary shack to be replaced, the rural Kebeles shows no capacity and mandate to manage neighborhoods which assume an urban dynamics. Traditional and customary social organizations such as self-organized neighborhood association, 'idir', 'iqub', and cooperatives step up their otherwise restricted mandates to manage the affairs of these informal settlements. Some of the observed activities being undertaken by such organizations other than their usual duties in these informal settlements are: moderation of negotiations and resolving conflicts among individual inhabitants or interest groups; planning and execution of projects for common use on informally claimed land; develop regulation and standards for communally used resources and properties and oversee their implementation; negotiation with governmental and non-governmental bodies in behalf of the inhabitants of the informal settlements, safety etc. The strengthening of such societal organizations and their

collaboration (through effective negotiation) with governmental and non-governmental bodies imply a form of collaborative problem solving (Mayntz 2003) which can also extend to include for-profit organizations. It can also be taken as a possible model for self-governance at the lowest level which can strengthen belongingness and care to communally developed projects - a model of self-governance implying to the concept of *Subsidiarity* where planning and decision making, on matters that affect the neighborhood, is left for the neighborhood itself.

On the flip side though, such organizations can be hijacked by few strong individuals and interest groups and fall into the jungle law. Hence, the coordination of decision making processes and administration of the commons demand clearer organizational setups which balances power structure from top down (ensuring regional stability and lawfulness), and bottom up (ensuring empowerment of communities for self-governance). Except in the case where an informal neighborhood is attached to formal development and where the two have a marked difference in lifestyle, inhabitants within the informal neighborhoods have similar socio-economic profile. The social hierarchy within these neighborhoods is primarily based on age and position in religious establishments. Elders and religious leaders (in almost all cases studied) are either customarily considered or consensually elected as community leaders. However, the increasing intersection of the existing pattern with political, economic and other societal systems has a potential to generate differentiated interest groups. Such differentiations can also lead to unhealthy contest to control resources and particular favorable spaces leading to spatial segregation. Moreover, neighborhoods themselves can claim public properties like water body and prohibit public access, in which case the neighborhood lock itself and the natural resource off from the public.

Emerging dense settlements around water bodies, which are based dominantly on horticulture production, pose a challenge for the current township definition of Ethiopia (which bestows township only on communities whose population is above 2000 and the livelihood of the majority is based on activities other than Agriculture). Beyond challenging the arbitrary definition of an urban center, dense settlements which are organized based on agriculture also bridge the urban – rural divide by allowing easy labor and material exchange between the legally divided entities. The unregulated environment creates a relaxed terms of employment and skill requirement particularly for rural migrants and - as observed in almost all case study sites – friendlier and accommodative material and technique usage in the production of livable spaces. However, the formal mode of urban production and the majority of the informal (which seeks formalization or acceptance by the formal criteria) within the emerging cities of Ethiopia are increasingly becoming dependent on imported materials. Paradoxically, such import dependent mode of urban productions is favored by the formal building bylaws which impose restrictions on the use of local materials in the construction industry. Though the rational is to ensure international standards, the industry is costing the country heavily in foreign exchange spending. Furthermore, in addition to being a challenge in the bio-physical systems

(material and energy cycles), it discourages the local material market and skill development processes –hence disruptive of the local economic cycles.

Conflicts and unhealthy competition for control of water and water sources can also be a challenge in many emerging areas. Though it is clearly confirmed on all civil codes, various proclamations, legal notices and customary rules that the state has the authority over water resources, its control over the daily use pattern is not enforced down to the settlement level around water bodies. This gap leaves the informal interactions and appropriation patterns to grow into a possible contest for control. Particularly when the livelihood production, safety and security of the neighborhoods are dependent on the water body, the possibility of running into conflicts with other contestants is high. As observed on case studies –though not pronounced into critical level - three interactions are potentially prone to conflicts: interactions among neighborhoods which share the same water source (water body); interaction between formal development and informal development sharing the same water body and located in the same vicinity; and with religious establishments which in some (if not many) cases act as custodians of strategic sites around water bodies and even the water body itself. This can also be fueled by the lack of a tradition (particularly an urban tradition) which could have developed norms and technical solutions in using water bodies among various groups for intensive processes.

The interaction patterns of settlements around water bodies vary based on the nature of the water body and the settlements around it. However, the general interactions line and direction of influence can be summarized as shown on Fig. 8.1. Around rivers, while the upper stream settlements have a higher control over the amount, quality and rehabilitation of the water cycle, settlements in the lower stream area have a larger amount of water and a better irrigable land but a higher risk of flooding and pollution. The influence is obviously flowing with the direction of the river. Around lakes - unless the landscape around the lake dictates settlement pattern - the influence spreads in all directions fading away with distance. Such configurations of interconnections imply the need to have an overarching regulation.

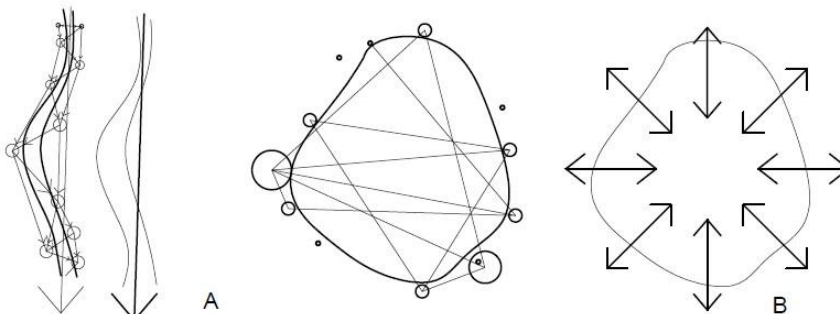


Fig. 8.2 Line of interaction among settlements and direction of influence across rivers (A) and around Lakes (B) and possible poly-central pattern

Nevertheless, the emergence of various groups of communities and urban centers around the same water body can also imply the creation of a larger

polycentric urban archipelagos where the water body plays a central role for both functional and morphological policentricity (see the gravity model on de Goei et al. 2010; van Oort et al. 2010). However, such patterns demand a conscious effort to coordinate rehabilitation of the common natural resource and various functions related to the development of livelihood production activities in both the individual center level and the larger urban region level.

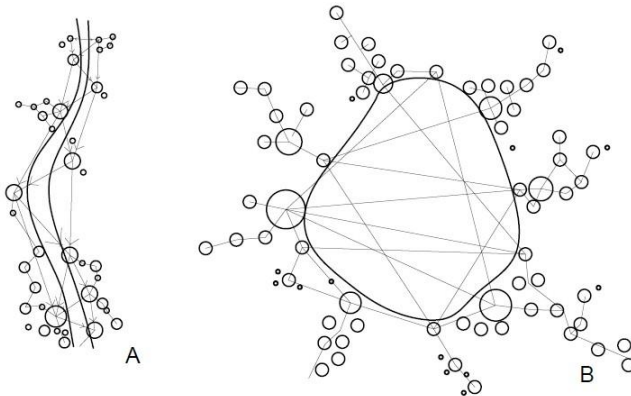


Fig. 8.3 development of polycentric urban archipelagos around water bodies

Architectural and Cultural implications

Water bodies becoming a material resource than a sacred spiritual element:

The increasing appropriation of water bodies for commercial purposes either through industrial or recreational projects weakens their reverence and spiritual significance. It also demystifies deep held religious norms and encourages easy appropriation by individuals and groups. This encourages the flourishing of crafts and small scale businesses related to livelihood activities founded on water bodies such as irrigation, recreation, fishing, etc. - demanding spatial layouts which respond to needs from these activities.

Water bodies and speculative architecture in informal settlements: As contest for sites around water bodies increases, the existing mode of urban production (dominantly informal) would be squeezed between two demands. In one side a need to become denser and adaptive to water related challenges and in the other a demand to remain temporary, cheap and fast – ready for relocation due to land tenure insecurity.

Currently, buildings in informal settlements around water bodies are largely single story which are built using less durable materials and elementary technique exposing them to risks associated to flooding and landslides. The excessive use of wood from surrounding forest as the main construction material fuels the flooding and landslide.

8.2. Concerning the nature of the emerging urban configuration and its trend - particularly around water bodies

It is plausible to claim that more than anywhere else, cities in Ethiopia in general are venues of negotiations of extreme realities - from seemingly different ages, various modes of production, diversified culture, and complex social relationships. Within this dynamism, which is filled with polarized elements, the intersections between social, political, economic and bio-physical dimensions are very complex to understand. Leaving aside the whole complexity of rapid transformations, the very conflict within the staggering population growth and environmental and economic uncertainties alone demands a bold and innovative reformulation in the usual theoretical and practical instruments in place. Currently though, both the theoretical and practical engagement in Ethiopian as well as Sub Saharan African urbanization is far from confronting the challenge.

Both policies and norms of practices are generated based on theories developed elsewhere. The predominant engagement of theoreticians who are working on African urbanization is still on the phase of struggling to determine the 'othernessness' or 'samnessness' or 'ordinariness' of African cities. The same is true in most of the practical disciplines like architecture and planning in which formal practices are flooded by either the 'star' international experts' prescriptive fixings or the local practitioners' copy-paste solutions.

Water bodies, water resources and Ownership: All (the civil codes, various proclamations, legal notices and customary rules) affirms on the priority of state authority over the use of water resources, including the community level¹. However, the study indicated that in most cases, water sources, water bodies, and areas around them and islands are customarily claimed and protected by special groups such as religious groups (EOC in the case of many islands and springs - 'Tsebel', and 'Irecha' traditional Oromo group in the case of Bishoftu lakes). Such a generalized legal environment with possible conflicting unaddressed cases implies precedence which needs to be addressed with care.

General policy environment concerning urbanization around water bodies: No policy, proclamation or rules of any kind is in place to regulate building activities around major water bodies and the formation of settlements. The two government bodies tangentially related to the phenomena of urbanization around water bodies are the Environmental Protection Authority (EPA) and Ministry of Urban Development, Housing and Construction (MoUDHCo). The former is a regulating and coordinating body providing advice to the government on policies and legislations with regard to environmentally related activities while the latter is a ministry responsible for regulating and leading urban development in the country. The former has a goal of ensuring the regeneration of the environment while the later the development of cities. The former sees the objective of the later as possible cause of challenges – as cities are generally considered the chief disorganizers of the environment. The closest attempt to address the issue by MoUDHCo was the development of a guideline on the protection of rivers which cross cities. In both cases however, the phenomena of the urbanization of areas around water bodies is not recognized as pressing issue which demands attention.

Informality as a main mode of urban production: Informality has many faces; however, in both livelihood production as well as architectural space productions, it dominates the economic and physical landscape of urban Ethiopia. The study confirmed - with its both general overview and real-world observations – that informality is the dominant urban production in the cities as well as the emerging urban centers of the country. Informal land acquisitions, informal constructions (construction without permits and documents), continuous informalization of formal properties through undocumented incremental constructions and informal transactions of land are the major faces of informality in the urban architectural production. In terms of livelihood productions too, the study showed that in both the emerging and older settlements around water bodies, informal economic activities prevail as a dominant form of livelihood production.

Informal development can happen as a self-organizing entity or as an extension (outgrowth) of a formal development project. Large scale irrigation and hydropower projects are identified as possible generators of associated informal urban production around major water bodies. Large scale infrastructure projects such as major motor ways are also observed to generate (attract) informal development. This is due to the opportunity they offer in generating other livelihood production activities and the speculative investments from farmers and young entrepreneurs (particularly from cities) who project that once infrastructure line is in place, the area would be urbanized.

Livelihood production possibilities as a main pulling factor towards water bodies: The study showed that people seek sites around water bodies primarily for livelihood production. It has to be underlined that it is not its scenic or any other environmental qualities which primarily attract the majority of inhabitants to water bodies. It is also necessary to note that even the emerging interest to appropriate land around (primarily) lakes for leisure and quality shelter is a recent phenomenon. This has to be researched separately though. However, the major force pulling people towards water bodies is the opportunity to have a more stable livelihood production.

Inhabitants on site: In cities, be it new sites or older settlements, sites around water attract rural migrants. In rural areas it is first the urban entrepreneurs who attempted to appropriate the water body for small scale horticulture production. They usually start their work through informal lease from farmers who has the use right of land around water bodies. However, through time, the study has showed that once the farmers are introduced to the skills and market, they easily overtake the business hiring other seasonal migrant farmers from dry highlands as daily laborers. It was possible to learn that increasing number of young farmers are attracted to such sites with water access which gives them a better security for a more reliable mode of livelihood production.

Livelihood production and architectural space production: As new possibility of livelihood production is the main attraction towards water bodies, the spatial organization of the neighborhood is dominantly influenced by the way the water body is explored for livelihood production. Particularly on neighborhoods dependent on irrigation (horticulture production), the pattern of spatial organization and the compound geometry are directly determined by irrigation water ways. The informal land market and negotiations also plays a minor role (See summary table III 1&2).

The role of planning and design in both informal and formal production: Little or no role from formal urban planning either in upgrading schemes or redevelopment is observed in informal settlements in case study sites - implying that sites near rivers are still regarded as the least valued sites. Moreover, in cities, dangerous sites on river banks (difficult cliffs on upstream sites and flood plains in downstream sites) are appropriated by low income group. However, the case around lakes is different. The values of waterfronts have appreciated exponentially in the last few years in the few cities around lakes and resort sites. These sites, which were historically reserved for the urban poor, are now being contested. Formal planning schemes, following political directions, favor large scale investment projects against the existing informal settlements whose livelihood production is largely dependent on the water body. Such proliferation and contest is rapidly expanding into rural areas near water bodies. Sites used by traditional farmers or sites reserved for forests and wet lands near fresh waters (in both lakes and rivers) are being targeted by development projects and informal self-organizations which seek the resource for livelihood production. Dominated by land tenure insecurity, the informal proliferation (small scale real-estate market and densification processes) in both rural and urban areas is inhibited.

The understanding of process and product in architectural space production: Unlike the formal processes, which often requires a clear separation of phases within the process of production and use(demanding a ready to use product), the informal urban production, as observed in all case studies, display a continuous cycle of production and use. The formal permit processes within the municipal regulations, which demand permit - control - certification in every step, are not compatible with a continuous process of use and production.

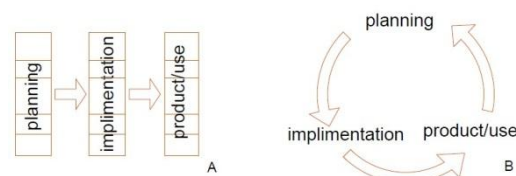


Fig. 8.4 Architectural space production processes in A- Formal and B- Informal systems

Stewardship of the commons: Other than the usual communally used open spaces and infrastructures, water bodies and irrigation infrastructure represent the common in the informal settlements around water bodies. In all observed cases, though there is a sense of association to the water body (be it a river or a lake), there is no sense of ownership among inhabitants and hence no organized attempt to protect it from being destroyed by pollution or excessive use. However, installed common irrigation channels and ditches are protected with the full sense of ownership. The internal foot paths and open spaces are also freely used and relatively neatly kept by the inhabitants displaying a deep sense of ownership – a characteristic uncommon on other public infrastructure in cities.

8.3. Concerning 'informal' architectural space production around water bodies: its processes, characteristics and its relationship with the water cycle

Informality as urban vernacular

Urban informality refers areas of businesses, employment, services, land and housing (see UNHABITAT 2008). The most widely used definition is by De Soto (1989) which refers informality as the unregulated, illegal and unregistered economy. But in transitional economies and countries with strong traditional foundations, referring the weak 'modern' structures of governances as formal and legal will result in creating a difficult legal-illegal, registered-unregistered, formal-informal dichotomies which discredits the major portion of their economic and cultural construct as illegal and informal. Especially when it refers to the complex process of urban space production and space use, such a strong lines of separations prohibits the development of the local culture and knowledge to find adequate responses to contemporary challenges. In many developing countries, in an attempt to join the global economy, the registration, regulation and formalization mechanisms adopt and impose ideas of imported concepts of modernization hence often undermines local practices. To refer someone 'illegal' or 'informal' after imposing rules alien to ones culture under the promise of betterment is often referred by some scholars as un-dealt colonial practices (see Robinson 2006).

Nevertheless a city cannot be an imposition to any culture. Actually cities – either in their evolved complex forms or in their primordial forms, are the primary organs for cultural and economic development of any society (Jacobs 1969). In such context, the struggle for survival of the majority of the inhabitants in developing countries - the poor - shall then be taken as a process of cultural and economic development in what seems hostile legal and economic environment. Hence such formations shall be taken as the creation of a space form which can be referred as an urban vernacular - a result of the will to survive and the creative response of people to actual realities (opposed to assumed and simulated realities on design tables through statistical information and third party interviews). Such 'raw' responses of a society exposed to new environments (physical and non-physical) sometimes display undesirable and dangerous characteristics, they also offer at least the opportunities to understand major forces (variables), spatial demands and behaviors for professional designers/planners who wish to guide the development of cities. And at its best, it can also reveal forms, methods, and techniques of usage and production of spaces developed through collective subsistence struggles.

Much more than the new rich corners of Addis Ababa, which often display a direct but expensive transport of un-resolved rural spatial culture with only new imported materials and forms², the dense informal constructs (particularly around rivers) offer a possibility for the growth of an urban tradition in Ethiopia. In a much more celebrated way - the urban vernacular (dense informal settlements) especially in Ethiopia in general are sites where inhabitants themselves tried to respond to urban demands under uncomfortable realities³. Hence, they offer a rare window of opportunities to learn the way contemporary societies in Ethiopia would reposition and transform their rural self-sufficient spatial culture into a much more complex assemblage by negotiating with the demand of urban interdependence.

Processes

Though the individual architectural space production processes and the neighborhood level processes are overlapping, three processes can be traces as the major processes involved in the general informal urban production. These are land acquisition process (usually at individual compound level), decision making process (in both levels), and construction process (in both levels). In the case of individual houses, the last two processes usually create a loop as indicated above (Fig. 8.5). However, shaping the neighborhood demands a continuous engagement in all the three processes.

Land acquisition processes: Informal land transaction - in rural areas from farmers who have use-rights and in cities from earlier informal occupants - is the most common way to acquire land. Such transactions lead to informal land use transformations in rural areas and further densification in cities. Squatting is also observed as the other means both in cities (on lake shores and river banks which are usually green reserves) and in rural areas (on sites reserved as communal areas).

In the first case (informal transaction), the processes are similar for both temporary leasing for irrigation purposes and indefinite use-right transfer in rural areas. It involves a direct negotiation with the occupant (a farmer with a legal use-right in the case of rural area and with the informal occupant who wishes to sale portion of his/her plot in the case of cities); making agreement (a deal) through elders and relatives; and work slowly to get accepted into the community and finally by the kebele. The processes involved in squatting (illegally appropriating land for temporary or permanent use) is more risky. Claiming a piece of land on public land and erecting a small house usually in the evening while watchmen retire from work. It often requires negotiation and sometimes bribes with watchmen and kebele leaders. As houses are done in the evening and weekends they are famously referred as moon-light houses. After building a small house, occupants will enter a long term struggle phase with the local administration to retain their claim and even to formalize their right. When the case involve considerable number (as in the size of a neighborhood), the struggle to formalize it demands an organized effort – which adds up for the formation of neighborhood associations.

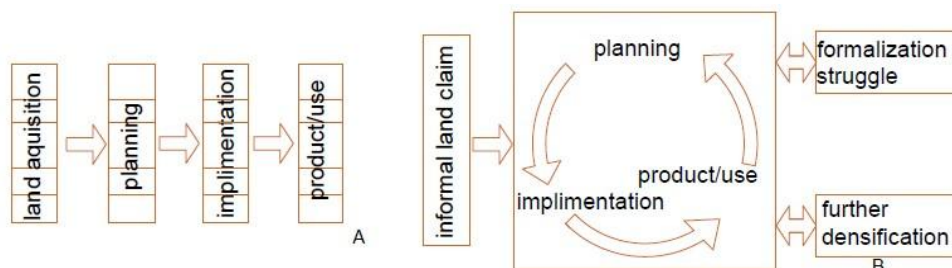


Fig. 8.5 General production processes in A- Formal and B- Informal systems

Decision making processes: on the affairs of communally used spaces and facilities is one of the most complex knots in informal settlements. Particularly in cities where the density is higher and a small portion of land area makes

considerable difference, negotiating to secure access roads, open spaces and infrastructure lines for sewage, water and electricity is usually a challenging task. Associations and cooperatives are formed out of a sheer necessity to regulate some operations and mediate negotiations after a serious of clashes among inhabitants (see Fig 8.5). In cities, cooperation between these self-organized neighborhood associations with the formal city administration and its various corporations (such as water and electricity providers) helps to loosen the knot. However, due to the absence of such services and the utter lack of capacity of the rural 'kebele' administration, such cooperation is not operational.

The question is pronounced in cases of informal neighborhoods around water bodies due to the inherent importance of the water body as a communally used resource for livelihood production and (in some cases) the irrigation infrastructure associated to it. In almost all cases, cooperatives are organized by the inhabitants to handle the affairs associated to the communally used resources. In most cases though one cooperative does not address all communal issues and hence a neighborhood association is formed to oversee the affair of the neighborhood in general while various cooperatives deal with their respective trades. Conflicts among them are usually mediated by the elders in the neighborhood association. In some cases though, government initiated (top-down) formation of cooperatives within informal neighborhoods can overlap with the local cooperatives creating a complex relationship within the neighborhood hierarchy. In other cases, self-organized cooperatives are required to reformulate based on requirement from 'kebele' administrations.

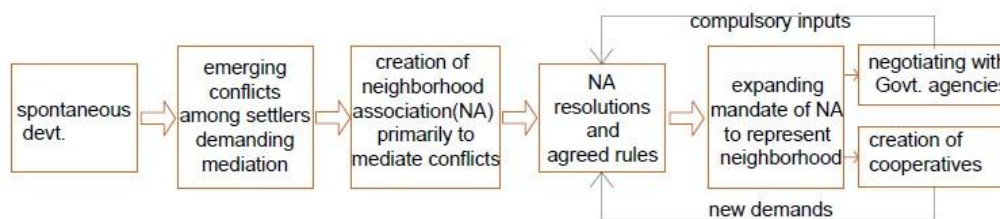


Fig. 8.6 Diagram showing existing decision making processes concerning communally used properties and spaces within informally developed neighborhoods

Construction processes: the absolute lack of housing finance in informal settlements in particular and in rural areas in general makes the mobilization of capital, labor and material to be dependent on personal connections and traditional relationships (see Box 8.1 BuraNest experience for practical example; see also Oswald & Shenker (2010)). The dual land administration system which strictly divides land into rural and urban does not recognize land-use changes in rural areas into uses associated to urban areas. As the land in rural area is reserved for agriculture, it is difficult to for financial institutions to finance housing and other development outside of agriculture – leaving farmers and the process of urbanization in jeopardy. Capital, hence, is mobilized from personal saving, from relatives and from 'Iqub' (local - traditional social banking). It is slow and hence dictates incremental construction processes.

Materials and labor are also mobilized by the contribution from relatives and neighbors which minimizes the amount of initial capital to start building. Accordingly, the technique of construction is rudimentary and based on unskilled labor. However, the new materials which usually are adapted in the later age of the incremental process – as a sign of progress and wealth - demand skilled and semi-skill labor which usually is transported from the nearby cities.

Products: Characteristics of the built form

Several scholars such as Turner (1985), Correa (1989), Kellett & Tipple (2000), Ribbeck (2002), and Brillembourg et.al.(2005) have tried to identify qualities in informal settlements which make them more resilient and accommodative than the formal constructs. Some positive observations within the informal constructs in the emerging urban manifestations around water bodies in Ethiopia which confirm with many of the findings of the scholars are noted below:

Space:

- In informal settlements much more than steel and cement - space is the main resource confirming what Charles Correa observed in India (Correa 1989:36 as quoted on Alazar 2011).
- High flexibility (changing, expansion, contraction) and density of use of space. Almost no space is left for single use and spaces are booked sometimes fully for various uses within the same day.
- Socially relatable and human scale in terms of volume and size.
- Variety and diversity of spaces for specialized and temporal uses, diversity of houses in design - size – method - material. Usually socially and economically not uniform(mixed),
- Compactness both in urban and singular house scale -survival spaces, minimum internal spaces while main events are dispersed to the outside or shared with neighbors, flexible internal spaces, compact and minimum spaces.
- hierarchy and flow of space,

Qualities such as diversity and flexibility of spaces, ‘social mixity’ and community, which are readily available in informal settlements, are what many architects and planners crave for to create in their expert works (Alazar 2011). The informal neighborhoods around water bodies in particular, can be characterized as mixed-use with a higher density of use, where production, living, and commercial activities occur within the same space (in some area though, where pattern gives priority to irrigation, horticulture fields are preserved from being taken up by house construction). The case also extends to private house organization where both internal and outdoor spaces are multi-use and the distinction between the two is often blurry (no strong dialectical relationship between internal and external spaces

as in the case of formal development). Due to the favorable climatic conditions in most of the days of the year, the daily activities of individual households share communal open spaces (semi-private but communally used spaces). Therefore, defined internal spaces remain minimal. Moreover, almost in all cases, spatial use is limited to single story horizontal development.

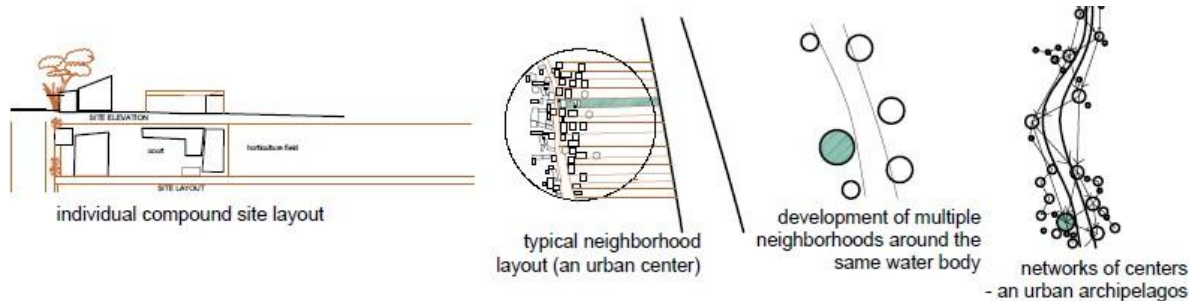


Fig. 8.7 Typical spatial organization pattern around water body at various levels

Material and technique

Informal settlements are also characterized by their usage of cheap and recycled materials. The two main criteria for construction material usage are availability and cost. Whatever is available in lowest price (the preferred is of course free of cost) has the highest priority. The knowhow of the owner to use the material for construction also counts in selecting materials so as cost is minimized from expert builder. The best candidates for such realities are - used materials (from recycled material market and waste sites) and naturally available materials around the site- like soil and valueless stones. Material selection is also a function of time- materials can be replaced whenever possible to afford the better, therefore one is ready to build or transform with almost anything at hand.

Most commonly used materials in informal settlements around water bodies are: walls- mud (with straw), recycled iron sheets, structural frames-wood (cheap eucalyptus reused from big construction sites); floor and light foundation- collected stones; floor finishes – used plastic sheets, used hard package papers, hand-made bamboo mats, hand-made palm leaves mats; roof cover- used iron sheets, used plastic sheets, straw, soil(mud); interior finishing – used papers as wall papers glued with wheat soup(newspapers, magazines, used paper packages), partition walls - clothes and used paper packages; ceilings(floor finishes + interior finishing). These materials are subjected to immediate change once the inhabitants acquire means to improve. Almost all upgrade their structure with more solid foundation and durable materials through time. But in the informal settlements within cities, the slow process of transformation quite often gets interrupted by sudden government interventions and displacement, hence investments on transformation is made with caution.

Identifying materials and techniques which are both low tech (does not require high level expertise) but also innovative (which can invoke training and interest), is a key for inhabitant- friendly process of space production. Moreover self-built and process oriented formation promotes not only the sustenance of small scale economic activities through time but also a more inter-active adaptation to new realities (economic and social) through continuous appropriation and detailing.

In all sites observed, material usage can be categorized into two: the use of local materials such as wood from the surrounding forest with grass and 'Chika' which dominates the older traditional constructions and imported materials such as CIS, steel, concrete and glass which are increasingly popular among the newly constructed and improved houses. In both cases however, the environment is a target of challenges. While the use of local building materials support the local economy, its excessive and irresponsible exploitation is believed to be one of the main causes of deforestation (both in cities and in new sites in rural areas). The imported materials, which are used when inhabitants upgrade their houses, in the other hand drain the country's foreign exchange while contributing their share for the general imbalance of both the local economy and the ecosystem. They also are found to be less responsive to local climatic conditions.

Local building materials in use are predominantly low tech and unprocessed materials which are found around the site. New and supposedly improved house constructions employ stronger materials such as concrete framing, concrete blocks, CIS roofing and sometimes steel and glass. These new and predominantly imported materials are popularized by the market and the media as a sign of progress.

Relationship with water body:

The characteristics of emerging settlements and their relationship, with the water body they are attached to, vary according to the nature of the water body and their relative location with the water line (in the case of Lakes) and water source (in the case of rivers). Major water bodies around which settlements develop can be broadly divided into two – still waters (lakes and reservoirs) and running waters (rivers). Still waters can also be further divided into fresh water and salty water in which livelihood activities are also determined accordingly. While horticulture, fishing, grass harvesting, and other small scale activities related to organic processes are common around fresh water, activities such as tourism, sand mining, resorts and recreation are common around salty lakes. Rivers on the other hand display differentiated flow pattern based on the nature of the landscape they are crossing and their proximity to their sources. In higher altitude near their sources (upstream), rivers tend to have forceful flow. Most of the major running waters in Ethiopia have their sources on highlands where the topography is rough. Such topographies make the water–settlement relationship complex. In lower altitudes, where the water flow calms down, settlements are prone to seasonal flooding but the fertile terrain becomes attractive for horticulture. In such cases, irrigation becomes the main livelihood production, where the neighborhood spatial layout strictly follows irrigation lines. However, individual houses (buildings) and its spatial organization (horizontal and vertical) has little responses towards the water body and its general water cycle (see table 8.1 for the summary).

Box. 8.1. BuraNest: an experimental model rural town project running in Amhara Regional State.

BuraNest is an experimental model rural town project in Amhara Regional State. It was initiated as an intellectual exercise by Prof. Franz Oswald and grew into a government run project in collaboration with Nestown group, regional Governmental agencies and non-governmental stake holders. The author, as a member of Nestown group has been involved on the ongoing project since its inception. Currently the project is in its implementation phase aiming to create a model which targets self-reliance.

Project brief: Rather than waiting for needs/ problems to arise so as to program its undertakings, the project takes a proactive step and attempts to instigate processes – hence, taking design as a proactive stimulus rather than a passive prescription. In order to do so, other than proposing a spatial plan, it introduces many initiatives including the formation of various farmers' cooperatives for housing and small scale businesses - including horticulture and agricultural processing. In its spatial scheme, it proposes a radical density (relative to the current rural setting) structured based on water cycles in both single house (a habitable void for 8families under a common roof – referred as a Rain Water Unit) and neighborhood level (A site layout based on irrigation and water harvesting). It also proposes to use local materials and the development of local skills. Rehabilitation of the local environment through the engagement of reforestation and soil conservation is also one of its premises. The central spine of the town project is composed of four tenants: Energy, Ecology, Exchange and Education.

Major findings up to date:

Decision making: The original top-down direction of decision, which was taken by the top regional government level, was proved to be not enough. An equally rigorous engagement from the bottom – up was needed. Furthermore social associations and religious institutions have a far deep importance in the social hierarchy and decision making processes than originally assumed. Hence they play crucial role in mobilizing inhabitants and conveying information.

A test to rural land administration - a complex puzzle in the land administration system which need interventions: The current dual land administration system which treats rural and urban land separately was a challenge in terms of land transfer and compensation systems; housing finances and status and value of properties on rural land, infrastructure development on rural land. As the model town is being built on rural land (supposedly on communal land and not on individual farm lands), the transfer of land into cooperatives and the compensation system procedure had to be worked out along the way. The administration system also inhibits real-estate development and any property transactions related to rural land.

Housing finance: unable to cover all the costs from savings, participating farmers obviously couldn't raise enough money to start the construction of their houses. Due to complications associated to land tenure regime and limitations imposed by land administration systems, banks and other financial institutes approached have repeatedly declined loan applications. The rational was more revealing. Land use of rural land is strictly designated for agriculture. Though, it allows farmers to build their houses on their agricultural land, it does not allow transactions of any kind which involves land - prohibiting farmers to enter to deals with banks for their property on the land – making the rural inhabitants unable to access bank loans for housing or related development. Repeated attempt to untie the knot was not successful until this research report is composed. Though some banks showed willingness to work with farmers on rural housing, a clear directive from the National Bank on modalities related to rural land and properties on it is demanded.

Informal development an organic resolution within a limiting administration system: both the kebele and the Woreda level formal administration offices have shown no capacity to manage or guide the rapidly growing informal development around the town project and around the main infrastructure lines. The regional government body directly responsible for administering all rural land (EPLAU) was also found unprepared both in its professional profile or governmental mandate to deal with the urbanization process of the rural inhabitants. The regional bureau of urban development and works claim that the issue is outside of its jurisdiction leaving urbanization as a process (rural-urban transformation) unattended. The strict rural land administration also makes it difficult to farmer and non-farmers to move from one place to another – exposing the new rural model town to remain closed for new comers. Hence, young entrepreneurs and other migrants from other places resolve the limitation through informal transactions in the informal development. (See Appendix II for further reference)

8.4. Implications on policy, practice, and theory

The peculiarity of Ethiopian urban history and its current predicament challenge mainstream theories on urbanization. Ethiopia is a country whose distant past urban civilization shared a history with its contemporaries. However, the long standing regional geopolitical and religious reorganizations have imposed lasting cultural and political norms. It forced the country to adapt a new form of socio-spatial configurations which falls outside the radars of the generalized theories coined to describe African urbanization. The continuous independence of the country; the temporariness of 'ketema' (Ethiopian cities); the continued avoidance of the vast water bodies and continued concentration on highlands; and the sustained non-craft/non-trade cultural landscape presented a peculiar case which demands its own reading. Established upon these historical backgrounds, the current urban dynamism is also destined to be characterized by peculiarities - particularly when seen within the larger region of Sub-Saharan Africa. The strict state owned land tenure regime; the growing economy based on agriculture, and its rapid population growth which is still largely concentrated on highland rural areas are some of its current peculiarities which reinforce the need to study Ethiopian urbanization dynamism from within.

Regarding the relation between urbanization and water bodies in particular, the pattern in Ethiopia has also been defiant to any established theoretical positions. Major water bodies throughout the world (particularly fresh water bodies) have been largely attached to both agriculture based civilizations (hydraulic civilizations) and industry bases civilizations (after industrial revolution) - hence serving as center of gravity for urbanization. In the long history of statehood, major water bodies in Ethiopia have little or no contribution in the organization of its urban centers. Due to the aggressive nature of rivers in the highlands, where many of the settlements concentrate, they are seen as delineators than connectors, dangerous than helpful, and sources of destruction than sources of wealth. In lowlands, both rivers and lakes, though full of fertile banks and shores, are similarly regarded as camps of death due to flooding and water-borne diseases particularly malaria. Environmental, demographic, economic, and socio-cultural changes are forcing this long held pattern to change rapidly.

However, the general lack of orientation regarding urbanization due to the country's long held priority in rural development and the particular lack of awareness and unpreparedness about the emerging urbanization dynamics around major water bodies gives rise to unguided spontaneous development. To address the possible consequences due to a sustained lack of orientation, including the aggravation of environmental degradation, a clear policy direction is needed either from the federal or regional governments. Its target must be to coordinate the urbanization dynamics with environmental rehabilitation and livelihood production activities.

In underscoring the intensity of the emerging urbanization and anticipating its scale, the study implies the need to review existing policies related to urban development, rural development, infrastructure development and particularly land and its administration. The cities of Ethiopia, which currently host a total of around 12 million people, will remain to be one of the most stressed centers expected to absorb the geometrically

increasing population and migrants from rural areas (projection indicates an addition of more than 50 million in the coming 15 years alone). It is obvious that the formal apparatus cannot address the humongous demand for housing, services and jobs. While it is obvious that the formal (as a regulated and legally approved processes) has never been and is still not the major mode of urban production, policies are directed and guidelines of practice are formulated with the assumption of formal apparatuses as the major instruments of implementation. Such mismatches are usually produced when policies and guidelines of professional practices are either imported without reflection or formulated based on theories which are developed based on different contextual realities. Both the theoretical basis upon which policies and practices are based and the core principles of policies and professional practices have to be exposed to critical reviews against the contextual realities of the country.

The study contends the perception of Informal mode of productions in formulations of policy frameworks and practice guidelines. Though unrecognized, informal processes have served and are still serving as the major mode of urban production. It is necessary that policies and guidelines of professional practice must acknowledge informal development and creatively address them as potentials to be guided than to be considered as threats. The way the formal and the informal systems are related has to be reformulated in order to explore the potentials of informal organizations in mobilizing resources which otherwise be left to be wasted. Unleashing the potential of the informal processes, which usually springs from the bottom up, and enforcing an overarching and empowering formal regulations from the top in order to protect future perspectives, has to ensure a longstanding safety by safeguarding the balance within both natural and social ecosystems.

Notes

1. Order No.1 of 1945: Article 22 (b), Article 25 (i); Legal Notice No. 112 of 1948; Proclamation No. 7/1992, Proclamation No. 41/1993, Proclamation No. 94/1994, Ethiopian Water Resources Management Policy (1999) Proclamation No. 4/1995, art.17 & Proclamation No. 256/2001, art. 20, and the most recent enactment - Ethiopian Water Resources Management Proclamation No. 197/2000 all affirm that the state ownership and control over all categories of water resources in the country.
2. Rural house hold in Ethiopia is characterized by its single family hut located in or at an agricultural land distanced from the next house with sometimes hundreds of meters. The social gathering among the rural-ite in most part of Ethiopia (especially in the north which claims to influence the contemporary culture) happens in religious festivity or funerals and weddings. The day to day life pattern of a closed family can only be broken into a collective engagement in farming seasons where the family works in a reciprocal relationship with other families. A weekly market in a near bye village can also be mentioned as a chance to the other (see Lipsky 1962, Lavine 1965, Panchrust).The current high end real estate colonies in major cities reflects similar constructs where rich single family houses are purposely distanced from any reality with a heavy fence(in some cases- double fences and guards) after a relatively large compound. Some even had dared to fence out the exclusive village and denied access of crossings through for any other inhabitants. Such a behavior, in my view, is a show case of resistance to transformation into urbanity, a transport of unchanged rural spatial culture which assumes any stranger as a possible offender.
3. Alazar G. Ejigu, quoting Caves 2005:139, summarizes the given realities under which the urban poor has to operate to produce and use spaces. According to him- lack of land tenure security, lack of basic infrastructure, predominance of physically sub- standard dwellings, and locations that are not in compliance with land use regulations and are often not suitable for development – are the major characteristics of informal settlements where informal space production is taking place.

Chapter 9

Recommendations: *Designing the 'informal' - A reorientation to address urbanization around Major Water Bodies in Ethiopia*

In an attempt to develop perspectives based on the findings of observations summarized in chapter 8, it is plausible to conclude that the current urbanization processes in Ethiopia can neither be left for unguided spontaneity nor for a complete control by the top-down formal apparatuses. In one hand, there are environmental, economic, and political processes at stake, which need to be rationally informed and coordinated with local, regional, and even global realities by formal institutional setups. On the other, the internal forces and dynamism of urbanization in a rapidly changing environment are beyond the controlling capacity of any operational mechanism installed by formal governmental apparatuses, hence, spilling over following organic and spontaneous course of development. Such paradoxical situations need to be addressed in time by reinventing the intrinsically formal actions of design and planning to make them palatable in the world dominated by informality - hence 'designing the informal'. However, it should be noted that reinventing spatial design alone does not ensure the needed resolution. Therefore, though primarily focused on spatial dimension, 'designing the informal' crosses over the confines of the traditional domains of spatial design and calls for an overhauling reorientation in the way of understanding and responding to urbanization in Ethiopia.

It must be noted that the 'informal' being addressed in this research does not necessarily denote 'slum' and hence 'designing the informal' is not an attempt of devising an intervention strategy for 'upgrading slums'. The 'informal' addressed here is the emergent settlement (particularly on sites around major water bodies) outside of the legal framework of urban development in Ethiopia. Accordingly, 'designing the informal' has to be perceived as an attempt of devising a strategy to guide processes of urban development which falls outside of the legal (formal) framework (see section 9.2.1 for details).

In proposing sets of recommendations under the title 'designing the informal', this research claims that *empowering local processes* is the key to guide urbanization in a country where informality is the main mode of urban production. Nevertheless, it also underscores that the empowerment of local (otherwise referred as informal) processes can only make sense when coordinated with a right orientation towards the general processes of urbanization in the macro level. Hence, it shall be based on a

balanced interplay with informed top-down decision making processes. In which case, the formal top-down, being informed by a fair assessment of realities, is needed to recognize the authentic potentials within the informal local processes. Therefore, in order to install an operational system, a meaningful intervention to guide the ongoing urbanization dynamics in Ethiopia demands major readjustments from both ends.

In the particular case of urbanization around water bodies, an enabling policy environment and targeted regulations are required from the top-down which address the intricate relationship between urbanization and key natural ecological reserves such as water bodies and forest covers. From bottom-up, the potential local processes and self-organizations must be reinforced through scientific and technological inputs (spatial design inputs) for a safe, socially responsive, and ecologically sustainable urban development. It is obvious that, interfaces between the top-down (usually formal) and bottom-up (usually informal) processes and between the natural (usually taken as neutral) and manmade systems (usually taken as disruptive of the natural) open up a wide field of engagement for professionals and researchers in fields related to spatial planning and design.

In order to establish the trajectory of the possible interventions on a long term and sustainable track, the attempt of guiding urbanization in Ethiopia additionally demands a serious reevaluation of basic conceptual frameworks of knowledge and skill production sectors (particularly in areas related to urban production). In an attempt to respond to the normative question the research posed, proposed recommendations are organized under three sections: the macro-level (policy related top-down actions); intervention strategies in a micro-level (as spatial design guidelines and a revisiting of production processes); and finally on reevaluating some of the key concepts in the education and practice of spatial design professions.

9.1. Macro level interventions: policy related recommendations

9.1.1. A need of reorientation

The recognition of the phenomenon of changing patterns demands a readiness for change in the way the states of affairs are handled. The scale, speed and sensitivity of the emerging situation concerning urbanization in Ethiopia can be classified as extraordinary demanding an extraordinary readjustment. The basis for the readjustment starts from a reorientation of perception on key concepts. The following are fundamental points to consider in a macro level:

Urbanization is a defining phenomenon of Ethiopia's future

For the world in general, it is already an urban age. The urbanization of the world is a non-arguable phenomenon. As discussed on part I of this document, almost all of what can be recognized as drivers of urbanization are set in place in Ethiopia. Both economic growth in a formal sense and rural poverty are fueling urbanization in their own dimensions. On the other hand, the staggering population growth within a limited and degraded natural resources such as land and water are realities demanding

urbanization as a resort. Other than the obvious observations noted in this research, there are also enough empirical evidences that indicate the eminence of the urban explosion.

Cities are not only markets for rural production, as they often are referred in papers of government strategies. Cities primarily are the production centers of culture, knowledge, and skills which instigates rural productivity. It is necessary to restate the notion that was argued by Jane Jacobs in her book the *Economics of Cities* that the notion which is widely accepted which asserts that cities are the product of rural development are but an oversimplification. The reverse is more plausible - cities are the generators of rural productivity and they were first in line in generating human progress. Never there is any rural progress registered without being steered by a city through injecting inputs of new inventions and offering an expanding market. Moreover, throughout human history, cities have remained to be the key center of civilization by being centers of politics, religion and advancements in knowledge.

It is imperative that the low level urbanization and the poor economic performance of Ethiopia are read as correlation. The classical view deeply held in Ethiopian polity which pictures cities as parasitical on rural production and as centers of only consumption has to be seriously and genuinely challenged. Rightly guided cities have always been and still are the pivotal centers of progress. Hence, urbanization, which indicates the transformation of rural population into urban population, has to be consciously promoted. Policies to advance urbanization in a stable manner - than limit it - have to be in place. Inclusive than prohibitive regulations have to be installed in order to guide the ongoing self-organizing urban settlements.

Urbanization – appearing as a problem but is a solution

The Ethiopian polity has for long retained a deeply held view which relates urbanization with complex social, economic and political problems. In both political and social forums, urbanization is very often associated with poverty, unemployment, pollution, suffocation and unpleasant density leading into the culture of greed and unhealthy competition – presented as exigent problem against the otherwise harmonious relationship of humans with nature and with one another. Contemporary images of extreme urban poverty in mega cities of the global south – as in the early seasons of industrial revolution - has painted urbanization as a processes of turning cities into centers of despair, disaster and grounds for political upheavals and instability. However, the case of Ethiopia itself presents an opposing argument. Ethiopia being one of the list urbanized country, have produced one of the most degraded local environment and become known as the venue of poverty and human catastrophe. Across the world, the case is similar – the list urbanized countries are the list economic performers. Nevertheless, the sudden surge in urbanization - particularly due to massive migration of people and poverty from rural areas to cities, are known to create unprecedented stress in prime cities resulting in urban unemployment, slums (deteriorating areas) and failure to supply basic needs and services, and unpleasant cultural mutations. The response, however, should not be to curtail and prohibit the process of urbanization – which, according to the global historical trend, can only fuel the negative effects. Rather, the attempt must be to guide it into a healthy and productive process. Moreover, the conflict within the staggering population growth and the increasingly deteriorating natural environment (land and water in

particular) can only be resolved with a properly guided urbanization processes which can offer a considerable densification of habitation with a diversification of livelihood and wealth production. A well-directed urbanization can coordinate the optimal and efficient use of natural resources for a growing population which also contributes for the rehabilitation of the environment. It is an already established fact that the more urbanized countries are the more wealthy and developed they become (see UNHABITAT 2010:18). Therefore, the central question is to find right models to adapt or invent a method to guide rapid urbanization processes to confront challenges of poverty and environmental degradation.

Environmental crisis, particularly in Ethiopia, is associated with the intensified demand and use of natural resources. In the case of Ethiopia, it is deforestation due to the ever increasing demand for agricultural land, fuel wood, and construction material which aggravated the devastation of the local environment. The lack of diversification that almost all the population is directly dependent on land and agriculture further fuels the problem. In simple terms, it is the lack of cities which should have injected more technical efficiency into rural land productivity and inventive material for energy and construction needs. It also absorbed the increasing population more efficiently by other diversified trades for their livelihood production.

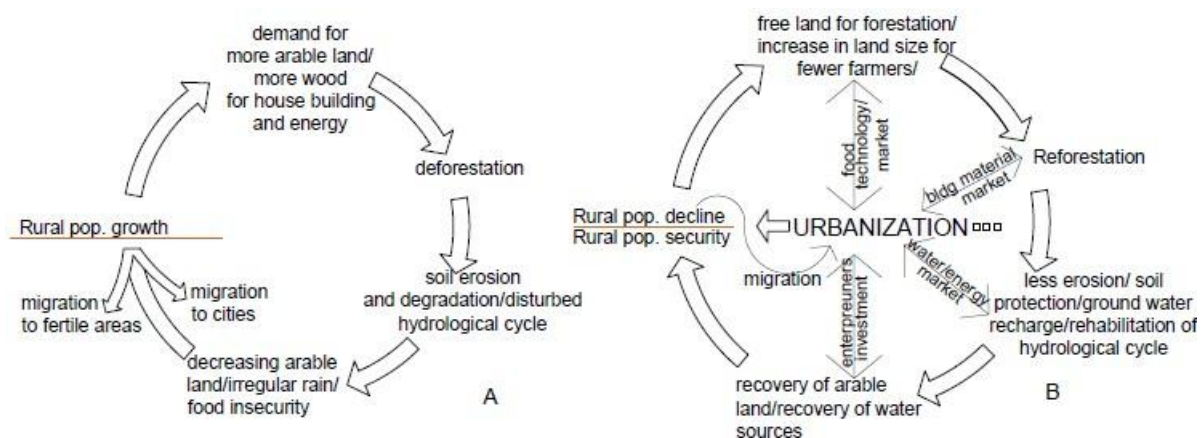


Fig. 9.1 A. Sustained localized disaster loop, B. localized recovery loop (urbanization as a strategy)

Diachronic superposing than succession – a need to an open reading of urbanization and development!

Urban development should no longer be understood as succession of distinct stages of development. Ethiopian urban centers, in particular, with their mixed mode of production ranging from a peculiar practice of an agrarian age to the information age (or any other peculiar extremities) are venues of superimpositions. The attempt to read them as in their transition phase from one stage to another stage of development - as in the case of Rostow theory (1960) - dangerously leads to formally discourage specific forms of production and organization as backward and inefficient. Cities in general (and much more so in the case of Ethiopian cities) has to be read as a complex manifestations of diachronic superposing and permeating development processes (Läpple 2013).

Rather than pressing cities and their inhabitants painfully to transit from one to the other, a more considerate and accommodative approach is to read cities as a venue of continuous transmutations through complex intercourses of various development processes. Such a reading cultivates the potentials of new forms and permits the development of both the new and the old. It also helps to mobilize all resources which are needed in steering development in countries with limited resources. In other words - a new immigrant from rural area should not wait until he passes through a rigorous training in order to be a productive citizen. Rather, Ethiopian cities, in particular, has to be open enough to absorb skills of seemingly a different age as productive input – on the way allowing it to mutate through interactions.

Reflexivity and collaborative problem solving - blurring distinctions

The vision of the early modernists which aimed at creating a well-orchestrated society within a nation state based on controlled nature and stable social principles and systems of coordinates is proved to be unattainable (see Beck, Bonss & Lau 2003). The emergence of globalization and the continued scientific, technological, economic, political and cultural developments have shown clearly that these coordinates and social principles, even in the modernized world, are always in flux and hence the project needs a revision. Though a nation of predominantly traditional societies, the institutional setup in Ethiopia are built on similar assumptions – demanding a clear distinction between modern practices and traditional methods; and between established knowledge and mere belief. However, it is openly observable that the daily undertakings of formal institutional apparatuses are filled with mismatches and conflicts. While the daily routines of the majority of institutional duties are run in informal processes than formal systems; while traditional methods run most systems than structured scientific methods; and most decisions are informed by customary belief systems than established rational knowledge, it would be necessary to reflexively adjust the institutional setups in order to be relevant to reality. Furthermore, considering the current global social, economic, political and environmental uncertainties, which are believed to be offspring of classical modernism, blind faith on the imported ‘modernization’ project has to be replaced by a locally processed, contextually defined, and a more absorptive and inclusive Ethiopian modernization project.

On the global level, though, the current age is characterized as a civilization based on fossil fuel. Its peculiar city model, which is rooted on the assumption that takes nature as an open and unending resource, have proven itself to be ‘a house built on a sandy ground’ – a short sighted vision. Cities produced based on this model, both in the west and more recently in the east, are caged in a rat-race to meet their continuously increasing demand for natural resources from across the globe (material, water, energy, food, etc.). Furthermore, by increasingly becoming a market place for the global consumer driven economy, questions of equity and inclusiveness challenge the everyday life of inhabitants. The need for major reforms in the area of bio-physical and social systems in order to address issues such as climate change, urban poverty, and inequality characterizes the urban development challenges of the current age.

What is alarming, though, is that cities in emerging economies - in their hunger for a fast development which is triggered by international investment - are charged to follow

the same city model. When these city models are confronted by rapid urbanization and sharp shifts, both the bio-physical and societal systems become more vulnerable. Their dependence on international capital, material, and energy flows makes their local systems of production and exchange exposed to the uncertainties of the global economy. Such challenges have to be addressed timely particularly in countries which have started a bid to join the global web of complexities.

Local processes and age long customary methods of societal organizations have to be empowered and upgraded through complementary scientific and technological inputs. Formal setups within urban development structures have to be redesigned in order to be flexible enough for collaborative engagement with traditional. The basis for such readjustment is a reevaluation of the theoretical foundation of these institutions itself – a rethinking of the norm of dialectical categorization of systems such as formal and informal; rural and urban; traditional and modern; science and religion; etc. Such a dialectical understanding of the world, which feeds itself through antagonism, has to be reassessed in order to establish a system of collaboration.

The entrepreneurship and creative drives in the informal neighborhoods (economic activities and urban production) has to be recognized and welcomed as a collaborative mechanism to formal processes. Traditional and customary associations and cooperatives ('Idirs', 'Iqubs', Neighborhood inhabitant associations such as those in informal settlements, etc.) have to be recognized as valued constructions of the inhabitants themselves and often more participatory and closer to reality than formal government bureaucracies. Hence, they can become a more efficient apparatuses to manage the affairs of the inhabitants.

A show case of coordination: Urbanization, Environmental Rehabilitation and Food Security.

These three issues will be among the top priorities of development engagements in Ethiopia in particular and the region of North East Africa in general. Quite often than not, efforts to resolve challenges in one area affects the other and means to coordinate efforts are limited. From the very fact of governmental setups down to strategies and programs imposed down the ladder are characterized by sectoral divisiveness. Unless coordinated, sectoral attempts of development endeavors are most likely to produce further complications. Environmental rehabilitation and food security are obviously intertwined with a wide range of interconnecting activities. It is only a meaningful coordination of the two with urbanization (as the major societal reorganization process) that can ensure a meaningful trajectory of development.

Emerging cities near sensitive ecological reserves and their neighborhoods, such as those which are targeted in this research, have to be guided to develop their own local capacities in producing materials and skills. In most of these sites, most of the required elements are available: water, land, possibility of forestation, material culture which makes use of soil and wood, and striving small scale real-estate market. Coordinating these elements in the urban production nexus offers both possibilities of local environmental rehabilitation and local economic instigation. Coupled it with local productions and processing of food and energy from renewable sources (in most of the areas if not all) would make the system partially self- supportive.

Neighborhoods around water bodies are ideal cases to implement an urban development approach which coordinates the bio-physical systems (material, energy, and water cycles) and societal systems (such as livelihood production and space production) (see fig 9.2). Development policies must install ways of incentivizing such practices as they also contribute for the local job and food securities.

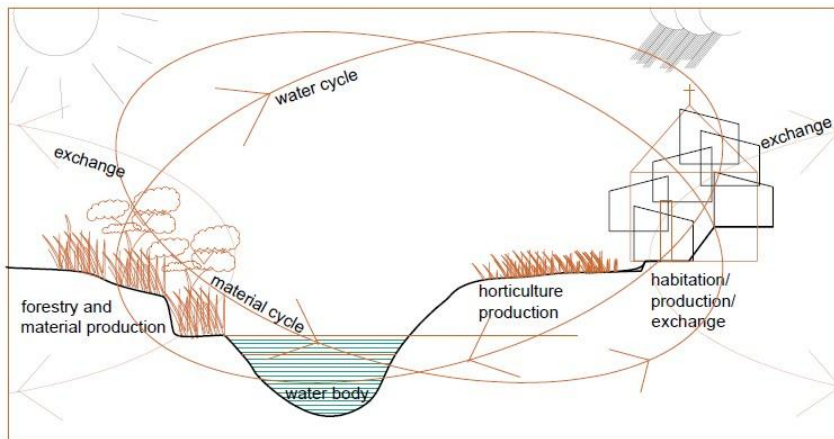


Fig. 9.2 Sites around water bodies offer clear potential to coordinate hydrological cycles and material cycles with urban production and food security

9.1.2. A need for policy direction

As indicated in earlier chapters, water bodies and immediate areas around them have become primary targeted for large scale development projects in Ethiopia – be it agricultural or industrial. However, most of the policy directions rendered for development focus to the particular sector of agriculture or industry (including power generation) and give little or no consideration to coordinate the associated urban development and environmental rehabilitation. In rural areas too, irrigation projects are expanding and the associated reorganization of scattered rural settlements into urban centers is not given due attention.

In the other hand, in both traditionally agrarian highlands and pastoralist lowlands, water points and sources are pivotal elements to determine the socio-spatial patterns of communities. The condensation of any rural settlement into more dense urban centers will be focused around more reliable water sources. Particularly for the lowland pastoralists, who are known for their temporary settlements and seasonal movements, water sources are the natural centers of gravity for any attempt of developing permanent settlements with related infrastructure and service centers. Coordinating the increasing urbanization processes with the development and rehabilitation of natural water resources shall be one of the major focus areas of engagement for both the federal and regional governments. Hence, a policy direction is essential.

Policy aims, objective, and focus

Self-sufficiency, environmental rehabilitation and resilience shall be taken as targets for a policy and its implementation strategies which aim to direct an emergent urbanization processes around ecologically sensitive areas. The resilience of any urban formation lies in its intrinsic relevance within the larger bio-physical and social systems and at this age of environmental, economic and political uncertainties, the relevance of any formation lies in its self-sufficiency. And hence:

Aim of the policy shall be to direct the emerging urban development into self-sufficiency and resilience. In a larger context, through taking urbanization as a strategy, it also shall target to address the challenge associated with the growing population within the degrading natural environment (Fig.9.1.).

The main objectives shall be to coordinate the two most pressing parallel processes which the country has to face, namely - urbanization processes and rehabilitation of the environment. Particular emphasis shall be given to areas of greater ecological fragility focusing on the coordination of emerging urban development in *direct impact sites* around major water bodies with the local environmental rehabilitation programs. For this reason certain water bodies such as major rivers, lakes and wetlands, and reservoirs have to be designated as *Major Water Bodies* based on their ecological significance.

Primary Focus on Direct Impact Sites

Sites within the inner zone of the water catchment area of Major Water Bodies; or sites which are physically adjacent to the Major Water Body; or sites whose water intake and discharge directly affects Major Water Body; or sites which can be directly affected by a Major Water Body; or areas with any other criteria set by federal or regional directives and designated as *Direct Impact Sites* have to be the focus of the policy.

Degree of impact on the water body is not necessarily determined only by physical proximity. Areas which are physically distant from the water body can be identified as having a high degree of impact and hence need to be zoned as a direct impact zone. However, the water body has a higher impact on areas which are physically adjacent. Rather than spreading over all the catchment area, policies and regulations about urbanization around water bodies need to focus in addressing areas which will have both a direct impact on the water body and directly impacted by the water body. Determining the specific criteria and degree of impact that a particular area has on the water body need to be established based on further scientific studies from the perspectives of both urban development and environmental sciences.

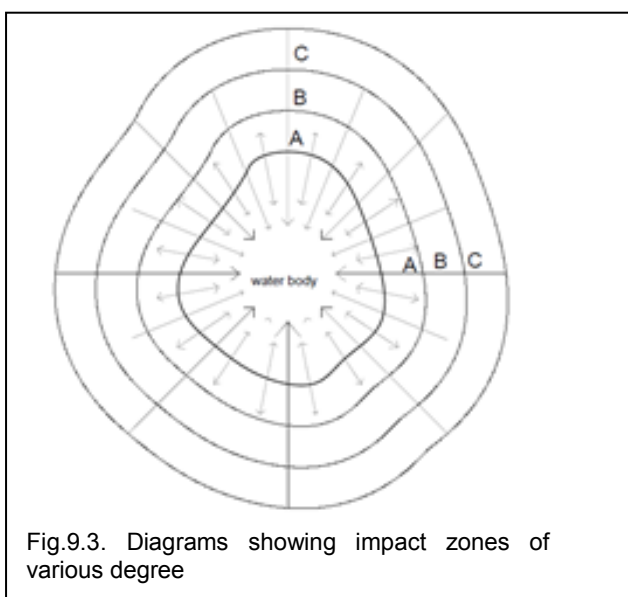


Fig.9.3. Diagrams showing impact zones of various degree

Though zones around major water bodies can be subdivided based on different parameters of impacts, the immediate (adjacent) sites (zone A in Fig 9.3) can be taken as an interface hence the direct impact site. Its physical size varies according to the nature of the water body and the topography around. However, based on observations, the area between of 0-5km (in the case of major still waters – lakes and reservoir) and 0-500m (in the case of major running water - rivers) from the water line (marked in the rainy season) can be taken as sites of direct

impact. Note that these are arbitrary dimensions taken from observations. In the case of lowlands flat lands, the area can extend into kilometers of flood plains. Impact on local hydrological cycles and direct influence on water body due to pollution and siltation have to be considered in determining zones. On the other side, impact on settlements from the water body such as flooding, water related diseases, and possibility of direct water source for production and habitation have to be considered.

Pillar Policy Principles

Policy to be developed to coordinate urbanization with environmental rehabilitation has to be established on three pillars: environmental, socio-political and economic principles.

>Environmental principles: rehabilitation of the environment through preservations of natural cycles such as water cycle and Material cycles (using natural mechanisms such as forestation, soil conservation, and conscious spatial planning/design interventions and implementation strategies (see section 9.3 for details).

>Socio-political principles: equity in accessing natural resources; the recognition of the validity of local processes in both urban development and environmental rehabilitation; collaboration between top-down government structure and bottom up self-organized community organizations; and the recognition and mediation between various interest groups in their customary righty in developing water resources(such as religious establishments). The principles of Subsidiarity and collaborative problem solving have to be the corner stone for empowering local processes.

>Economic principles: empowering the locally embedded economy by promoting local food and construction material production and processing; linking environmental rehabilitation works, urban production and livelihood activities (promoting cases such as linking forestation as a livelihood activity with a construction material supply-demand chain of urban production, linking horticulture as a livelihood activity with environmental rehabilitation and urban food security, etc); coordinating large scale investments with local informal economy (promoting complimentarily between the formal and informal economy - ensuring a fair access of the low income for its livelihood production possibilities); and activating low-income informal real-estate economic opportunities through furthering tenure security (particularly in the rural area which suffers from restrictive tenure regime). Relaxing the use-right and attaching it to farmers run real- estate would produce a higher density settlement in contested areas (see Läßle (2013) for a discussion on locally embedded economies and local economies).

Possible Key Actors

The emerging urbanization dynamism in Ethiopia has to be classified as extraordinary which demands extraordinary measures. As in the core point of the principle of subsidiarity, which should be taken as a pillar principle in the emerging urban explosion,

local communities and their self-organized associations and cooperatives have to be the prime elements in the process. However, ensuring coordination along the cross section of the various processes and their demand for overarching regulatory oversight is a task which demands a party that has sensitivity towards both the detail and the whole.

Considering the acute shortage of trained man power, capital and time span necessary to organize processes, other than the inhabitants, their respective organizational setups, and the various organs of the government, universities and research institutes have to be drawn into the center of this long term process with special mandates.

However clear the emerging phenomena is, the daunting task of guiding urbanization in Ethiopia is further complicated by the lack of open discussions and debates among decision makers, academics, and professionals. Much worse is the lack of well trained and responsive professionals in the various fields related to urban development. Both the existing limited professional education and narrow discussions are characterized by an over simplification of otherwise complex phenomena. They often dwell in two positions – either on an utter simplification of the social and biophysical processes into technical realities, considering urbanization as a phenomenon which primarily implies a demand for technical infrastructure and hence implying the production of technicians, or, on a dogmatic ideologue perceiving urbanization as a mainly political reorganization which demands personnel who can steer the political apparatus. Hence, the complex process of urbanization is left on the field to be steered by poorly trained technicians with limited scientific inputs or a junior politician running the local political apparatus which is established in an assumption that views urbanization as a risk. Therefore, demanding universities and research institutes in Ethiopia – as institutions with neutral positions with political and economic interests - to assume an active role in steering urbanization processes has to be considered seriously.

At this critical time of transition in Ethiopia, the steering of urbanization needs to rightly consider and scientifically enrich all possible processes. Involvement of experts (to give necessary scientific inputs) at the early stage of informal organization of neighborhoods is crucial - particularly in areas with sensitive ecological settings. In order to ensure such involvements, academic institutions which have the necessary capacity and mix of professionals in the fields of urban development have to be mandated to directly participate in the development processes (see diagram 9.5 for detail). Considering the utter lack of well trained professionals in the country, the academic institutions - which have relatively higher concentration of better trained professionals - have to be drawn systematically into practical engagement (as an institution with a diverse professional profile rather than commissioning individuals). However, care should be taken through inventive institutional mechanisms so that academic independency is protected.

University education of professionals can also be twined with practical involvement of the universities in the process of urbanization which in turn enriches the education processes. Such a refocus demand a review of mandates given to academic institutions to give them direct access to development processes - easing out the complex bureaucratic processes which currently demand universities to acquire governmental

permits for almost every step. It also demands revisions of curriculums and also inventions of new experimental and flexible teaching methods which allow courses to be tuned to cases on the ground. Furthermore, both governmental and nongovernmental organizations have to be committed to participate actively in focused researches on retrospective studies (researches) and projective studies (scenario and alternative projections) on urbanization and urban development in the country (see chapt.10 for detailed possible list of further research areas).

Establishment of accessible (open) data centers

Inhabitants must have access to data and key information so that their decision both as an individual and as a community is informed. Federal or regional policies related to the coordination of environmental rehabilitation and urbanization must command the establishment of publicly accessible data centers which compile and avail data concerning issues related to urbanization and environmental rehabilitation. Data such as meteorology; disease patterns and other related risks; physical, biological and chemical data, etc have to be compiled and availed for inhabitants, developers, and researchers with possible ease. Permanent museums and sign posts have to be established showing possible scenarios and risks. Posts of flooding levels, land-slid sites, special reserved sites, dangerous insects/animals zones, etc have to be marked so as to inform current inhabitants and future migrants about risks and challenges.

9.2. Micro level operational guidelines: recommendation regarding spatial design guidelines and production processes

9.2.1 Basic Reorientations

The physical space: These sets of recommendation address the design and production processes of the physical (environmental) space within the emerging informal settlements around major water bodies. Based on observations documented on Part II and indicated on chapter 8, it recognizes the use pattern which ranges from spaces for individual uses to spaces appropriated for collective uses (private to public) as predominantly mixed. Hence, it is necessary to avoid a strict categorization of the physical space based on uses such as commercial space, spaces for living, spaces for production, spaces for leisure, etc.

The physical space within the emerging neighborhoods around water bodies, rather than being perceived as a static object which can be categorized and calibrated in use and in scale, it has to be perceived as a continuum which is in continuous transformation due to constantly changing activities. Due to the specificity of the cases upon which the study is based, recommendations address the spatial continuum spanning from the individual household level to the space used communally by the emerging assemblage of a community which - irrespective of its physical scale - is referred in this study as a neighborhood (otherwise can also be referred as emerging urban centers).

Spatial design within informal settlements – as an agent of formalization: The phrase *spatial design* is consciously employed in an attempt to avoid the increasing disciplinary categorization within the task of the reorganization of the physical (environmental) space based on an assumed scale of intervention (see also section 9.3 for detail discussion). It indicates neither a scale nor another sub category in the ever increasing division of the discipline of Architecture: Architecture (interior/exterior and with all its varieties of sub- specializations), urban design, landscape design, environmental design/planning, urban planning, regional planning, country planning, etc. Spatial Design, as a physical design, generally implies a set of conscious decisions taken to decide on the quality of the end product of a certain spatial organization. In the formal process of spatial production, it represents a sub process which starts and ends before construction starts within the linear production process. However, as illustrated in Fig. 8.4 and Fig. 8.5, within the cyclical informal production processes, spatial design shall be viewed as *a continuous process in which conscious decisions are taken to guide actions of reorganizing the physical space in order to respond to needs within natural and manmade limitations*. Though such actions and decisions are taken by all actors within the sphere of spatial production, due to its intrinsic task to respond to natural principles and societal regulations, spatial design as a professional practice has to be induced within an informal setting as a harmonizer of parts to the whole (the whole being the embodiment of the bio-physical and societal systems). Hence, design as a discipline can be taken as the *formalizing (formalization) agent of the informal*.

The need to invent appropriate design methods: Though it is not possible to establish the importance of recommending a particular strand of design method as the legitimate method, it is necessary to promote the introduction of technical documentations of decisions within the informal settlements. Creative ways of documenting technical decisions about construction have to be explored so as to keep the traces of addition, subtraction, safety and standard of qualities, and claims of formalization. Particularly design by figurative drawing has to be explored with inventions of easily communicable representations.

A need to read local natural setting appropriately: For so long, the modern chapter of human civilization, which has been centered in the 'civilized West', has conceived nature either as an adversary to be controlled and dominated or as an open resource to be exploited without limits. Modern architecture and modern urban configurations have been at the forefront in displaying such a position. Without much of a repentant position after rampant local and global environmental crisis, the current practice in spatial design copied in developing countries including Ethiopia, principally reflect the same conqueror position over nature. Large scale infrastructure development and city as well as building designs in Ethiopia, where in most cases the given climatological and topographic situations offer possibilities of healthier relationship with nature, show little regard towards nature's prime cycles such as air, water and material cycles. In the particular area that this research focused on, natural water cycles coupled with material cycle have to be taken as the major force in determining the norms in both architectural and urban scale *space production* processes and livelihood production processes (see Fig.9.2).

9.2.2 Conceptual framework

Based on the observations noted on the research body, it is plausible to assume that in the rapidly urbanizing population of Ethiopia, sites rich in natural resources - such as water and fertile soil - will increasingly be targeted as preferred locations for both habitation and production. These sites, which in most cases are less urbanized corners of the country, need a solid organizational concept which considers the challenges from all the possible dimensions, i.e. environmental, economic, cultural and socio-political. Hence, a comprehensive concept is needed to respond to the general policy environment sketched out above and guide the detail architectural and urban interventions.

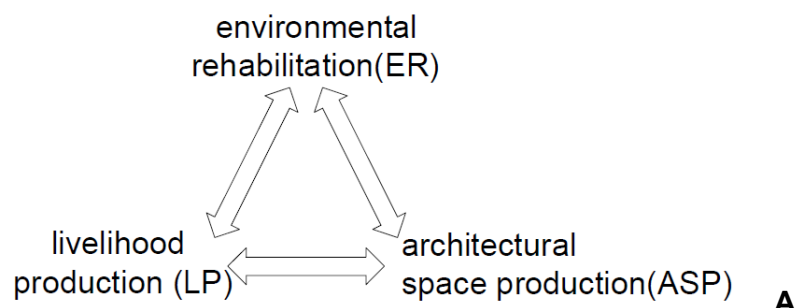
>A concept which presupposes that the scattered settlement and the sporadic urban expansion around sensitive ecological reserves due to its continual expanding demand for land, water and materials, if left unguided, drives the region into an ecological catastrophe.

>A concept which targets to guide such development into dense self-sustaining urban settlements which also collaborate in the rehabilitation of natural ecological systems.

>A concept that acknowledges the emergence and growth of cities particularly as a self-initiated socio-spatial and socio-political concentration of rural settlements, by its nature of complexity and the time scale it require to mature, shall be taken as an open-end process. Hence, it also shall recognize that the success of guiding such processes (to produce preferred centers of human sustenance and progress) depends on the quality of adaptability towards emerging realities.

In establishing the conceptual framework, core compulsory processes are identified; norms and visions are sketched out; and major principles with local intervention guidelines are discussed as follows:

Core processes: Architectural space production (houses and landscapes) and the appropriation of sites for livelihood production (income and food securities) are the two obvious processes which are observable in all emerging settlements around major water bodies. What is often missing is compulsory environmental rehabilitation process (rehabilitation of water and material cycles). These three processes have to be linked to one another locally through the principle of subsidiarity.



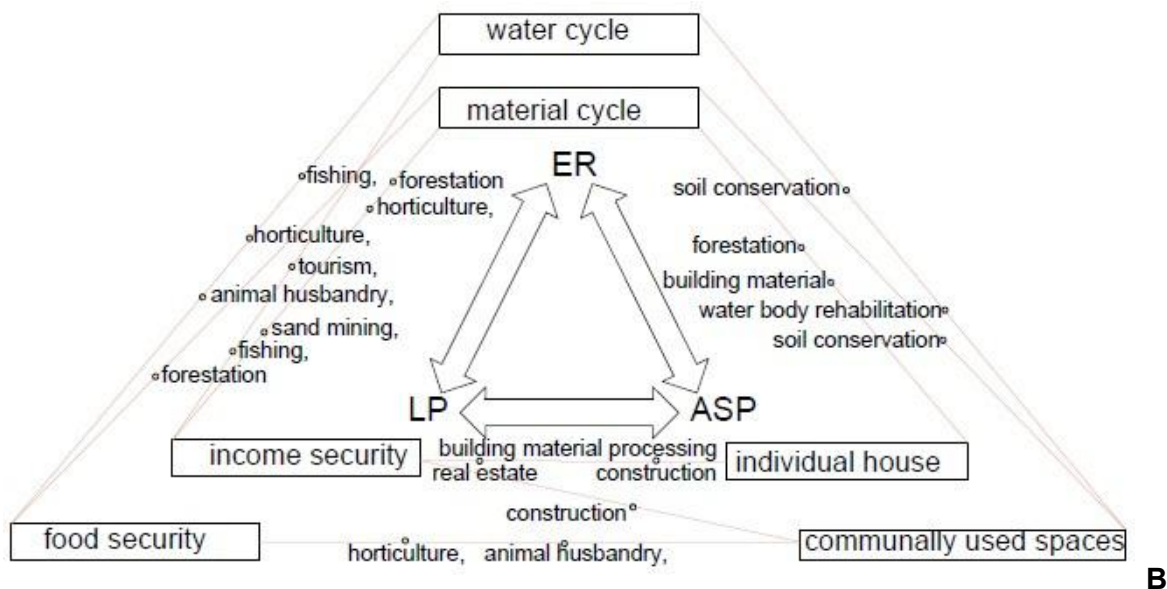


Fig. 9.4 A, The three core processes and their linkage; B, Activities and possible links (source: authors sketch)

Norms and visions: The following are the major points which summarize the norms deduced from the synthesis of findings:

>Emerging neighborhoods around water bodies shall be conceived as units which shall be guided to grow into self-sustaining urban centers resulting from the concentration processes of scattered rural settlements.

>These multiple urban centers shall be guided to be functionally and morphologically interconnected using the same central water body to grow into a larger poly-central urban archipelago - eventually creating hierarchies of centers. (The individual units should be understood as units with their own internal complex processes of both bio- physical and societal systems whose interplay makes the unit to grow into a more complex system demanding interaction with others).

>Despite the existing rural-urban dichotomy, the networked landscape shall be perceived as a single socio-economic expanse with multiple centers. Within this expanse, a new form of cityness shall grow through the processes of concentration rather than a superimposition of preset ideas.

>The development of rules and regulations to guide physical as well as social developments shall be developed in collaboration with local processes with appropriate technical and scientific inputs. It is observed that such collaboratively developed regulatory guidelines have a much more chance of acceptance and implementation than those imposed from the formal governmental structures. Moreover, standards and rules shall create an enabling environment within an allowable general framework. Land use regulation; standards of material usage; density, height and volume regulations; safety

regulations; regulations for construction time schedules; rules of usage of common spaces; etc. have to be empowering local processes than prohibitive.

>Challenging the age long central pillars of architecture (as in the Vitruvian principles – Firmitas, Utilitas, and Venustas) which demands durability and permanence, a type of architecture which allows change and embrace temporariness(in terms of form and materiality) shall be instituted (including fast birth, growth and death of architectural produces compliant with the fast changing social and economic realities).

>Attempts of intentional spatial organization (spatial design practices such as architecture and urban scale space productions) have to give priority to the maximization of livelihood production opportunities linked with the security of basic consumables such as food and water (example: maximization of volume of space/planes/surfaces for horticulture, linking forestation with food and construction materials, linking water body rehabilitation with sand mining and fishing, reinventing architectural and urban spaces to enhance natural water cycles, see tables 9.1,2,3,&4 for more details).

>Its central target of the guiding of the reorganization of people and landscape shall be to ensure safety (against natural and manmade disasters) and security (basic needs through opportunities of livelihood productions) for inhabitants and the continuous rehabilitation process of natural ecological systems – hence resilience.

> Urban production (in terms of materiality) – has to be linked with rehabilitation of the environment, building local economy (expanding livelihood production opportunities), and responding to cultural values (Fig. 9.4.B).

Core Principles: Details of normative actions can be discussed under four categories of principles namely: environmental, social, economic, and holistic-coherence principles.

1. *Environmental principles: (responsiveness to natural water and material cycles, responsiveness to environmental challenges – disease, floods and deforestation)*

2. *Social principles: (cultural/religious sensitivity, inclusiveness, equity in accessing natural resources, contribution in community building)*

3. *Economic principles: (building livelihood production possibilities, building local economy, responding to changing economic conditions of inhabitants),*

4. *Holistic-coherence principles (operational and visual harmony): (responding to natural, functional, visual, cultural and historical setting and needs)*

9.2.3. Guidelines for local interventions

Defining particular objectives within the main principles and identifying the major tasks and possible actors helps to establish and interpret the above listed principles spatially within local processes.

1. Environmental responsiveness as spatial principle: For their own long-term benefit, urban development around water bodies - be it in a small scale neighborhood level or a large scale city expansion projects, have to target to achieve possible harmony with natural systems. The basic natural systems which directly determine urban production around water bodies are energy, material and water cycles. Unlike the early modernist dictum of controlling nature, more and more scientific understanding is revealing that the more an artificial system alters and hinders natural cycles the less its relevance and hence the less its own survival. The more an artificial system is aligned and coordinated with nature's systems (the more it operates as nature itself operates), the more it resonates the resilience (the regenerative qualities) of nature itself. It would be a mere inanity if urban and architectural schemes proposed for most part of Ethiopia fail to recognize and articulate the offer from nature as in comfortable climate, renewable energy, and material resources such as water and soil.

Though the material cycle and water cycles can best be coordinated in a larger scale, the observations on case studies have shown the possibilities of linking the water system to produce and enrich material production - as in the case of Addis Ababa where 'Shenbeko' harvesting, sand mining and soil processing are interrelated in the production of housing. Though it is becoming too difficult to resolve the quality issues of materials injected from the global market, local urban productions around water bodies have to be guided to orient themselves by producing their own material with the natural cycles (forestry) which also feeds local economic cycles.

In urban design practices, water is treated in three separate systems: potable water systems; sewage system (grey water, which often is correlated with material system); and storm water drainage systems. In all systems though, water is a basic natural input into the urban systems hence completely dependent on the natural cycle - hydrological and ecological cycles. In both single building level and neighborhood level, architectural constructs have to be formulated to respond to the natural water cycles (See table III.3 and III.4 for basic technical recommendations).

The following table draws the major objectives and actions necessary to establish environmental responsiveness within the emerging urban centers around water bodies.

objective	Main Action	Further details of actions and <i>spatial implications</i>	Possible actors and possible link with other sector
Rehabilitation of natural water and material cycle	<ul style="list-style-type: none"> >forestation >increasing infiltration >soil conservation >water body conservation >introduce water body as a land use 	<ul style="list-style-type: none"> >increase forest cover of catchment area, banks and shores (<i>identify and allocate land</i>) >introduce water body as a land use (<i>to be protected and developed</i>) >Differentiating FAR and BAR in relation with water bodies (<i>less bar near water bodies</i>) >increasing no-built surfaces and porous surface proportion for natural infiltration >increasing green volume in individual compounds and neighborhood designs standards >Revising FAR, BAR, for individual buildings >Retaining river banks 	<p>Local communities, Universities, research institutes, municipalities/local governments.</p> <p>Forestation as an activity can be linked with livelihood production, building material production and processing</p>
Rehabilitation of water quality for diverse use of water bodies	<ul style="list-style-type: none"> > controlling pollution >inject public functions around and inside water bodies 	<ul style="list-style-type: none"> >differentiate gray waste water discharge from surface water discharges >expansion of waste water drainage system in cities >minimize discharge points and purify (filter) incoming surface waters naturally >popularize water bodies through injecting public functions >create artificial ponds and fountains to celebrate and expand water presence in the city –of particularly highland areas >regulate usage of fertilizers on horticulture fields around water bodies >minimize vehicular access to water body 	<p>Municipalities, Universities, experts and professionals, local communities</p> <p>Such actions can be linked with job creation and the possible means to alter land values around rivers</p>
accessibility of information on water bodies and their immediate areas	<ul style="list-style-type: none"> >Marking of Risk zones >Marking of reserved areas for public goods 	<ul style="list-style-type: none"> > Field research to generate and analyze meteorological data, geographical data, zoological data, etc. >mapping and marking of flooding areas, land sliding areas, disease prone areas, and areas with dangerous insects, reptiles and animals around major river banks and lake shores. >Development of easy graphic signs and symbols to communicate information; and introducing signs and symbols to the public about >marking areas of special functions (research, public uses, etc.) >development of design strategies and details against malaria infestation, flooding, etc. 	<p>Universities, research institutes, responsible regional/local governmental offices</p> <p>Community access to knowledge and information makes it easier for informed individual and collective decisions making (Linked with social responsiveness)</p>
Responding to Material cycles and water cycles through design	<ul style="list-style-type: none"> >Reformulating architecture, Designing with water >Material Spatial organization diagrams, Designing with local materials 	<ul style="list-style-type: none"> >Introducing new typologies of houses, buildings, landscapes, neighborhood layouts and details for easy water infiltration and material recyclability. >Introducing means to increase density without consuming land (<i>exploring vertical density with local materials and adaptable techniques</i>) 	<p>Cooperation between Universities and local communities of informal settlements, between universities and municipalities and local governments</p> <ul style="list-style-type: none"> >linked with visual and functional relevance >linked with building local economic

Table 9.1 Detail objectives, actions needed to be taken and possible actors within environmental principles

2. Social responsiveness as a spatial principle: Social acceptability of any spatial scheme by inhabitants depends on inclusiveness of the decision making process and the relevance of the proposed scheme - which is a function of its responsiveness to actual bio-physical and societal needs. The inclusiveness of decision making processes can also serve as a way to ensure (at least partially) that societal needs are represented in the decision making processes.

By qualifying and empowering the exiting local decision making processes (illustrated in Fig 8.7) by both conferring recognition (Fig. 9.5B), and with proper scientific and design inputs (Fig. 9.5B), it is possible to install a more efficient and acceptable processes of decision making. As a governance principle, subsidiarity can be adapted as a model which suits to the current self-organization of neighborhoods.

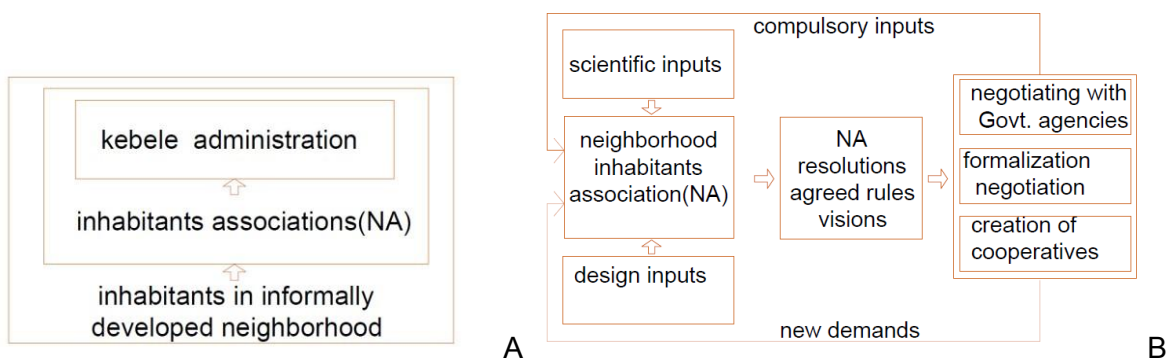


Fig. 9.5. A, Possible hierarchy operating with Subsidiarity principle for a more efficient and acceptable system of governance (NA representing inhabitants through elected elders, religious leaders, representatives of cooperatives and social organizations such as idir and iqub within the neighborhood) collaborating with formal administrative structure(Kebele) on issues demanding the interference of the latter; B, Enriched decision making process through inputs(scientific inputs being given from universities and research institutes and design inputs being offered from either universities, professional bodies or NGOs).

Regarding the social relevance of spatial schemes around water body, both as a material resource and socio-cultural entity, water as the central natural currency has to be treated as an organizing element. As observed from case studies and general background study, water bodies have a far more relevance in many places in Ethiopia as a spatial referencing element for religious and major social functions (see table 9.4 for technical recommendation).

As the contest to water and areas around it intensify, neighborhoods around water bodies can fall into exclusivity. The danger of being closed from external interactions and the danger of internal segregations are both serious hurdles for vitality and harmony. Any spatial scheme must intentionally target to promote openness to external interaction and ensure equity in accessing the water body. It also has to sensitively negotiate with cultural and religious norms in areas where exclusive rights on water bodies are claimed by them.

Objective	Main Action	Details of actions and spatial implications	Proposed actors and possible link with other sector
Recognize and empower local processes to ensure fair and participatory decision making	>Install the principle of subsidiarity in decisions related to spatial development >install professional inputs at the neighborhood level	>formation of NA with representatives of various cooperatives and associations within the neighborhood >inform NA decisions related to spatial issues with design and scientific inputs >establish norms and terms of collaboration with Kebele	Elders, religious leaders, representatives of cooperatives and associations within the neighborhood, kebele, Univ.
Ensure equity in accessing natural resources	>preserve free access lines to water fronts and water sources,	>design inputs in marking access lines and spaces for communal uses >design inputs in maximizing access to water body	Neighborhood association Kebele admin. Design Asst.
harmony and Openness	>resist segregation within the neighborhood >promote openness for exchange and further densification	>ensure accessibility to and from the outside, >avoid dead-end and excessively privatized corridors, >promote further overlap of private and public uses of spaces	NA, Design inputs with technical innovations for further densification (Univ. and research institutes)
Responsive to Cultural and religious needs	>articulate and respond to the r/ship of the spatial requirements of religious and cultural functions with the water body	>identify cultural and religious functions which permanently or seasonally appropriates the water body >negotiate details needs of spatial form and structure >study possibilities of mixing/overlapping/shifting possibilities with other commercial/public/production functions	>design input From spatial design professionals >elders and religious leaders

Table 9.2 Major objectives, actions needed to be taken, and possible actors within social responsiveness as a spatial principle

3. Instigating and promoting locally embedded economy as a spatial principle: If livelihood production is the prime factor to draw people to water bodies, then it is evident that the spatial organization must target to maximize opportunities for local economic activities by developing value-chains on local produces. Other than its basic biological services - drinking and hygiene, which can also be translated as an economic activity, water as a body and as an element, coupled with the land around it, can be appropriated for various economic and social activities: irrigation(food production), transportation, recreation facility, sport facility, fishery, regulating climatic comfort (humidity particularly on highland climates), security (defining and protecting areas - fencing), energy production (small scale power generation), inputs for various industrial productions, visual element on landscape, etc. Neighborhoods around water bodies have better opportunity to explore some or all of the possibilities offered based on their setting.

The most obvious activities observed on case study sites themselves, if properly appropriated, reveal a range of possibilities. Identifying particular potentials on the given site and reorganize it for better coordination with environmental rehabilitation shall be

the major target of spatial design exercise which aims to contribute to the guiding of emerging neighborhoods for the better. Table below sketches out the objectives, major actions to be taken, and possible actors.

Objective	Main Action	Further details of actions and spatial implications	Proposed actors and possible link with other sector
>strengthening local food production and processing	Explore possibilities in >horticulture >forestation >fishing >animal husbandry >small scale food processing	>maximize possibilities of horticulture and other urban agriculture >integrate irrigation based agriculture in both architectural and urban spatial schemes >link forestation with possible food security cycle (fruit) production – in private courts and common areas. > basic food processing and >spatial design alternatives to coordinate water cycles/waste cycle/ in agriculture and animal	Local communities, Universities for design and scientific inputs, research institutes for local flora and fauna, municipalities/local governments for land allocation. >NA
>stimulating local construction and related manufacturing industries)	Explore possibilities in: >forestation >sand mining >bamboo/other grasses >further processing workshops	>introduce forestation as an economic activity, link it with building material production(wood, Bamboo / 'Shenbeko' and various grass types) >promote building material processing workshops to qualify local materials for higher standards through design and scientific research inputs >equip local construction teams/firms with new techniques	Local communities, NA, Universities for design and technical inputs, research institutes for forestation inputs , municipalities/local governments for land allocation.
>exploring possible economic activities in tourism, sports and leisure, et	Explore Possibility to qualify water body for >tourism >leisure and sport activities	>explore potentials of tourism and leisure activities around water bodies >explore means of qualifying water body and water fronts for business activities (cafeterias, swimming, and gardens) through purification and studies canalization >explore potentials and spatial demand of fishing	Local communities, NA, Universities for design and technical inputs, research institutes for forestation inputs , municipalities/local governments for coordination of water body with other communities
Densification and Unleashing local real-estate	>deepening tenure security to allow real-estate >establishing the culture of storied living units	>densification potentials through technical innovations (building storied houses with local materials) >introducing property transaction contracts for storied housing (existing contracts rely on land transaction)	>universities with new research inputs >local communities and professionals >regional and federal governments >NA
>Exploring (technologically) advanced economic activities	exploring technological innovations in: >construction, >manufacturing >services >energy	Coupling advanced technologies with local processes >digital technology for banking and insurance (mobile banking), >digital technologies for manufacturing and construction >inventive decentralized energy production	>universities with entrepreneurship ... extending to inhabitants
Promoting local and regional exchange	>install easy mobility, >articulate specialization based on relative advantage >local energy harvest	>explore possibility of water based mobility as possible industry to grow >identify output locations for regional exchange(locations of stores and transportation facilities) >facilitate easy access for loading and unloading of produces >direct energy for mills and other small scale cottage industries directly from running waters >small scale hydroelectric generation for larger collaboration with neighboring settlements	>private entrepreneurs, Universities, local governments, NA >Universities, NGO

Table 9.3 Major objectives, actions needed to be taken and possible actors to promote local economy

4. Holistic-coherence as a spatial principle: Spatial design, by definition, has to be understood as a holistic response and a systemic operation to organize events in space. As indicated on the conceptual diagram (Fig, 9.4A), the integration of livelihood production, environmental rehabilitation and architectural space production processes creates new frontiers for research and practice in spatial design fields. Other than the environment and the local economic activities, which demand the space production processes to be aligned to; cultural, religious, and visual (aesthetic) needs characterizes the basics of architectural space production.

However, informed by the existing (observed) informal practices, the following can be considered as the summary of possibilities to which spatial design as a tool can contribute to the coherent development of the emerging urban centers around major water bodies in Ethiopia:

>Spatial design as a tool to cultivate livelihood activities through supporting local economy by spatially integrating and qualifying local productions (food, construction materials & real estate) and instigating and qualifying other economic activities in the neighborhood spatial layouts which are based on water bodies such as transport, tourism and leisure;

>Spatial design as a tool to rehabilitate the fragile environment by generating methods of integrating urban production and livelihood production with environmental rehabilitation;

>Spatial design as an input to empower local decision making processes by providing technical and strategic spatial organization alternatives and scenarios.

Further than coordinating technical needs, spatial design is also often tasked to respond to visual (aesthetic) demands. Unlike cities of the past, such as Lalibela and Gonder, water, as a body, is not explored as a design element (even as a decorative landscape element) in Ethiopian contemporary urban landscape. Understanding its natural properties, forms and processes within its various cycles helps to bring one of the most basic elements of nature into the vocabulary of spatial design. Be it on a neighborhood level or a building level, the element water has to be re-introduced into the everyday architectural dialogue and production in Ethiopia.

The attempt of addressing the challenge holistically invokes a temptation to formulate a method of generating a golden rule of proportion of spatial allocation for the various needs listed. Though such idea is against the very concept of empowering local processes to decide on lists of needs and priorities, in an attempt to respond to the impending needs observed, a general recommendation (rule of thumb) is composed in the attached summary table(summary table III.3 and III.4) targeting awareness building, capacity building, and community building. Following the rough categorization of areas into four in the preceding chapter, the proposed points are assembled to address the emerging settlements on upstream river banks, downstream river banks, fresh water lake shores, and salty water lake shores.

Nevertheless, the following is also proposed as a general possible conceptual frame of the (1) biophysical and (2) societal systems needed to guide emerging settlements around water bodies in Ethiopia:

1) Porous Dense neighborhood - within polycentric forms of centrality: a concept promoting higher density of people and activities (flows of goods and information as indicated on Oswald & Baccini 2003) but with an urban/architectural structure which do not inhibit natural cycles. Density is inevitably among the chief contemporary necessities in urban areas emerged due to population growth within a landscape of a depleting natural resource. It is also a genuine operational demand of urban centers in order to optimize physical infrastructures such as mobility, water, energy, data, etc. Higher density has to be perceived not only as a higher number of households per area, but also a larger intensity of events per space. Spatial reorganization for higher density has to presuppose challenges associated to it such as disease outbreak related to waste management and hygiene; fire, floods, earthquakes, etc.

Nature and its cycles is what activate space for habitability and sustenance of human life. The materiality of spatial design must be composed of the very elements of nature (water, air, soil, light and plants). In both collective(urban and neighborhood) and individual house levels, nature and its cycles have to be considered as the major forces which dictates design processes and decisions as the foundation for urban metabolism (including water, food, energy, material cycles). In spatial design, the balance in the urban ecology, particularly basic natural cycles, has to be given priority.

Many Ethiopian cities have favorable outdoor climate and in many of Ethiopian rural culture, life happens primarily outdoor (defined indoor spaces are minimal). Both in collective assemblages of a neighborhood and individual buildings in urban areas, the idea of open spaces shall be reintroduced and coupled with natural cycles. It can use the climate as a resource and make structures porous for natural cycles to processes. It also optimizes investments on built space.

2) Community (social and economic solidarity): Addis Ababa has been referred as a unique African non-colonial city whose structure triumphantly succeeded in refusing the intentional segregation concepts imposed by formal planning through continuous informalization. Its balanced spatial mix of social groups within neighborhood is rewarded by a commendable low urban crime rate. Ironically recent market forces are directing it otherwise. Mixed and balanced diversity and symbiosis among social groups (economic, ethnic, religious groups) expressed in spatial operations are collective qualities which have taken ages to develop and such treasures have to be nurtured and consciously cultivated in emerging neighborhoods through conscious spatial designs. Signs of spatial segregations shall be taken cautiously and their root shall be differentiated among functional, social, or economic segregation in order to respond to those which lead into social tension. .

Attempts to create communes and communities from top-down directives in Ethiopia have had devastating historical precedent. Such projects have to be left for a more organic bottom-up and informal processes. However, conscious spatial organizations of neighborhoods have to facilitate such formations by promptly responding to its spatial needs. Communities on the other hand, have to be recognized and empowered to administer themselves and manage their spatial and material resources. Their economic solidarity can be reinforced by establishing the architectural space production based on the local material cycle and labor market. Spatial design layouts can also relate local food production and environmental rehabilitation with architectural spaces. It must be recognized that most of contemporary construction materials injected to local processes (cement, iron bars, aluminum plates, tiles, paints, glass, etc.) are technically distanced from natural and local economic cycles and cultural associations of most societies in Ethiopia.

Objective	Main Action	Details of actions and spatial implications	Proposed actors and possible link with other sector
Responding to Bio-physical systems standards	Develop basic spatial standards for communally used spaces within the NA	>defining and establishing sizes of communally used open spaces (Various hierarchies and width of streets, and open spaces) >identify possible overlaps and formulate optimized sizes >identify the possible overlap between public and private spaces	NA, local municipalities(inputs from local cities), Universities,
	Develop and approve standards of water use(for production), discharge, cycles and water quality within the house hold and in the neighborhood	>water use for horticulture(wells and direct pumping) >water for animal husbandry (wells and pumping) >Water for other purposes	Universities, NA, research institutes, inhabitants
	Identify key plantations relevant for rehabilitating water and material cycles	>Mark sites of forestation around water bodies > (identify green elements which can also be linked spatially to address pollution(filtration)	>inputs needed from Regional offices of forestation/environmental protection offices
Responding to Societal systems and standards	Local economy	>Identify particular potentials of local material production and processing (wood, bamboo, sand, soil, grass, etc.)	NA, University, local experts/elders, local agriculture experts, NGO
	Religious and cultural norms	>discussions and open forums on cultural norms >discussion with religious leaders about religious norms >identify spatial needs and negotiate with other needs >find possible overlaps	NA/religious and community leaders, designers(professionals, NGO)
Responding to Visual quality demands	Assisting through visual design tools for easier decision making of NA assembly	>Producing alternative scenario with visual aids for consideration in decision making by NA >injecting quality enhancing projects(landscapes, water fronts, on community spaces, private houses)	Design inputs, NGO, universities,
	>water as a land use	>for established neighborhoods and cities near water bodies, attempts to introduce water bodies into the everyday >ponds, fountains, public water points celebrating water	Design inputs, municipalities, universities, NA,

Table 9.4 Major objectives, actions needed to be taken, and possible actors to address the whole

9.3. Education and practice

The tangible dimension of space (architectural space) is where all physical events happen – the ritual of birth, the struggle and celebration of life or the veneration of death and even the contemplation of the after death. It is also where social space is germinated. And its reproduction is far too important social, political, and economic activity to be left for an over simplified technical process. The urban construct particularly, where the

density of people and activity is higher, is the most complex ecology and needs an extra sensitivity in understanding and guiding its spatial manifestations in both academic studies and professional trainings.

As it is discussed throughout this research document, guiding the emerging urbanization in Ethiopia demands appropriate interventions in both top-down and bottom-up processes. Referring to education within the context of rapid informal urbanization involving ecologically sensitive areas, it is essential to address both university level academic and professional studies and trainings at various levels particularly addressing inhabitants and their self-organized associations.

Unlike the prevailing rural culture in Ethiopia, where one is supposed to deal with reality individually through the basic knowledge and norms inherited directly from parents and local society, the urban construct is where a collective¹ wholeness is cultivated by delegating (entrusting) varied tasks for individuals (diversified trade and division of labor as the main characteristics of urbanity). Such diversification promotes creativity and education (see Jacobes 1969). Urban areas are where the density of new ways of livelihoods is created every day. Thus, an urban society is deemed to collectively nurture education for its own sustenance and refinement – either (1) through **trainings**² (formal or informal) - to learn various created skills, methods, and tools for daily operations or (2) through a deeper academic engagement (**education**) - to understand better the increasing complexities of both local and global realities; respond promptly to pressing challenges; and also project the future more acceptably.

Due to the obvious lack of urban tradition in Ethiopia, particularly regarding the dangers and benefits of building and settling around water bodies, neither an instituted traditional training nor an academic culture has been developed concerning the intricate relationship between urban systems and aquatic systems. Hence inhabitants within these informally organized settlements need to be informed and trained on basic necessary skills. Trainings can be organized as workshops and curriculums and training manuals can be prepared in collaboration with universities, NGOs, locally active religious institutions, and local elders. Nevertheless, the following can be taken as possible lists from which particular courses of trainings manuals and training kits can be prepared and adapted to the need of particular site condition:

- >water cycles, material cycle, and aquatic ecology;
- >maximizing livelihood opportunities;
- >risks and preparedness (flooding, landslides, water born disease, etc.);
- >easy techniques and basic standards of building around water;
- >food processing (fish, vegetable, etc.) and marketing.

Regarding education, particularly higher learning leading to professional practices in spatial design, the condition in Ethiopia demands a serious intervention. Though the making of spaces for relationships in life (architecture) is considered in many vernacular cultures as an art of the land (particularity and context), its major direction around the world was turned around (by the infamous modernism) to become a universal prescription free from tradition and other particularities. The foundations of schools of architecture and their curriculums in post-colonial Africa since the 1950ies, including in Addis Ababa University of Ethiopia, was heavily influenced by the seasons hit of

modernism and its attempt of simplification of otherwise complex realities of life. By excluding subjects related to context (local culture, local history, socio-politics and urban ecology), which could have helped to understand the complex setting of life, spatial design education was reduced to the study of typologies. Buildings and cities were taken as mere objects which can be produced for categorized activities of life – as in zoned cities and ‘machines for living’³. Generally architectural education in Ethiopia was left for unrealistic assumptions divorced from local realities and based on international norms which often have no corresponding relevance outside university campuses. Even after modernism (in architecture) was declared dead, architectural education and practice in Ethiopia affixed itself as a re-creator of reality than being a force to inform and reform existing reality. The trend is the same today in almost all of the newly founded schools and departments of architecture throughout the country. Though further research is needed to have a clear view on this issue, the author – being a long time faculty and being involved in major reform projects of the only (prior to 2009) institute of architecture and planning in the country – have observed the same curriculum being handed out for almost all schools.

As in many emerging economies, the pressing demand for skilled human power forces educational strategists to incline towards mass production – turning education into mere training based on manuals. When education in spatial design, particularly architecture and urban design, is engineered as training, and when such trainings are targeted to narrow down the attention of the trainees to a certain specific skills (in an attempt to create efficiency) then basic knowledge gaps and dangerous voids of understandings would be created in all levels of operations – be it practice or policy formulations. Such inclinations are observed in the past decades or so in Ethiopia. The massive expansion of higher educational institutions across the country, though commendable for its enrollment achievements, has thinned down the quality. Students in spatial design (architecture, urban design and planning) are deprived of basic academic depth and are partially exposed only to technical skills related to drawings and some procedural training in planning. Such imbalances distort the needed professional profile and produce professionals who are not able to read and translate contextual realities. Eventually such trends would cost the emerging economy and damage social systems and the fragile natural environment.

University level education in spatial design fields in Ethiopia have to be re-evaluated in the light of the impending challenges confronting the country. The colossal challenge of environmental rehabilitation and the massive demands of reorganization and urban production associated to rapid urbanization demand a bold and committed institutional stature. At the very list, the established institutions which are offering studies in spatial design have to restructure their curriculums to ensure that their students would get a fair understanding of *the mechanisms of nature* and *the operations of culture* in addition to the regular traditional academic course structure. A balanced understanding of the biophysical systems and the societal systems has to be taken as a prerequisite to further into professional studies and professional practice. Table below sketches some of the challenges and proposed recommendations.

Particular area in higher education	Major challenges	Observed challenges in practice	Proposed recommendation
Professional profiling	Excessive sub-specialization	Indifference to the whole – urban ecology; difficulty to read phenomena and difficulty to respond to complex realities; professional exclusivity and increasing lack of horizontal communication	Introduce holistic studies within spatial design disciplines on bio-physical and societal systems before students branches out into various fields of studies Introduce compulsory studies to establish general understanding of the urban ecology
Curriculums – study structures and courses	Excessively university based, career focused	Less service oriented more market oriented, gaps in professional services for the underserved - the majority of the country(informal inhabitants, the urban poor, the rural majority)	Introduce courses and institutional mechanisms for further active collaboration directly with communities, introduce joint projects with communities as platforms of learning and service
Contents, method, and materials	Distanced from actual reality in content and method, lack of literature on local reality	Misreading of local environmental, economic and social phenomena and disability to see quality and potential within the existing local and vernacular realities	>Reinvent contents and methods to respond local realities >encourage research and publication on local materials, and local urban processes.
Lack of open forums for discussions and debates	limited media of communication of research output within and outside of the university	Major decisions in urban development are taken without research inputs. Studies and research outputs are not translated to be applied.	>Academic institutions must take the lead in organizing discussions forums bringing together academics, decision makers, practicing professionals and inhabitants

Table 9.5 Challenges in the education of spatial design professionals and proposed recommendations

Notes

1. Collectivity is a central concept when referring to urban inhabitants which takes institutional forms enabling inhabitants to share resources much more intensely than a rural construct.(see Ostrom:1990 for the evolution of institutions for collective actions).

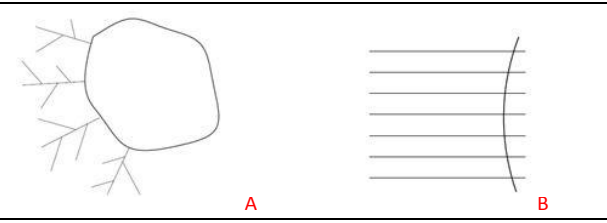
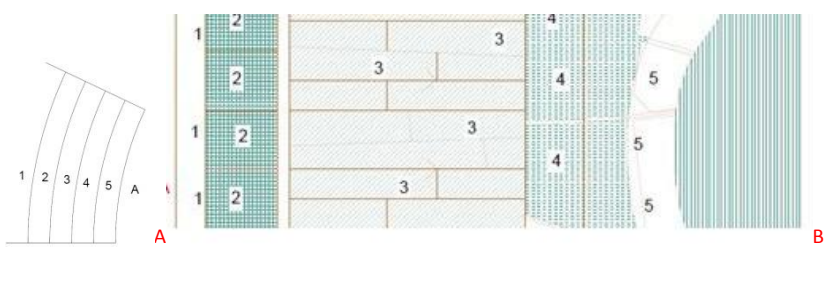
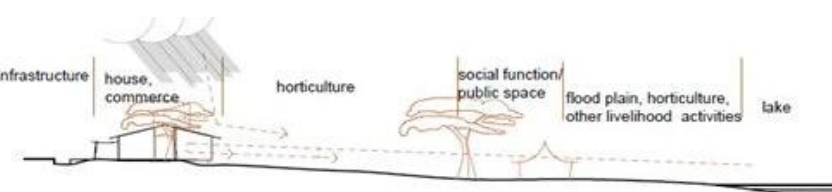
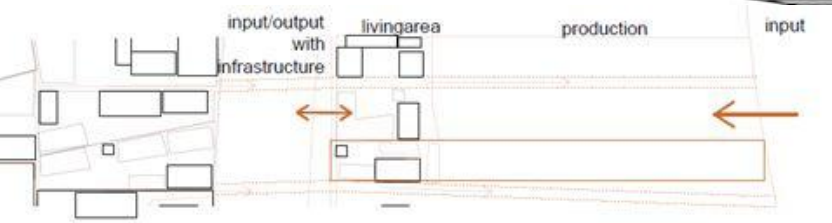
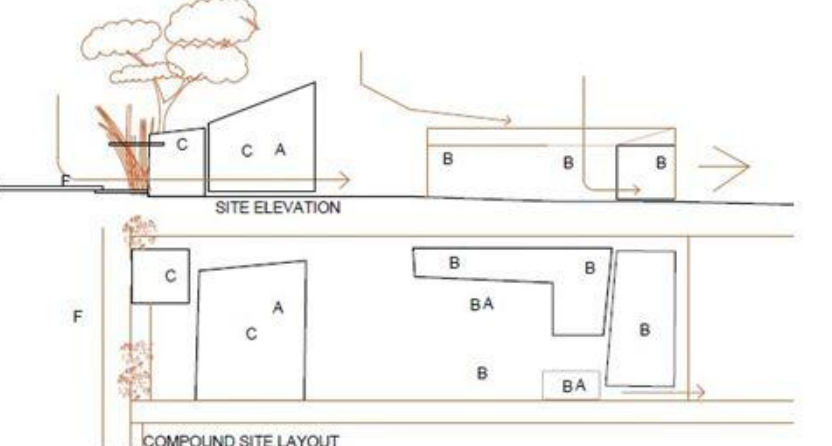
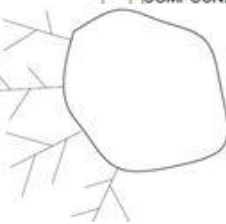
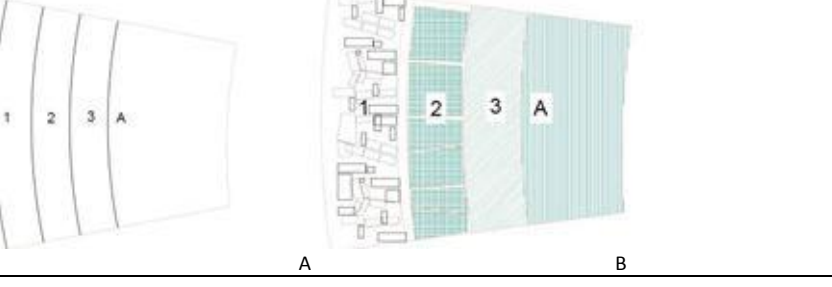
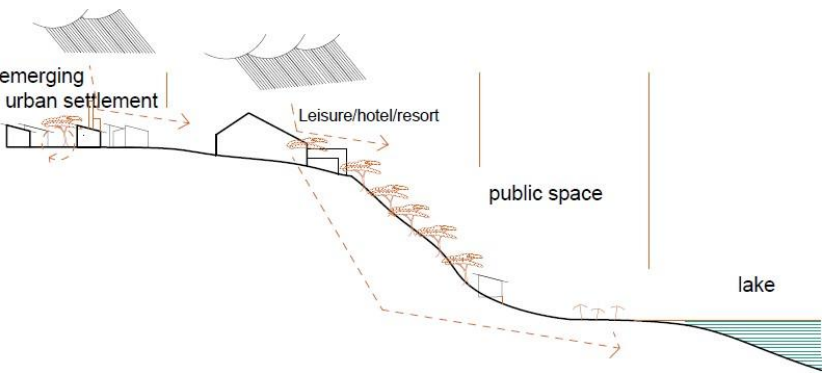
2. Training for an urban inhabitant is a way of life. A city is a constantly changing organism and its inhabitants have to adapt to it through a continuous formal or informal training. Two decades ago the minimum average know how for an urban inhabitant in major cities of the world was to be able to read signs and symbols but now the expectation is raised to knowing how to use a mobile phone and a computer. Having an email account or an online operation are becoming basic skills expected from a city inhabitants.

3. The radical ideas of Le Corbusier-probably the most influential architect of modernism, were given full expression in his 1923 book Versune Architecture ("Towards a New Architecture"), an impassioned manifesto which is still the best-selling architecture book of all time. "A house", Le Corbusier intoned from its pages, "is a machine for living in."

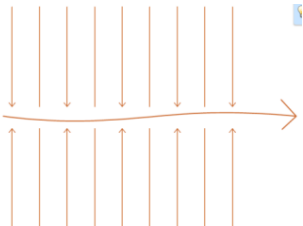
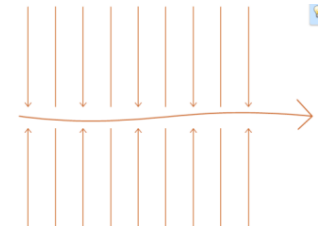
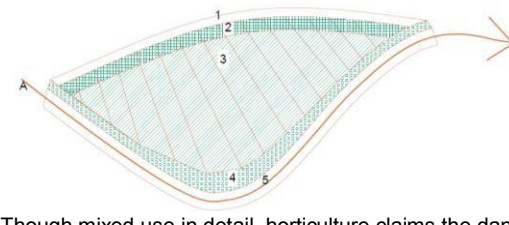
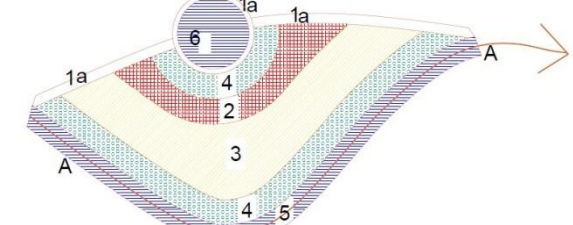
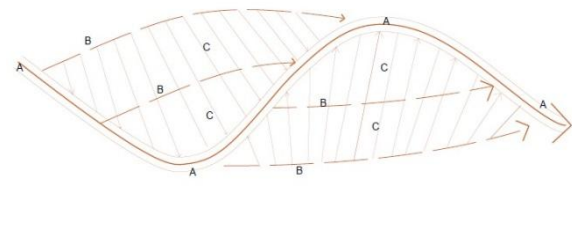
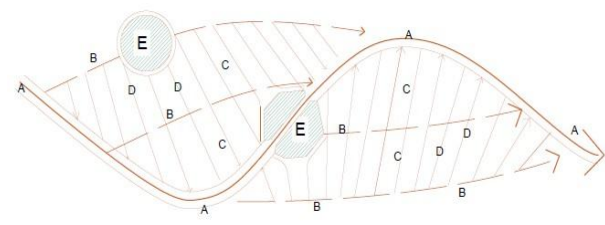
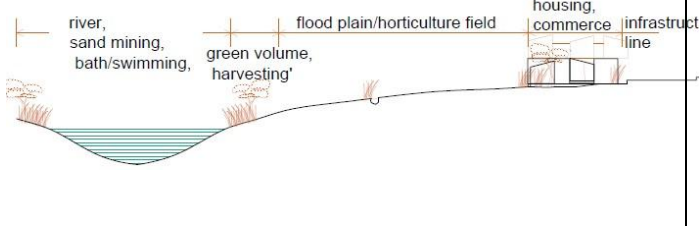
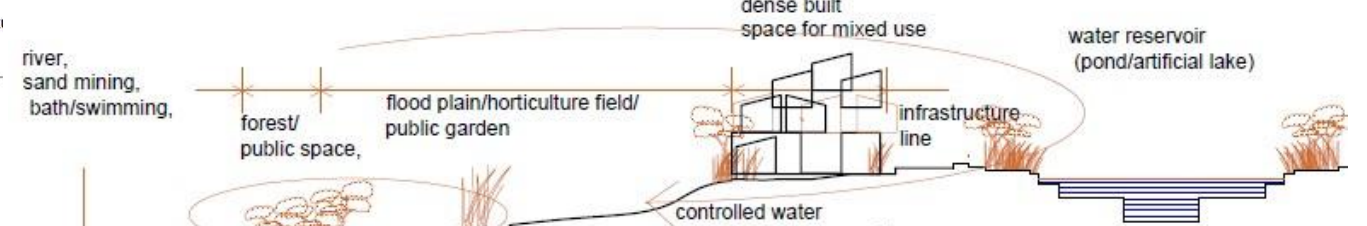
Summary table III.1– Overview: synthesis of findings –emerging spatial patterns around rivers

Category		Findings		possibilities for adaptations	remarks
Site location	Pattern category	Pattern form	Major elements		
Rivers banks - lower stream	basic form – spatial organization		Major River line Irrigation channels	Interpretations of natural water ways to generate layouts of neighborhoods on sites around rivers – particularly on flood plains	current formal planning, parcels are made irrespective of river water lines
	Major water lines and irrigation parcels		A)river line B)Diversion channels making use of natural slopes C)plots on flood plain for horticulture production D)irrigation channels lines defining individual fields and compounds	Gravity and slope as the main forces to guide pattern generation targeting livelihood activities (in this case horticulture based on irrigation). However, the approach can be adapted for other activities.	Discharge channels can also be used to control flooding
	Land use patterns		1)Access roads and channels 2)Houses, commercial outlets 3)Flood plains for horticulture (except for rainy season) 4)Bushes and trees(can also be takes as permanent green elements) at the edge of rivers, 5)Spots for sand/pebble mining and Other activities A)river line	Water body as a land use; urban agriculture as a part of public space distinct from green cover.	
	Land use detail /section (topography and land use)		Arrow showing input and output accesses Following water movements and redirecting to reach further up to claim more production land, linear and defined strands of irrigation land extended to define living and commercial areas.	Use of water ways as a major element to generate layout of neighborhood and individual plot geometry; Use of plantation to guide water and filter dirt; Use of natural slop and gravity to guide water Use of waste as fertilizer Further densification of settlement by building story buildings Intensification of horticulture practices	
	Land use detail /typical layout				
	Building pattern within flood plains and immediate area		Typical layout A.main house B.extensions (rental rooms) C. Space for commerce D.Plantation for protection against overflowing channel E. diversion channels F. infrastructure access line >all drainage are directed towards the river; Arrows showing water movement directions	Mixed space use and organization (flexible) Particular location at the edge of the flood plain Predominantly uses materials available on site Low-tech and continuously evolving /changing(incremental) Emerging use of imported materials	
Rivers banks –upper stream	General pattern		Deep cut valleys and lines of streams natural drainage lines dominating the topography and patterns of footpaths. Exposed surface due to deforestation enhances the deepening of the gorges. Housing lots are built sometimes blocking the natural drainage lines. Arrows showing water movement	natural drainage lines can be rearranged and adapted to generate pattern discharge points to the main river line must be minimized and controlled for purification	
	Typical Land use pattern		1)infrastructure lines(distanced from river valleys due to difficult topography 2)Houses, commercial outlets, 3) Horticulture on smaller plains within the deep valleys. 4)Bushes and trees(can also be takes as permanent green elements) at the edge of rivers, 5)Spots for sand/pebble mining and other	Reinforcement walls are built to protect land sliding in some areas, hence predominantly appropriated informally by the low-income for housing	Less infrastructure lines around rivers due to difficult topography
	Land use, building – site relation		Religious activities, buildings on difficult site conditions, horticulture on small spots on available plains. (Arrows showing water movement)	Terracing, better use of topography, stabilization of ground, reforestation and rehabilitation work on landscape.	Land slide, collapse of houses, and related risks are associated with the settlement

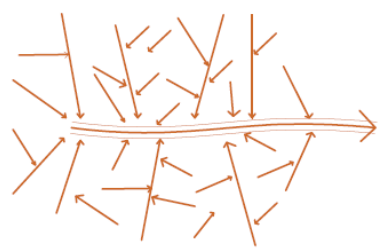
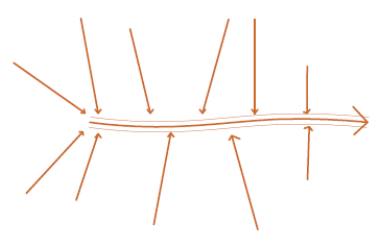
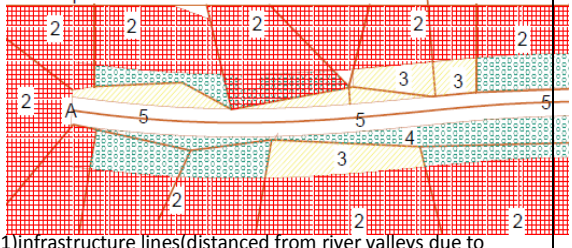
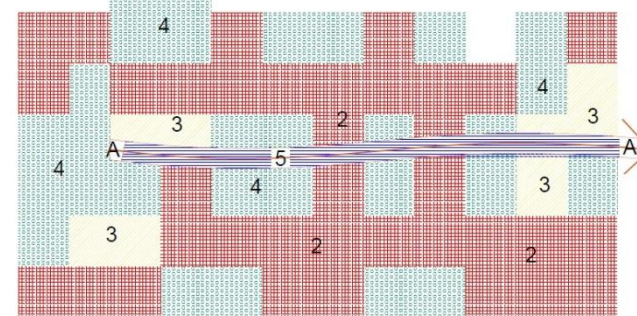
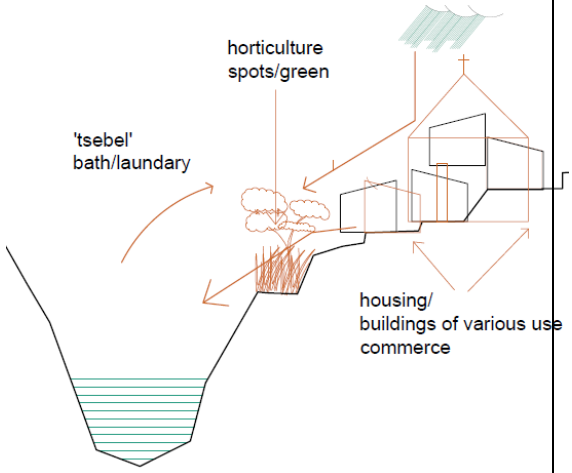
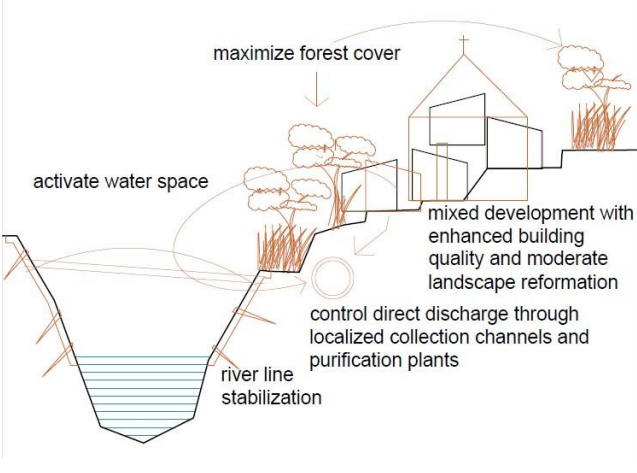
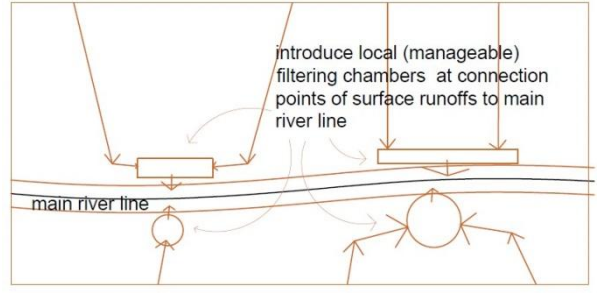
Summary table III.2– Overview: synthesis of findings –emerging spatial patterns around lakes

Category		findings	possibilities for adaptations		remarks
Site location	Pattern category	Pattern form	Major elements		
Lake shores – fresh water (water which can be used directly for agriculture)	Basic form – spatial organization		A. Lake and drainage valleys (water ways) defining the topography of catchment area (large scale) B. Lake line and basic pattern of plots for horticulture (based on irrigation using small pumps)	Interpretations of natural water ways to generate layouts of neighborhoods on sites around rivers – particularly on flood plains	In the current formal planning, parcels are made irrespective of possibilities of irrigation lines
	Land-use patterns		A, general pattern, B, detail: 1) Access roads. 2) Houses, commercial outlets. 3) Horticulture fields. 4) public space and major tree lines (can also be taken as permanent green elements) at the edge of lakes, 5) 'bahrshesh meret' extension for horticulture in dry season and Spots for sand mining, grass harvesting, fishing access and related activities. A) Lake edge	Gravity and slope as the main forces to guide pattern generation based on livelihood activities (in this case horticulture based on irrigation). However, the approach can work for other activities too.	
	Land use detail /section (topography and land use)		(arrows showing water movement directions)	New elements to be incorporated as land use elements: water body, and urban agriculture as distinct from green cover.	
	Land use detail /typical layout		Use of plantation to guide water and filter dirt, Use of natural slop and gravity to guide water Use of waste as fertilizer	Individual parcels can be allowed to further densify without compromising	Similar with downstream pattern on flood plains
	Building pattern within flood plains and immediate area		Typical layout A. main house B. extensions (rental rooms) C. Space for commerce F. infrastructure access line >all drainage are directed towards the horticulture field and ultimately towards the lake	Mixed space use and organization (flexible) Particular location at the edge of the flood plain Predominantly uses Materials available on site Low-tech and continuously evolving/changing (incremental) Emerging use of imported materials	Similar with downstream pattern on flood plains
Lake shores – leisure sites (salty water, rocky and hilly sites)	General pattern		Deep cut valleys and lines of streams natural drainage lines dominating the topography and patterns of footpaths. Exposed surface due to deforestation enhances the deepening of the gorges. Housing lots are built sometimes blocking the natural drainage lines.		
	Typical Land-use pattern		A, general concentric pattern B, Detail of land use pattern: 1) settlement with mixed residential and commercial functions 2) resort hotels 3) water front – public space, sand miners, fishers, etc. major tree lines A) Lake	segregation and zoning, denying the public access to natural resources has to be reconsidered	between privately developed resorts versus the public in accessing water fronts
	Land use detail /section (topography and land use)		(arrows showing water movement directions) Segregated zones of informal settlements, resort developments, water and reserved spaces	Preservation of the public space (in most of the water fronts) Better Inhabitants can well be beneficiaries if their cooperatives further claim areas with direct access to water for service giving and production activities	Government bodies seem to be passive in regulating the claims of investment projects expanding and claiming public access points and areas of local inhabitants

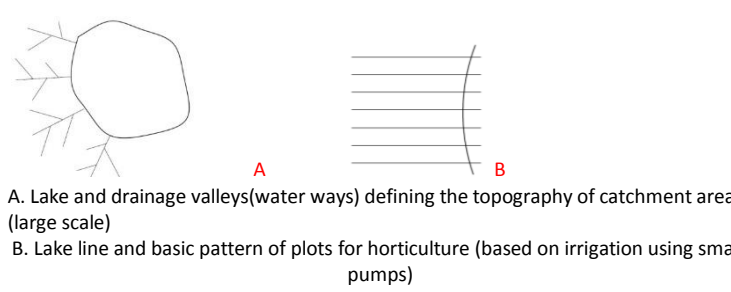
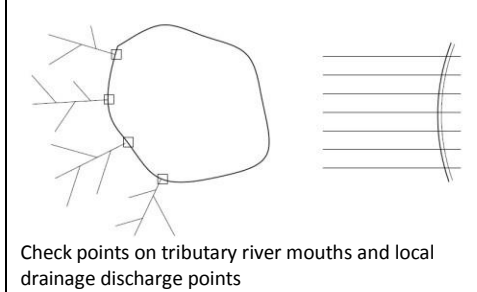
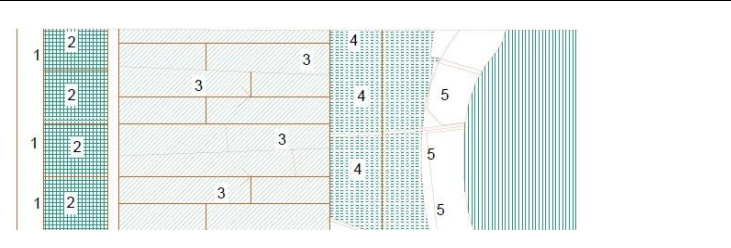
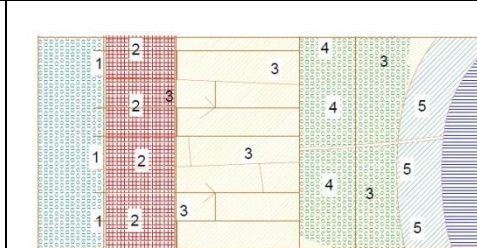
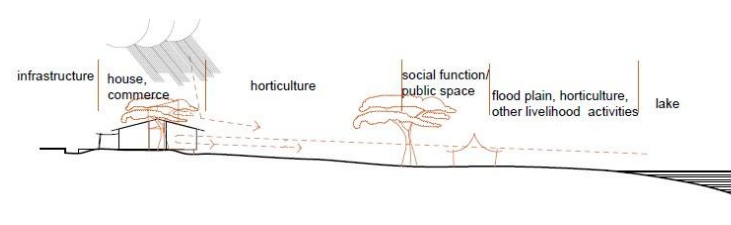
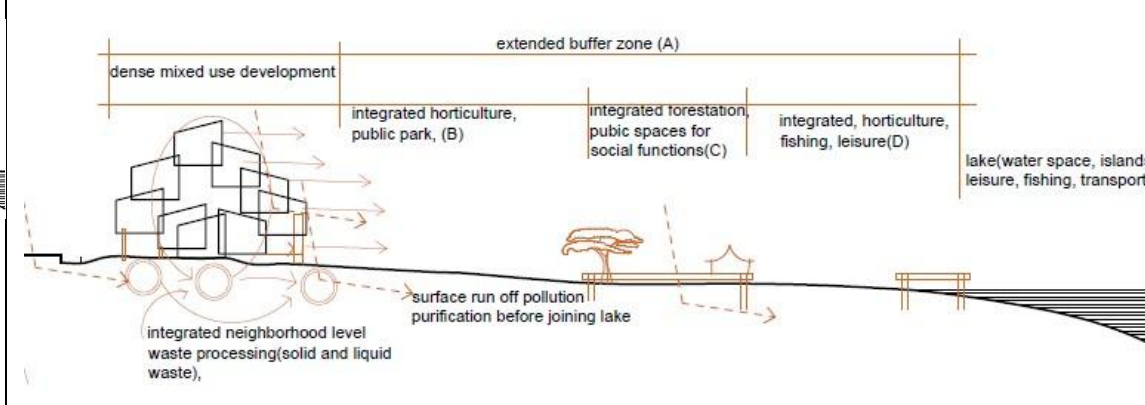
Summary table III.3A– Overview of recommendation of spatial patterns for settlements on downstream river banks

Category		existing	recommendation			remarks	
Site location	Pattern category	Pattern	Recommended pattern form	Major intervention possibilities for existing neighborhoods	Major point for new settlements designs	Introduced elements	
Downstream river banks	basic form – water lines and spatial organization	 <p>Prevailing pattern in areas where horticulture (based on irrigation) is the major livelihood production</p>	 <p>Form functions following natural drainage pattern and irrigation pattern</p>	<ul style="list-style-type: none"> >Keep the existing pattern if it respects natural flows and topography; >Reinforce forestation on upstream sites 	<p>Pattern form to follow natural topographic formations unless proved risky and impossible</p>	<p>Major River line Irrigation channels Interpretations of natural water ways to generate layouts of neighborhoods on sites around rivers – particularly on flood plains</p>	<p>current formal planning, parcels are made irrespective of river water lines</p>
	Local Land use patterns	 <p>Though mixed use in detail, horticulture claims the dangerous flood plains as its field in the dry season. Trees and bushes around rivers often are used as buffer. 1)Access roads and channels 2)Houses, commercial outlets 3)Flood plains for horticulture (except for rainy season) 4)Bushes and trees(can also be takes as permanent green elements) at the edge of rivers, 5)Spots for sand/pebble mining and other activities A)river line</p>	 <p>1a)integrated infrastructure with water diverting channels, 2)mixed use dense built space, 3)Flood plains for horticulture and public gardens 4)public gardens, forestation (fruit trees)- 5) water body: material production, fishing, leisure activities 6) introduced water body as an element, A)river line 3&4 can be considered as buffer and size should be decided based on topographic condition on particular location.</p>	<ul style="list-style-type: none"> Keep the mixed use pattern as much as possible but in sites too dangerous to mix housing in flood plains, loose land use can be adapted with the elements indicated: >Introduce open water reservoirs (6)at adequate locations (for water storage and to expand livelihood production opportunity (fish ponds, swimming area, etc). >dense housing can also be explored for furthering horticulture 	<ul style="list-style-type: none"> >Introduce water as a land use element, >introduce water reservoirs as an urban element and storage, >Create a safe and manageable system of water circulation >Keep mixed use approach, otherwise adapt land use as indicated 	<ul style="list-style-type: none"> >Water reservoirs (artificial lakes and ponds), >new activities related to water reservoirs >open public parks integrated with forestry and horticulture >forestation integrated with food production 	
	Major water lines and irrigation parcels		 <p>A)river line; B)Diversion channels making use of natural slopes; C)plots on flood plain for horticulture production; D)irrigation channels lines defining individual fields and compounds; E) introduced reservoir(ponds, artificial lakes)</p>	<ul style="list-style-type: none"> >Additional reservoir to balance the flow and serve as venting channel to protect flooding >create additional activities based on introduced water reservoir 	<ul style="list-style-type: none"> >Maximize activities, maximize public access and pedestrian crossings >introduce public parks coupled with horticulture >Minimize vehicular access to the minimum 	<ul style="list-style-type: none"> E)introduced reservoir(ponds, artificial lakes) >Water body as a land use; >urban agriculture as a part of public space /gardens distinct from general green cover. 	
	Land use detail /section (topography and land use) Land use detail /typical layout			<p>Reinvention of building forms neighborhood patter is needed in order to enhance horticulture production as well as to improve safety. In both existing and emerging neighborhoods, leaving the flood plain for horticulture integrated with public space (gardens and parks) is necessary. Landscaping has to follow natural water drainage pattern and employ indigenous plants and shrubs for soil conservation purposes</p>			

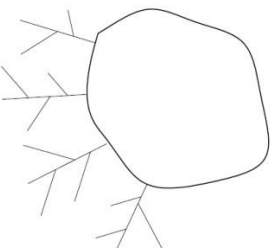
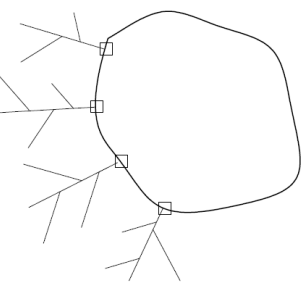
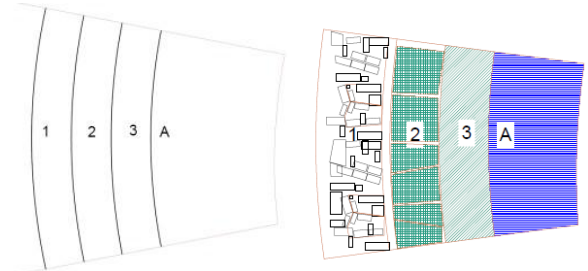
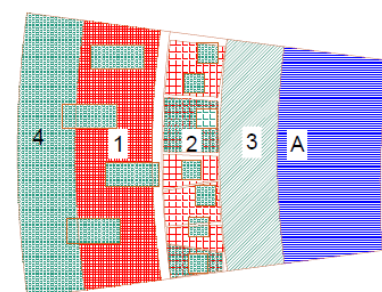
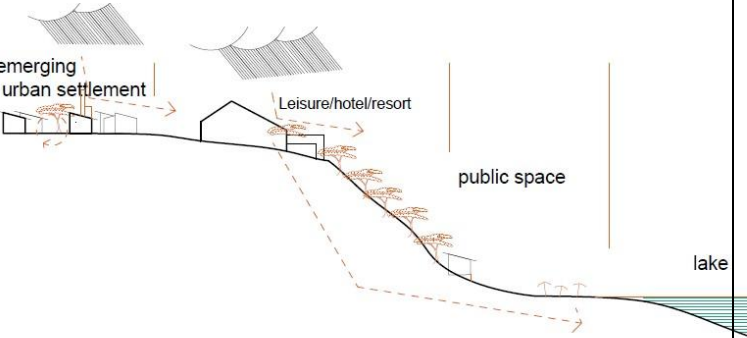
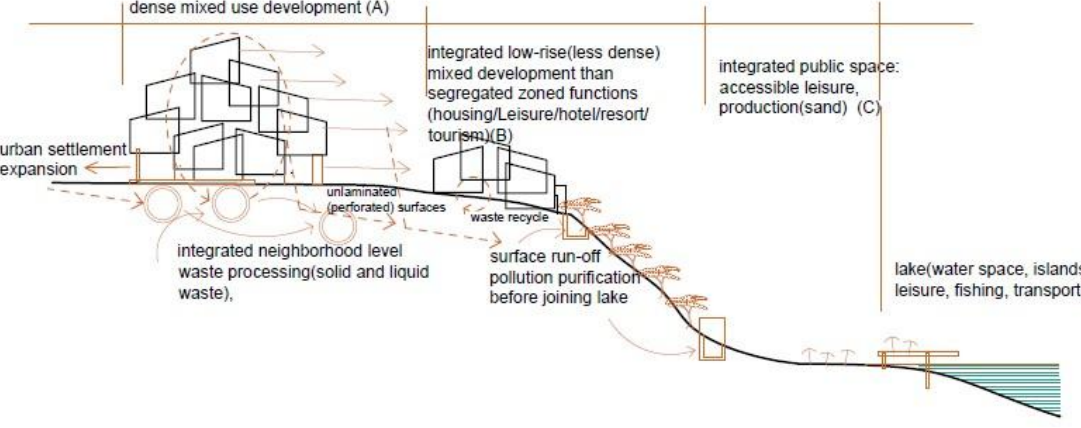
Summary table III.3B – Overview of recommendation of spatial patterns for settlement on upstream river banks

Category		existing	recommendation			remarks	
Site location	Pattern category	Pattern	Recommended pattern form	Major intervention possibilities for existing neighborhoods	Major point for new settlements designs	Introduced elements	
upstream river banks	basic form – water lines	 <p>Hilly and difficult landscape with often complex organic drainage pattern with fast runoff</p>	 <p>Simplify drainage pattern to manageable level,</p>	<ul style="list-style-type: none"> > Follow the main natural drainage lines and topographic features to minimize the natural surface drainage routs which run directly into the river to the possible few numbers. >Controlling the surface drainage routs helps to control pollution >negotiate for the protection of sources - if springs and sources of streams and brooks are claimed by individuals or groups such as churches (tsebel). 	<ul style="list-style-type: none"> > Follow the main natural drainage lines and topographic features to minimize the natural surface drainage routs and discharge points which run directly into the river to few lines. >Controlling the surface drainage routs helps to control pollution >identify, mark and protect springs and sources of brooks 	<ul style="list-style-type: none"> >controlling of surface runoff discharge points >readjustment of landscapes and ditches for easier control of drainage patter >Protection of sources(springs and brooks) 	current formal planning, parcels are made irrespective of river water lines
	Local Land use patterns	 <p>1)infrastructure lines(distanced from river valleys due to difficult topography; 2)mixed development ; 3) Horticulture on smaller plains within the deep valleys.; 4)Bushes and trees(can also be takes as permanent green elements) at the edge of rivers, 5)water body A)river line</p>	 <p>2)mixed use dense built space, 3)pockets for horticulture and public gardens 4)public gardens, forestation (fruit trees)- 5) water body: material production, leisure/resort activities A)river line Strict buffer zone can be imposed when found necessary</p>	<ul style="list-style-type: none"> >Reinforce forestation to mitigate excessive surface runoff (erosion) >integrating forestation with livelihood production (wood and food) makes it realistic for its sustainability >reorganize drainage from homes >horticulture activities can be explored on pocket sites and compounds; >forestation, horticulture, and wood production can be integrated 	<ul style="list-style-type: none"> >introduce forestation as local livelihood production >Create a safe and manageable system of water circulation >Keep mixed use approach, 	<ul style="list-style-type: none"> >forestation for water and soil conservation >forestation for livelihood production >forestation for food production >open public parks integrated with forestry and horticulture 	Pattern is hypothetical. Main objective is to ensure mixed development and the integration of forestry as a way to ensure both water cycle rehabilitation and soil conservation
	Land use and spatial relations /typical detail	 <p>horticulture spots/green 'tsebel' bath/laundry housing/ buildings of various use commerce</p>	 <p>maximize forest cover activate water space mixed development with enhanced building quality and moderate landscape reformation control direct discharge through localized collection channels and purification plants river line stabilization</p>	<ul style="list-style-type: none"> >Maximize activities, maximize public access and pedestrian crossings >introduce public parks coupled with horticulture >Minimize vehicular access to the minimum > develop easy filtration standard for Drainages which run directly from houses to river line >develop manageable filtration channels for surface drainages from neighborhood to river lines 	<ul style="list-style-type: none"> >Introduce filtration chamber >Activate water space >increase forestation >Reinvention of architectural forms to use landscape as features >stabilize river line 	 <p>introduce local (manageable) filtering chambers at connection points of surface runoffs to main river line</p>	

Summary table III.4A – Overview of recommendation of spatial patterns for settlement on shores around *fresh water* lakes and reservoir

Category		existing	recommendation				remarks
Site location	Pattern category	Pattern	Recommended pattern form	Major intervention possibilities for existing neighborhoods	Major point for new settlements designs	Introduced elements	
Shores around fresh water lakes and reservoirs	basic form – water lines	 <p>A. Lake and drainage valleys(water ways) defining the topography of catchment area (large scale) B. Lake line and basic pattern of plots for horticulture (based on irrigation using small pumps)</p>	 <p>Check points on tributary river mouths and local drainage discharge points</p>	<ul style="list-style-type: none"> > catchment forestation >discharge control for pollution >check point introduction on river mouths >Follow the main natural drainage lines and topographic features to minimize the natural surface drainage routs which run directly into the river particularly from the urban settlements to the possible few numbers. >Controlling the surface drainage routs helps to control pollution >negotiate for the protection shores with churches and individuals who have customary or use-right control over shores. 	<ul style="list-style-type: none"> > Follow the main natural drainage lines and topographic features to minimize the natural surface drainage routs and discharge points which run directly into the lake to few lines. >Controlling the surface drainage routs helps to control pollution >generate spatial pattern respecting natural drainage pattern 	<ul style="list-style-type: none"> >controlling of surface runoff discharge points >readjustment of landscapes and ditches for easier control of drainage patter >Protection of shores >forestation of catchment and also shores 	current formal planning, parcels are made irrespective of natural drainage and topographic features
	Local Land use patterns	 <p>1)Access roads. 2)Houses, commercial outlets. 3) Horticulture fields. 4)public space and major tree lines (can also be taken as permanent green elements) at the edge of lakes, 5)'bahrsesh meret' extension for horticulture in dry season and Spots for sand mining, grass harvesting, fishing access and related activities. A) Lake edge Gravity and slope as the main forces to guide pattern generation based on livelihood activities (in this case horticulture based on irrigation). However, the approach can work for other activities too.</p>	 <p>1)forestation as infrastructure,2)mixed use functions development. 3) Horticulture fields as public gardens. 4+3) integrated public space with forestation, 5)'bahrsesh meret' extension for horticulture in dry season and Spots for sand mining, grass harvesting, fishing access and related activities.</p>	<ul style="list-style-type: none"> >Reinforce forestation to mitigate excessive surface runoff (erosion and siltation) >integrating forestation with livelihood production (wood and food) makes it realistic for its sustainability >reorganize drainage from neighborhoods (collective waste recycling) >horticulture activities can be explored as pubic garden >forestation, horticulture, and wood production can be integrated >explore and restructure for fishing, leisure activities, transport 	<ul style="list-style-type: none"> >introduce forestation as local livelihood production >Create a safe and manageable system of water circulation >Keep mixed use approach, >explore and restructure for fishing, leisure activities, transport 	<ul style="list-style-type: none"> >forestation for water and soil conservation >forestation for livelihood production >forestation for food production >open public parks integrated with forestry and horticulture >enforce fertilizer free horticulture 	
	Land use and spatial relations /typical detail		 <p>integrated neighborhood level waste processing(solid and liquid waste), surface run off pollution purification before joining lake</p>	<ul style="list-style-type: none"> >Introduce filtration chamber for pollution prevention >Activate water space >increase forestation >Reinvention of dense architectural space composition >stabilize lake shore >introduce creative ways to integrate public space in the buffer zone by activating shore >open up shore lines for public accessibility 	Proportion of A,B,C, and D shall be determined based on potentials of specific locations. Use of plantation to guide water and filter dirt Use of natural slop and gravity to guide water Use of waste as fertilizer		

Summary table III.4B – Overview of recommendation of spatial patterns for settlement on shores around leisure lakes and reservoirs (salty waters)

Category		existing	recommendation				remarks
Site location	Pattern category	Pattern	Recommended pattern form	Major intervention possibilities for existing neighborhoods	Major point for new settlements designs	Introduced elements	
Shores around salty water lakes and reservoirs	basic form – water lines	 <p>Deep cut valleys and lines of streams natural drainage lines dominating the topography and patterns of footpaths. Exposed surface due to deforestation enhances the deepening of the gorges. Housing lots are built sometimes blocking the natural drainage lines</p>	 <p>Check points on tributary river mouths and local drainage discharge points</p>	<ul style="list-style-type: none"> > catchment forestation >discharge control for pollution >check point introduction on river mouths >Follow the main natural drainage lines and topographic features to minimize the natural surface drainage routs which run directly into the river particularly from the urban settlements to the possible few numbers. >Controlling the surface drainage routs helps to control pollution >negotiate for the protection shores with churches and individual farmers who have customary or use-right control over shores. 	<ul style="list-style-type: none"> > Follow the main natural drainage lines and topographic features to minimize the natural surface drainage routs and discharge points which run directly into the lake to few lines. >Controlling the surface drainage routs helps to control pollution >generate spatial pattern respecting natural drainage pattern and topography 	<ul style="list-style-type: none"> >controlling of surface runoff discharge points >readjustment of landscapes and ditches for easier control of drainage patter >Protection of shores >forestation of catchment and also shores 	current formal planning, parcels are made irrespective of natural drainage and topographic features
	Local Land use patterns	 <p>A, general concentric pattern B;detail of land use pattern 1) settlement with mixed residential and commercial functions 2)resort hotels 3)water front –public space, sand miners, fishers, etc. major tree lines A) Lake</p>	 <p>1)dense settlements with mixed functions 2)integrated development formal resort hotels with community based leisure based businesses 3)protected water front for free public access with access small scale businesses such as sand miners, fishers, etc. 4) reforestation of the surrounding and upper catchment areas and fairly distributed pockets of forestations to ensure soil conservation and water cycle rehabilitation</p>	<ul style="list-style-type: none"> >Reinforce forestation to mitigate excessive surface runoff (erosion and siltation) >promote regulated sand mining by community cooperatives, >integrating forestation with livelihood production (wood and food) makes it realistic for its sustainability >reorganize drainage from neighborhoods (collective waste recycling) >horticulture activities can be explored as pubic garden >forestation, horticulture, and wood production can be integrated >explore and restructure for fishing, leisure activities, transport 	<ul style="list-style-type: none"> >introduce forestation as local livelihood production >Create a safe and manageable system of water circulation >Keep free public space mixed use approach around the lake >explore and restructure for leisure activities and transport 	<ul style="list-style-type: none"> >forestation for water and soil conservation >forestation for livelihood production >forestation for food production >open public parks integrated with forestry and horticulture 	
	Land use and spatial relations /typical detail	 <p>emerging urban settlement Leisure/hotel/resort public space lake</p>	 <p>dense mixed use development (A) integrated low-rise(less dense) mixed development than segregated zoned functions (housing/Leisure/hotel/resort/ tourism)(B) integrated public space: accessible leisure, production(sand) (C) lake(water space, islands) leisure, fishing, transport (D) urban settlement expansion integrated neighborhood level waste processing(solid and liquid waste), unlaminated (perforated) surfaces waste recycle surface run-off pollution purification before joining lake</p>	<ul style="list-style-type: none"> >Introduce filtration chamber for pollution prevention >Activate water space(D) >increase forestation(A & B) >Reinvention of dense architectural space composition(A) >stabilize lake shore (D) >introduce creative ways to integrate public space in the buffer zone by activating shore(C) >open up shore lines for public accessibility (C&D) >secured public access to water front; communities actively participating from water based livelihood activities 	Hotels and resorts can be effectively integrated with local housing rather than segregating it. Proportion of A,B,C, and D shall be determined based on potentials of specific locations. However a minimum of 100-150 m water front wide strip have to be reserved for C. Use of plantation to guide water and filter dirt Use of natural slop and gravity to guide		

Chapter 10

Further Research Issues

Urbanization, as an academic and political subject in Ethiopia, can be referred as only young. With the increasing opening up of the country to global complexities, obviously, a conscious student or practicing professional of spatial design in Ethiopia is confronted with multitude of questions related to the very meaning and relevance of spatial design. Particularly, the paradox of the classical and established perceptions of spatial design (architecture and urban design) with the current reality of poverty, environmental degradation, and regional political uncertainties, invoke confusion. Nevertheless, the physical space and its qualification and reproduction, as the main currency in political and economic transactions and the central object of study and deliberations in the fields of spatial design, play a crucial role in generating solutions for challenges at hand. However, in such season of transformation, a systematic reorientation is needed which opens up basic classical concepts in spatial design fields for daring redefinitions and contextualization. Moreover, as it is indicated in the introduction of part III, the benefits and challenges that low level urbanization and rudimentary condition of economic and technological development offers, have to be investigated and explored.

In this spectrum of possible questions and challenges, this research can only claim to be a basis for further research works for both general urbanization trends in the country and particular inquiries regarding the intricate relationship between the fragile environment and urbanization. It is hoped that it's broader dimension in its background study (Part I) and its focused investigation on particular issues (Part II) exposes the field of issues needed to be studied properly while the country is still at its threshold of its urban explosion.

Conditions of research

Before discussing possible research areas which are discovered as gaps through this particular research, it is necessary to address some of the fundamental problems of the research culture in Ethiopia – particularly in the field of spatial design and urbanization.

Local researches in spatial design fields in Ethiopia in general has for long been nonexistent. Following the opening of postgraduate studies in Addis Ababa University, particularly in EiABC, interests have started to emerge. However, except very few PhD theses and recent Master theses, books and journal articles written on local issues are very limited. The very fact that, there was only one academic institution in the country dealing

with spatial design issues (architecture and planning) with a limited capacity of enrolling only 30 students per year (till 2007), reveals the backlog of both knowledge and skill production.

To address the backlog and activate the current passive state, local research capacity has to be built through local and international networks. The establishment of adequate *research funding* (locally) and at least one centralized *peer reviewed journal* for architecture, construction and city development in the country can be taken as important steps to help bridge the gap. Governmental organizations, private sector, and the multitudes of NGOs have to be mobilized to directly contribute to the advancement of knowledge through research finance and collaborative research undertakings.

Research areas

The three major processes in this research - urbanization, environmental rehabilitation, and activities of food/livelihood security – are believed to remain as the main areas which absorb the political and social engagements of the country at least for the foreseeable future. Inquiry into the spatial component of the interface and intricate interactions of these three processes opens up many questions in many levels.

History and tradition: Though this study covered some aspects of Ethiopian urbanization history, the spatial and environmental dimension of Ethiopian urban past is an untouched field. The spatial translations of the spiritual, economic, environmental, and political logic of the camping cities (the wondering courts) of the medieval Ethiopia is worth investigating. Studies also must focus to find out the materiality (material and technique of assembly), spatial organization logic, and environmental impacts of historic cities. Looking into traditional (vernacular) practices of settlement production, spatial and material logic in the various ethnic and tribal societies of Ethiopia is also worth considering. However, learning from traditional societies and religious communities living around water bodies or on islands within major Lakes can reveal helpful insights for the emerging urban development around water bodies. Societies around Lake Tana, religious communities on islands of Tana and island of Zeway, societies living around River Omo, and other rivers and lakes *can offer age long spatial, technical, and organizational alternatives.*

Policy: Existing policies obviously have impact on the urbanization processes of the country. Three areas deserve an in-depth investigation: the impact of Ethiopian Land Policies on pattern and modes of urbanization; land policy, land administration and real estate in rural-urban transition; and policies enacted regarding environmental protection and their impacts on forms and structure of urban and rural settlements.

Legal and regulatory frameworks: To make the principle of subsidiarity operational (proposed on the recommendation section) in the emerging neighborhoods, particularly in rural areas, studies on similar cases from other places would be necessary. Such regulatory frameworks can also be extended to other processes where there is an interface between local informal processes and formal systems from governmental or other formal bodies.

Education and practice: The current university education in Ethiopia is largely structured following western academic structure. The recent university reform program¹, which particularly targeted technology education, has made European university systems as its

benchmark. Though, courses and details of courses are left to be filled according to the specificity of the university, the general structure and curriculum of technology education in Ethiopia is engineered to follow what is assumed to be right - the assumption being based on economic and scientific achievements. Local knowledge, skills, practices, and organizational systems have little chance to make it into the knowledge body offered in the universities. The strong dichotomization of formal-informal, modern-traditional, scientific-mere belief is instituted at ease in both education and practice categorizing all local processes, methods, skills, and knowledge as informal and irrational. Such categorization erodes a wealth of local knowledge and leaves the emerging scientific tradition itself without local ground. Bridging such dichotomy demands a serious deliberation and study. Particular emphasis shall be given to the study of local processes, vernacular architecture, and the effect of such dichotomies within the education and practice of the professions in the field of spatial design.

Architectural design in both education and practice assume the basic resources, such as land and capital, as givens. Legal title deed is one of the first documents needed to start with the processes of design – automatically bracketing out the informal. Multiple inventive cases from practice, both from within the country and outside, which worked and managed to guide informal settlements into formalization can be studied to formulate methods for professional involvement. Cases can also be studied which employ spatial design practices as a tool in various dimensions: spatial design as a social activism - as a tool to claim formalization of the informal; Spatial design as a tool of collective decision making in the informal settlement; spatial design as a tool to explore and generate livelihood activities; spatial design as a processes to create the sense of community in emerging settlements, etc.

Furthermore, key concepts in architecture and urbanism such as sustainability and cost/resource efficiency, which are broadly accepted into the education and practice vocabularies without that much of critical review, have to be opened for new perspectives established by updated understandings of local as well as global realities.

Building materials and construction technology: One of the issues that this research brings into attention is the possible impact of the use building material on the environment and the local economy. The impact of local traditional building practice, which is a directly cause of deforestation, and the use of imported materials, which distorts the local economy, have to be studies further in light with the emerging urban explosion. If linking environmental rehabilitation with livelihood production as proposed in the recommendation is in place, searching for ways to qualify local materials (structure and safety) for dense and storied urban construction will be necessary. Though the study highlighted the relevance of water in Ethiopian urban past, the use of water as a material and as an element (body) in city level and single building level can also be investigated in detail. The impact of various building materials on the aquatic ecology has to be studied in order to control the impact of the urban development around water bodies.

Experimental studies can also be extended to understand the processes and conditions of natural water and material cycles through various building materials, building elements, building forms, and details - extending to urban forms. Particular areas can be – performance and contribution of materials, surfaces, building forms and arrangement of urban elements for the infiltration of rainwater and its impact on water cycles.

Opportunity of livelihood production based on water related activities, as the main pull factor for urbanization around water bodies and the primary force to shape the spatial organization pattern, is one of the major observations that this research highlighted. However, further researches are needed to explore possibilities of intensification. Experimental researches can also be used to test ways of integrating the water based activities (particularly irrigation based horticulture and fishing) in the fabrics of dense urban structures. Spatial design models can also be developed based on experiments that can maximize production and quality through duplications of harvestable urban surfaces (horizontal, vertical, and inclined surfaces, shelves, and further densification methods).

The attempt of integrating environmental rehabilitation and livelihood production within architectural space production processes opens up a wide spectrum of research possibilities. It also opens up possibilities for spatial design practices to directly and meaningfully contribute in the rehabilitation and production processes of both bio-physical and societal systems.

Note

1, the author participated in the Engineering Capacity Building Program (ecbp) - university reform program component which targeted reforming engineering education in the country. The program was a collaborative program between the government of Ethiopia and Germany which was first launched in 2005. The program have succeeded to install eight technology institutes (IoT) and among them EiABC, which focuses on architecture, construction and city development, which is based within Addis Ababa University is one.

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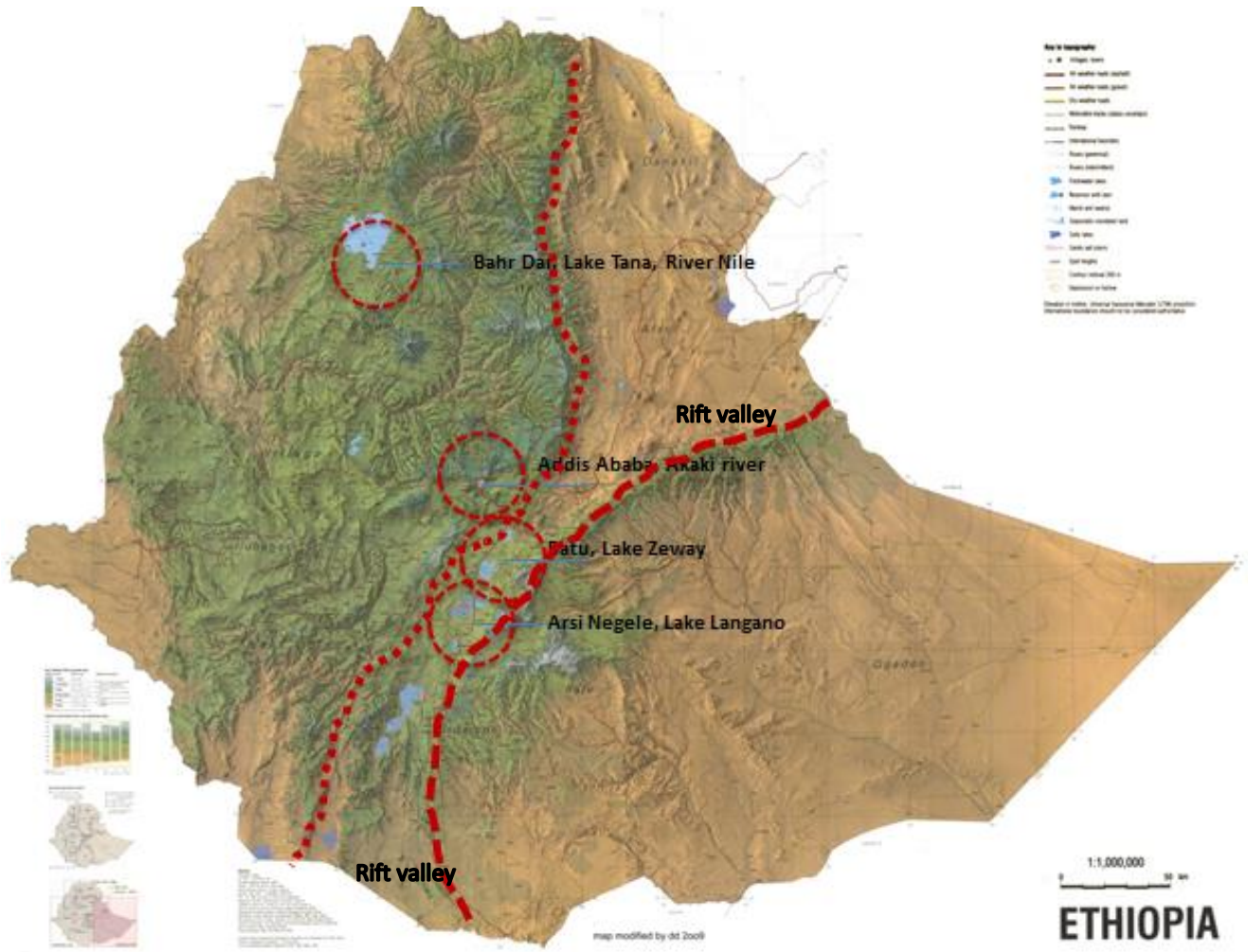
* In Ethiopian naming system, people are formally identified by their first name (first name followed by father's name and grandfather's name). Accordingly, for easy identification of authors, some authors are cited using their first names in the text (such as Zegeye & Helawi 2012) and their full name (first name followed by father's name) are given in the bibliography (Zegeye Cherenet & Helawi Sewnet ed. (2012)). However, for those Ethiopian authors who are already introduced in literature and cited in other works, the usual citation is followed (Familyname which can be father's name or grand father's name as stated on the publication (such as Giorgis 2012 in the text) and familyname and then first name separated by a comma in the bibliography (Giorgis, Fasil 2012). When cited as a secondary source, it follows the original citation pattern.

Appendices

- I. A. Map of Ethiopia: topography and location of case study sites
 B. Map of Ethiopia: River basins, major rivers and lakes
- II. BuraNest – experimental model rural town in Amhara Regional State
- III. Discussion questions, list of individuals and groups discussed with (Experts, academics, officials, and inhabitants), and sample survey questions
- IV. Image gallery – development around water bodies: *mosaic of images taken around Lake Tana, Lake Zeway, Lake Awassa, Rivers in Addis Ababa, River Blue Nile,*

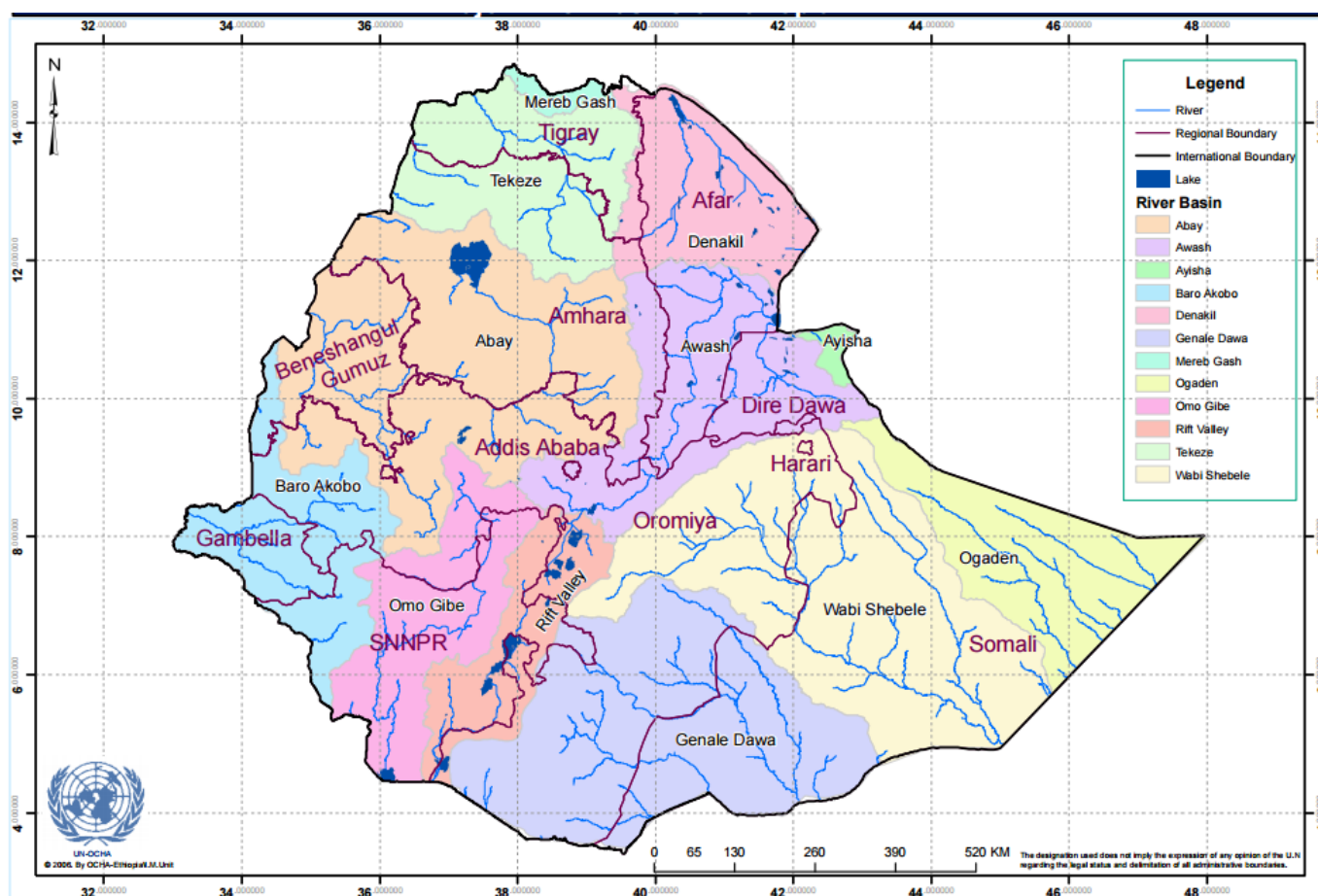
Appendix I

A. Map of Ethiopia: topography and location of case study sites



Ethiopian Topography, location of case study sites with marked rift valley crossing the country
Source: Adapted from SCRIP 2004

B. Map of Ethiopia: River basins, major rivers and lakes



Main River Basins, rivers and lakes of Ethiopia; Retrieved from <http://www.idp-uk.org/Resources/Maps/>

No.	River basin	Catchments area (km ²)	Annual run off ($\times 10^9$ m ³)	Specific discharge (litres/km ²)	Share out of total
1	Abay	199,812,112,00	52.6	7.8	43.05/17.56
2	Awash	112,700	4.6	1.4	3.76/9.9
3	Baro-Akobo	74,100	23.6	9.7	19.31/6.51
4	Genale-Dawa	171,050	5.88	1.2	4.81/15.03
5	Merab	5900	0.26	3.2	0.21/0.52
6	Omo-Ghibe	78,200	17.96	6.7	14.7/6.87
7	Rift Valley	52,740	5.64	3.4	4.62/4.63
8	Tekeze	90,000	7.63	3.2	6.24/7.9
9	Wabi-Shebele	200,214	3.16	0.5	2.59/17.59
10	Danakil	74,000	0.86	0	0.7/6.5
11	Ogaden	77,100	0	0	0/6.77
12	Aysha	2200	0	0	0/0.19
Total		1,138,016	122.19		

Ground water resource potential is approximately 2.6 billion cubic metres.

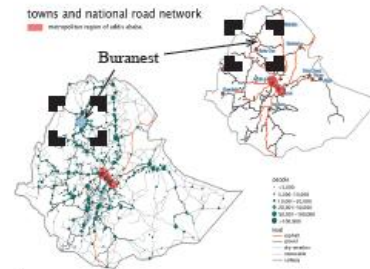
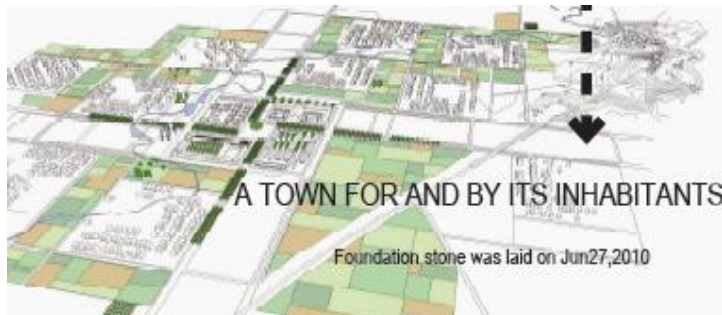
Ethiopian surface water resources by major river basins;
Source: different master plan studies quoted on Birhane. (n.d.)

Appendix II: BuraNest – experimental model rural town in Amhara regional state

Sources: Oswald, F. & Schenker, P. (2010), <http://www.nestown.org>, Zegeye & Helawi(edt). (2012)



Buranest is a real life experiment with the goal of creating a *Self-sustaining Town*. The founding of *Buranest*, the new Ethiopian town, was celebrated on June 27, 2010. The name is chosen by the local authorities. It is composed of *Bura*, the local kebele or territorial corporation of about 8000 inhabitants, and of *NEST*, the code for New Ethiopian Sustainable Town, a design for more than 20'000 inhabitants. The new town *Buranest* was declared the *Amhara Model Town* by the regional government. It is situated close to *Yifag*, close to the Eastern shore of Lake Tana, and about 70 km north of *Bahir Dar*, capital of the Amhara Region where about 23 million people live, about a quarter of the Ethiopian population.



Reports from newspapers on the launching and relevance of Buranest project

Major principles: The proposal is based on three pillars: 1) Human rights and democratic principles; 2) inhabitants with secure landholdings; and 3) a balanced urban metabolism. While the first two pillars are acknowledged and accepted in daily actions, the third requires further explanation. It regards to the metabolic cycles and processes of ecology, energy, exchange and education, or what could be termed as the 4E approach to town planning.

ECOLOGY
Any town can be understood as an ecological system combining natural and human forces. The concept of metabolism is used to understand and shape all processes for the transformation of energy and matter, be it within a town or in exchange with its context. The NesTown mode starts by investigating flows and stocks of energy, people, and matter. Like all living things, town systems require essential physical goods, matter, and energy for their construction and operation. A town is realized through the driving force of human activities, encompassing all action: to satisfy the basic needs: to nourish and recover, to reside and work, to clean, to transport and communicate. On the basis of such activities, a town may be functionally structured into overlapping subsystems.

EDUCATION
The key to urban transformation is education. Combining know-what and know-how, the pedagogical objective of nesTown is based on *learning by doing*. The implementation process of the new town is like a training workshop for construction and communal governance. The techniques of building, operating, and maintaining a town - such as water management, health care, construction of roads, irrigation and soil cultivation systems - are taught and practiced. Experiences and skills gained through building the town will serve as the basis for further professional developments and job creation in various trades of construction, agriculture, engineering.

ENERGY
NesTown is an acronym originally derived from: New Energy Self-Sustained Town. Its primary energy resource is people. In Ethiopia, this resource is abundantly and perpetually renewed. The main concern of NesTown is to offer diverse opportunities to deploy this unique form of energy. Its potential for added value production must be used, regardless of gender and age, social status, or professional orientation. In order to achieve this goal, artificially produced energy, such as electrical power, is needed. Historically, the discovery and use of electrical power accelerated and differentiated the social development by introducing, for example, the light bulb transforming night into day, and by enhancing processes of manufacture.

EXCHANGE
A town stems from the idea of higher productivity and higher efficiency. It leads to increased prosperity, growth of production, and better use of available resources. This in turn offers higher economic and social security.
On the basis of its declared intention to enhance trade, social stability, and sustainable development, Ethiopia is interested in promoting the interaction of economic and cultural forms of exchange. Sustainable development demands balanced exchanges between all social groups and on all scales of the country's territory. Through such exchanges one may achieve high resource efficiency combined with a high degree of self-sufficiency. Resource efficiency is the relationship between the quantity of a resource utilized and the quantity that is available. Complementarily, self-sufficiency describes the relationship between the available resources within a defined socio-economic unit and the resources required to meet its needs.

Major milestones (source: <http://www.nestown.org>,)

- >2007 - 'NETS FOR URBAN CAPACITY BUILDING' by Franz Oswald at ecbp- Lecture Series *Engineering towards Development and Change* at Addis Ababa University. The lecture sets the platform for the project.
- >2008 - Accord between Ato Helawi Yoseph, Founding President of Amhara Development Association (ADA), and NESTown Group, Fasil Giorghis and Franz Oswald, to develop the design for *Amhara Model Town* at Lake Tana within one year.
- >2009 - Design submission of Amhara Model Town to Ato Helawi Yoseph by NESTown Group; Exhibition of Amhara Model Town Design in ETHiopia Urban Laboratory Pavilion at EIABC / AAU in combination with the inauguration of Ethiopian Institute of Architecture, Building Construction and City Development (EiABC / AAU), Addis Ababa; Start- up Initiatives, Wettingen, first campaign for maintenance workshops and mechanic handicraft; HOLCIM Foundation for Sustainable Construction, Zurich, research fund for 2010 – 2012
- >2010 - Buranest Town Inauguration Ceremony under the lead of RUPI, General Director Wro Genet Gebre Eyesus; Green Ethiopia Foundation, Winterthur, Kurt Pfister, President, funds the Buranest tree nursery; Benjamin Stähli, New Town Coordinator, starts working locally under contract by ETHZ, Prof. Dr. Marc Angelil
- >2011 – Kebele Council Vote on Buranest Master Plan and Action Plan; SEUL (Singapore ETHiopia Urban Laboratory) at FCL/SEC; Woreda Libo kemkem Implementation Committee, in action; Cost Sharing Agreement between Amhara Government and NESTown Group; 1st NESTown Workshop I in Bahir Dar: *Shaping Urban Ethiopia – the Case of Lake Tana Region*, Lead HCU / Prof. Dr. Dieter Laepple,
- >2012 – Bridge over Shene River and Access road to Buranest town centre; successful test of Prototype II Construction for Model House Buranest; ABZ Letter of Intent, signed by H.E. Ato Ahmed Abtew, Vice President of Amhara Region; Ato Aderaw, Head, Cooperative Promotion Agency (CPA) and Peter Schmid (ABZ President)

Since then, the foundation of cooperatives and the building of model house and the ongoing construction of the school are to be mentioned.

Initiators of the project: Franz Oswald, Fasil Gorgis, Dieter Läpple, Monica Oswald, Peter Schenker, Roland Walthert, Martin Grunder, Surendra Kotecha, Corinne Kuenzli, Zegeye Cherenet.

Other than the inhabitants, the regional government with its various offices, and Nestown group (headed by **Prof. Franz Oswald**), the project is recognized for its successful mobilization of various governmental and non-governmental organizations. **Benjamin Stähli** (Nestown member) has been working as the town coordinator operating on site.



Project site with Shine river

Participating organizations

-  ADA
AMHARA DEVELOPMENT ASSOCIATION
-  ABZ
Allgemeine Baugenossenschaft Zürich
-  ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich
-  DARCH
-  GREEN ETHIOPIA
Gemeinnützige Stiftung für Umwelt und Entwicklung in Äthiopien
-  Holcim foundation
for sustainable construction
-  Organization for rehabilitation and development in Amhara (ORDA)
-  SEC
Singapore ETH Centre for Global Environmental Sustainability

Image gallery

A



B



A. welcome post on a tree
 B. Blue Nile and Tana lake as defining water bodies of the region
 (Source: A. Author, B. zegeye&Helawi (2012))

A. Foundation stone by Regional Govt. and Nestown group
 B.3D model of section of proposed town
 (Source: A. www.nestown.org, B. zegeye&Helawi 2012)

A. Local housing types
 B. model improved houses for higher density and (A. Photo by author, B. photo by Benjamin Stähli)

Horticulture experiment, B. First trainee on building construction with certificate finally to establish cooperative for housing construction (A. photo by author + B. photo by Benjamin Stähli)

A&B. Experimenting with Local material (Photo by author)

Appendix III

A. Discussions

Discussions with academics, researchers, experts, elders, officials were open ended discussions on water body and urbanization in Ethiopia; Current and historical trends, government programs and professional practices, challenges and opportunities etc. Many of the discussions are recorded and some are only noted due to unfavorable conditions

A.I: list of Experts and Academics

1. Professor Emer. Dr. Bairu Tefla: History of Ethiopia, cultural roots in settlement patterns, linguistic, water, and settlements in Ethiopia
2. Professor Dr. Yakob Arsano – Political scientist(hydro- politics in east Africa). Discussion on water bodies and political history, on the nature of Ethiopian cities and their foundation and logic of structure related to water bodies and water sources. The regional political agenda and water usage.
3. Professor Dr. Seifu Kebede - Hydrologist and hydrogeologist, on Ethiopian surface water distribution; the culture of water use, preservation and settlement in Ethiopian rural settlement ; and water use and settlement patterns in Ethiopia. The highland and lowland water usage and settlement locations. The pressing migration and water resource as a focal point.
4. Associate Professor Fasil Giorgis(Architect) – chair of urban and architectural heritage and architectural historian, architect and urbanist. On history of Ethiopian cities and the relevance of water bodies; Foundation of Addis Ababa; current trends.
5. Prof. Emer. Franz Oswald – ETHZ, on emerging urbanization around Lake Tana and River Nile, on experimental rural town projects and water as an organizing element in the new sustainable towns in Ethiopia – as a test to guide the larger urbanization processes around the Lake.
6. Ato Lema Eshetu (senior expert, tropical consult plc., on water and development, on development plans of the Nile basin and Rift valley basin, studies and policies on integrated regional development)
7. Dr. Hailu Worku (Associate Professor, former head of Addis Ababa city environmental protection agency, currently chair of environmental design-EiABC) on water spaces as a land use in the city, the city of Addis Ababa and its strategies around water body, settlement patterns and environmental realities, water bodies and urbanization patterns, the changing environmental reality and the changing settlement patterns, economic forces and environmental forces in shaping urbanization patterns, Addis Ababa and water spaces
8. Dr. Kumelachew Yeshitela (Ass. Professor), Chair of Ecosystem Planning and Management, EiABC, CLUVA team leader and team leader of environmental planning team of the current Addis Ababa city master plan revision office), urbanization pattern and environmental realities, water bodies and urbanization patterns, the changing environmental reality and the changing settlement patterns, economic forces and environmental forces in shaping urbanization patterns, Addis Ababa and water spaces.
9. Dr. Solomon Mulugeta(Associate Professor - AAU) urban and regional planning, Geography, urbanization patterns and the physical geography, environmental forces, and trends of future urbanization; Sites of environmental sensitivity and urbanization; Ethiopian highland settlement patterns.
10. Ato Alazar Assefa (former lead planner and LDP design team leader for development plan of the case study site at Mekannisa) on formal plan and its relationship with water and social organization of the informal settlements around rivers.
11. Ato Liku (expert on municipal formal planning on Mekannisa site and recent CLUVA research team on flood vulnerability of the settlements around rivers in Addis Ababa.

12. W/t Darik Zebenigus (CLUVA team) on socio-economic assessment on the MeKannisa river site settlements.
13. Group discussion with OADUS architects and urban designers
14. Discussion with working team on environmental design of the Master Plan Revision Office of Addis Ababa
15. Abiye Hailu: National archive and library agency on old maps and documents on settlements
16. 'Ato' Kassahun; Ethiopian Mapping Authority(EMA)
17. 'Ato' Michael Shiferaw(architect/TV talk show host)

A.II: List of Elders and religious leaders discussed with:

In-depth discussions with Elders and religious leaders about: social , cultural and religious relevance of water body; the culture of housing and settlement around water; The preference of location for settlement; etc.

'Ato' Lemma Mamo, farmer,
 'Ato' Shumet Berhanu, pensioner/former civil servant
 'Ato' Cherenet Mamo, Pensioner/former civil servant
 'Ato' Sefiw Biru, Pensioner/former civil servant
 W/ro Alchalum firew – small business owner
 'Merigeta' Kibret - priest, EOC
 'Aba' Giorigis – priest/monk, EOC
 'Ato' Dima Gameda- farmer
 'Ato' Geleta waqo -farmer
 W/ro Hamelmal – small business owner
 'Memher' Kassaye – Church teacher/EOC

A.III: List of Officials in Government Offices

>Federal Government Offices

1. Dr. Yosef Tsegaye (director, Construction regulatory directorate, Ministry of Urban Development, Construction and Housing)
2. Ato Israel Tesfaye (Head, Urban land development & management Bureau MoUDCoH)
3. Ato Fitsum Haile (Head of department of studies and research MoUDCoH)
4. Ato Seife Bashaye (Expert on Malaria distribution in Ethiopia, Ministry of Health MOH and WHO)

>Addis Ababa City

1. Ato Mathewos Asfaw(Architect/ Planner), General Manager of Addis Ababa Master Plan Revision project office, on formal planning and water bodies in the city of Addis Ababa, on informal settlements and informal appropriation around rivers, urban agriculture and livelihood production.
2. Ato Eyob, (Expert, in environmental protection agency, Addis Ababa City)
3. Ato Waleign(Expert in office of master planning, environmental planning section)

>Oromia regional state

1. Ato Mohamed Hamda Waqo (Deputy Director – Regional Urban Planning Institute -RUPI , Oromia regional state)

2. Ato Nigussie. (expert, zonal office of environmental protection and land administration, Adama, Oromia)
3. Ato Amino Nanisso, (officer, environmental protection and land administration, Batu)
4. W/t Desisa woreda dest, (desk officer, environment and land administration desk, Adamitulu jido combolcha woreda)
5. W/t Aster woreda, (woreda cadaster expert, environment and land administration Adamitulu jido combolcha woreda desk),
6. Ato Kedir Adem Chairman and Ato Muata Kulea/Kebele (chairman and vice chairman respectively, Edo Gojoola Kebele)
7. Ato Belete Workineh, (expert, Arsi Negele woreda, Eenvironment, Land Administration and Use desk)

>Amhara regional State

1. W/ro Genet G/Egziabher (Director, Regional Urban Planning Institute – RUPI, Amhara Regional State)
2. Ato Tilahun, (Head, Planning department, RUPI, Amhara Regional State)
3. Ato Kidanie Misikir (Manager, Bahr Dar City Municipality, Amhara Regional State)
4. Ato Tegared Zerihun (Head Micro and Small Enterprise agency, Bahr Dar City Municipality)
5. Habamu Nibret (Head, of MSE of Shinbet Kebele)

A.IV. List of discussion groups held with inhabitants

Addis Ababa

- >Shenbeko harvesting group - Makannisa
- >Sand collecting group - Mekannisa
- >Car washing association – Piassa, Mekannisa
- >Farmers (horticulture) group – Mekannisa, Pickoke
- >Groups of young men using the area for relaxation (with 'khat') – Mekannisa, Pickoke, Kebena

Bahr Dar

- >Sar-sefer Michael port discussion with members of youth association
- >Sar-sefr Gerima port discussion with workers on port (grass and wood harvesting)
- >Sar-sefer port Michael student group (coming from the Tana Islands)
- >Sar-sefer port Michael church student group (EOC)

Lake Zeway

- >Farmers group (irrigation works)
- >Group of young people relaxing on the shore (zeway/Batu town)

Lake Langano

- >Langano lake (kebele Delu Harengama) discussion with daily laborers
- >Group of holiday makers from nearby town

B. Discussion guides, Interview questions, and questions for sample survey

B.I Guiding question for discussion in discussion groups (with inhabitants)

- >What are the main reasons for people to prefer to live in this site?
- >What are the major threats and opportunities while living in this site?
- >Will it make a significant difference in the daily life of the neighborhood if the Lake/river disappears?
- >Did you ever have discussion (collectively) about the water body?
- >What should be done to improve the situation in the neighborhood particularly related to the Lake/River?
- >Are there any rumors that the site is needed for development project(government/private)?

>What will you do if such project is proposed? Will you get organized to develop the site yourself, would you prefer to be resettled? Or will you negotiate to accommodate the project without being resettled? Or...?

B.II Guiding questions for discussion with officials and experts in governmental and nongovernmental institutions

>How do you see the current pattern of developments (both urban/rural and habitation/industrial/agricultural) around major water bodies (Lakes and rivers)

>Do you see a shift from the traditional/age long pattern?

>If a change is observed, what are the main reasons for the change?

>Who are the main actors?

>Is there a strategy in place in your office to address the emerging change?

>What do you think is at stake in this emerging phenomenon (opportunities/threats)?

B.III. Interview questions for key informants (inhabitants) in case study sites

>When and why did you end up living here?

>Where were you before you moved here?

>How did you get the land?

>Did you build your house by yourself? With help from neighbors and relatives? Or through contractor/mason/carpenter?

>What materials could you get from around freely and which materials did you have to buy?

>What is your relationship with the water body (River/Lake)? Opportunities/threats?

>Are you or anyone in the family making use of the water body as primary resource for income generation? If yes, through what kind of activity?

>When you built your house, what were the most important points you considered about the water body (river/lake) – opportunity/threat?

>What would you consider if you build it again?

> Any future plan concerning your living space?

B.IV. Sample household survey

Note: collected by author original questionnaire is in Amharic and the following is translation

1. Inhabitants / livelihood

>house hold head

father/mother

>family size

1-3, 4-5, above 5

>co-dwellers

debal/kiray; how many(1,2,3,4 and above)

>Main income source (livelihood)

Employed in private businesses/ Self-employed/ Government Employed, others

>livelihood related to the water body

Yes/no

>if yes, primary/additional resource for income generation

>If primary, through which activity?

Urban agriculture/ sand or pebble collection/'shenbeko' or grass or wood

harvesting/fishing/transportation/tourism or leisure related/other.....

>is the production activity based on individual work /cooperative

>Social association membership

Idir/ Iqub / Other associations/ none

2. means of access to land and function for which the land is used and property developed

- >Tenure type of the house/compound
 - Private (own/family property)/Kebele /Rented from private owner/
Leased or rented from government/other
- >Means of Acquisition of land and legal status
 - Formal/informal
- >Year of building the first house in the compound
 - Before 1974 / 1974-1991/After 1991
- >Main reason for preference of the site
 - Access to irrigable land (for vegetable farming)/Cheaper land/housing price/Chance/
visual and environmental qualities/Centrality and convenience
- >Major uses of compound and house?
 - Only residence/Only commercial/Only production/Residence + commercial
Residence + production/Commercial + production

3.Ways of participation in the decision making process on development and use of public infrastructure and commonly used spaces

- Through participating in Kebele meetings
- Through cooperatives
- Through social associations
- No participation in any communal decision making

4.Housing condition/ primarily filled based on observation

- >House form of main house (Circular hut/ Rectangular prism/irregular, other)
- >House type (row houses, Detached houses/ storied houses)
- >building materials
 - >>main house
 - Roof (CIS/Plastic/Thatch/mixed)
 - Wall (CIS/Chika/HCB/brick/stone/mixed)
 - floor
- >Number of rooms (1,2,3,4 and above)
- > built (self-built/'debo')
- >processes of building (at once/incremental)

5. Water access and use and, B. drainage and waste treatment

Water source - Use/location

- >River/Lake water use
 - Drinking and kitchen/Washing/Livestock/Vegetable/Other use
- >Piped water source
 - no/yes
- >>If yes, where
 - In the house/In the compound/Public tap/Shared -Outside the compound

Waste water treatment

- >Toilet type
 - Pit latrine (dry toilet)/ Flush toilet
- >toilet access
 - Private/public (shared)
- >Surface and kitchen waste water drainage
 - Drained to the Drained to the river/Lake/Drained to the street/ Drained to an open compound or
backyard/Drained to a septic tank

V. Appendix IV:

Image gallery: Development around water bodies: *mosaic of images showing recent development around lakes and Rivers in Ethiopia -Photo by author (2011 - 2014)*



Informal development
 A.Lake Tana
 B.Following rivers in Addis Ababa

Markets
 A:Fish market
 B.Fish restaurant

Infrastructure around water:
 wooden bridge and port

Imports from islands of Lake Tana, port Michael activities

Informal activities:
 Harvesting wood from shore and island of Lake Tane for fuel and building material



Grass harvesting from the shore and islands, and grass on the market



Produces of grass
A. building skin
B. household utensils



Small workshops on site - boat building
A. 'Tanqua' building workshop
B. Metal boat building



Bars, restaurants around water
A. Formal on land leased from municipality
B. Informal on land from the church



A. Small scale Horticulture on irrigation fields from Lake Zeway
B. Produces from irrigation fields on emerging road side shops

Acknowledgement

It has been my long held belief that though it usually is steered by a wrong hand, the earth is a strangely beautiful place - primarily due to many kind people. My proof is firsthand – I have always been surrounded by them! Mentioning all would be difficult and I shall try to name and extend my gratitude for some who are directly related to this research work.

Foremost, boundless gratitude to Professor Dr. Dieter Läßle - my advisor in this research and my host in the city of Hamburg, it is indeed a privilege to be gently guided not only to the particularities of the subject at hand but also to territories beyond the traditional boundaries of my own discipline and seek for a more comprehensive understanding of our habitat. I shall equally remain thankful for the kindest hospitality I have been shown.

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Thanks to the city of Hamburg - the streets, corners, cafes, libraries, water fronts..., I wonder what more a city can offer for those who, like me, wish to observe the bondage between the life of a city and the waves of waters...