

Assessment of Local Land and Water Institutions in the Blue Nile and their Impact on Environmental Management

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Abstract

Land and water institutions play a vital role in managing and sustaining land and water resources as well as enhancing economic development and poverty alleviation efforts. While a lot has been done in terms of understanding the micro-determinants of farmers' decisions in land and water conservation, there is little attempt to understand the broad macro-institutional and organizational issues that influence land and water management decisions. The objective of the study was to assess institutional arrangements and challenges for improved land and water management in the Ethiopian part of the Blue Nile Basin (Tana and Beles subbasins). Focus group discussions and key informant interviews were held in Amhara and Benishangul Gumuz regions with important stakeholders such as the bureaus of Agriculture and Rural Development, Water Resources Development, Environmental Protection and Land Use Administration (EPLUA), National Agricultural Research Systems, and important NGOs, operating in the area of land and water management, and selected community members. As the major findings in this study, we outlined major land and water-related institutional arrangements that are currently in place and their design features, in order to identify those institutions related to superior performance. We highlighted major institutional and policy gaps and actions that are required to respond to emerging issues of environmental degradation, upstream/downstream linkages and climate change. Such analysis of institutions and their design features provides useful insights and contributes to the debate on institutional reform for improved land and water management in the Blue Nile Basin, in general. By doing so, it identifies the gaps in institutional arrangements and policies and potential remedies.

Key words: institutions, organizations, policy choices, Blue Nile Basin, Ethiopia

Introduction

Problem analysis

Erosion and sedimentation: major problems in the Blue Nile Basin

In this section we describe the most important environmental problems in the sub-basin, their local and downstream impacts and their possible causes. Soil erosion, nutrient depletion and deforestation are common environmental problems in the Ethiopian Highlands, not least in the Blue Nile Basin part of Ethiopia (Hagos, et al. 1999; Desta et al., 2000; ENTRO 2006).

Four main areas of high sheet erosion are found in the Abay basin (Hydosult et al, 2006b). The steep slopes around Mount Choke in East and West Gojam stand out as significant areas with a high sheet erosion hazards. This is an area characterized by high rainfall intensity causing severe soil erosion. The second widespread area of high erosion hazards occurs North and East of the Abay River in the Lake Tana sub-Basin. This area includes the steep cultivated slopes around Mounts Guna (South Gonder) and Molle (South Wello). A third more restricted area is found in the upper Jema sub-basin in South Wello on the high hills North and West of Debre Birhan. A fourth area is found South of the Abay and encompasses the upper and middle steep and cultivated slopes of the Middle Abay Gorge Sub-basin in East Wellega. Two subsidiary areas with a high erosion hazards can be seen in the Upper Didessa Valley and along the escarpment hills to the West of Lake Tana in the upper Dinder and Beles valleys (ENTRO, 2006).

Awulachew et al., (2008) and ENTRO (2006) documented the scale of erosion and sedimentation in the Blue Nile Basin (BNB). Accordingly, the total soil eroded within the landscape in the Abay Basin is estimated to be 302.8 million Mg per annum and that from cultivated land is estimated to be 101.8 million Mg Yr⁻¹. Thus about 66% of soil being eroded is from non-cultivated land, i.e. mainly from communal grazing and settlement areas. Those authors also provide disaggregated figures for scale of erosion in the three regions of Ethiopian Blue Nile Basin. Accordingly, the area of cropland subject to "unsustainable" (i.e. loss exceeds soil formation or 12.5 Mg ha⁻¹Yr⁻¹) are 968,900 ha, 104,000 ha and 956,900 ha in the Amhara, Beni-Shanugul Gumuz (BSG) and Oromiya regions respectively. Thus, some 2.03 million ha of cultivated land have unsustainable soil loss rates.

Of the total 302.8 million Mg of soil eroded a significant proportion is re-distributed within the landscape, the remainder reaching streams and rivers. At the Basin level the estimated Sediment Delivery Ratio (SDR) indicates that approximately 55 % of sediment remains in the landscape and does not reach the river system (Awulachew et al., 2008; Haileslassie et al., 2006). This estimate is much lower than the 90% estimated by the Ethiopian Highlands Reclamation Study (EHRS) but closer to the estimate by Hurni

(1988). The rest gets its way into the streams and ends up in reservoirs and irrigation channels in the downstream regions of the basin.

In 1990, accelerated soil erosion caused a progressive annual loss in grain production estimated at about 40,000 tones, which unless arrested, will reach about 170,000 tones by 2010. Livestock play a number of vital roles in the rural and national economy but according to one estimate some 2 million hectares of pasture land will have been destroyed by soil erosion between 1985 and 1995. Declining use of fallow, limited recycling of organic and limited application of inorganic soil nutrient sources, compounded with the high level of erosion, have also exacerbated the problem of nutrient depletion of the major soils in the sub basin affecting crop productivity (e.g. Hailelassie et al., 2005).

In economic terms, soil erosion in 1990 was estimated to have cost (in 1985 prices) nearly Ethiopian currency (ETB) 40 million in lost agricultural production (i.e. crop and livestock) while the cost of burning dung and crop residues as fuel was nearly ETB 650 million. Thus in 1990 approximately 17% of the potential agricultural GDP was lost because of soil degradation. The permanent loss in value of the country's soil resources caused by soil erosion in 1990 was estimated to be ETB 59 million. This is the amount by which the country's soil stock should be depreciated in the national accounts or which should be deducted (as capital depreciation) from the country's Net National Income (NNI (Sutcliffe, 1993; Bojo and Cassells, 1995).

Deforestation is also going unabated because of growing demands from construction, fuel wood and farm land. In many areas of Ethiopian highland, the present consumption of wood is in excess of sustainable growth. This implies the degree of mining of the natural vegetation and impacts on water resources (i.e. through runoff and erosion). Estimates of deforestation, which is mainly for expansion of rainfed agriculture, vary from 80,000 to 200,000 hectares per annum (EPA, 1997). Although there are no specific estimates for the sub-basin, the Ethiopian Forestry Action Program (EFAP) estimated the full value of forest depletion in 1990 to have been about ETB 138 million or some 25% of the potential forestry GDP of ETB 544 million (EFAP, 1993).

Soil erosion, agricultural run-off and domestic and industrial effluents cause serious negative externalities in downstream environments. In fact, although estimates of costs are missing, there are reported signs of increasing pollution and pollutants load on water bodies and reservoirs in the sub-basin and beyond. MoWR (2007) reported that increased nutrient loads (from sewage, pit latrines and fertilizers) are contributing to increased pollution, affecting eco-system health in the sub-basin. The social costs include loss of life and agricultural production due to pollution and eutrophication of fresh water resources, sedimentation of water reservoirs, siltation of irrigation channel, (Ekborn, 2007). This underlines the far reaching consequences of environmental degradation on ecosystem health, land and water productivity. Understanding these consequences and their possible causes are important research questions that need to be pursued for improved management of land and water.

As presented above the lists of proximate causes of land degradation are apparent and generally agreed and there are other underlining causes behind these causes. Understanding the underlining causes have greater use for policy making. Factors underlying these direct causes include population pressure, poverty, high costs of and limited access to agricultural inputs and credit, fragmented land holdings and insecure land tenure, and farmers' lack of information about appropriate alternative technologies (Hagos, et al. 1999; Desta et al., 2000). Many of these factors are affected by government policies on infrastructure and market development, input and credit supplies, land tenure, agricultural research and extension, conservation programs, land use regulation, local governance and collective action, and non-governmental programs (Hagos, et al. 1999; Desta et al., 2000). And a lot has been done in terms of understanding the specific roles of the set of factors in different contexts in Ethiopia and elsewhere (Gebremedhin and Swinton, 2003; Gebremedhin et al., 2003; Hagos and Holden, 2006; for a review see Yesuf and Pender, 2005). However, there is a little attempt to understand the broad macro, institutional and organizational issues that influence land and water management decisions, which is the focus of this paper.

Research rational and objectives

Land and water institutions play a vital role in managing and sustaining resources as well as in economic development and poverty alleviation (Ananda et al., 2006; Hannam, 2003). The institutional issues that the Ethiopian land and water sector is grappling with can be classified into three main areas: ecological destruction due to high level of environmental (mainly land) degradation; poor performance of rainfed agriculture, low level of water resources development, and transition from a soil conservation focus to an integrated land and water management system that takes the hydrological boundaries into account. A lot of concerted efforts are going on to reduce land degradation, improve the productivity of rainfed agriculture and to develop the water resources of the country in integrated manner.

On the research side, there is little attempt to understand the broad macro, institutional and organizational issues that influence land and water management decisions and addresses the understandings of upstream and downstream linkages. There is inadequate understanding of the policy and institutional failures that shape and structure farmer incentives and investment decisions (Shiferaw et al., 2007). There is no doubt that the creation of an enabling environment for farmers and agencies to adopt management practices that reduce water and land degradation and improve food security is crucial (Hannam, 2003). This is particularly important in view of mitigating impacts of upstream water resources development on downstream stakeholders dependent on the Blue Nile Basin.

For example in response to increasing demand for food and contrastingly dwindling agricultural production, the Ethiopian government is considering Tana-Beles Sub-Basin

as the development corridor and thus embarked on development of irrigation and hydropower development projects in the Tana and Beles Sub Basins. This requires designing institutions that can provide legal and policy framework to define: activities that are prohibited or allowed in a certain areas, the incentive structures and policy instruments to enable action, and responsible body to enforce the provisions and careful choice of policy instruments. Designing institutional mechanisms to sustainably manage the land and water resources of the country has been an important legal and political concern in Ethiopia. Lately, the government of Ethiopia has come up with various measures to enable sustainable land and water management. But little has been done in understanding the design of the institutional arrangements and choice of policy instruments. Such analysis of institutions and their design features provides useful insights, contributing to institutional reform debate in land and water management in the study sub basin. The overall objective of the study is, therefore, to carryout assessment and gap analysis of institutional arrangements for improved land and water management in the highlands the Blue Nile Basin (taking Tana and Beles Sub-Basin of Ethiopia as an example). The specific research questions include:

- What are current and envisaged changes in policies and institutional arrangements for improved land and water management in regions within the Ethiopian Abay Blue Nile?
- What are the design features of the existing/envisaged institutional changes?
- Whether the current level policy, institution and processes effectively respond to the emerging issues (e.g. land degradation, water shortage, climate change and variability, upstream downstream relations, etc.).
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Following problem analysis, in this introductory part, the second chapter outlines the approach taken to identify and evaluate the features of the institutional framework and institutional design criteria that can used to evaluate land and water related institutions in Tana Beles Sub-basin. It also briefly discusses the study site and data sources. In the result sections it highlights existing formal and informal institutional arrangements and their design features. Based on the analysis presented in section four, the study draws key conclusions and policy recommendations.

Study Methodology

The study site

The focus of this study is the Tana Beles Sub-Basin in North western Ethiopia. The Tana and Beles Sub-basins are important Sub-basins of Blue Nile (also called Abay) River Basin and are located in the Amhara and Benshangul Gumuz Regional States. The Tana Sub-basin is fully located in the Amhara National Regional State and covers parts of the West Gojam, North Gondar and South Gondar Zones. The Beles Sub-basin, on the other hand falls within the two regional states and drains the Agew Awi Zone¹ of the Amhara and Metekel zone of the Benshangul Gumuz National Regional States. The total area of

¹ Zone is the second administrative unit in a region

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the Tana and Beles Sub-Basins is about 30,000 km². Lake Tana, the largest fresh water lake in Ethiopia, covers an area of 3,042 km². It is at the heart of the Tana Sub-Basin whereas the Beles River that drains the Beles Sub-Basin is the largest right bank tributary of the Blue Nile and joins the main stream just before the Ethio-Sudanese Border (Figure 1).

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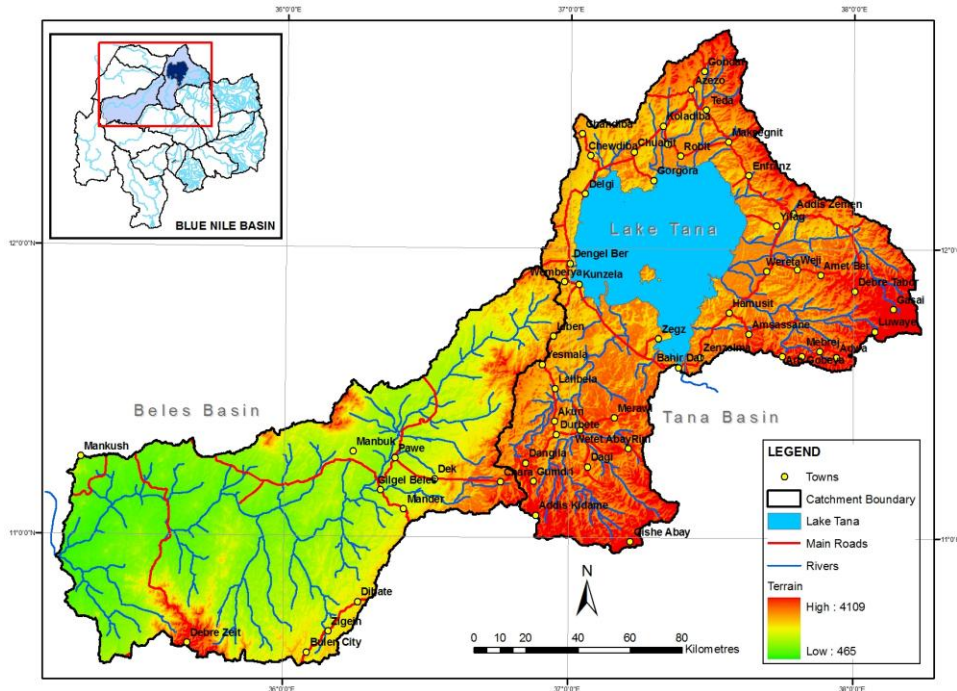


Figure 1: Location map of Tana and Beles subbasins

Analytical framework

Overall approach

In this study, we analyzed institutional setups for sustainable land and water management at national, regional and sub-basin and local scales. Formal institutions in Ethiopia are structured at federal and regional levels and informal institutions are locally instituted. The informal institutions lack linkages with the formal institutions and among themselves affecting information flow and their effective involvement in land and water management. The regional states adopt federal land and water institutions, as they are, or, as in some case, develop region specific institutions based on the general provisions given by the federal policies and institutions (e.g. Rural Land Administration and Use). Therefore, in this paper we focused more on the assessment of federal land and water management institutions and policies as they apply to regional, sub-basin and local scales. Moreover, we shaded light on the synergy between informal and formal institutions and the challenges they face in executing their responsibilities.

Institutional designing criteria

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Following the frameworks developed by Ananda et al. (2006); Hannam (2003) and Bandaragoda (2000), we identified the following criteria to evaluate the design features of land and water related institutions in Tana and Beles Sub-Basins. If institutions are to succeed in their function, they are expected to have and develop clear institutional objectives by taking various constraints they face in to account. The question of whether institutions have clear institutional objectives and how they develop them is a pertinent question to assess institutional design features. In a given socio-economic context, both formal and informal institutions have bearings on shaping behavior of actors. How formal and informal institutions influence each other is another important issue we address here to assess performance of land and water institutions. Institutions will perform better if they institutionalize adaptive management given the persistent changes in the bio-physical and socio-economic environments. In this case exploring the forms of adaptive management institutions utilize, whether it involves evolutionary – trail and error approach; passive – lessons from the past used to develop best single policy, or active – learning focused and participatory and uses policy and its implementation as tools for learning, is critical. Key here is to assess how institutions maximize the level and effectiveness of institutional learning, without compromising institutional stability.

Finally, translating these objectives requires due process of implementation and enforcement. The institutions' enforcement capacity is hence critical. Besides what are the typical forms of enforcement: self-enforcement vs. third-party enforcement? These criteria and the key questions summarized, in Table 1, are used to evaluate key land and water institutions in the study site.

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Table 1: Institutional design criteria

No.	Institutional design criteria	Key issues\questions
1.	Clear institutional objectives	<ul style="list-style-type: none"> ▪ What are the key objectives from among the many objectives? ▪ What are the key constraints in meeting these objectives? ▪ Is there a transparent process of adjusting institutional objectives?
2.	Interconnectedness with other formal and informal institutions	<ul style="list-style-type: none"> ▪ What is relationship between formal and informal institutions and the influence of each on institutional performance? ▪ Are informal institutions constraints to formal institutions? ▪ Are there cases where informal institutions substitute formal institutions?
3.	Adaptiveness	<ul style="list-style-type: none"> ▪ What is the adaptive capacity of institutions to changes in technology, private and political tests and preferences? ▪ What are the common forms of adaptive management?
4.	Appropriateness of scale	<ul style="list-style-type: none"> ▪ Spatial scale? ✓ Boundaries of natural resource institutions. ✓ Establishment of local groups using social boundaries ✓ Administrative scale? ▪ Who is responsible for its implementation?
5	Compliance capacity	<ul style="list-style-type: none"> ▪ Dealing with incompleteness in costs ▪ Dealing with violations of norms, laws and polices? ▪ What are the typical forms of enforcement?

Data capturing mechanisms

This study was done as part of the research project on “Improved water and land management in the Ethiopian highlands and its impact on downstream stakeholders dependent on the Blue Nile” financed by the Challenge Program for Water and Food. This study falls under the policy and institutions component of the project. This component of this project was developed in recognition of the fact that every intervention is implemented in a unique context where not only physical factors, but also institutions and policies, will influence its impact. To develop successful interventions it is, therefore, important to understand the context in which these interventions are to be implemented. A combination of different approaches was used to gather data for the study. These included:

- Literature review based inventory of local and regional policies, formal laws and regulations, informal rules and practices, and formal and informal organizations;
- Stakeholder analysis of the knowledge of policy, interests related to the policy, position for or against a policy, linkages between key stakeholders, etc. Focus group discussions and key informant interviews were held in Amhara and Benishangul Gumuz Regions with important stakeholders such as the Bureaus of Agriculture and Rural Development, Water Resources Development, Environmental Protection and Land Use Administration (EPLUA), National Agricultural Research Systems in both regions, and important NGOs working in the two regions in the area of land and water management.
- Institutional analysis – a closer look into the roles and responsibilities of the various stakeholders, their interactions and lack thereof, policy frameworks and gaps to understand the institutional setting in the Ethiopian Blue Nile Basin. Institutional analysis was done based on a defined institutional framework to identify key design features and evaluate the performance of these features. The data collected from diverse sources was compiled and analyzed to prepare this report.

Results

Land and water related institutional arrangements

‘Institutions’ in this study is defined broadly to include not only formal organizations, but also informal organizations, laws, customs and social practices that influence people’s behavior in a society or economy. Organizations can be defined as “structures of recognized and accepted roles” (Merry 1993; cited in Bandaragoda 2000). Organizations are groups of individuals with defined roles and bound by some common purpose and some rules and procedures to achieve set objectives (Bandaragoda 2000). The institutional framework for water resources management in a river basin context consists of established rules, norms, practices and organizations that provide a structure to human actions related to water management (Bandaragoda 2000). Saleth and Dinar (1999a; 1999b) classified water management institutions into three main components: water polices, water laws and water administration. In this section, we describe the exiting institutional arrangements and assess the appropriateness of the arrangement in meeting the following issues.

- Whether the key stakeholders have clearly defined objectives to explore the value and usefulness of the existing institutional framework as accepted by the stakeholders.
- What does cohesiveness and the functioning of the various elements of the existing institutional framework look like?
- Whether there are scopes for integrated natural resources management in the sub-basin?
- What are the needs for institutional reform in the land and water sectors?
- What are the important policies, strategies and guidelines in relation to land and water management?

In Ethiopia land and water related organizational arrangement are broadly categorized into three different tiers: basin /sub-basin level organizations, federal (national) level and regional (state) and local level organizations. Critical issues here are: do these organizations have clear mandates; how are they related to each other; and what need to be improved in terms of organizational arrangements for better performance and what are the most important policy instruments developed to accomplish their roles and responsibilities. But first on organizational arrangements

National level land and water related organizations

The roles and responsibilities for land and water management at the federal level are promulgated through the definition of powers and duties of the executive organs (proclamation No.471/2005). Accordingly, the organizations/ministries that currently exist at the federal level and are directly involved in the development and management of land and water resources include: Ministry of Water Resources; Ministry of Agriculture and Rural Development; Environmental Protection Authority, and other affiliated authorities and agencies. A brief description of their roles and responsibilities is given below.

Ministry of Water Resources

The Ministry of Water Resources (MoWR) in Ethiopia, established in 1995, has the following powers and duties as spelt out in proclamation No.471 /2005 (FDRE, 2005a). These include *inter alia* inventory of the country's surface water and groundwater resources; basin level water management and benefit sharing; develop water infrastructure; issue permits and regulate the construction and operation of water works; and administer dams and hydraulic structures.

Ministry of Agriculture and Rural Development (MoARD)

The MoARD, established in 2001, is responsible for initiating agricultural and rural development policies; food security strategies and extension programs, and ensuring conducive environment for development, supporting regions in expanding agricultural and rural development as well as monitoring the food security program. According to proclamation No.471/2005, the MoARD's powers and duties include: to develop and implement a strategy for food security, rural development, and natural resources protection; support development of local (through expansion of cooperatives and the provision of credit facilities) and export markets; development of rural infrastructure and promotion of improved rural technologies and disaster prevention and agricultural research. So far, overarching strategies such as the Agriculture Development Led Industrialization (ADLI) strategy, the rural development strategy, commercialization of the smallholder agriculture, etc., were developed at the federal government level, through the MoARD.

Environmental Protection Authority (EPA)

The EPA is the government regulatory authority responsible for environmental protection. EPA aims “to formulate policies, strategies, laws and standards, which foster social and economic development in a manner that enhance the welfare of humans and the safety of the environment, and to spearhead in ensuring the effectiveness of the process of their implementation” (FDRE, 2002, p. 2). This is envisaged to be achieved through: development of enabling policy and regulatory frameworks; preparation and implementation of proactive environmental management systems; enforcement and compliance mechanisms and community empowerment; improving education and awareness and availing information and fostering participation in decision taking; and identification and availing of environmentally sound technologies and best practices and resource mobilization and channeling. The government has further defined the institutional frameworks, responsibilities and mandates for the implementation of the environmental policy (FDRE, 2002).

Regional level organizations

Regional bureaus, in Ethiopia, have been established with similar designations and responsibilities as the federal ministries described above. The most relevant state level bureaus in relation to land and water management include bureaus of water resources Development, Agriculture and Rural development (BoARD), and Environmental Protection and Land Administration and Land Use Authority (EPLAUA). We briefly describe the roles and responsibilities of the regional bureaus.

Regional Bureaus of Water Resources development

The major regional water sector offices have the responsibility to manage resources on behalf of MoWR. They are also mandated to administer resources under their geographical jurisdiction, i.e. non-transboundary and non-trans-regional water bodies. In Amhara and BNG the water bureau is made accountable to the regional president and administration council² (CANRS, 2004; *BGRS, 2006*). In BNG regional state it is called bureau of water, mines and energy bureau with wider mandates responsibilities. Their roles and responsibilities, in relation to land and water management, include: develop region-wide policies, strategic plans, directives, standards and manuals concerning the management of water resources in line with the federal water policies and laws; issue permits in relation to WRD; develop the water resources of the region; help solve water related conflicts; devise a system of integrated water resources management; maintain the health of water bodies from pollution, support the development of water institutions, etc.

² There is still the view that the role of regional bureaus is not well-defined (NBI, 2006, p. 16).

Bureau of Agriculture and Rural Development

Similar to the federal ministry, the regional bureaus are established, their roles and responsibilities defined by law (CANRS, 2006a; BGRS, 2006). Accordingly, their roles and responsibilities, in relation to land and water management include: develop laws on the conservation and utilization of forest and wildlife resources; coordinate food security programs; provide agricultural extension services; provide support for the expansion of water harvesting and irrigation development activities; promote market-led agriculture development and create efficient agricultural input and product marketing systems, etc. (including through organization of cooperatives). Unlike the federal ministry, conservation of soil and water resources is not mentioned as one of the prime responsibilities of the bureau.

Environmental Protection and Land Administration and Land Use Authority (EPLAUA)

EPLAUA is the regional equivalent of the federal EPA. The major roles and responsibilities of EPLAUA include: ensure interventions are carried out in a manner that will protect the welfare of human beings as well as sustainably protect, develop and utilize the resources; create conducive atmosphere by which the management, administration, use of rural land of the region could be appropriately decided pursuant to federal and regions policies (BGRS, 2006; CANRS, 2006a). To this end, EPLAUA in Amhara³ has developed regional environmental regulations and strategies based on federal environmental policy; environmental impact assessment (EIA) procedures to support development projects; issued directives to implement the rural land administration and land use; and issues environmental clearance to development projects. Furthermore, EPLUA coordinates environmental protection efforts of NGOs and community organizations besides developing strategies, policies to protect and conserve natural resources of the region and to be executed by implementation offices; (e.g. developed guidelines for soil and water conservation in 2007 (see EPLAUA, 2007)

Non-governmental organizations (NGOs)

Although there are many NGOs operating in both regions, Water Aid in BNG and Sustainable Water Harvesting and Institutional Strengthening in Amhara (SWHISA) are the two active actors working in the water sector, particularly in developing the water related institutions.

SWHISA is a CIDA supported six-year project co-managed by Amhara National Regional State (ANRS) and to support training programs, pilot and demonstration projects related to rain water harvesting for irrigated agriculture production. The project

³ In BNG, EPLAUA is in the process of developing environmental regulations and other policy instruments.

strives to strengthen water related capacity of regional institutions and farmer associations to develop and promote sustainable water harvesting and the use of water for irrigation. So far SWHISA has been involved in the development of byelaws for irrigation cooperatives (Personal correspondence). Likewise, Water Aid, although primarily engaged in provision of domestic water, has help the regional government in developing guidelines in organizing water users associations and tariff setting for sustainable operations and maintenance of water points.

Basin or sub-basin level organizations

In Ethiopia, there is no basin authority responsible for the Blue Nile⁴. The national Water Policy (MoWR, 1999; p.13) calls for the establishment of basin-level institutions with the aim “to ensure efficient, successful and sustainable joint management of the water resources of the basins through concerted efforts of the relevant stakeholders”. The establishment of river basin organizations (RBO’s) is envisaged to happen phase by phase. Their establishment is considered one of the main instruments to implement integrated water resources management through river basin plans and effective joint management by relevant stakeholders.

Hitherto, a proclamation for the establishment of River Basin Councils and Authorities has been issued (FDRE, 2007). This proclamation stipulates the establishment of River Basin High Councils and Authorities through regulations to be issued by the Council of Ministers (Art. 3(1)). When it is deemed necessary, the proclamation stipulates, two or more river basins may be put under the jurisdiction of a single Basin High Council and Authority.

There is an on-going effort to establish a river basin authority for the Abay, which is the major sub-basin of the Nile. An institutional study already undertaken pointed out the need for: (1) networking between water related actors, (2) coordination of their water related activities, plans and projects, (3) a sound knowledge of water resources, water uses and of their interactions and (4) a power to administer water resources in the basin (Gizaw, 2004). The legal basis for establishing the river basin authority is pending the enactment of establishment regulation to be issued by the council of ministers.

Watershed level organizations

There is no formal land and water related organizations that operate at the watershed level in Ethiopia. In some watersheds there is informal (ad-hoc) watershed development committees established as part of integrated watershed development projects, mostly by NGOs. But the life and functions of such project-related institutions are dependent on the specific project objectives and are likely to vanish with phasing out of the project.

⁴ There is one functioning river basin authority in Ethiopia for the Awash basin whose major responsibility is the distribution of irrigation water and collection of tariffs.

Local level organizations

At the Woreda (district level), Water Desks are responsible for planning, budgeting, implementing and monitoring and follow up of water projects and programs. These local water desks report to a Woreda level government administrative body called the desk for rural development, not directly to the regional water bureaus. The rural development government body, in turn, reports to the Woreda Council, the locally based highest authority. Urban Water Supply Utilities have traditionally been accountable to the regional water resource development Bureaus.

Water user associations (WUAs) and irrigation cooperatives (ICs) are the most common local institutions engaged in water management at the level of the landscape or hydrological units. WUAs could be defined as social units commonly organized by communities themselves for their own benefits of fair water distribution, improved water delivery and accounting. They are headed by a respected personality from within, leading the effective functioning of the irrigation operation services. The role of WUA is commonly restricted to the distribution of water among members, rehabilitation and maintenance of canals and address water related conflicts. WUA are sometimes threatened by parallel established government-supported ICs, which have broader operational scopes (besides water distribution and operation and maintenance also providing marketing, credit and extension services) and have stronger links with government institutions.

The Amhara National Regional State Cooperative Societies Establishment Proclamation (Zikre Hig No., 134, 2006) provides a comprehensive legislation by which cooperative societies are organized and managed. The region has developed an irrigation cooperatives organization guideline 2/2001 (CPB, 2001). The Cooperative Promotion Bureau is responsible to organize, register and train; give other technical supports to cooperative associations (CPB, 2001; p. 4). The document calls for establishment of ICs in traditional and modern schemes, which is tantamount to a call for transforming traditional WUAs, which do not have formal legal status, to ICs. This is a risky venture given the multiple functions of ICs and poor performance of ICs so far in irrigation water management. This happens in the backdrop of the successful performance of traditional WUAs, despite having limited tasks, in distribution of water among members, rehabilitation and maintenance of irrigation infrastructure and addressing water related conflicts. A better option could be to facilitate the legalization of WUAs so that they could access the formal saving and credit markets.

There are also Water and Sanitation (WATSAN) Committees responsible for the management of drinking water points, operational and maintenance of water points, and provides sanitation training to members. Those are formed for the proper organization and management of drinking water supplies. The members often received training and

users' fees are usually collected to finance the maintenance and repair of public water supply schemes. For example in Farta Woreda (Gumera watershed) about 270 WATSAN has been trained.

The land administration committees (LACs) have been formed and trained in all Kebeles in order to assist the EPLAUA with the land registration process. During the discussions held with key informants in the Koga and Gumera watersheds number of other local institutions have been identified. Those includes: *Churches, Edir, Ekub, and Debo*. Despite the fact that those institutions are deeply anchored to the local tradition, most of them have weak linkage to the formal land and water management institutions and activities in the sub basins. Neither have they recorded bylaws. Exceptionally Ethiopian churches are involved in forest conservation. From our observation during field visits we realized that forest in churches seemed to be the remnant pieces of the past forest ecosystems and thus the preserved ones can be read as a blueprint for the lost ecosystems. They can also serve as springboard to restore the forest ecosystem in the extent one may require.

Land and water related policies and guidelines

Various policies and laws have been lately promulgated by the government of Ethiopia with the intention of improving land and water management. These belong to the class of formal institutions promulgated at the federal and regional levels. We intend to describe the key intents and features of these polices and laws in this sub-section. In doing so the critical questions raised include:

- What are the policies and legal instruments in place to tackle environmental problems?
- Do land and water relate policies and laws have clear objectives? If so, are these objectives reflected in a clear and unambiguous manner?
- What are the main features of the policies and laws, particularly in addressing downstream and upstream linkages and their scope for integrated natural resources management in the sub-basin? In other words, does the exiting policy setting create enabling environment for integrated water resource management (IWRM)?
- Are there policy gaps or in legislative framework that affect effective organizational performance? This question address the issue of compatibility between exiting laws, customs, policies and organizational arrangements; Where do informal rules overrule formal rules (dysfunctionality) and rules in use due to lack of proper enforcement or due to disregard towards the spirit of the written laws?
- What do the enforcement mechanisms and compliance behavior of different agents look like?

Here, we present important land and water related policies and laws and their implications on environmental management.

National conservation strategy

The conservation strategy of Ethiopia (FDRE, 1996) provides an umbrella framework, detailing principles, guidelines and strategies, for the effective management of the environment. It elaborates the state of the resource bases of the country as well as the institutional arrangement and action plans for the realization of the strategy. The strategy aims to meet the over goal of improving the environment of human settlements to satisfy the physical, social, economic, culture and other needs of the inhabitants on a sustainable basis (FDRE, 1996). The document emphasizes the need to ensure the empowerment and participation of the people and their organizations at all levels in environmental management activities; and raise awareness and promote understanding of the essential links between environment and development.

The document outlines the importance of:

- Providing security of tenure for land and natural resources by clearly defining and strengthening land and other natural resources tenure rights and responsibilities so as to support sustainable agricultural, pastoral, forestry and fisheries production and a sustainable urban environment;
- Achieving coordinated, integrated and participatory local plans and land use decisions to achieve ecologically, socially and economically sustainable state and private sector land utilization;
- Ensuring that disadvantaged members of the community are fully involved in the development, management and use of natural, human made and cultural resources and the environment and thus social, cultural and economic sustainability is achieved.

Environmental policy

The Environmental Policy of Ethiopia (EPE), which was approved on April 1997, has an overall policy goal to “improve and enhance the health and quality of life of all Ethiopians, and to promote sustainable social and economic development through the sound management and use of natural, human-made and cultural resources and the environment as a whole, so as to meet the needs of the present generation without compromising the ability of future generations to meet their own needs” (FDRE, 1997a). EPE emphasizes the need for arresting land degradation and promote improved environmental sanitation and health. To this end the Ethiopian Environmental Protection Authority has issued three major proclamations; namely, Establishment of Environmental Protection Organs (FDRE, 2002c), which re-establishes and re-defines the functioning of an Environmental Protection Authority (EPA) as an autonomous Federal Government

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Organ, Environmental Pollution Control (FDRE, 2002e), and Environmental Impact Assessment proclamation (FDRE, 2002d) in the country.

Environmental Organs Establishment Proclamation, enacted in 2002, besides making EPA as an autonomous Federal Government Organ established the Environmental Protection Council (EPC). EPC oversee EPA's activities, as well as the activities of sectoral agencies and environmental units with respect to environmental management. It also ensures coordination among sectoral ministries and agencies on environmental matters. The proclamation stipulates the need for the establishment of environmental organs by regions. Mandates of the regional environmental organs are to enable regions to coordinating the formulation, implementation, review and revision of regional conservation strategies; environmental monitoring, protection and regulation; ensure the implementation of federal environmental standards or, as may be appropriate, issue and implement their own no less stringent standards; and prepare reports on the respective state of the environment and sustainable development of their respective states and submit them to the Authority (FDRE, 2002c, Art. 15).

The Environmental Pollution Control Proclamation prohibits the release of pollutant into the environment by any person engaged in any field of activity. Any person who causes any pollution shall be required to clean up or pay for cleaning up of the polluted environment. The installation of sound technology that avoids or reduces, to the required minimum, the generation of waste and, when feasible, recycling of waste is encouraged (FDRE, 2002b).

To enforce this, EPA is empowered to formulate practicable environmental standards based on scientific and environmental principles and in consultation with relevant agencies (FDRE, 2002b). The standards are required to include standards for the discharge of effluents into water bodies and sewerage systems; air quality standards that specify the ambient air quality and give the allowance amount of emissions for both point and non-point air pollution sources; standards for the types and amounts of substances that can be applied to the soil or be disposed of on or in it; waste management standards specifying the levels allowed and the methods to be used in the generation, handling, storage, treatment, transport and disposal of the various types of waste. So far, EPA has prepared Provisional Standard for Industrial Pollution Control (EPA, 2003) and draft proposal of Ambient Environmental Standards (EPA, 2004), and a regulation for the enforcement of the standards in Ethiopia. Regional states are required to develop their own standards, even stringent ones considering their specific situations. This proclamation also specifies clearly the function of law enforcement of the EPA and of the Regional Environmental Agencies, in charge of taking administrative or legal measures against a person violating the law and releasing any pollutant to the environment. Two approaches are advocated by EPA in pollution control; namely: encouraging cleaner production (voluntary) and requirement to use of best available technologies (end-of-pipe control).

The EIA proclamation empowered EPA to prepare procedure, regulations, guidelines and standards to effectively implement and enforce EIA proclamation. Environmental guidelines are among the tools for facilitating the inclusion of environmental issues and principles of sustainable development into development proposals. To this effect, sectoral environmental impact assessment guidelines on agriculture, transport, industry, tannery and settlements have been prepared. In addition to these, a general guideline for facilitating EIA in all sectors has been prepared (EPA, 2003). The provisions include:

- Without authorization from the authority or from the relevant regional environmental agency, no person shall commence implementation of any project that requires EIA;
- Any licensing agency shall, prior to issuing an investment permit or a trade or an operating license for any project, ensure that the authority or relevant regional environmental agency has authorized its implementation; and
- EIP study or permission does not exonerate the proponent from liability to damage.
- Through this directive EPA is expected to identify projects not likely to have negative impacts, and so do not require environmental impact assessment and those that do have and requires EIA. Furthermore, EPA has developed an EIA guideline, the purpose of which is to ensure that proponents, the government and all other interested and affected parties have the opportunity to participate meaningfully in the EIA process and facilitate EIA in all sectors.

Water related policies, laws and regulations

The most important water related policies, strategies, regulations and guidelines in Ethiopia include: Water Resource Management Policy (MoWR, 1999); Water Resources Management Proclamation and Regulation (MoWR, 2000); and National Water Sector Strategy and Water Sector Development Program (MoWR, 2004). The range of relevant policies point to the complexity of numerous institutional mandates relevant to water management. Each of these is briefly described below.

Federal Water Resources Management Policy, Regulation and Guidelines

The Ethiopian Federal Water Resources Management Policy stated that the goal of the policy is “to enhance and promote all national efforts towards the efficient, equitable and optimum utilization of the available water resources of the country for significant socio-economic development on a sustainable basis” (MoWR, 1999, p.1). The fundamental principles of the Ethiopian Water Resource Management Policy are that (i) water is a natural endowment commonly owned by all the people of Ethiopia, (ii) every Ethiopian citizen shall have access to sufficient water of acceptable quality, to satisfy basic human needs, (iii) water shall be recognized both as an economic and a social good, (iv) water resource development shall be underpinned on rural-centered, decentralized management, participatory approach as well as integrated framework, (v) management of water

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resource shall ensure social equity, economic efficiency, systems reliability and sustainability, (vi) the participation of all stakeholders, user communities specially that of women, shall be promoted in water management. The policy has a series of highly relevant provisions, in particular regarding the IWRM approach. These include:

- Enhance the integrated and comprehensive management of water resources that avoids a fragmented approach;
- Recognize water as a scarce and vital socio-economic resource and manage water resources on a strategic planning basis with long term visions and sustainable objectives;
- Ensure that water resources management is compatible and integrated with other natural resources as well as river basin development plans and with the goals of other sectoral developments in health, mines, energy, agriculture, etc.;
- Recognize and adopt hydrologic boundaries or “basins” as the fundamental planning unit in the water resources management domain; and
- Promote and advocate institutional stability and continuity in water resources management and ensure smooth transition during times of changes.

More specifically the document provides additional relevant provisions on the enabling environment:

- Promote appropriate linkage mechanisms for the coordination of water resources management activities between the Federal and Regional Governments;
- Establish phase-by-phase Basin Authorities, for efficient, successful and sustainable joint management of the water resources of the basins through concerted efforts of relevant stakeholders,
- Create conducive environment for the enhancement of linkages and partnership between the Federal and Regional States on the basis of the constitution for the realization of efficient, sustainable and equitable water resources management, and provide the legal basis for active and meaningful participation of all stakeholders.

The policy also addressed cross cutting and sectoral issues such as water allocation and apportionment, environment, watershed management, water resources protection and conservation, technology and engineering, water resources management information systems, monitoring, assessment and auditing, water cost and pricing (economics of water), groundwater resources, disasters, emergencies and public safety, transboundary water stakeholders, gender, research and development, water quality management and enabling environment. The sectoral part of the policy has incorporated specific issues on the area of water supply and sanitation, irrigation and hydropower.

Although the issues addressed in the policy are equally important, the issue of water allocation, a basin development approach, integration of developments, water pricing, cost recovery, and water financing could be taken as key pillars for the future development and management of water resources. We present these issues briefly for closer scrutiny. The water policy provision on water allocation and apportionment indicates that it is to be done in accordance with a permit system for uses of irrigated agriculture, commercial animal rearing, industry, mining, urban water supply, etc; while

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no permit is required for use of water by peasants, artisan miners, traditional fishermen, traditional irrigation, water mills, hand-dug wells. The supervising body (MoWR) is responsible for determining the allocation and manner of use of water resources among various uses and users; and for issuing directives to prevent inappropriate use and wastage of water. More specifically, the policy directs that:

- The basic minimum requirement for basic human and livestock needs as well as environment reserve has the highest priority in any water allocation plan;
- Water allocation gives the highest priority to water supply and sanitation, while apportioning the rest for uses and users that result in highest socio-economic benefits;
- Encouragement of water allocation need to be based on efficient use of water allocation, which is based on efficient use of water resources that harmonizes greater economic and social benefits;
- Water allocation shall be based on the basin, sub-basin, and other hydrological boundaries and take into considerations the needs of drought prone areas;
- Adopting the principle that water allocations shall not be made on permanent basis, but rather on agreed time horizon that fits best with the socio-economic development plans; and
- Priority is given, generally, to multi-purpose projects as compared to single purpose for optimum water utilization as well as for fair administration of water uses in reservoir operations.

The policy document underlines the importance of an integrated approach to water resources development for optimal utilization of the country's water resource. Integrated water resources management promotes the coordinated development and management of water, land and related resources to maximize economic and social welfare in an equitable and sustainable manner. The policy document has also recognized and adopted hydrologic boundaries or "basins" as the fundamental planning unit and water resources management domain. It indicates that water resources management need to be compatible and integrated with other natural resources as well as river basin development plans and with goals of other sectoral developments in health, mines, energy, agriculture, etc. To this end, river basin integrated development master plan studies have been carried out on six river basins: Abbay, Baro-Akobo, Gibie-Omo, Tekezie, Wabi Shebelle and Mereb Genale Dawa river basin. Presently, similar studies are being carried out in the Rift Valley river basin. Comprehensive potential projects in water supply, irrigation, hydropower, flood control, fisheries, recreation, navigation, industry, etc have been identified. Priority for development of these projects has been set; and implementation of some has started.

With regard to transboundary waters, the policy explicitly calls to (i) study Ethiopia's stake and national development interests in the allocation and utilization of transboundary waters; (ii) promote the establishment of an integrated framework for joint utilization and equitable cooperation and agreements on transboundary waters; (iii) ascertain and

promote Ethiopia's entitlement and use of transboundary water based on those accepted international norms and conventions endorsed by Ethiopia; and (iv) foster meaningful and mutually fair regional cooperation and agreements on the joint and efficient use of transboundary waters with riparian countries based on "equitable and reasonable" use principles; comply with those international covenants adopted by Ethiopia, and manage transboundary waters accordingly.

Furthermore, the water resources management policy has given importance and recognition to the value of water. In order to significantly contribute to development, water shall be recognized both as an economic and a social good; and the policy has clearly recognized the disadvantaged groups of the population by citing that, "although all water resources development ought to be based on the economic value of water, the provision of water supply services to the underprivileged sectors of the population, shall be ensured based on a special social strategy" (MoWR, 1999). The most important role of water valuation relates to demand management and better allocation of water among the various uses. The value of water depends on its quantity, quality, location, access, reliability and time of availability. Valuing water is linking the concern that water uses must be able to meet different social, economic and environmental functions. Priority in water allocation is given to human and animal consumption, followed by irrigation.

The water policy has specific stipulations pertaining to tariff setting, requiring that (i) tariff structures are site-specific and determined according to circumstances; (ii) rural tariff settings are based on the objective of recovering operation and maintenance costs while urban tariff structures are based on the basis of full cost recovery; (iii) adopt a "social tariff" to enable poor communities to cover operation and maintenance costs; (iv) establish progressive tariff rates, in urban water supplies, tied to consumption rates and flat rate tariffs for communal services like hand pumps and public stand pipes. The Water Resources Management policy also stipulates the following provisions relevant to irrigation:

- Ensure that irrigation development is integrated with the country's socio-economic development strategy and overall water sector development strategy, especially with regard to agricultural development led industrialization;
- Irrigation development strategies should promote socio-economic development while ensuring participatory and sustainable development;
- Ensure that adequate resources are devoted to irrigation development particularly in capacity and institution building;
- Irrigation development should take the interest of the end users into account, particularly the rural women;
- Develop strategies for the development of small-, medium- and large-scale irrigations schemes to meet the country's food, raw materials, and foster economic development;
- Support traditional irrigation schemes to ensure improved with water harvesting, delivery and water management efficiency;

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- Protect irrigation water from pollution, reduce damage and maintain irrigation water quality;
- Develop water allocation mechanisms to ensure social equity, economic growth and environmental sustainability; and
- Integrate appropriate water drainage service with irrigation development works;

The main actors in irrigation development are identified as: farmers, service cooperatives, governmental and nongovernmental organizations' and the local people who will live in and near the irrigation development. Participation from all of these stakeholders, as well as transparency and social equity in irrigation development, are priorities. With regard to financing, the irrigation water policy calls for the establishment of norms and procedures for financing sustainability and viability; the promotion of credit facilities and bank loans; and appropriate cost recovery systems and mechanisms for all irrigation schemes. Following the Water policy, the government of Ethiopia has issued Water Resources Management Proclamation to enable proper management, protection and utilization of the country's water resources. This proclamation provides the basic legislative framework for the country with respect to the management, planning, utilization and protection of water resources. The stated purpose of the proclamation is "to ensure that the water resources of the country are protected and deployed for the highest social and economic benefits of the people of Ethiopia; to follow up and supervise that they are duly conserved; to ensure that harmful effects of water are prevented; and that the management of water resources are carried out properly" (Art. 3). The basic trust of these fundamental principles is that water resources management and administration in the country should be based on the National Water Policy, the Integrated River Basin Master Plan Studies (IRBMPs) and the Water Resources Laws of the country.

According to the proclamation, the right to allocate and apportion water is best bestowed upon the legal jurisdiction of the Ministry of Water Resources in its capacity as supervisory body. The legal provisions in the proclamation, with regard to ownership of the resources and its allocation and apportionment, clearly show that the development, management, utilization and protection of all water resources in the country lies effectively in the hands of the Federal Government.

Regional states and local administrative bodies, without requiring any new law for water, are strictly obliged by law to implement the water policy and the water proclamation in accordance with set directives and guidelines provided by the Federal Ministry of Water Resources. Moreover, this proclamation confirms the duality of management arrangements, i.e., surface waters whenever linking two or more Regions or being transboundary clearly falls under the Federal level while water resource within the jurisdiction of regions are addressed by the Regional States legal provisions.

A federal Water Resources Management Regulations (MoWR, 2004), while its contents are similar to those covered in the proclamation, but details the procedures as to how the

various legal materials contained in the proclamation are to be effected on the ground. In particular the regulations present a further elaboration of the main requirements for the issuance of permits for different uses of water and the conditions for the issuance, as well as the level of water charge and procedure for licensing water operators.

The MoWR still retains the mandate to issue permits for large bulk of water resources of the country although it can delegate it further to any relevant body. This is also true for collection of fees and water uses charges. Furthermore, tariff rates are determined for different water uses at national level, without intervention of Regional States.

Water sector strategy and development program

The Water Sector Strategy provides the framework, which contains ways and means of attaining the intended objectives. The goals and guiding principles remain the same with that of the policy. The strategy sets the road map on how to make meaningful contributions towards improving the living standard and general socioeconomic well-being of the n people. These objectives include:

- Realizing food self-sufficiency and food security;
- Extending water supply and sanitation coverage to large segments of the society;
- Generating additional hydropower and enhancing the contribution of water resources in attaining national development priorities; and
- Promoting the principles of integrated water resources management.

The Ethiopian Water Sector Development Program (WSDP) is taken as an instrument to translate the Ethiopian Water Resources Management Policy into action. The 15-year WSDP has five major components: Water Supply and Sanitation Program; Irrigation and Drainage Program; Hydropower Development Program; General Water Resources Program; and Institutions/Capacity Building Program.

In view of the enormous water demand in the country, the WSDP has adopted the following water resource development priorities.

- Making clean drinking water available to the larger segments of the society, including water for sewerage purposes;
- Making water available for livestock in critical areas such as the pastoral areas;
- Expanding irrigated agriculture to the maximum possible extent;
- Meeting hydropower generation capacity needs arising from electricity demand in the economic and social sectors; and
- Providing water for the industrial development.

Within the overall priority provided above, the highest priority has been given to the programs and projects, which are ongoing and their implementation is expected to continue during the period of the plan; those that require rehabilitation and reactivation; were started, but for some reason their implementation was discontinued; have already been subject to appraisal and are already being considered for possible funding; have

been identified in master plan studies; have been considered for capacity building; and re indicated in the Nile Basin Initiative and the Eastern Nile Subsidiary Action program.

Recognizing that WSDP is a national water plan, stakeholders including public, private sector, NGOs, international development partners and communities are anticipated to participate in the implementation of the Program. To this end, the detailed implementation arrangements of the WSDP are worked out to address the roles of various stakeholders, be it government institutions such as the Federal Ministry of Water Resources or Regional Water Bureaus. Various organs are proposed to be established towards implementing WSDP such as an Inter-Ministerial Steering Group; Federal Program Management Unit (FPMU); Regional Program Management Unit (RPMU); Sub-Program level teams under the FPMUs and RPMUs. These entities are not established as yet (NBI, 2006).

Land use and land administration

A series of proclamations on Rural Land Administration and Use (FDRE, 1997b; 2005c) and Land Expropriation and Compensation (FDRE, 2005b) provide the legal framework for rural land administration and use. The laws define rights of land holders and their obligations. In line with the constitution of Ethiopia, proclamation declared land to be the property of the state. Hence, it may not be sold or mortgaged. One of the important provisions of the proclamation is the provision on the rights of land users to get and use land freely through land distribution and/or by bequeath or gift. Holding rights are defined in the Federal Constitution (FDRE, 1995) as "the right any peasant shall have to use rural land for agricultural purposes as well as to lease and, while the right remains in effect, bequeath it to his family member; and includes the right to acquire property thereon, by his labor or capital, and to sell, exchange and bequeath same" (Art 2 Sub Art. 3). The state also has the ultimate power to enact laws about utilization and conservation of land. Art. 51 of the constitution states that the Federal Government shall enact laws for the utilization and conservation of land and other natural resources (FDRE, 1995). Art. 52 also states, that Regional Governments have the duty to administer land and other natural resources according to Federal laws. Both proclamations vested Regional Governments with the power of land administration (defined as "the assignment of holding rights and the execution of distribution of holdings") (FDRE, 1997b, Art. 2.6). They also called for land registration and certification to reduce land conflicts and encourage long-term investment in rural lands.

Lately, the government has come up with land expropriation and compensation proclamation (FDRE, 2005b) which states that "a landholder whose holding has been expropriated shall be entitled to payment of compensation for his property situated on the land and for permanent improvements he made to such land (Ibid: p. 3128)". Compensation for permanent improvement to land shall be equal to the value of capital

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and labor expended on the land (Ibid.). A rural landholder whose landholding has been permanently expropriate[d] shall, in addition to the compensation payable, be paid displacement compensation which shall be equivalent to ten times the average annual income he secured during the five years preceding the expropriation of the land (Ibid.).

Following the 1997 and 2005 federal land related proclamations, regional governments came up with their own proclamation on rural land administration and use (For instance see CANRS 2006b). In doing so, they formalized land-lease practices between farmers with contracts up to a maximum of 25 years. Furthermore, the regional proclamations paved the way for land titling, by registering all arable lands, to the landholders who received land during the last land redistribution or through inheritance from their close kin. By doing so, the regional governments hope to boost farmers' sense of security, which, in turn, may encourage investment in erosion reducing and landing quality enhancing technologies. Preliminary studies on the impact of land certification on tenure security long term investment and functioning of land markets indicate that they are having significant impacts on both accounts (Hagos, 2007; Holden et al., 2007). Similar policies were also promulgated in all the major regions of Ethiopia (Deininger, et al. 2007).

Important provisions of the land administration and use proclamation, both federal and state, that have provided incentives that encourage farmers to improve their management and make additional investments on their land include (FDRE, 1997; 2005; CANRS 2006b):

- Right to use has no any time limit;
- Right to transfer holdings in bequeath or donation;
- Transfer right in rent to any person for a maximum of 25 years;
- Right not to be expropriated without consent of the user or unless it is to be used for public services;
- Right of any person deprived from his land holding to get compensation for the permanent property he had developed on the land;
- Right of the state to deprive holding rights if gross damage occurs over land due to mismanagement;
- Land measurement and registration; and
- Granting a legal land holding certificate where in the land holding certificate shall indicate the main provisions of right and obligations of the land holder.

The new proclamations also have specific regulation on land use obligations of the land user. The land use regulations include: any rural land shall have land use plan and any rural land with 60 % slope and above shall not be used for farming and free grazing other than forestry, perennial plants and development of forage for animals (CANRS 2006b, p. 8). The obligations of the land user include: protect the land under his/her holding or land obtained in rent and conserve the surrounding; to plant trees around his/her land and properly protect them; undertake trench terracing and favorable soil conservation activities to use the land forms which are 31 to 60 % slope for perennial plants and to use

land based on land use plan (CANRS 2006b, p. 21). Non-compliance is likely to lead to deprivation of use rights and penalty. The Rural land Administration and Land Use of the Amhara National State (CANRS 2006b), for instance, indicates that where land is degraded due to weakness, not to conserve it, the household will be obliged to transfer the right to use land in rent temporarily for a person who undertakes an obligation; if not corrected it goes from suspending him from using his right for a limited time up to expropriating with compensation. In the extreme case, he shall be made to pay compensation for the damage pursuant to civil code in addition to measures above (p. 23).

Integrated watershed management guidelines

This guideline was developed with the intension of promoting and expanding participatory community watershed development in Ethiopia. This is an attempt to streamline the experiences of various actors (GOs and NGOs) in participatory watershed development, combined with the need to have a common and standardized, more effective approach to the country as a whole (Lakew et al. 2005). The guideline aims to build upon exiting community-based participatory watershed efforts to harmonize and consolidate planning procedures at the grass-roots level. The intent is to provide development agents and communities with a workable and adaptable planning tool. Another objective of the guideline is to provide practical guidance on the correct selection of technologies under different conditions and their correct implementation (Lakew et al. 2005).

Analysis of Institutional Setup

In the subsequent section, we will closely analyze the institutional design architecture of institutions in the Tana and Beles Basins and in Ethiopia in general. Five criteria will be used to structure our discussion: presence of clear institutional objectives; interconnection between formal and informal institutions; institutional adaptiveness; appropriateness of scale; and compliance capacity.

Institutional design architecture

In terms of clarity of institutional objectives, the institutional arrangements for land and water in Ethiopia in general and BNB in particular are fairly well defined. There are organizations with clear mandates, duties and responsibilities. The organizational settings have been organized in such a way that organizations that have to do with land and water, directly or indirectly, have been identified and given by law duties and responsibilities. The policies and laws in place have also clear objectives and some have developed strategies and policy instruments to meet these objectives. That said, however, there are

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important problems noticed in the organizational setting and some questions about the institutional arrangements that remain to be answered. Important policy gaps are identified as well.

Like elsewhere in Ethiopia in Tana and Beles Basins, there are at least three federal and other subsidiary agencies and the same number of regional bureaus/authorities working in the area of land and water and environmental protection. The government tried to define the roles and responsibilities of government bodies, a careful look into the work portfolios of ministries indicate the presence of overlaps in mandate between MoWR and MoARD, EPA. For instance, MoWR and MoARD have both responsibilities related to water resources development, although MoWR focuses on medium and large-scale works while MoARD focuses on small-scale irrigation and micro water harvesting. The broad areas of integrated natural resource management also fall into the mandates of these two ministries and the EPA.

It seems there is a problem of split jurisdiction here, which may create problems in implementation and enforcement. EIA and water pollution control also fall under the jurisdiction of EPA and MoWR. There is already possible overlapping of responsibility between on the one hand the general and broad mandate of EPA and Regional Environmental Bureaus or Authority in the field of pollution control and on the other hand the IWRM framework that promotes integration of all aspects of water resources. If these two organizations work separately, this would lead to a clear duplication of effort and waste of resources. The critical questions here are: to what extent these overlaps in mandates mean duplication of efforts and conflict of mandates? An equally important issue is to what extent are these overlaps minimized through joint planning and coordination? Furthermore, who is responsible, mandated by law, for regulating that tasks and responsibilities are fulfilled by the responsible ministries and agencies? What specific linkages and information sharing mechanisms are in place to ensure institutional harmony and efficient information and resource flows?

As indicated earlier, MoWR is responsible for water resources that are transboundary in nature and not confined within a regional state while regional Water bureaus are responsible for water resources within their jurisdiction. At the same time, MoWR is responsible for developing medium and large scale schemes in the whole country while responsibility to develop small scale schemes falls under the jurisdiction of regions, to be more precise under the Bureau of Agriculture and Rural Development. This separation of mandates between the federal water ministry and the regional water bureaus is artificial, to say the least, and is contrary to the principles of IWRM. In this line, an important point here is whether central ownership of these resources is compatible with decentralized management, one of the principles of IWRM, which is also advocated in the Ethiopian water policy documents. Several questions also arise from this situation: what is the role of the regional bureau of Water Resources Development? Is its role limited to provision of domestic water supply in the regions as small scale irrigation also falls under the jurisdiction of the Bureau of Agriculture and Rural development? Is the MoWR in a

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position to issue water permits and collect water charges at national scale? Or could be more efficient to delegate parts of its mandate to regional water Resources Bureaus? The same questions could be raised on the relationship of other ministries (i.e. MoARD and EPA) to their counterpart in the regions.

In addressing these questions we developed an actor linkage matrix for the Tana Beles Sub-Basin (see Table 2) where we explored information flows and linkages. We found three types of information exchange and linkages within the federal ministries and regional and between the two. There are, at least in theory, formalized and institutionalized information flows and linkages between organizations falling within the same sector, example between the MoWR and BoWR or MoARD and BoARD, etc. There are indirect information flows and linkages between close neighbor sectors (e.g. land and water). The mechanisms of indirect information flows and linkages are usually through reports to a higher body (regional president or Prime Minister) and discussions at the regional/federal council of ministers level. As stated earlier, the EPE calls for the establishment of Environmental Protection Council (EPC), which oversee EPA's activities, as well as the activities of sectoral agencies and environmental units with respect to environmental management. It is also expected to ensure coordination among sectoral ministries and agencies on environmental matters. Although whether EPC is operational as yet or not is not known, a project based ad-hoc coordination platform, where national steering committee is established, is usually used to oversee the planning and implementation of a project. The committee defines, terms of reference for contractors/consultants, evaluates the outputs thereof. Any water related project is, in principle, subject to EIA based on EPA guidelines. Horizontal communications between ministries and bureaus belonging to different sectors is seldom common. There are hardly any information flows and linkages between sectors not apparently related. The lack of Integrated Information Management System exacerbates this problem of poor communication. The organization of ministries, bureaus and departments, hence, seems to follow 'disciplinary' orientation while problems in the sector call for interdisciplinary and integrated approach. For instance, there is no structural and coordinated linkage among the various stakeholders that are involved in the water sector activities, even between the two key institutions, i.e. Ministry of Water Resources and the Regional Water Bureaus (Gizaw, 2004). On the other hand, research institutes have limited direct linkage the development ministries/bureaus. There is hardly any linkage and information flow between the formal and informal organizations.

In summary: a high frequency of overlapping and conflicting roles and responsibilities between institutions reported (NBI, 2006: p. 3). NBI (2006) also identified poor inter-sectoral collaboration and control as one of problems related to roles and responsibilities of organizations. Concerns existed that roles and responsibilities between levels remained ill-defined and resulted in implementation inertia and even failure (NBI, 2006). This could lead to inability to achieve the goals of the sectors. Additionally, the stakeholders may not collectively drive some synergic benefit from being able to integrate their

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administrative efforts. Both protective institutional responses and lack of effective coordinating mechanisms are featured as reasons (NBI, 2006).

In this line, the organizations involved in land and water were marked by frequent restructuring and re-organization over the last few years and the process seems to be going on. While adjusting institutional responsibilities and redesigning organizational structures may be called for in the light of the changes and development needs of the country, the frequent, at times endless, restructuring process has certainly produced uncertainties, made capacity building difficult and affects the political will to push for change. NBI (2006) documented many challenges related to implementation within weak institutional environments that were evident, with particular awareness of the need to build substantial capacity at decentralized levels (p.5).

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Table 2 Actor linkage matrix in the Tana Beles sub-Basin (map of information flow and linkages between major actors)

↓	BARD	BWRD	EPLAUA	AARI	SHWISA (NGO)	Water Aid (NGO)	MoARD	MoWR	EPA	EIAR
BARD		IFL	IFL	FFL	FFL	NFL	FFL	IFL	IFL	IFL
BWRD	IFL		IFL	IFL	IFL	FFL	NFL	FFL	IFL	NFL
EPLAUA	IFL	IFL		IFL	IFL	NFL	NFL	NFL	FFL	IFL
AARI	FFL	IFL	IFL		NFL	NFL	IFL	NFL	NFL	FFL
SHWISA (NGO)	FFL	IFL	IFL	IFL		NFL	NFL	NFL	NFL	NFL
Water Aid (NGO)	NFL	FFL	NFL	NFL	NFL		NFL	IFL	NFL	NFL
MoARD	FFL	NFL	NFL	NFL	NFL	NFL		IFL	IFL	FFL
MoWR	NFL	FFL	NFL	NFL	NFL	IFL	IFL		IFL	IFL
EPA	NFL	NFL	FFL	NFL	NFL	NFL	IFL	IFL		IFL
EIAR	NFL	NFL	NFL	NFL	NFL	NFL	NFL	NFL	NFL	

Codes: FFL= Institutionalized flow & Linkage; IFL= Indirect flow& Linkage; NFL= No flow & Linkage at all.

In terms of the role of different organizations in the development of new policies and laws, in relation to natural resource management, the federal ministries were instrumental in developing key policies and laws while regional bureaus kept a lower profile (see Table 3). In some case, regional bureaus developed proclamations and guidelines to implement federal policies and in some cases they adopted federal polices as they are. The regional Rural Land Administration and Use proclamations and guidelines falls under the former category while water related policies, regulations and guidelines have remained fall into the second category. Noticeably, there was limited research input in the development policies, as policy research in the country is at best fragmented and rudimentary to yield outputs that are worth of policy uptake.

Level of influence	Roles			Responsible
	High			EPA/MoWR/MoARD

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Medium			EPLAUA/BARD/ BWRD
Low			EIAR/AARI
	Negative	Neutral	Positive

Table 3 Role and influence of organization in policy change in the Tana Beles sub-basin: Land and water management

The policies and laws hitherto developed in Ethiopia are said to reflect global policy changes or the widespread adoption of the IWRM principles (NBI, 2006). Not surprisingly, the policies are reflections of the institutional arrangements as the major intents and objectives of the policies and laws reflected the roles and responsibilities of organizations that developed them. The narrow disciplinary orientation that we witnessed in organizational arrangement is also manifest in the key trusts of these policies. It is known that sustainable land management has a lot of bearing on water availability and quality, the water policy in Ethiopia, however, does not consider the need for improved land management in relation to water resources development. The limited coordination between MoWR and MoRAD also manifests in this. Informal institutions seem to play a critical role in the *modus operandi* of many organizations.

There is no doubt that a lot of progress has been made lately in creating an institutional framework for improved land and water management in Ethiopia. However, there are cases where informal institutions substitute formal institutions. Informal institutions here are understood as those, contrary to the written policies and laws, unwritten codes of practice that shape organizations behavior. One policy gaps that still calls for immediate action is the management of transboundary waters. The Ethiopian water policies (for that matter all other riparian countries in the Nile) advocate for integrated water resources development, where the planning unit should be a river basin. Practices, however, deviate a lot from the written policy. Actual water development interventions follow a piecemeal approach. There is uncoordinated and unregulated harvesting of the countries' ground and surface water resources. Adequate upstream and downstream considerations are also lacking in the implementation process. Mechanisms for cost and benefit sharing between upstream users (who cause the degradation and could control it if they have the incentive) and downstream users (who could gain more from improved management of land and water upstream and loose due to poor management of the same) are not in place in the water policy of the country. At the basin scale, while important progress has been made though the NBI and individual efforts of countries (e.g. promulgation of proclamation for the establishment of river basin organizations in Ethiopia), still the riparian countries could not come up with mechanisms for equitable and efficient distribution of the Nile water. Still old rules govern in the distribution of the Nile water in general and the Abay Blue Nile in particular.

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The focus of all the water organizations is on surface water and groundwater, i.e. blue water. While rain water is the major contributor to livelihood in the basin, particularly in the Ethiopian highlands, little attention is given to it in the policies and strategies and in the organizational arrangement of the water sector. Policies leave out rain water management which has a great bearing in the sustenance of both surface water and groundwater (NBI, 2006). The lack of focus on green water is another policy gaps that calls for remedy.

Furthermore, there is discrepancy between the stipulations of the law and the practice in cost recovery. The laws indicate that water schemes, potable or irrigation, are expected to operate on a cost recovery basis. The policy, for instance, stipulates that if these schemes are located in rural areas, they are at least expected to cover operation and maintenance costs of those schemes. However, practices throughout the country (not only Tana Beles sub-basin) indicate that farmers are not made to pay for operation and maintenance. This encourages overuse of water and poor management of water structures. Moreover, lack of effective cost recovery mechanisms often inhibits the ability of organizations to sustain themselves and fulfill their mandates (Gizaw, 2004; NBI, 2006).

While Ethiopia's water development and environmental protection policies and laws recognize the need and importance of taking proper EIAs in pursuing any water related development intervention, traditional practices still dominate: environmental considerations are given limited consideration in water resources development. Or if they did, this is done without the involvement of EPA/ EPLAUA. As indicated earlier, both EPA and MoWR resources seem to be mandated to care for the protection of water pollution. This has become a potential source of conflict, where MoWR, and specially the regional BoWR, does not seek to secure environmental clearance from EPA/EPLUA for water related intervention. MoWR/BoWR seems to grant permits without go-ahead from EPA/EPLUA.

There is also confusion in the definition of the appropriate scale. Regional bureaus and federal office are organized on the basis of administrative scale, i.e. regions or the country. On the other hand, the relevant water resources policy and watershed management guidelines advocate the basin or watershed to be the basic planning unit for intervention. A critical constraint against effective river basin management is the commonly prevalent conflict between boundaries of river basins and those of political units (nations, regions, districts, etc). The administrative boundaries also pose potential constraint in management of small watershed that fall between two districts or PAs. This calls for establishing viable and acceptable institutional mechanisms for shared management of water resources in the river basin or watershed. While the major rivers in the Abay Blue Nile are transboundary in nature, there are no transboundary organizations as yet responsible for the management of water resources at a basin scale. Many development interventions within the sub-basin are not centered on watersheds. However, the ground for the establishment of river basin organizations seems to be in the making although taking watersheds as development domains is hardly practiced.

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Enforcement capacity of institutions is another indicator against institutional performance is evaluated. The issue here is: how are violations of accepted institutions dealt with and what are the typical forms of enforcement by land and water institutions. If there are enforcement problems, what are the major causes of these problems? Overall, assessment is that regulations on water resources management, pollution control, land use rights related to water, watershed development, environmental quality and pollution control standards are not effective or enacted because of enforcement capacity (NBI, 2006). The major government regulatory agency, EPA, complains of inadequate staff and resources to do proper enforcement of environmental provisions. The same story is also heard in the regions, where inadequate manpower and resources constrain enforcement. Moreover, in the regions, they complain of lack of environmental pollution standards to do effective job of enforcement and EIA. On the development wide, there is lack of systematic monitoring and evaluation of policy implementation (NBI, 2006). The poor record in monitoring and evaluation is highly linked with the absence of an integrated system of information management at the country level or at the sub-basin level. While the land and water organizations, both in the country and regions, are mandated to collect and store relevant data to support decision making, the data collection is at best inadequate and haphazard. There are attempts, for instance, to establish Water Resource Information Center (WRIC) at the MoWR. In fact, the Ethiopian Water Management Policy (MoWR, 1999, p. 10) calls for the establishment of Water Resources Information Center (WRIC) and indeed to this effect the Ministry has now created Data and Information and GIS Center (WoWR, UNESCO and GIRDC, 2004). However, as yet there is no Integrated Information Management System in place to enable information sharing and exchange between organizations and support timely policy decision making. In the light of this, various organizations keep and maintain a wide range of data to meet their purposes although the quality and coverage of the data maintained by each organization is generally appraised as weak (MoWR, UNESCO and GIRDC, 2004; p. 75). On top of this, there is a considerable weakness at all levels of the regional water sector institutions in keeping proper records of data and information. There is also a lack of standard procedures for gathering and storing of data and information. Data management is not done in a way conducive to enable easy data sharing. This is more so at the basin scale, i.e. across countries.

We have described the various land and water institutions in Ethiopia and the Tana-beles basin. Interesting in this regards is to assess how these institutions evolved, particularly the type of adaptive management pursued. Although, a rigorous analysis is called for in how specific polices, laws and organizations evolved. It seems apparent that adaptive evolutionary management is the typical type of strategy followed in drafting institutionalizing these policies and organizations. Institutions – broadly meant the rules of the game and the actors – in the Tana Beles sub-basin or Ethiopia are developed through a series of trial and error. This explains partly the omnipresent process of restructuring of the ministries/ bureaus and revisions of policies and laws in the country /regions.

Another related issue is the adaptive capacity of institutions to changes in socio-economic and bio-physical contexts, i.e. technology, climate change and water scarcity, market factors, environmental and health risks, etc. Institutional efficacy is measured not only in fulfilling daily work mandates but also in developing forward looking solutions to emerging issues. Looking into the dynamics of the institutional settings in the Abay Blue Nile basin, there is hardly any indication that the emerging challenges are reflected upon and strategies to address these issues developed. There are allusions in the policy documents that envisaged water sector and broader development strategies in the country (sub-basin) are expected to provide mechanisms to mitigate some, if not all, of these challenges. However, these strategies assume that there is plenty of water potential to tap in from in the sub-basin. Economic water scarcity is considered a greater challenge than physical water scarcity. Climate change scenarios and their impact on water resources are hardly taken into account in the development of these strategies.

Choice of policy instruments

We described the overall intent and main features of the various land and water related policies in Tana Beles sub-basin in the proceeding sections. Now we make a more focused discussion of the choice in policy instruments to enforce these policies and laws. These policies and laws will be understood in the light of their intent to influence actors (policy makers, practitioners, land and water users, etc.) to change their behavior such that the policy goals of sustainable resource use are met and externalities are minimized. Externalities are internalized if individuals account for effects of their actions on others. Imposing costs on others requires compensating them, and providing benefits for others requires being compensated for them (Kerr et al., 2007).

According to Kerr et al. (2007), the most important criteria in designing effective policy instruments include: cost-effectiveness (administratively feasible, with low transaction costs); direct targeting (addressing the problem more directly will have fewer side effects); creates strong incentives to comply (easily monitored or self-monitoring are more feasible and cost-effective); has long-term impacts (avoid short time fixes); protects poor people's livelihood (helping poor people or at least not harming them); does not concentrate costs on a particular group (avoids uneven distribution of costs and benefits to encourage collective action) and replicable across scale and context (mechanisms effective in multiple settings). Policy makers will take account of these criteria in developing certain policy instruments. However, the weight given to a given criteria in choosing policy instruments could vary from context to context. The performance of different instruments is not the same in all contexts either. The performance of the same policy measure judged against these criteria could vary a well: different approaches for internalizing externalities tend to perform better against some criteria than others, so tradeoffs are inevitable (Kerr et al., 2007).

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There are different types of policy instruments and approaches to internalize externalities (Pagiola et al., 2002; Sterner, 2003; Kerr et al., 2007). These include: moral suasion and social conventions; regulatory limits and economic penalties; taxes on negative externalities; tradable environmental allowances (permits for negative externalities); investment subsidies; indirect incentives; payment for environmental services; change in property rights; facilitation in negotiation and conflict resolution. For the sake of convenience, these instruments could be broadly classified into two broad categories: economic incentives and market-based instruments and command-and-control (coercive) instruments (Kolstad, 2000). OECD (2007) indicates that instrument mix rather than a single instrument are effective in addressing specific environmental problems because of two main reasons: many environmental problems are of multi-aspect nature; certain instruments can mutually underpin each other. Our intention here is to uncover the policy instruments chosen in the major land, water and environmental policy of the country and assess whether they are effective in addressing the major environmental problems in the sub-basin and the country in general. The focus here will be on the Environmental Policy, Land Use and Land Administration, Integrated Watershed Management Guideline and Water Resources Management Policy.

Table 4 Essential elements of water and land management policies

Instrument/element	WRMP	EPP	LULA	WSG
General intent of the policy/law	✓	✓	✓	✓
Jurisdiction – spatial and administrative scales	✓	✓	✓	✓
Responsibility (establishes or enables commitment)	✓	✓	✓	✓
Goals and objectives	?	?	?	?
Duty of care (Ethical, legal responsibility, attitude, responsibility or commitment)	✓	✓	✓	✓
Hierarchy of responsibilities ('rights and obligations' of hierarchies)	?	✓	✓	✓
Institutional changes (statements of an intended course of action/ needed reform or legal change)	✓	✓	✓	✓
Climate change scenarios	X	X	?	?
Upstream-downstream linkages	X	X	✓	✓
Role of educational activities	X	X	X	X
Need for research and investigation	X	X	X	X
Community participation	✓	✓	✓	✓
Water/land use planning	?	?	✓	?
Financing	✓	?	?	?
Enforcement/regulation (SE vs. TPE)	?	✓	✓	?
Mechanisms for dispute resolution	?	?	✓	?

Codes: WRMP is for Water Resources Management Policy/ Regulation/ Guideline; EPE is for Environmental policy of Ethiopia; WSG is for Watershed Management Guideline ;

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LAUP is for Land Administration and Use policy; X is for not clear, ✓ is for clearly reflected, ? is for uncertain

The Ethiopian Environmental Policy document, without making any serious discussion, lists a series of policy instruments with the aim of improving environmental management in Ethiopia. The possible policy options listed to control/minimize environmental pollution (i.e. air, water, land, etc.) are summarized on Table 5

Command-and-control (coercive) instruments

Regulation/administrative and legal measures against offenders, technology standards (requirements to install sound technology or apply methods to recycle waste, if required), closure or relocation of any enterprise and permits in the case of hazardous waste or substances fall under this category. However, EPA has not developed relevant pollution standards for different kinds of effluents. In fact, in Tana Beles project, lack of standards was considered as one of the bottlenecks for effective pollution control and EIA.

The new proclamations on land use and administration also have specific regulations on land use obligations of the land user. The land use obligation requires any rural land shall have land use plan prepared and approved by EPLAUA. In actual land use, any rural land with 60 % slope and above shall not be used for farming and free grazing other than forestry, perennial plants and development of forage for animals (CANRS 2006b, p. 8). The policy also lists a set of obligations of the land user to protect the land under his/her holding or land obtained in rent and conserve the surrounding; to plant trees around his/her land and properly protect them; undertake trench terracing and favorable soil conservation activities to use the land forms which are 31 to 60 % slope for perennial plants and to use land based on land use plan (CANRS 2006b, p. 21). Non-compliance is likely to lead to deprivation of use rights and penalty.

The Water Resource Management Policy underpins the need to make the basin as a major planning unit for water resources development. And this is expected to influence the behaviors of many stakeholders involved in land and water management, although its realization into action is falling behind.

Incentives and market-based instruments

Pollution charges (clean up or pay the cost of cleaning up), registration, labeling and packaging (in the case of hazardous materials) as per the applicable standards fall under this category. EPA may also issue waiver to newly established firms from applying these stringent standards. The guideline also provides incentives for the introduction of methods that enable prevention or minimization of pollution into an existing undertaking. In this case, importation of new equipment that is destined to control pollution shall, upon verification by the authority, be exempted from payment of custom duty. It also promises

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to provide any environmental rehabilitation or pollution prevention or clean up project with financial and technical support, to the extent that its capacity allows (FDRE, 2002c).

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Table 5 Typology of policy instruments in Environmental Management (X= not clear, ✓= clearly reflected,?= uncertain)

Policy instruments	IWSM	LULA	WRMP	EP	Responsible
Information and education	✓	X	X	✓	?
Regulations/standards	?	✓	?	✓	EPA/EPLAUA
Incentive-based					EPA/EPLAUA
Subsidies	?	✓	?	✓	
Taxes	?	?	?	?	
Charges/penalties	?	✓	✓	✓	
Certification (property rights)	?	✓	?	?	
Cost and benefit sharing	?	?	✓	?	MoWR
Cost Recovery	?	?	✓	?	MoWR
Public programs (PSNP, FFW, CFW/ Free labor contribution, etc.)	✓	?	?	?	MoARD/ BoARD
Conflict resolution	✓	✓	?	?	EPLAUA/social courts

Codes: IWSM is for Integrated Watershed Management; LAUP is for Land Administration and Use policy; is for WRMP is for Water Resources Management Policy/ Regulation/ Guideline; EP is for Environmental protection policy/guideline

As far as incentives for improved agricultural land management include (FDRE, 1997; 2005; CANRS 2006b) providing unlimited right to use land; right to transfer holdings in bequeath or donation or lease; right not to be expropriated without consent and without due compensation for the permanent property developed on the land; and the right of the state to deprive holding rights if gross damage occurs over land due to mismanagement; and land measurement and registration and granting of a legal land holding certificate.

The water policy has specific stipulations pertaining to tariff setting that call for rural tariff settings to be based on the objective of recovering operation and maintenance costs while urban tariff structures are based on the basis of full cost recovery. However, it also calls for adoption of a “social tariff” to enable poor communities to cover operation and maintenance costs and to establish progressive tariff rates, in urban water supplies, tied to consumption rates and flat rate tariffs for communal services like hand pumps and public stand pipes. Users from irrigation schemes are also required, at least, to pay to cover operation and maintenance costs. The institutionalization of cost recovery schemes and

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tariff setting is expected not only to generate funds for maintaining water points/schemes but also change users' consumption behavior.

The WSM guideline aims to institutionalize community-based participatory watershed efforts to enable watershed development planning at the grass-roots level. The guideline provides more of a working tool to implement participatory watershed management. The intent is to provide development agents and communities with a workable and adaptable planning tool. Another objective of the guideline is to provide practical guidance on the correct selection of technologies under different conditions and their correct implementation (Lakew et al. 2005). However, the implementation modalities are not clearly spelt out.

In summary the various policy documents propose a mix of policy instruments, some incentive based and other command-and control type instruments. The policy instruments are clearly formulated in terms of their general intents, although lacking in terms of specific objectives and goals, jurisdiction and responsibility, hierarchy of responsibilities and proposed institutional changes (see Table 4). On the other hand, some features of the policy instruments are not well articulated. Particularly lacking are issues related to climate change scenarios, upstream-downstream linkages, role of education and research, financing, conflict resolution and enforcement.

Overall there is tendency to focus on command-control type policies, this more so in the environmental policy documents, than carefully devised incentive mechanisms for improved environmental management. The tone in the policy documents is heavily loaded with the need for third party enforcement (the relevant ministry/agency supervising and regulating economic agents' behavior) than to rely on self-enforcement. This does not mean the government should not assume a role in environmental management. On the contrary, international and local experiences indicate that the government has a key role to play in providing incentives to actors to adopt improved environmental management strategies. Through proper incentives farmers, for instance, could be motivated to build up their soil capital, prevent soil loss and nutrient leakage, and hence reduce downstream externalities. But there is a consensus that policy instruments building on command and control, like regulations and mandatory soil conservations schemes, have limited or negative effects (Pagiola et al., 2002; Sterner, 2003; Kerr et al., 2007; Ekborn, 2007). Likewise, information and extension advice have had limited, although generally positive impacts. Arguably extension advice is a necessary but insufficient measure to reduce downstream damage, mainly due to poor farmer incentives to fully prevent soil loss (Ekborn, 2007). There are suggestions for increased use of positive incentives, like payment for environmental services, to address land degradation problems in Developing countries (Ekborn, 2007). Gebremedhin (forthcoming) argues that various forms of incentives have been provided to land users to conserve the land resources in Ethiopia and elsewhere in eastern Africa. However, most of the incentives were aimed at mitigating the effects of the direct causes of land degradation. The underlying causes of land degradation remained largely unaddressed.

Hence, there is a need to carefully assess whether the proposed policy instruments address incentive problems of actors form improved environmental management.

Conclusions and Policy Recommendations

Land and water institutions play a vital role in managing and sustaining land and water resources as well as in enhancing economic development and poverty alleviation. The institutional issues that the Ethiopian land and water sector is grappling with include restoring ecological destruction due to high level of environmental (mainly land) degradation; improving the poor performance of rainfed agriculture, low level of water resources development, and transition from a soil conservation focus to an integrated land and water management system that takes the hydrological boundaries into account. While a lot of concerted efforts are going on redress these problems doing it in integrated manner so that upstream and downstream linkages are understood remains a big challenge. On the research side also, a lot has been done in terms of understanding the micro determinants of farmers' decisions in land and water conservation, however, there is a little attempt to understand the broad macro and institutional and organizational issues that influence land and water management decisions. The objective of the study was, hence, to carryout a preliminary assessment and review of institutional arrangements for improved land and water in Ethiopian part of the Blue Nile. The study describes the various formal and informal institutional arrangements (with more focus on the former) that are in place currently and their design features in order to identify those institutions related to superior performance. The analysis of institutions and their design features provides useful insights, contributing to institutional reform debate in land and water management in Ethiopia.

Our results indicate that the institutional arrangements for land and water, in Ethiopia in general and BNB in particular, are fairly well defined. There are organizations with clear mandates, duties and responsibilities. The organizational settings have been organized in such a way that organizations that have to do with land and water, directly or indirectly, have been identified and given by law duties and responsibilities. The policies and laws in place have also clear objectives and some have developed strategies and policy instruments to meet these objectives. In spite of these improvements, there is a high frequency of overlapping and conflicting roles and responsibilities between institutions besides poor inter-sectoral collaboration and control as one of problems related to roles and responsibilities of organizations. Particular concerns exist that roles and responsibilities between levels remained ill-defined and resulted in implementation inertia and even failure. This could lead to inability to achieve the goals of the sectors. Additionally, the stakeholders may not collectively drive some synergic benefit from being able to integrate their administrative efforts. Both protective institutional responses and lack of effective coordinating mechanisms are featured as reasons (NBI, 2006).

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Moreover, the organizations involved in land and water management were marked by frequent restructuring and re-organization over the last few years and the process seems to be going on. While adjusting institutional responsibilities and redesigning organizational structures may be called for in the light of the changes and development needs of the country, the frequent, at times endless, restructuring process has certainly produced uncertainties, made capacity building difficult and affects the political will to push for change.

The policies and laws hitherto developed in Ethiopia are said to reflect global policy changes or the widespread adoption of the IWRM principles (NBI, 2006). Not surprisingly, however, the policies are reflections of the institutional arrangements as the major intents and objectives of the policies and laws reflected the roles and responsibilities of organizations that developed them. The narrow disciplinary orientation that we witnessed in organizational arrangement is also manifest in the key trusts of these policies.

There is no doubt that a lot of progress has been made lately in creating an institutional framework for improved land and water management in Ethiopia. However, there are cases where informal institutions substitute formal institutions, pointing to dysfunctionality of formal institutions. Cases where practices deviate a lot from the written policy include: lack of integrated water resources development (in spite of the written policy for it); inadequate upstream and downstream considerations in development interventions; lack of mechanisms for cost and benefit sharing between upstream users (who cause the degradation and could control it if they have the incentive) and downstream users (who could gain more from improved management of land and water upstream and loose due to poor management of the same); and at the basin scale, absence of agreement for equitable and efficient distribution of the Nile water. Furthermore, while Ethiopia's water development and environmental protection policies and laws recognize the need and importance of taking proper EIAs in pursuing any water related development intervention, traditional practices still dominate: environmental considerations are given limited consideration in water resources development. Or if they did, this is done without the involvement of EPA/EPLAUA. Informal institutions seem to play a critical role in the *modus operandi* of many organizations.

There is also confusion in the definition of the appropriate scale. Regional bureaus and federal office are organized on the basis of administrative scale, i.e. regions or the country while the relevant water resources policy and watershed management guidelines advocate the basin or watershed to be the basic planning unit for intervention. A critical constraint against effective river basin management is the commonly prevalent conflict between boundaries of river basins and those of political units (nations, regions, districts, etc). The administrative boundaries also pose potential constraint in management of small watershed that fall between two districts or PAs. This calls for establishing viable and acceptable institutional mechanisms for shared management of water resources in the river basin or watershed.

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Judged by their enforcement capacity, another indicator of institutional efficacy shows that regulations on water resources management, pollution control, and land use rights related to water, watershed development, environmental quality and pollution control standards are not effective or enacted because of enforcement capacity (NBI, 2006). The major government regulatory agency, EPA, and its regional counterparts complain of inadequate staff and resources to do proper enforcement of environmental provisions. Moreover, lack of environmental pollution standards are cited as reasons for weak enforcement in environmental protection and EIA. On the development side, there is lack of systematic monitoring and evaluation of policy implementation which is linked with the absence of an integrated system of information management at the country level or at the sub-basin level.

With regards to adaptiveness of institutions in the Tana Beles sub-basin or Ethiopia, it seems apparent that adaptive evolutionary management is the typical strategy followed in drafting and institutionalizing these policies and organizations. Institutions are developed through a series of trial and error type adaptations. This explains partly the omnipresent process of restructuring of the ministries/ bureaus and revisions of policies and laws in the country /regions. In terms of the adaptive capacity of institutions to changes in socio-economic and bio-physical contexts there is hardly any indication that emerging challenges are reflected upon and strategies to address these issues developed. There are allusions in the policy documents that envisaged water sector and broader development strategies in the country (sub-basin) are expected to provide mechanisms to mitigate some, if not all, of these challenges. However, these strategies assume that there is plenty of water potential to tap in from in the sub-basin. Economic water scarcity is considered a greater challenge than physical water scarcity. Climate change scenarios and their impact on water resources are hardly taken into account in the development of these strategies.

The various policy documents propose a mix of policy instruments, some incentive based and other command-and-control type instruments. The policy instruments are clearly formulated in terms of their general intents (although found lacking in terms of specific objectives and goals), jurisdiction and hierarchy of responsibilities and proposed institutional changes, etc. Overall there is tendency to focus on command-and-control type policies, more so in the environmental policy documents, than carefully devised incentive mechanisms for improved environmental management. The tone in the policy documents is heavily loaded with the need for third party enforcement (the relevant ministry/agency supervising and regulating economic agents' behavior) than to rely on self-enforcement. This does not mean that the government should not assume a role in environmental management. On the contrary, international and local experiences indicate that the government has a key role to play in providing incentives to actors to adopt improved environmental management strategies. But there is a consensus that policy instruments building on command and control, like regulations and mandatory soil conservations schemes, have limited or negative effects (Pagiola et al., 2002; Sterner, 2003; Kerr et al., 2007; Ekborn, 2007). Likewise, information and extension advise have

had limited, although generally positive impacts. There is a need for increased use of positive incentives, like payment for environmental services, to address land degradation problems in developing countries (Ekborn, 2007). Gebremedhin (forthcoming) also suggests the need to carefully assess whether the proposed policy instruments address incentive problems of actors from improved environmental management.

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