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Stakeholder Analysis of the Chara Chara Weir, Lake Tana

By

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Table of Contents

EXECUTIVE SUMMARY	1
1. INTRODUCTION	3
1.1 BACKGROUND.....	3
1.2 METHODS	4
2. DATA PRESENTATION AND ANALYSIS	6
2.1 COMMUNITY GROUPS	6
2.1.1 FARMERS	6
2.1.1.1 Significance of Lake Tana	6
2.1.1.2 Interests	6
2.1.1.3 Opinions.....	8
2.1.1.4 Concerns	11
2.1.2 FISHERS	13
2.1.2.1 Background.....	13
2.1.2.2 Interests	14
2.1.2.3 Opinions.....	16
2.1.2.4 Concerns	17
2.1.2.5 Background.....	18
2.1.2.6 Interests	19
2.1.2.7 Opinions.....	19
2.1.2.8 Concerns	20
2.2 GOVERNMENT ORGANIZATIONS	21
2.2.1 MAJOR STAKEHOLDERS IN ELECTRIC POWER GENERATION – THE ETHIOPIAN ELECTRIC POWER CORPORATION (EPPCO) AND THE AMHARA REGION BUREAU OF WATER RESOURCES (ARBWR).....	21
2.2.1.1 The Ethiopian Electric Power Corporation (EPPCO).....	21
2.2.1.1.1 Background.....	21
2.2.1.1.2 Interests.....	21
2.2.1.1.3 Opinions.....	22
2.2.1.1.4 Concerns	23
2.2.1.2 Amhara Region Bureau of Water Resources (ARBWR).....	23
2.2.1.2.1 Background.....	23
2.2.1.2.2 Interests.....	24
2.2.1.2.3 Opinions.....	25
2.2.1.2.4 Concerns	26
2.2.2 MAJOR STAKEHOLDERS IN ENVIRONMENTAL PROTECTION- THE AMHARA REGION ENVIRONMENTAL PROTECTION, LAND USE AND ADMINISTRATION AUTHORITY (EPLUA) AND THE AMHARA REGION PARKS DEVELOPMENT AND PROTECTION AUTHORITY (PDPA).....	28
2.2.2.1 The Amhara Region Environmental Protection, Land Use and Administration Authority (EPLUA)	28
2.2.2.1.1 Interest	28
2.2.2.1.2 Opinions.....	28
2.2.2.1.3 Concerns	30
2.2.2.2 Amhara Region Parks Development and Protection Authority (PDPA)	33
2.2.2.2.1 Background.....	33
2.2.2.2.2 Interests.....	34

2.2.2.2.3	Opinions.....	34
2.2.2.2.4	Concerns	35
2.2.3	REGIONAL RESEARCH INSTITUTIONS– LAKE TANA BASIN RESEARCH CENTRE (LTBRC) AND AMHARA REGION AGRICULTURAL RESEARCH INSTITUTE (ARARI)	36
2.2.3.1	Lake Tana Basin Research Centre (LTBRC).....	36
2.2.3.1.1	Interests.....	36
2.2.3.1.2	Opinions.....	36
2.2.3.1.3	Concerns	37
2.2.3.2	Amhara Region Agricultural Research Institute (ARARI).....	38
2.2.3.2.1	Opinions.....	38
2.2.3.2.2	Concerns	39
2.2.4	STAKEHOLDERS RELATED TO TOURISM AND WATER TRANSPORT SERVICE - THE AMHARA REGION CULTURE AND TOURISM BUREAU, AND THE TANA LAKE TRANSPORT ENTERPRISE	40
2.2.4.1	Culture and Tourism Bureau.....	40
2.2.4.1.1	Interests.....	40
2.2.4.1.2	Opinions.....	40
2.2.4.2	The Tana Transport Enterprise	42
2.2.4.2.1	Opinions.....	42
2.2.4.2.2	Concerns	43
2.3	PRIVATE SECTOR GROUPS	44
2.3.1	BAHIR DAR GHION HOTEL.....	44
2.3.1.1	Opinion	44
2.3.1.2	Concern	44
2.3.2	BAHIR DAR TANA HOTEL	45
2.3.2.1	Concerns	45
3.	SUMMARY OF KEY FINDINGS.....	46
3.1	THE PERSPECTIVES OF LOCAL LIVELIHOOD GROUPS	47
3.1.1	<i>Overlapping Interests</i>	47
3.1.2	<i>Conflict of Interest</i>	48
3.1.3	<i>Crosscutting Concerns</i>	48
3.2	THE PERSPECTIVES OF GOVERNMENT SECTOR ORGANIZATIONS AND RESEARCH INSTITUTIONS.....	48
3.2.1	<i>Overlapping Interests</i>	48
3.2.2	<i>Conflict of Interest</i>	49
3.2.3	<i>Crosscutting concerns</i>	49
4.	CONCLUDING REMARKS.....	50
	REFERENCES	52
	APPENDIX A.....	53

Executive Summary

This stakeholder analysis of the Chara Chara Weir was conducted to assess the opinions, interests, and concerns of various stakeholders, in relation to the weir's socio-economic and environmental impacts. The stakeholders are different community and livelihood groups, as well as a range of relevant government and private organizations in the project area. The findings of the analysis are expected to direct and influence decision making processes in relation to the weir operation. Multiple data gathering instruments, essentially of a qualitative nature (i.e., in-depth interviews, focus group discussions and case studies), were employed to generate the information required to develop sound and objective conclusions.

Community stakeholder groups, namely farmers, fishers and the minority occupational group of the Negede, maintain both overlapping and conflicting interests regarding the operation of the weir and its impact on the water levels of Lake Tana. Nevertheless, their shared concern is that disturbance in the hydrological regime of the lake, caused by the operation of the weir, threatens their respective livelihoods. The groups, of course, approve the role the weir has to play in national development, although they were not consulted in its planning and implementation stages. Their position nonetheless is that, beneficial as the weir project may be from a national development point of view, it should still be operated in a manner that minimises disturbance to the natural ecosystem and minimises adverse impacts on their respective livelihoods.

Relevant government stakeholders include: The Amhara Region Ethiopian Electric Power Corporation (EPPCO), Bureau of Water Resources (BWR), Environmental Protection, Land Use and Administration Authority (EPLUA), Parks Development and Protection Authority (PDPA), Lake Tana Basin Research Centre (LTBRC), Agricultural Research Institute (ARI), Culture and Tourism Bureau (CTB), and Lake Tana Transport Enterprise (TTE). Invariably, these stakeholders maintain that the hydropower potential of the lake should be exploited to the benefit of the local people and in the interests of national development. In principle, they also subscribe to the idea that a sound balance needs to be struck between water harnessing practices for development purposes, and the likely consequences of such action on the natural environment, livelihood groups and business endeavours. However, there is another dimension to the position held by these stakeholders. It seems that, regardless of practical differences when it comes to their respective and specific domain, they agree that the weir development was not based on adequate information in relation to stakeholder analysis, socioeconomic surveys and an environmental impact assessment. They also share the view that the project failed to be sufficiently participatory and transparent from the planning to the implementation stages. Besides resulting in various misconceptions and conspiracy theories about the intentions behind the project, this lack of foresight in the project design is believed to have led to the present socioeconomic and environmental problems. There is a strong shared feeling that these could have been averted. Furthermore, not enough is being done currently to mitigate their severity.

The continuing threat posed to the environment, livelihood structures and business activities is attributed to the lack of coordination and synergy between the various stakeholders. There is a consensus among the concerned groups that an all-inclusive and autonomous monitoring and regulatory system should be established to ensure that the missing coordination and synergy is achieved. It is recommended that such a body is established to ensure effective regulation of the waters of the lake in an optimal fashion, with the varied stakeholder needs and interests given due consideration. Such a body has recently been formed, but is reported to be ineffective, playing only an advisory rather than an executive role. If this body is to produce the desired results, it has to be empowered to execute regulatory and decision making functions in connection with the monitoring of the weir operations. It is also recommended that a higher body be established at the federal level to coordinate the different stakeholders, supervise the activities undertaken on and around Lake Tana, and operate in close consultation with local organizations engaged in the management of the lake water resource.

1. Introduction

In the past, planning of dams and their operation focused primarily on meeting future demand (i.e., for water, power or irrigation) through identification of the least-cost option. Very often environmental and social aspects were largely ignored. However, in recent years the need to improve water management to maximize benefits and minimize negative environmental and social impacts has been increasingly recognized. This has led to a fundamental re-evaluation of decision-making processes for the planning and operation of dams. It is now widely recognized that to ensure sustainability, consideration must be given to environmental impacts as well as issues of equity and the rights of people who may be adversely affected. This requires consideration of a large number of complex and inter-related subjects, and poses intricate technical and political problems (McCartney and Acreman, 2001). It is essential that the multiple, and often conflicting, objectives of all stakeholders are properly considered.

As part of the Challenge Program for Water and Food (Harrington *et al.*, 2006) a research project is being conducted into the use of decision support systems to improve dam planning and operation (McCartney and Awulachew, 2006). The objective of the project is to increase understanding of the application of innovative tools and methods for improved water resource planning. As part of the project, case studies are being undertaken on the Chara Chara weir and the Koga dam, both of which are located in the Abbay (Blue Nile) River Basin in Ethiopia. This report presents a synthesis of the information gathered in the stakeholder survey conducted for the Chara Chara weir. A comparable report has been produced for the Koga dam stakeholder survey (Ayalew *et al.*, 2007).

1.1 Background

Lake Tana and its environs are valuable for many people, including the communities who live around the lake-shore and those living on the lake islands. The lake is an important source of natural resources including water for domestic supply, irrigation and hydropower production, fisheries, grazing and water for livestock, and reeds for boat construction. It is also important for water transport and as a tourist destination. Similarly, the Abbay River which flows from Lake Tana contributes to the livelihoods of many people living nearby (Seleshi *et al.*, 2007).

Both lake levels and downstream river flows are controlled by the operation of the Chara Chara weir, which has been constructed to regulate flows for power production at the Tis Abbay power stations (Figure 1). The modification of the natural lake water levels and the river flow regime by the Chara Chara weir has without doubt affected the livelihoods of people living in the vicinity of both the lake and the river.

The aims of the stakeholder survey, conducted between May and July 2007, were to:

- i) Identify key stakeholders in the operation of the weir;
- ii) Ascertain the main issues of concern for each stakeholder group;

- iii) Determine potential areas of difference in the way different stakeholders would like the weir to be operated;
- iv) Determine if any measures to mitigate negative environmental and social impacts of the weir were identified in the environmental impact assessment (EIA) and, if so, have they been implemented;
- v) Ascertain the current procedures for decision-making in relation to weir operation;
- vi) Determine the current procedures for dealing with issues of public (and other stakeholders) concern over the weir operation and how effective these are.

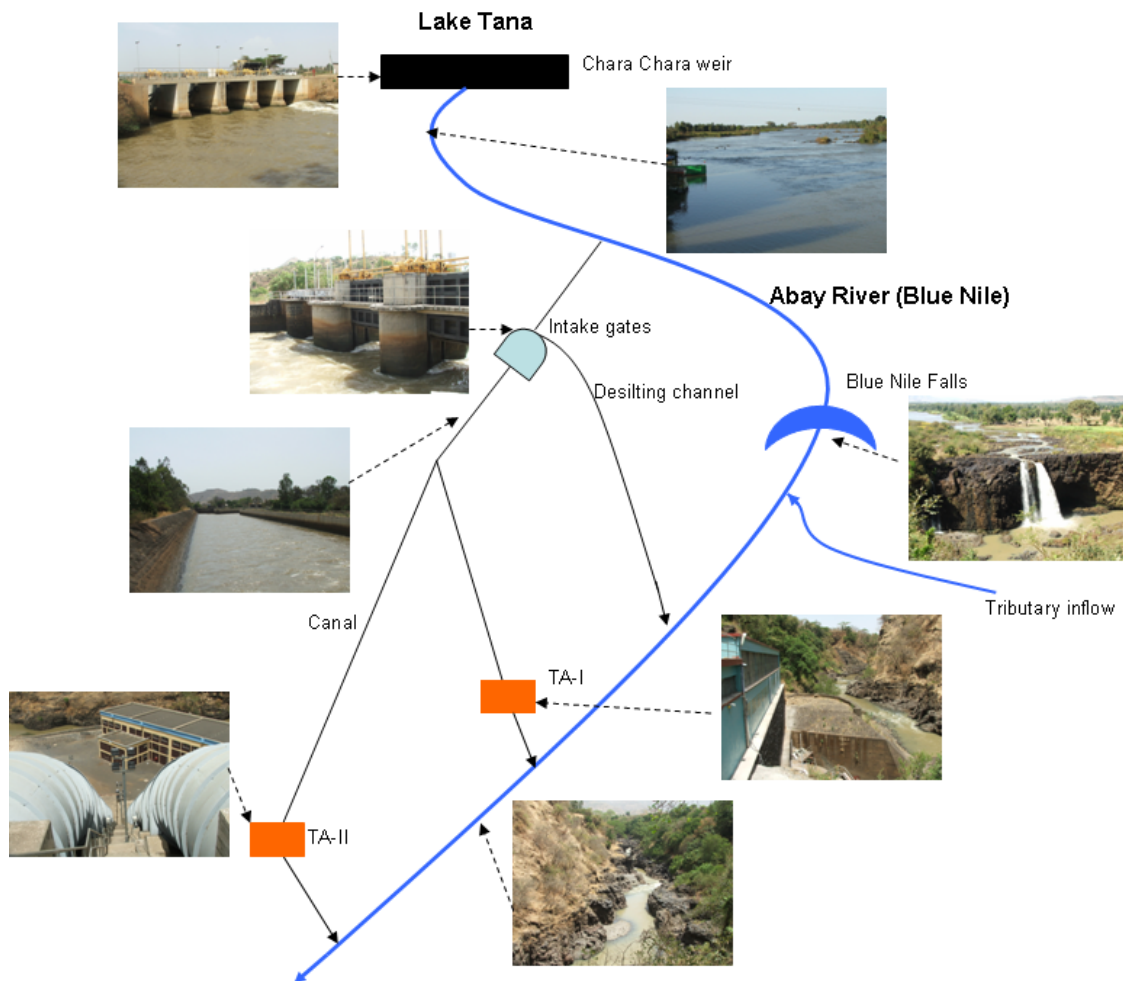


Figure 1: *Schematic of the Abay River (Blue Nile) downstream of Chara Chara weir (not to scale).*

1.2 Methods

Being essentially a qualitative study, this stakeholder analysis was conducted by employing the following data gathering instruments:

- Conversational interviews were carried out with systematically selected individual stakeholders representing local communities, groups, and institutions. This technique was particularly employed to capture the views and perspectives of individuals representing different government and private stakeholder organizations on particular topics, which they might be reluctant to disclose in group situations.
- Focus group discussions (FGD) were conducted with 4-7 people who are residing around the lake shore, on the lake islands, and downstream of the Chara Chara weir. These include sample persons representing the farming communities, fishers, and the Negede (and occupational minority group).
- Case studies were undertaken with a limited number of individuals representing the various stakeholder groups. The purpose of this technique was to capture the perceptions of informants regarding the project, as reflected in their true to life individual or group experiences. .

A list of people interviewed and participating in the focus group discussions is presented in Appendix A.

2. Data Presentation and Analysis

2.1 Community Groups

2.1.1 Farmers

Farmers who inhabit and practice agriculture on the islands of Lake Tana and adjacent areas are one of the foremost stakeholder groups affected by the operations of the Chara Chara Weir. To capture insights into their feelings, perceptions and attitudes regarding the structure, focus group discussions (FGDs) were conducted with sample populations representing the different farming communities. Involved in the FGD sessions were farmers who live: (i) in close proximity to the Lake Tana shoreline, (ii) on the Zege Peninsula, which is the largest land mass extending into the lake, (iii) in a rural village called Andassa, which is located midway between the Chara Chara Weir and the Tis Abbay power station, and (iv) in rural neighbourhoods found further downstream close to the Tis Abbay power plant. These farming communities were selected with the aim of obtaining the full range of likely responses that could be elicited from this group of stakeholders.

2.1.1.1 Significance of Lake Tana

The FGD participants in all the four sites emphasised the vital role that Lake Tana and the Abbay River play in their lives. Both the Lake and the River are indispensable to the communities as sources of water supply for human and livestock populations. In addition to drinking, community members also use the waters for sanitary and livelihood purposes. Types of crops grown include coffee, fruits and vegetables, and spices. The participants stated that, in addition to meeting the subsistence and utilitarian requirements of the surrounding communities, the Lake and the River are also hugely important as tourist attractions. Monasteries, churches and related museums located on Lake Tana are sites of important historical, cultural and religious significance that have high tourist appeal. The flourishing local tourism is significant for some of the local population in economic terms, as it enables them to eke out their livelihood as tourist guides or traders of hand-made souvenirs, such as national costumes and craft products. There is no doubt therefore that Lake Tana and the Abbay River make an essential contribution to their lives.

2.1.1.2 Interests

In relation to the Chara Chara Weir and its regulation of the water levels of Lake Tana and Abbay River, two major issues are of key interest to the farming communities. Firstly, the decline in the water levels of the lake due to the operation of the weir has introduced the practice of *recession wetland cultivation*. This type of farming has increasingly become common, attracting a growing number of peasant farmers living close to the lake shore. The second development caused by the weir is the introduction of *small scale irrigation agriculture*, to which increasing numbers of farmers living in the

rural *kebeles* found between the weir and the Tis Abbay power station are engaging. This is made possible by the discharge in the dry season (*begga*) of the waters collected at the Chara Chara Weir during the rainy season (*kiremt*). Although the discharge is primarily intended for hydropower generation, it also becomes a source of water for irrigation cultivation by farmers living downstream of the Chara Chara Weir. Thus, both the *recession wetland cultivation* and *small scale irrigation* are directly influenced by the rise and fall in the water levels of Lake Tana and River Abbay. The former is an outcome of the decline in the water levels of Lake Tana, caused by the discharge from the weir. The latter, however, is facilitated as a result of the rise in the average water volume of River Abbay during the dry season, because of the release regulated by the weir.

(A) Recession Wetland Cultivation (upstream of the Chara Chara Weir)

Farmers involved in *recession wetland cultivation* practice farming when the water of the lake recedes making way for their activity. They normally grow vegetables (onions, cabbage and potatoes) as well as maize, wheat, and barley. *Recession wetland cultivation* is a recent practice in the area. A rapid decline in the lake water levels over the last four years has led to the expansion of this type farming. As one of the FGD participants in Korata *kebele*, Derra *Woreda*, South Gonder Zone expressed, raising the number of farm households engaged in it to about 600 in the locality. The man added that the reduction in the water volume of the lake is a result of the function of the weir, which ‘steals’ large quantities of water from the lake, as he and his fellow residents have learned. The FGD participants in this *kebele* also observed that some farmers have gone so far as to incorporate contiguous recession wetland as part of their personal holdings and get them registered in the Kebele Peasant Associations. The same FGD participants testified that lake retreat wetlands had officially been distributed to 600 farm households in Dengel Mesk and Bosit parishes (*got*) found within the Korata Kebele Peasant Association. They emphasized that for a few years since 2001, they were not able to cultivate the wetlands because the area was waterlogged from the overflow caused when the Chara Chara dam held back the outflow from the lake. The last two to three years, however, have witnessed a gradual decline in the lake water-levels, allowing the wetlands to be used for cultivation, presumably due to the discharge by the weir, as the discussion participants maintain.

(B) Irrigation Agriculture (downstream of the Chara Chara Weir)

Small scale irrigation schemes are being practiced by more and more farm households especially in villages where the Abbay River undergoes a high increase in its water volume due to the discharge from the weir during the dry season. Participants of the FGD held in Andassa *kebele*, indicated that these small holder irrigation schemes are proving to be lucrative, enabling farmers to produce highly marketable horticultural crops and citrus fruits, traded in the nearby Bahir Dar Town. An FGD participant stated that so profitable has the practice been for some cultivators that they have managed to buy personal motor pumps costing as much as Birr¹ 3,000 to 4,000. Besides being used to water fields, the pumps attract additional sources of income in the form of rentals to

¹ At the time of writing US\$ 1 is equivalent to Birr 9.0

fellow villagers practising irrigated cultivation or sharecropping. In view of this, the Abbay River has become a vital source of livelihood for the part of the farming population that is becoming involved in small-scale irrigation farming.

2.1.1.3 Opinions

The opinions of farmers about the Chara Chara Weir and the Tis Abbay I and II power plants vary according to the location of the communities where they live.

(A) Chara Chara: Drought and Declining Vegetation Cover

Residents of the Korata *kebele*, which is located along the shores of Lake Tana, and the Zege peninsula had little positive to say about the construction of the Chara Chara Weir. Focus group discussion participants in these two villages pointed out that the construction of the weir was followed by a rapid decline in the water levels of the lake in 2002/2003. One participant, a resident of the Zege peninsula, had this to say in this connection:

Large quantities of water were withdrawn from the lake via Chara Chara Weir, resulting in large-scale devegetation on the peninsula and other islands of the lake. The papyrus plants which grow in profusion along the lake shores, no more green for lack of water, were cut down and used as firewood. Following the retreat of the lake, the coastal plains were also converted into farm plots. Hence, we view the Chara Chara Weir as a harbinger of environmental problems, loss of vegetation cover, and inevitable drought.

Another farmer from Korata *kebele* added:

Grazing fields resulted in lost pasture and there was little for the livestock to survive on, causing us extreme worry and concern. We were also anxious that the livestock and ourselves might even go without drinking water. Therefore, a significant drop in the water volume of the lake is not to our liking and benefit, although a limited retreat of the lake is still useful for those who practice crop cultivation. In the case of a sharp fall in the water levels, pasture will become scarce, farm plots lose moisture, and trees wilt, endangering the lives of both humans and livestock. There will not even be enough tree cover to serve as a shade from the scorching heat of the sun.

(B) Chara Chara: Control Mechanism for Inundation

By contrast, farmers inhabiting downstream localities between the weir and the hydropower plant expressed views that are strongly in favour of the construction of the weir. They cited as a big advantage the role of the structure as a control mechanism of the flood levels of Abbay River at the height of the rainy season (*kiremt*), which previously

used to inundate and destroy their crop fields. A key informant of the study made this remark:

Prior to the construction of the weir, there was little to control of the flooding whenever the Abbay River burst its banks in the rainy months. As a result, extensive damage was caused to the surrounding kebeles and farm plots adjacent to the river course. Since the weir was built, however, inundation has not been a serious problem, because the water levels of the Abbay River are regulated by the Chara Chara structure.

Another informant gave what sounds like a philosophical description of the role of the Chara Chara Weir:

Ye Abbay mechemeruna ye mekenesu guday besew ej honoal!!!, which by translation means: The rise and fall in the water levels of the Abbay River has come within the control of the human hand.

The implication is that human beings are now able to regulate the flow regime of the river, avoiding the destructive effects of the inundation and flooding, which resulted from the overflow during the rainy season.

FGD participants in Korata Kebele Peasant Association had these opinions to share regarding the regulatory function of the weir:

When the lake overflows, to the extent of inundating adjacent lands, we say the Chara Chara dam is closed and heavy rains have fallen. When the height of the lake decreases, with the result that the waters recede, we conclude that the weir gates are opened and large amounts of water released downstream. As far as we are concerned, we go for the optimal level of the lake. In the case of overflow, inundations make it impossible for livestock to graze, human beings find space for easy mobility and practice cultivation. The other way round, when the lake runs short of water, the vegetations cover dries out, too much moisture will be lost and life will be difficult for human and animal populations.

(C) Chara Chara: Increased Water Availability for Irrigation

From the standpoint of the villagers living in the vicinity of Andassa, the Chara Chara Weir is seen to be beneficial in terms of increased water availability for irrigation. The structure collects and stores excess rainwater in the wet season, which it discharges down the course of the River during the dry season, thereby enabling irrigation. The farmers maintain that, if the Chara Chara Weir did not exist, the extra surface water collected in Lake Tana would not be regulated and discharged down the river course to reach their farm plots. A farmer in the Andassa locality stated:

Currently, the Abbay gorge undergoes a relatively high flow of water in the dry season which is a direct result of the discharge of water that has been regulated by the weir. Of course, the water that the weir discharges in the dry season is the amount of excess rain and surface water that it has collected and preserved in the rainy season for the primary purpose of hydropower generation. Being located downstream adjacent to the structure that diverts the discharged water to the power plant, the Andassa locality gets access to water supply that is not actually intended for it, but still is in a position to benefit from the rise in the flow regime caused by the discharge.

A second farmer from the same locality went on to say: “*The weir has not caused us harm in any way. In fact, we are getting a greater supply of water in the dry season because of it*”.

(D) Chara Chara and the Tis Abbay Power Plant: Widespread Feelings of Inequity and Marginalization

The population of the small rural town of Tis Abbay, where the Blue Nile Falls and hydropower plant are located, and the nearby village communities are particularly resentful about the construction of the power plant and the Chara Chara Weir. The rural kebeles located immediately downstream of the power plant diversion have seen a dramatic decline in the water levels of the Abbay River over the past four years. This is caused by the diversion of large quantities of the river into the canal system of the power plant. However, the population in these communities have not benefited from the power supply and this has further aggravated their resentment. Neither the town of Tis Abbay nor the surrounding rural kebeles have access to electricity, despite the fact that the power plant is located in their midst. The following are the words of a respected elder in Tis Abbay Town:

We have not benefited at all from the power plant. This has not happened despite our constant appeal to the concerned regional authorities, filing petitions a number of times and pursuing the case for so long. Four hundred households were promised electric power supply by the Ethiopian Electric Power Corporation (EEPCO), and required to pay registration fees for that purpose. However, anything like it has not so far materialized, and the area still remains without access to electricity. The fact that the population suffers denial of electric service, while the plant that produces it is based on their own land and water resource, is highly ironical and strongly suggestive of the inequity being meted out.

The community members also expressed disappointment at the destructive environmental impact of the power plant and the Chara Chara Weir. Besides almost draining the water of the river, the structures have nearly ruined the natural beauty and appeal of the scenery created by the Blue Nile Falls. With it have also receded the pride and sense of identity

that used to be attached to the Blue Nile Falls. Given the vast tourism potential that the Blue Nile Falls hold, community members expressed a strong feeling that they would benefit from the local development of the sector, were the regional government to give it emphasis. A focus group discussion participant said:

A few of our children have established an association of tourist guides, whereby they eke out their subsistence and support us their parents. But the sector is not flourishing as it should, for lack of social amenities in the locality. Even the road that connects Tis Abbay to Bahir Dar Town has not been paved. Much worse, the power plant and the Chara Chara Weir have caused a sharp fall in the water volume of the Abbay River and serious damage to the graceful view of the Blue Nile Falls, which impact only serves to reduce the tourist appeal of the natural heritage.

Replying to whether the power plant has offered community members any employment opportunities, FGD participants said the following:

There are some who have been hired as guards and janitors at the power plant. Others are earning limited income from house rentals to the employees of the plant. Little more than this has been facilitated by the presence of the structures, by way of economic returns.

The locals further stated that EEPSCO had promised to build a general health centre for the community with twenty maternity beds, and to staff it with qualified medical personnel. However, they claim that EEPSCO has constructed a substandard health post for a cost of Birr 80,000, which was neither staffed with professional personnel nor equipped with the good quality materials and drugs. In view of the aforementioned, the communities in Tis Abbay and surrounding *kebeles* seem to have gained little from the construction of the hydropower plant and the Chara Chara Weir. As a result, their reactions clearly indicate feelings of resentment, marginalization and inequity.

2.1.1.4 Concerns

The farming communities in the study area have expressed various concerns in connection with the fluctuations in the water levels of Lake Tana and the flow regime of the Abbay River, both of which are directly affected by the operations of the Chara Chara Weir.

(A) Decline in the Water Level of Lake Tana

Explaining their worries, farmers in upstream localities said that they are relieved when the water levels of the lake are high, and get anxious when the opposite happens. In the former case, the situation is favourable for the vegetation cover to grow profusely. Hence, it is not difficult to appreciate why the regulation of the lake water by the weir structure is a matter of serious concern from the point of view of the local farmers. As the farmers on

the Zege peninsula stated, the more water the weir structure extracts from the lake for hydropower generation, there will logically be less water for such vital needs as plant growth and fish production. Thus, their concern understandably is that the process will, in the long-term, result in grim consequences for the ecosystem and biodiversity of the region as a whole.

Expressing their concerns, for their part, FGD participants in Korata Kebele Peasant Association added:

We were informed about the purpose of the Chara Chara project right from the start. It aims to produce hydroelectric power, which might in the future also give us access to electricity. Our concern, though, is that it might completely drain the lake, leaving only a small quantity to supply our vital needs. Our desire is that the project utilizes the waters of the lake for its purpose, without jeopardizing our livelihoods and future. Speaking in comparative terms, we opt for a situation where the lake overflows rather than runs low. However, it is indeed a matter of concern for us if the lake is going to run dry. Although the former, that is an overflow, is still undesirable, its disastrous consequence is nonetheless not as severe as the latter. Hence, we continue to live in fear that what happened in 2003 may once again be repeated. When an unprecedented catastrophe occurred in that year, the lake water decreased to an alarming low point not experienced previously. The local people were horrified by the calamity that had struck the area. Excessive retreat of the lake is not to the liking of even those who cultivate the wetlands. Uncontrolled recession of the lake is a source concern for all. The crop growers benefit for two or three months on average from cultivating the wetlands. But the shrinking and possible disappearance of the lake is worrisome for everybody, since water constitutes the mainstay of every activity and the entire population.

(B) Unpredictable Flow Regime of the Abbay River

Community members in downstream villages are worried that the flow regime of the Abbay River has become subject to the operations of the weir, fluctuating between low and high water levels in a manner that is difficult to predict. Unexpected water surges, due to the release of high water volumes from the structure without prior notice, are proving to be extremely dangerous to human and animal life. Participants of focus group discussions (FGDs) conducted in the Andassa locality and the Tis Abbay town reported that lives have been lost because of flash floods resulting from such incidents, as people were either swimming across the river or taking a bath or washing clothes at the riverside. An unspecified number of animals have also been casualties in similar situations.

(C) Chemical Pollution

Water pollution has been raised by farmers in downstream *kebeles* as another of their serious concerns. On this issue, FGD participants in Andassa locality stated that the Abbay River is being increasingly and dangerously polluted with toxic chemical wastes. Of course, mainly responsible for the release of the chemical wastes are industrial establishments such as the Bahir Dar Tannery, operating in Bahir Dar area close to the river course. However, the weir also has a part to play. The industrial establishments wait for the discharge of massive quantities of water from the gates of the structure, as the opportune moment to dump their chemical wastes into the river course, to be washed down by the powerful currents. As the community members complain, it is out of question that the pollution of the river in this way does not have serious implications for human and animal health in the area.

(D) Non-Inclusion in State Run Development Projects Associated with the Weir

Community members in Tis Abbay town and the surrounding localities are also concerned that they may be marginalized with respect to what they perceive are legitimate socio-economic benefits arising from the operation of the weir. Their chief complaint is that little has been done to compensate them for the negative impacts that the power plant and the weir structure have caused to their lives and livelihoods. Furthermore, by virtue of the physical location of the hydropower plant in their area, they consider themselves to be duly entitled to a share of the benefits in the form of access to electricity. Upon the launch of the project, they were also promised construction of infrastructure facilities such as a health centre, a secondary school and the upgrading of the Tis Abbay-Bahir Dar all weather road. However, none of these promises were fulfilled following the construction of the weir and the expansion of the hydropower plant.

2.1.2 Fishers

A focus group discussion was held with four members of the Lake Tana Number 1 Multi-Purpose Fishers Cooperative. In addition an interview was conducted with the Chairperson.

2.1.2.1 Background

Lake Tana occupies a wide depression in the Ethiopian plateau, and is the largest lake in the country. It covers an area of 3,156 square kilometres, which makes it the third largest lake in the entire Nile Basin region. More than 40 rivers are reported to feed Lake Tana, of which four, namely Gilgel-Abbay, Rib, Gumera and Magetch contribute over 93% of the inflow (Seifu *et al*, 2005:1). The lake is richly endowed with aquatic fauna, and is inhabited by three major types of fish species scientifically known as *Labeobarbus*, *Tilapia Nilotica*, and *Garepinus*. It is noteworthy that fifteen types of the first-mentioned fish species (*Labeobarbus*) are known to exist in the lake. These represent the “only

known remaining intact flock of large cyprinid fishes since the extinction of most endemic cyprinid species in Lake Lanao in the Philippines (De Graaf *et al*, 2006: 305).”

The number people who make their living out of fishing in Lake Tana and its surroundings is significant. According to De Graaf (2006: 305) a total of “113 reed boat fishermen were counted in the Bahir Dar Gulf in 1992 who had a total of 374 gillnets of an average 18 m length, 8 cm stretched mesh”. Motorised boats and modern, more efficient, nylon gillnets were introduced into Lake Tana in 1986. The development of the commercial motorised gillnet fishery in Lake Tana was initiated by an EU-sponsored Lake Fisheries Development Program. The establishment of a Fishers’ Cooperative in December 1994 has added impetus to the development of the sector. According to Ato Sileshi Abraham, the chairperson, the cooperative currently operates in three zones (West Gojjam, South Gonder, and Bahir Dar) of the Amhara national regional state, and claims a total membership of 150 fishers (134 male 16 female).

2.1.2.2 Interests

Dependent on the fish resource of the lake for their livelihood, the principal interest of this major stakeholder group is to see that the fauna and flora of the lake are fully protected, conserved and maximized. Participants of the FGD concurred with members of the fishers’ cooperative who observed that their livelihood remains intact only if the lake continues to be conducive to aquatic life and the vegetation on the nearby land. Therefore, it is a vested interest of the fishers that the natural ecosystem of the lake is maintained and its water catchment conserved. However, current developments seem a far cry from the expressed interests of the fishing community. An FGD participant said:

The lake bed is silting up due to the deposits of sediments brought in by heavy floods on the rivers feeding the lake, particularly during the rainy (kiremt) season. In the dry season, a drop in the water levels, partly caused by the action of the Chara Chara Weir, dries up the wetlands along the lakeshores, killing the vegetation, particularly the papyrus plant growing there. The loss of vegetation, in turn, badly affects the breeding grounds of the fish species and disrupts their reproductive cycle, since fish lay their eggs by the shore using the plant life there as shade.

By way of averting further escalation of the environmental situation, the FGD participants strongly suggested catchment treatment, to conserve the lake and the fish and vegetation that it supports in and around the water body.

It is in the interest of fishers that the lake maintains its regular average height. When it is full as in the wet season, there is abundant fish stock and the species reproduce well. In the case of decline, the surrounding wetlands (which are part of the natural habitat for many fish species) are converted into crop fields. This deprives the fish of breeding habitat, and causes stress to their reproductive cycle. As the fishers said, although they know that wetland cultivation causes damage to the fish resource, they have no power to

prevent the farmers from carrying on with this practice. One problem is that although they are based in Bahir Dar *Woreda* as residents, they nevertheless have to travel as far as localities in South and North Gonder to drop their nets. This undermines their position to oppose the farming of wetlands, since the cultivators are quick to note that as non-residents they do not have the right to speak against the way they make their living. Thus, the fishers draw attention to the conflict of interests between themselves and the practitioners of wetland cultivation.

Ato Bahiru Andarge, representative of the Bahir Dar branch of Fish Production and Marketing Enterprise, made the following remarks concerning another dimension to the conflict of interests over the fluctuations in the water-levels in Lake Tana.

Farmers in the localities of Enfranze and Denbia in North Gonder are in favour of the retreat of Lake Tana. It goes without saying that the more the lake recedes, the more wetlands rich in silt deposits they find to practice cultivation. The retreat increases with the discharge of more water from the lake, which is regulated and facilitated by the weir. Enfranze and Denbia being high grounds, offer the advantage of a clearer view of how low the lake has gone, leaving extensive area of land around it wet and favourable for farming. On the contrary, the retreat of the lake is not in the interest of our Enterprise. The shrinking of the lake has a serious negative impact on fishing activities. Besides a significant fall in fish production, the lake becomes inconvenient, even dangerous for navigation. Because of the difficulties involved in offshore fishing, fishers have to travel to distant sites on the other sides of the lake to do fishing. The Enterprise will thus need to deploy boats to these distance fishing sites to collect the yields. To avoid the heat of daytime, the boat operators choose to sail at night usually about 3:00 am local time, which is still too dark to navigate in a situation where the waters are not deep enough. As a result, accidents have occurred in many instances, the boats hitting the basalt rocks beneath the surface of the shallow lake. In this way, three boats of the Enterprise were wrecked. Navigation was especially difficult and fraught with risks in 2003, a year when the problem had reached its peak.

Ato Sileshi Abraham, Chairperson of the Number 1 Multi-Purpose Fishers' Cooperative, put the issue of conflict of interests regarding Lake Tana in a broader context. He said:

When it comes to exploiting the water resources of Lake Tana, every stakeholder seems to look at the issue from the perspectives of its self-interest. EEPCO, for example, views the water resource from the point of view of hydroelectric power production. There is little to show that it takes into account the pros and cons of the power generation process in regards to other interest groups such as tourism, water transport, and fishing. EEPCO is not the exception, however. It is also the same with us, the fishers' cooperative. We are more concerned with the utilization

of the waters of the lake in our own way, and to the promotion of the interests of our cooperative, which are primarily the maximization of fish production, safe and easy water transport, and the deployment of the maximum possible number of boats to collect fish loads. Therefore, it can fairly be said that stakeholder in general are more concerned with their respective interests, than with the possible impact of their actions on the needs and rights of other groups with a stake in the lake. Based on these considerations, our cooperative tried to promote an idea that other stakeholders also advanced at a workshop conducted in November 2006, and organized by the regional bureau of environmental protection. The position that we shared with others was that Lake Tana requires an autonomous body, entrusted with the responsibility of administering the affairs of the lake, coordinating the activities of various stakeholders and ensuring that the resources found there are optimally exploited. Where things stand at the moment, it is difficult to say that the lake has an owner that works exclusively to the promotion of the ideals such as was advocated at the workshop.

2.1.2.3 Opinions

FGD participants were asked for their perceptions of the construction of the Chara Chara Weir and its operations on their fishing practices and the fish potential of the lake. The FGD participants responded by saying that the structure and its regulation of the water of the lake had an impact, although it is indirect in their opinion. In the long run, constant decline in the water levels of the lake will result in increased wetland cultivation and the destruction of the natural vegetation cover. Inevitably, this will cause serious damage to the natural habitat, significantly reducing the size of the fish stock, and throwing fishing into severe crisis.

The FGD participants expand on what they said by adding:

Lake Tana was reengineered so that its outflow gained added force and momentum upon joining the Abbay River, by dynamiting away the natural wall that separated the lake from the river. As a result, a much larger volume of water now flows out of the lake to enter the river than was the case prior to the coming into being of the Chara Chara dam. The impact of the weir on the water of the lake is potentially severe, particularly in cases involving failure to properly regulate the discharge into the river. Illustrating how extreme the resulting situation can be is the situation that unfolded in 2003. In that incident, so much water was abstracted by the weir that the lake shrunk, killing off the surrounding plant life such as the Cyprus Papyrus. Among other uses, this plant provides ideal breeding grounds for the fish of the lake. Local species of trees such as Doqoma and Eshe also drop wild fruits which the fish of the lake feed on and reproduce. The shrinking of the lake dried out these plant species vital for the reproduction of fish

stocks, resulting in a large loss of many fish varieties. That was not the only dire consequence. The further the lake retreated, the wider area of the lakeshore turned into dry ground, where fishers could no longer cast their nets. The fish also moved further in toward the deeper parts of the lake, following its increased retreat, making fish catch more and more difficult.

2.1.2.4 Concerns

The fishers also raised several other issues as important points of concern, directly or indirectly associated with the construction and operation of the weir. Paramount, in their list of concerns is the decline in the water level of the lake, as large amount of water continue to be withdrawn for hydropower generation. In the words of FGD participants:

It is not that the Chara Chara Weir serves no useful purpose. We also know why it was necessary to have it, which benefits we share are important. However, these benefits should be obtained in manner that does not pose any threat to the future of the lake as a perpetual natural reservoir. It is not hard to understand that a continuing decline in its height can lead to the disappearance of the lake, in which case the aquatic life it supports, plant and animal alike, will also become extinct. Livelihoods and businesses will also be in a state of jeopardy, including that of our own, namely fish production and marketing. Hence, care has to be taken in the operation of the weir, as it regulates the storage and discharge of water by means of its reported five gates. In other words, as much attention should be given to ensuring that the lake is intact as a water body as to the generation of maximum electric power.

The second concern has to do with the continuing sedimentation and silting up of the lake. Silt deposition is estimated at more than 5,000 tons per year, according to Dr Zerfu Hailu, former staff of EPLUAA, which makes things difficult for fish to prosper. To reverse the trend, and prevent a decline in the size of the fish stock, it is suggested that watershed management be undertaken on the lake catchment.

The concerns of the fishers are further corroborated by the results of a study conducted on the state of the natural eco-system and the fish stock of the lake. Martin de Graaf et al (2006: 305), states: “*Motorised gillnet fishery has increased the total effort (number of trips per year) and annual yield from 1986 until 1997. However, there is a decline in the annual yield beginning from 1997!*” The author also stated that one of the major types of fish found in the lake, *Labeobarbus*, is at the risk of extinction. The researcher therefore proposed a ‘sound management plan’ of fishing activities on the lake, which includes the conservation of the lake water and its aquatic fauna.

The Negede (Woitto), Minority Occupational Group

2.1.2.5 Background

The Negede, also referred to as the Woitto in a pejorative sense, are a minority occupational group, who, in addition to fishing, have traditionally made their living out of boat construction from the papyrus plant. This minority group have long been viewed and treated as social outcasts by the dominant Coptic Christian Amhara, the majority of whom are small holder peasant farmers. Focus group discussions (FGDs) were conducted with a sample population of Negede elders. Their community constitutes one of the major stakeholders groups, by virtue of the fact that their livelihoods are closely associated with the lake and its resources. In the discussion session, the participants described themselves as skilled and experienced canoe builders, who used the papyrus plant as construction material. They sell the canoes to lake traders who use them to transport people and goods. They also make their living as hired canoe operators for the boat owners. In the course of time, though, papyrus canoes have increasingly been replaced by the introduction of motorized boat transport. This has had a big impact on the occupation of the Negede.

Sale of papyrus trunks, locally called *dengel*, to urban dwellers for fence making purpose also constitutes part of the income earnings for the Negede. In addition, Negede women produced traditional household utensils largely used as food servers or containers, using the papyrus. They sell these to the local people on market days, thus supplementing the household income. Besides such objects meant primarily for utilitarian purpose in the local community, Negede women also craft similar household items of mainly decorative value, which they trade as souvenirs to domestic and international tourists. In recent years, there has also been a decline in the production and trade of such household utensils, following the depletion of the papyrus resource, as a result of the cutting down of the reeds by farmers and urban dwellers. A Negede key informant pointed out that some farmers abused the papyrus resource by uprooting the plants with the result that it could not re-grow. They complained that their appeals for intervention by the authorities went unheeded, and the practice still continues.

The focus group discussion participants went on to say that these developments have left the Negede and their livelihood highly vulnerable, causing major occupational displacement for many members of the group. In fact, they indicated that the majority of the Negede population have moved to Bahir Dar, settling in certain neighbourhoods of the town, which are almost exclusively inhabited by this community. However, the town has not proved to be a better place for the group since there are few job opportunities and no government assistance to help them cope with the hardships. The younger Negede population in Bahir Town used to operate quarries located on the outskirts of the town. These were used to excavate stones which were sold as construction material for buildings. However, they did not last long. The quarries were sold to private investors, and the alternative left for the youngsters was to survive as wage labourers of the businessmen. In the light of these impacts, one may conclude that the Negede are among the most adversely affected community groups, as a result of the developments that have been taking place on and around Lake Tana.

2.1.2.6 Interests

Despite the decline of the papyrus resource as a livelihood base for the Negede, the community continues to maintain high interest in the vegetation, though on a reduced scale. Some members of the group continue to eke out their living from activities related to, or based on, the plant. FGD participants attributed the sharp decline in the papyrus resource, which was richly abundant until the recent past, to fluctuations in the water levels of Lake Tana, and the advent of recession wetland cultivation (see above). The participants blamed both developments on the weir structure. They noted that at its optimal level, the lake water produced a favourable environment for the growth of the papyrus. When the water regresses, as a consequence of regulation by the weir, however, the roots of the plant find it difficult to absorb water. As a result, the plants dry out, inviting the practice of cutting them down to provide fuel for fires and to clear ground for recession wetland cultivation.

A conflict of interests thus arises between the Negede and the farmers around the lakeshore. For their part, the Negede are highly in favour of high water levels of the lake for the flourishing of the vegetation on the shore and the fish resource inside the lake. On the other hand, the farmers wish to see lower lake water levels so that they can undertake wetland cultivation. The Negede complain with a sense of bitterness that the farmers engage in acts that are destructive to the vegetation cover, with the full knowledge that their livelihoods are heavily dependent on its growth. As they say, the farmers are intent on cutting down the reed cover for firewood and the expansion of fields, even though this is tantamount to the destruction of the livelihood base of a whole occupational group. So serious has the conflict of interests been that the Negede took the case to the attention of the local authorities. However, nothing has come of it. On the contrary, the authorities reportedly have taken the stance that the introduction of recession wetland cultivation is a positive development in view of the primacy they attach to the attainment of food security and self-sufficiency by farm households.

2.1.2.7 Opinions

The view of the Negede is that the Chara Chara Weir has thrown their livelihood into crisis, by depriving them of the type of plant that forms the basis of their subsistence. Participants of the FGD underscore the implication of the existence of the weir for their livelihood in the following way:

When the rains fail to come in the wet season, the inflow of the lake normally declines. On top of that the Abbay River gravitates or 'pulls as it were' the lake towards itself, by withdrawing large quantities of its water. The resulting retreat of the lake keeps water supply out of reach for the papyrus plant that grows along the lakeshores. Thus, papyrus and water stay apart, with the consequence that the vegetation dries out, for lack of water, which it constantly requires in abundant proportions.

The Negede community are convinced that the Chara Chara Weir is behind the chain of all the recent developments. It is the principal factor in the fluctuation of the water levels of the lake. A key informant observed:

Rumours have it that the weir is a result of the agreement concluded with the Sudanese government, so that there would be a dramatic increase in the size the outflow from Lake Tana to that country by way of the Abbay River. As we learned, an operation was undertaken to bulldoze the walls which naturally separated Lake Tana from the course of the Abbay River. We also understand that the Chara Chara Weir structure was constructed below the optimal height of the lake, to facilitate the flow of water from the lake into the river. As a result, water easily flows out the lake and gets into the river in massive quantities, upon the opening of the gates of the weir. The consequent reduction in the water volume of the lake become a cause for competition between us the Negede, and the farming community over the management of the recession wetland according to our respective occupational interests. We subscribe to the view that it is in our best interests, if the lake continued to exist the way it did prior to the advent of the weir.

2.1.2.8 Concerns

The chief concern of the Negede is that the vegetation cover, particularly the papyrus growing along the lakeshore, will totally be depleted. They stated their concerns with these words:

We are extremely worried in relation to the Chara Chara Weir. Provided Lake Tana continues to shrink as the weir drains its water, the likely scenario is that our livelihood will be destroyed, and together with it our own life and future. Conflict is unavoidably imminent with farming groups who cultivate the wetlands, as we follow the trace of the papyrus plants left on places adjacent to the retreating lake. Besides farming the lake retreat fields, the farmers also have an interest in making use of the papyrus plants for basketry and other purposes. Any attempt to lay hands on the plant near the wetland fields is viewed as a trespass into their territory. Therefore, they allow no access for our women or ourselves to the papyrus plant in their neighbourhood, and if we tried to get there driven by want, conflict of any magnitude is out of question. These concerns are subjects of routine social conversation in our own ranks. Apart from that, we have not gone any further, such as trying to bring the issue to the attention of the authorities. We do not believe that we will get an audience with the local government, all that our pleas and concerns will be heeded, other than perhaps getting the lip service of the officials at best. The

Chara Chara Weir project is a deliberate government imposed scheme. The authorities are in full knowledge of all the dimensions of the impact that the project is set to entail. Therefore, what use is telling a problem to a body or agent that has caused it in the first place? Our decision therefore is to wait and see what will eventually happen, as the rest of the population do. It is better for us to leave things in the hands of Allah so that he will take away the ordeal that he has brought on us, at a time and in way that he chooses.

2.2 Government Organizations

2.2.1 Major Stakeholders in Electric Power Generation – The Ethiopian Electric Power Corporation (EPPCO) and the Amhara Region Bureau of Water Resources (ARBWR)

Interviews were held with the regional head of the Ethiopian Electric Power Corporation (EPPCO) and the deputy head of the Amhara Region Bureau of Water Resources (ARBWR)

2.2.1.1 The Ethiopian Electric Power Corporation (EPPCO)

2.2.1.1.1 Background

The Ethiopian Electric Power Corporation (EPPCO) owns and operates the Chara Chara Weir, and the Tis Abbay I and Tis Abbay II power plants, the water requirements of which are regulated by the weir. At full capacity, Tis Abbay I and Tis Abbay II power stations generate a combined power output of 84 MW. The power production capacity of Tis Abbay I and II is low compared with the actual, or expected, capacities of the following hydropower plants: Fincha (recently upgraded) 133 MW; Gilgel Gibe I and II 180 MW; Tekeze (under construction) expected to generate 300 MW; and Tana Beles (under construction) expected to generate 460 MW. At present, Tis Abbay I and II are operating at maximum capacity as part of the overall national Inter Connected System (ICS), in order to assist in meeting the current high demand for electric power supply in the country. As the Head of the North-Western Region Operation, Ato Getachew Teshager stated, the national power demand and supply is centrally controlled through the Inter Connected System (ICS), which means that any particular power plant is not in a position to serve a specific region, while discriminating against other parts of the nation.

2.2.1.1.2 Interests

Primarily, EPPCO is interested in the production of hydroelectric power and the sale of it to clients in the country and overseas. This interest has increased in magnitude since the Corporation's launch of the rural electrification program. Ato Getachew Teshager, quoted earlier, affirmed that the Corporation is planning to complete the rural electrification program within the coming two years. According to the official, electric power consumption has sharply increased in the region over the last five years. The number of

clients has risen from 40,000 to 80,000 since 2002. He also mentioned the Corporation's plans to export electricity to neighbouring countries, especially to Sudan.

The Head of the North-western Operation went on to say that the expansion program was not being conducted without impact on other interest groups in the region. This has been particularly pronounced since the construction of the Chara Chara Weir and the subsequent extension of the Tis Abbay I to include Tis Abbay II. Foremost among the interest groups affected in the process are the Lake Tana boat transport service and the local tourist industry. The official continued:

Boat transport operations on Lake Tana were severely disrupted in 2003 because of exceptionally high abstractions of water from the lake for the purpose of hydropower generation. The situation was exacerbated by the drought conditions of the time that resulted in a sharp decline in the water storage of hydropower dams in other parts of the country. As a result, Tis Abbay I and Tis Abbay II were under intense pressure, operating to maximum capacity and therefore requiring massive discharges of water facilitated by the Chara Chara Weir, with the inevitable consequences to other sectoral interests. Demonstrating the degree of impact caused by the weir operations is that the water levels of the lake dramatically declined to an alarming 1,784 meters above sea level, from the average 1,785 above sea level.

Also badly affected by the same development is the power of the Tis Esat (the Blue Nile Falls), which is a major tourist attraction in the area. The diversion of water by the weir for power production has caused a marked decline in the volume of the Abbay River water that reaches Tis Esat to produce the natural water falls. He said: "*The problem has not still been resolved since tourist and film makers continue to contact my office, requesting large quantity water to be discharged by the Chara Chara Weir, and the gateway to the intake canals of the hydropower plant to be closed, to allow the flow to take its natural course and enhance the power and beauty of the Blue Nile Falls*". Hence, there is no doubt that tourism in the area is another sector negatively affected by the weir and the power plants. A conflict of interests is therefore evident between the effort to meet the growing demands for hydropower generation on the one hand, and the promotion of local tourism and ensuring the continuity of water transport service over the surface of Lake Tana on the other.

2.2.1.1.3 Opinions

From the standpoint of EEPSCO, the impact of Chara Chara and the associated hydropower plants on the water volume of Lake Tana and the Abbay River is only temporary. In the near future, upon the completion of a larger hydropower and irrigation scheme, namely Tana-Beles Project, the Tis Abbay I and Tis Abbay II power plants will cease to operate. With the suspension of these power stations, the Chara Chara Weir will become less operational, since there will be no constant need for the regulation and extraction of water to discharge to the power plants. Although the Tana-Beles

Hydropower and Irrigation Project will still be dependent on the water resource of Lake Tana and the Abbay River, its water requirements will be reduced significantly, compared with that of Tis Abbay I and II. In this case, the turbines will need only limited quantities of water to generate power since the flow is forcefully discharged from the head situated on elevated grounds. Thus, the launch of the Tana-Beles Projects will lead to the closure of the Tis Abbay I and II plants whose role will thereafter be to serve only as standby power stations, with the consequential lifting of the present high pressures on the lake and the River Abbay. Dependence on the water resources of the lake and the river will further be reduced as additional hydropower projects currently underway on Gilgel Gibe and Tekeze Rivers are completed and become operational in the near future. However, the concern remains that water will continue to be abstracted through two outlets rather than one, towards Beles River and Tis Abbay Two, affecting the flow regime of River Abbay. Hence, it does not look feasible that the launch of the Tana-Beles project will necessarily signal a significant decrease in the abstraction from Lake Tana.

2.2.1.1.4 Concerns

Despite increased hydropower production and the rural electrification program, the concern of EEPCO remains that people on the whole will still prefer biomass fuel to electricity as the source of household energy supply. A shift to the use of electric power to meet household energy needs will help reduce the strains on the natural environment, by preventing the depletion of forest reserves. Besides, electricity consumption is comparatively less expensive, than the use of biomass fuel, which consumers have also to pay for to get supplies from firewood and charcoal sellers. However, it appears that lack of awareness about the cost effectiveness of electricity is preventing local communities from making the expected changes in energy preference. This seems to be aggravated by the discouraging initial costs of electrical appliances such as ovens, stoves and cookers, which are not affordable to most rural households. In this regard, EEPCO may have to complement its rural electrification program with the promotion of community awareness about the benefits of electric power consumption to meet household energy requirements.

2.2.1.2 Amhara Region Bureau of Water Resources (ARBWR)

2.2.1.2.1 Background

The Amhara Region Bureau of Water Resources (ARBWR) is the second major government organization with a stake in development intervention projects associated with Lake Tana and the Abbay River. Ato Muluken Lakachew, Deputy Bureau Head and in charge of the Watershed Development Sector, gave the following explanation about the purpose of the Chara Chara Weir.

The Chara Chara Weir was constructed as an interim solution for the shortage of hydropower generation, aggravated by the delay in the launch of the Tana-Beles Hydropower and Irrigation Project. The rationale behind the construction of the weir is to harness the excess rain and river water that goes into the lake in the wet season, and

utilize it for hydropower generation. Over a surface area of 3,600 square kilometres, Lake Tana receives an average annual supply of 1,500 millimetres of surplus flow in the rainy season, which raises the normal water levels of the lake by a height of three meters. The weir is intended to harness the three-meter surplus volume of water inside Lake Tana as a natural reservoir, and regulate its discharge to reach the power generating turbines located at Tis Abbay I and Tis Abbay II power plants in controlled fashion. Thus, if the weir did not exist, the surplus flow would only take its natural course to become part of the waters of the Abbay River. Hence, the role of Chara Chara dam is little more than harnessing and regulating seasonal excess lake water for hydropower production, which would flow out of the lake anyway unutilized. Accordingly, the intention behind the weir structure is to collect the volume of water for power production without fundamentally affecting the optimal water levels of Lake Tana.

2.2.1.2.2 Interests

The Amhara Region Bureau of Water Resources maintains the strong position that the existing water potential should be exploited for regional and national development at any cost. The Chara Chara Weir project was initiated in the imperial period and was brought to fruition towards the end of the military regime, becoming fully operational when the incumbent government ascended to power. Therefore, little benefit is to be gained by trying to reverse the development that led to the construction of the weir. Of course, critics are right in pointing to the fact that no socio-economic impact assessment was conducted prior to the commencement of work on the construction of the weir. However, the approach to addressing the problem should focus on how to deal with the issues involved in the current context.

The Bureau also argues that the benefits of the Tis Abbay power plants in meeting electric power requirements of the population outweigh any claimed side effects that critics say they cause. No development intervention is without its costs and consequences and these need to be weighed against the advantages and services conferred. Much of the local criticism labelled against the weir development is unbalanced and not well founded. It can be equated with the irrational arguments of certain riparian countries that Ethiopia is unduly exploiting the water resources of the Abbay River catchment. The Bureau's side of the argument is that Ethiopia reserves the right to the use of the catchments water resource. Once the Abbay River has run its course to enter into the 45-kilometre-long gorge there is not the capacity, nor do the hydro-politics permit the country, to utilize its potentials for power production and irrigation. The opportunity to make any sensible or real use of the water for development purposes is in its initial stage, and by utilizing the catchments water resources. Therefore, the Bureau maintains a strong interest in the fullest possible utilization of Lake Tana and Abbay River water resource for hydropower generation and irrigation development projects. Currently irrigation stands at no more than 3% of the existing total potential. The vested interest that the Bureau has in the

Chara Chara Weir and the Tis Abbay power plants should be understood in the context of these arguments.

Regardless of the public discourse and debate on the issue, competing interests continue to surface and persist. The tourism sector, for instance, demands the release of more water by the weir to enhance the force and impact of Tis Esat (Blue Nile Falls) as do the local community members. On the contrary, stakeholders like the Tana Boat Transport Enterprise strongly object to the discharge of water, explaining that the sharp drop in water levels prevents transport operations on the surface of the lake.

2.2.1.2.3 Opinions

The Amhara Region Bureau of Water Resources differs from other stakeholders who share the stance that the abstraction of water for hydropower generation by the weir structure causes a significant fall in the water levels of the lake and the flow regime of the Abbay River. Furthermore, the Deputy Bureau Head says that the biodiversity of the lake is not in jeopardy as a result. Explaining why the water extraction and regulation of the weir is not a problem, the Deputy Bureau Head stated:

The weir was constructed taking into consideration the optimal water level of the lake, which equates to 1,784.5 meters above sea level based on the meteorological data spanning 36 years back. The professional opinion is that no serious consequence is caused to the state of the biodiversity, provided that the water levels do not fall below this optimal height. The gates are designed and operated in such a way that water extractions are regulated so as not to affect the dead storage of the lake and ensure that the optimal water level is maintained. The Chara Chara Weir is designed to harness, regulate and utilize three-meter surplus volume of water, in excess of the optimal 1,784.5.

Nonetheless, there were times when water levels dropped to an all time low, disrupting boat transport and fish production. Conversely, floods have occurred with disastrous effects on surrounding communities including Bahir Dar Town. The Deputy Bureau Head goes on to explain:

The floods could not be prevented at the time because the weir gates were not opened to make way for excess water due to inexperience in the early stages of the weir operation. More recently, in 2006, torrential rains of the wet (kiremt) season resulted in floods that hit many parts of the country including the areas in the vicinity of the weir. Lake Tana was likewise full to the brim. But nothing like the previous kind of problem was experienced, since lessons were learned from past mistakes and the weir gates opened to allow excess water to flow into the river. Nearby localities like Foggera, Libo Kemkem, and Derra were hit with floods, causing critics to attribute the damage to a failure associated with the Chara Chara Weir. But the actual cause, in the

opinion of the Bureau, is that the feeder rivers burst their banks and inundated the low lying plains before they reached the lake. In the year 2003, Lake Tana experienced the lowest water level for many years. The finger of blame was again pointed at the Char Chara Weir. However, the actual cause was not the excess abstraction of water but, rather, the severe drought that occurred in many parts of the country, as it did in this region. The resulting acute shortage of water, of course, necessitated the power plants to operate to full capacity, competing over whatever amount of water resource was left in the lake. Furthermore, the retreat of the lake had given occasion to farming communities to turn the surrounding wetlands into cultivation fields. In the final analysis, as long as the seven gates of the weir are properly operated, and the water volume in excess of the optimal water level of the lake is duly regulated according to the project design, the Bureau is of the opinion that the lake will still contain sufficient water resource to satisfy other interests. In order to ensure that this is what actually takes place on the ground, a Monitoring Committee on which the most relevant stakeholders are represented was set up a year ago

On a note of admission, the Deputy Bureau Head stated that the overemphasis laid on the socioeconomic benefits offered by the weir and the power plants, to the disregard of the interests and concerns of other affected stakeholders, has indeed been a serious problem. The failure to conduct prior stakeholder analysis and environmental impact assessment, which could have assisted in the avoidance of the adverse consequences suffered, is similarly a reflection of the lack of foresight and poor judgement experienced in the venture. The secrecy and lack of transparency surrounding the whole exercise, partly manifested in not keeping the community members and various stakeholders informed and not involving them in different stages of the project design and implementation betrays inadequate commitment and non-recognition of the role of stakeholders. The various circulating misconceptions, misrepresentations and conspiracy theories concerning the weir structure are to be blamed on the failure to be transparent and participatory to the necessary extent.

2.2.1.2.4 Concerns

A primary concern expressed by the Amhara Region Bureau of Water resource is related to flood management and control. There has to be an effective control and management system in place, to ensure that the weir gates are open to release surplus water from the lake into the Abbay River, so that flooding will not result. Operational errors have previously caused Lake Tana to overflow, inundating nearby localities including Bahir Dar Town, at least in one officially admitted instance. A recent repeat of flooding, which occurred in upstream *woredas* of the Fogerra Plains, Kolla Deba, Derra, and Achefer, although controversial, emphasises the continuing concern. On the other hand, failure to properly regulate the weir operations causes a sharp decline in the water levels of the lake, with serious consequence for the affected stakeholders and local people. Indeed, the concern is so serious that it has prompted the establishment of a Monitoring and

Consultative Committee responsible to the regional state and composed of key stakeholder organizations including: i) the Regional Bureau of Water Resources, ii) the Meteorology office, iii) the North-western Region EPPCO, and iv) the Tana Transport Enterprise. The mandate of the committees is to gather timely information on the water levels of Lake Tana, and consult the regional government about the appropriate action to be taken. It is reported that the committee has been effective in carrying out its mandate, contributing to the avoidance of a flood crisis in the rainy season of 2006.

However, EPPCO takes a different position regarding the Monitoring Committee, pointing out that its mandate is blurred between advisory and executive roles. As far as the North-western region EPPCO is concerned, it conducts its operations in relation to the regulation of the lake water in line with orders issued by the national monitoring committees based in Addis Ababa. The national committee takes into consideration the countrywide power demand on the basis of the Inter Connected System (ICS), before it issues instructions on the closing or opening of gates at Chara Chara. Hence, even though the regional monitoring committee in Bahir Dar draws annual plan on the timing and volume of water to be regulated, it has little chance of being complied with, as long as it does not correspond to the orders passed down from the national monitoring committee in the capital. The implications of the observed operational conflicts between the two bodies and the lack of clarity in the mandate of the regional monitoring committee seems to aggravate rather than help resolve the concerns felt by the individual stakeholder groups involved.

The Regional Bureau of Water Resource shares the feeling that there is hope for a way out. The Tana-Beles Hydropower and Irrigation Project is expected to be operational, after the completion of construction work in 2009. The expectation is that, with the current water consumption level of Tis Abbay II power plant alone, Tana-Beles will be able to produce 460 MW. This is nearly six times as much as that produced by both of the Tis Abbay power stations. The weir project and the associated power plants will then phase out, their role changing to that of standby power generation facilities in the case of emergencies or maintenance-induced power shortages. Obviously, the pressures on the water levels of the lake and the flow regime of the River will be significantly lifted, the flows taking their natural course to reach the Blue Nile Falls. Although this is expert opinion, one can question its plausibility, since the discharge of water from the lake to Beles seems set to weaken the force of the flow in the Abbay River

2.2.2 Major Stakeholders in Environmental Protection- The Amhara Region Environmental Protection, Land Use and Administration Authority (EPLUA) and the Amhara Region Parks Development and Protection Authority (PDPA)

2.2.2.1 The Amhara Region Environmental Protection, Land Use and Administration Authority (EPLUA)

Interviews were conducted with the head of the Amhara Region Environmental Protection, Land Use and Administration Authority (EPLUA) and experts based in the Bureau.

2.2.2.1.1 Interest

The water resources of Lake Tana directly or indirectly support a large population inhabiting 45 surrounding villages, located in eight neighbouring *weredas* of the Amhara National Regional State. In addition, twenty-two churches and monasteries exist on the islands of the lake. Fishing is one of the major sources of livelihood employing as many as three thousand people. The Cyprus Papyrus plant which grows in profusion along the lakeshores also constitutes an important means of subsistence for up to four thousand people of the Negede minority group. Rich in biodiversity, the lake and its surroundings account for a wide variety of fauna and flora, including many different species of birds. It is estimated that twenty-six species of fish are found inside Lake Tana, fifteen of which are said to be endemic. In line with the type and scope of its mandate, the Amhara Region Environmental Protection, Land Use and Administration Authority (EPLUA) maintains an interest in the protection, conservation and development of the diverse plant and animal resources found in and around the lake. To that extent, the activities of development ventures associated with the lake such as the Chara Chara Weir and the two Tis Abbay power plants are of great interest to the authority.

2.2.2.1.2 Opinions

Quite a number of groups claim a stake in the affairs of Lake Tana and the associated resources. The legally constituted responsible body is said to be the Ministry of Water Resource. It does not, however, mean that this organization is the only concerned stakeholder group. Different categories of community members, whose livelihoods are directly or indirectly associated with the lake, should likewise be recognized as having a stake. Any development venture based on the lake water, which excludes these groups as stakeholders, cannot be expected to be sustainable and environmentally friendly. Dr. Zerfu Hailu, former staff of EPLUAA, and currently head of Global Environmental Facility (GEF), explained the arguments and counterargument of the environmentalists and water development experts on the issue:

As far as Ministry of Water Resource people are concerned, they contend that North America and Western Europe attained their present level of industrial development at the expense of their natural

environments. However, it should be noted that environmental awareness and concerns were not major issues in those days. Today, though, they have become so environmentally conscious that they deeply regret the variety of biodiversity that they sacrificed in the process. As environmentalists, our position is: why must we develop through a process of environmental destruction. Any development activity is bound to incur environmental costs, that is unquestionable. The point nonetheless is how big are the costs in terms of social and environmental impact? No matter how beneficial, if the potential damage of a project far outweighs its intended gains and prospects, it is no good pursuing it. Furthermore, development ventures implemented with the disregard of grassroots level stakeholders and excluding these groups as development partners, or not accommodating their expressed interests and concerns, can hardly achieve their stated goals and objectives. A case in point is the Borkena earth dam irrigation project, which serves as a typical example of failed projects².

In the opinion of EPLUAA staff, the Chara Chara Weir project seems to be repeating previous blunders, by not having been transparent enough since it was initiated. Neither have the right stakeholders been consulted, including local livelihood groups and relevant government organizations. Socio-economic surveys and environmental impact assessments were not conducted. Once the project was launched, and impacts were observed, no mitigation measures were introduced to deal with environmental problems. Apparently, only the engineering aspects have been the subject of consideration and planning. In fact, the whole project is shrouded in secrecy, continuing to operate beyond the reach of any groups with a stake or interest in the process. The mystery that surrounds the Chara Chara dam project has actually given rise to different misconceptions and conspiracy theories that circulate in the local community.

The claim made by the Regional Bureau of Water Resource is that the purpose of the Chara Chara Weir is to harness the excess inflow into Lake Tana and discharge it as necessary for hydropower generation, while the optimal water levels are maintained. What actually happens on the ground, however, runs counter to this claim. Critics contradict the explanations of water development experts, by exposing the failure to conduct sufficient hydrological studies on the optimal height of the lake water, the amount of inflow, and the actual depth of the lake. The supposedly optimal water level of 1,784 meters is challenged. It is a faulty premise, to suggest that only a decline below that point can have ecological impact and harm the interests of other stakeholders. Cited in support of this argument is the crisis of 2003. In that year, water levels dropped to an alarming low point, and the lake retreated significantly, causing serious disruption to boat

² This was an irrigation dam constructed on the Borkena River, South Wollo Zone of Amhara Region, in 1991 at the cost of US \$ 30 million. The project is frequently cited as an exemplary failure attributed mainly to a wasteful attempt of pre-feasibility and integrated conservation plan. As a result, the dead storage volume of the reservoir of the dam was silted up before the construction of the dam was completed (N. Haregeweyn *et al.*, 2006).

transport services and fishing activities. What was surprising, however, is that the crisis resulted from the decline of water levels to 1,784.66 meters, which was still more than half a meter above the minimum optimal height of 1,784 meters. According to the recommendations of a study sponsored by the Japanese International Cooperation Agency (JICA), the minimum optimal water level of Lake Tana should be 1,785 meters, contrary to the official claim of 1,784 meters.

Similarly, the Tis Abbay II hydropower plant was constructed amid serious disputes and controversies. Those expressing environmental concerns recommended that the plant be located below rather than above the Tis Esat (Blue Nile Falls). In that case, the falls would be intact, without consequence to local sentiments and tourism interests. These concerns went unheeded, and worse, due to political sensitivity of the issue, stakeholders promoting environmental interests were misrepresented as challenging the development agenda of the government³.

It appears that there is little coordination and integration between stakeholder groups and institutions associated with Lake Tana. EPLUAA maintains the position that an autonomous authority needs to be created to bring about the necessary synergy between such bodies. The creation of the kind of institution being proposed will enable other stakeholders, besides the Bureau of Water resources and EEPKO, to be vocal and have a say in decision making pertaining to the utilization of the water resources of Lake Tana. A resolution to this effect was adopted at a recent scientific conference hosted by EPLUAA, and conducted with the involvement of relevant university scholars. The resolution demanded the establishment of an independent institution in the form of a Lake Tana basin development authority. The conference resolution was presented to the regional state council for consideration and action. Conference participants also drew attention to the need for the declaration of Lake Tana as a biosphere reserve area. If declared as such, parts of the lake catchment would be designated as a core zone (fully protected from human interference), another as a buffer zone (allowed for fishery development and research activity) and another as transitional zone (set aside for development interventions).

The announcement by the Federal Ministry of Water Resource that draft legislation is being prepared to authorize the creation of an autonomous advisory and regulatory body may be regarded as a welcome development.

2.2.2.1.3 Concerns

The fall of lake water levels remains a serious concern. As the water level declines and the lake retreats, the surrounding wetlands dry up. This encourages the practice of wetland cultivation and livestock grazing, on an area of land once covered by the lake. The natural ecosystem will thus be seriously disrupted. The reproductive cycles of fish species will likewise be badly affected, since fish require high water levels and

³ It should be noted that while this is a common suggestion put forward by stakeholders who wish to see the Falls flowing, since power production requires a head of water, it is in fact not technically possible to have constructed the diversion channel below the falls.

surrounding wetlands into which they migrate and lay eggs. Declining fish resource, in turn, means that the livelihood of fishers is jeopardized. Besides fish, the biodiversity of other amphibians and reptiles will be endangered in similar fashion. Similarly, the papyrus plant that grows in abundance along the lakeshores will dry out and die for lack of water. When such vegetation loses moisture and becomes dry, the local people have an excuse to cut it down or uproot it for fire fuel. The repercussions are serious for members of the Negede minority occupational group, whose livelihoods are heavily dependent on the papyrus plant. With the destruction of this vegetation, the risk is the loss of livelihood for a whole community.

Negative impacts caused to the biodiversity and the natural ecosystem of the area is certain to have serious implications for the local tourism industry. Lake Tana and the Tis Esat constitute major tourist attractions in the region. The Blue Nile Falls depend entirely on the force and velocity of the Abbay River flow. A high flow is required to produce the scenic effects of the Falls. Lamentably, as stakeholders concerned by recent developments complain, the discharge of water by the weir for power production purposes significantly reduces the volume and intensity of water that reaches the Blue Nile Falls. Thus the spectacle that used to occur is significantly diminished. The impact on the majesty and grace of the Blue Nile Falls caused by the decline in the volume and power of the river flow has not gone without hurting the feelings of the native population, and eliciting satirical remarks suggestive of their disappointment. A couple of these can be translated as follows:

“It is better to pour a bucket full of water down the cliff to recreate the Falls”.

“The Falls are now only as forceful as the urine of an adolescent”.

Viewed in this light, it is not hard to understand that local tourism has also been adversely affected by the disturbance of the hydrological regime of Lake Tana and the decline in the flow regime of the Falls. Suffering the consequence as well are groups and community members whose businesses or livelihoods are directly or indirectly associated with tourism activities. Included among these are catering services, tour operators, guides, and boat owners.

Boat transport services too are seriously affected. Without boat transport life is difficult for the inhabitants of the islands and peninsulas of the lake. The population of the largest island, called Deqe, is estimated to be 10,000. These people are heavily dependent on the boat transport service to get around and do business. Many travel frequently between Bahir Dar and their settlements. Not least, the Tana Transport Enterprise stands to lose from the decline in the lake water levels, as its entire workforce also does. Construction projects in Bahir Dar Town will also suffer since the Zege and Gorgorra peninsulas supply much of the sand requirements for construction work and this sand is transported by boat. As a result, the labour force that the sector employs will lose their means of income, not to speak of the economic consequences caused by delays in construction.

Environmentalists also draw attention to other areas of concern. They seriously question the feasibility of maintaining the regular water level of Lake Tana and the closure of Tis Abbay II power plant through the conservation of the water of four feeder rivers of Lake Tana. The Tana-Beles Hydropower Project is intended to utilize for power production the water harnessed in reservoirs under construction on the four primary tributaries, namely Megech, Rib, Gumarra, and Gilgel Abbay. The rationale is that the volume of water conserved in these dams will be sufficient for the Tana-Beles Hydropower Plant to produce 460 MW of electricity. Hence, there will not be the need to maintain Tis Abbay II power plant in operation. The closure of this power plant and the dependence of Tana-Beles on the waters of tributaries conserved in the cofferdams will mean that the lake water is not going to be affected. But as already indicated, the likelihood of this scenario remains highly controversial. Environmentalists express reservations about the chances of things proceeding as planned. Firstly, they are worried that the dams being built will reduce the river water that flows into Lake Tana. Secondly, they fear that the reservoirs themselves will lose part of their storage capacity because of siltation, with the result that the power output of Tana-Beles will become affected. In the event of a sharp drop in the volume of power output at Tana-Beles as a consequence, the probability is that Tis Abbay II power plant and the Chara Chara Weir will still be used to make up for the generation of the power difference. Thus, the Tis Abbay II power plant will still need to be supplied with water regulated from Lake Tana.

EPLUAA staff who voice their concerns challenge the view of the Water Resource Bureau that the sharp decline in the lake water levels of 2003 was an isolated incident and a one time crisis. The environmentalists emphasize that Lake Tana is replenished by rain water, besides the inflow of feeder rivers. Droughts have become recurring phenomena in Ethiopia, repeating themselves in cyclical patterns. The crisis of 2003 associated with the decline in lake water levels was exacerbated by the general drought conditions of the time. There is no guarantee that droughts will not reoccur, resulting in a spiral of crisis situations, causing a sharp drop in the lake water levels and shrinkage of the lake.

The environmental experts insist that their concerns have nothing to do with resistance to development-oriented and properly managed change. Their contention is that the efforts aimed at the exploitation of environmental resources for development purposes should be planned and coordinated in a well-studied and knowledge-based fashion. With present trends left unchecked and the water levels of the lake continuing to fluctuate, with severe consequences on the state of biodiversity, it is difficult to imagine what the fate of Lake Tana is going to be in the foreseeable future⁴. In this connection, it is appropriate to learn from relevant past domestic and foreign experience. Lake Haromaya in Ethiopia, Lake Chad in Chad, and the Aral Sea in Asia each disappeared, leaving behind the dry ground that they once covered, and the living memories of their past existence⁵.

⁴ It should of course be noted that the lake levels fluctuated under natural conditions as well (i.e. before the weir was constructed).

⁵ Of course, this occurred because of abstractions upstream of these lakes. It was not a consequence of lake regulation. It seems apparent that the informants referred to these developments to suggest that human activity was in any case responsible for what happened.

In the light of the lessons from these unintended outcomes, the outcry is that the natural environment and resources should not be sacrificed in the interest of devolvement ventures. Projects meant to improve the quality of life should be designed and implemented in such a manner that a trade-off between the desired gains and the possible environmental impact is ensured. In recognition of this, a provision has been included in Federal constitution of the country (1995: Article 92, sub-articles 2, 3, and 4), which stipulates that the natural environment should be protected, and development programs should be planned and conducted in a manner that corresponds to both the letter and spirit of the statute. In a similar vein, the Federal Environmental Protection Authority (EPA) has issued a national act, the Environmental Policy of Ethiopia (EPE, 1997), which requires the judicious and responsible utilization of natural environmental resources. It is unfortunate that environmentally costly projects are being undertaken regardless of these legal provisions. Compliance with the stated regulations would have prompted or necessitated the undertaking of environmental impact assessments (EIA) prior to the launch of the projects. Their purpose is to facilitate a safe entry into a venture and enable the design and putting in place of the proper preventive and mitigation measures, in the case of any anticipated negative environmental impacts. Hence, the timing of the EIA should be prior to the commencement of any given venture, rather than in the course of its implementation, or after the detection of the signs of serious environmental damage. The observation made in connection with the Tana-Beles Hydropower Project is what may be described as an ill-timed environmental impact assessment. Construction work on the project had already gone a long way, when problems necessitated EIA, tens of millions of Birr having been spent on it. How plausible is it that, should the result of EIA be against the continuation of the project, the responsible body will decide to terminate the venture? Therefore, one may conclude that the emphasis when planning development programs is more on the economic side than on the long-term environmental consequences to be averted or otherwise suffered. As the same stakeholders (EPLUAA) continue to argue, the Chara Chara Weir project is another typical example of the kind of failure under discussion. In the first place, it commenced without the necessary socio-economic survey having been undertaken.

2.2.2.2 Amhara Region Parks Development and Protection Authority (PDPA)

2.2.2.2.1 Background

The Amhara Region Parks Development and Protection Authority (PDPA) was established in 2004. Its mandate includes the delineation, administration and protection of parks and other game reserve areas in Amhara region. Moreover, it is responsible for the exploration and designation of potential reserve areas in the regional state. The Semien Mountain National Park, registered by UNESCO as world heritage, is the oldest gazetted national park in Ethiopia and is located in this region. The Alatish National Park in North Gonder, Quara Wereda, is the latest to be designated as such. Thus, the main purpose of the authority is to ensure the gazetting, designation, and legal protection of areas in the region with the potential or status of protected reserves.

2.2.2.2.2 Interests

Lake Tana and its surrounding areas are endowed with vast resource potential in terms of both fauna and flora. Ato Mulugeta Wubeshet, head of PDPA, confirmed that abundant fish including endemic species exist in the lake. Besides, different kinds of freshwater creatures and plant life, particularly the papyrus plant, breed or grow in or around the lake. The continued existence and development of this rich biodiversity requires the conservation of the lake water. Furthermore, the lake is significant from historical and cultural perspective. Ancient churches, monasteries, and museums of immense historical, cultural and religious importance also abound on the islands, peninsulas, and in the villages surrounding the lake. These endow the area with vast potential for tourism.

In view of the existing vast resource potential, it is not surprising that the protection and development of the area is a matter of considerable interest to the authority. In addition to its magnificence and splendour, the lake water needs to be conserved for the sake of the surrounding wetlands that are vital habitat for the bird and plant life that they support. The wetlands also provide favourable environments as breeding grounds for different kinds of fish. In addition, different birds' species feed on insects and worms that live and multiply in the wetlands, kept moist from the overflow of the lake. Environmental stress in the form of sharp decline in the water levels of the lake is bound to adversely impact the ecology of the area. In this regard, the Chara Chara Weir poses a threat to the interests of the authority. The water regulating role for power production causes the authority concern. It fears that regulation will interfere with its mandate to ensure the protection and conservation of the lake.

2.2.2.2.3 Opinions

It is undeniable that Lake Tana deserves to be treated as a protected area in view of its abundant water resource and vast biodiversity. Nevertheless, so many intervening factors make it difficult to treat and develop it as such. The head of the authority explained that, for one thing, a considerable number of local people base their livelihoods on the lake. These are fishers, wetland cultivators, and the Negede, who use the papyrus plant for boat construction and other income generating activities. Further complicating the process of reserving the areas as a protected zone are the development activities supported by federal and regional government stakeholders, including the Chara Chara Weir project. In fact, the area has already been designated by the Federal government as a development corridor. This "corridor" covers five feeder rivers, as well as the lake itself. The head of the authority underscored the position of his organization which is not to exclude these groups and institutions from access to the lake and the resources there. The protection of the lake as a reserve area should allow room for its utilization in a sustainable manner. Furthermore, protecting the lake is an action that encompasses a wider area than is actually covered by the lake. The catchment of the lake is so large that twenty eighty *woredas* lie within the watershed. The development of Lake Tana cannot be undertaken in isolation from the conservation of its catchment. The more deforestation there is in the catchments area, the higher will be the chances for flooding in the wet season, since there will be less vegetation to contain rainwater, and as a result flow velocity will greatly

increase. With the run-off, huge deposits of sediments will be swept into the lake, causing silt to accumulate with detrimental effect on its volume. In the view of the head of the authority, the country should utilize its water resources in order to achieve poverty reduction and food security. However, the development effort should be planned and undertaken in such a way that risks and consequences to the resource potential and the natural environment are safely averted. A holistic and integrated approach is therefore required to ensure sustainable use of resources to meet development needs.

The problem with the Chara Chara Weir is that it was constructed and brought into operation on the basis of a short-term vision and inadequate data. The project therefore lacks a sufficient volume of information, spanning extended periods of time into the past, which would enable accurate understanding of the history of the lake water levels, and effective regulation and management of the outlet. As a result, two major challenges and difficulties are observed. When the water levels fall too low because of the operation of the weir or the shortage of rain, the biodiversity and the livelihoods of community members suffer. Conversely, in the event of high water levels and overflow, such as occurs in the rainy season, and the failure of the weir to duly discharge excess flow, serious consequences result; islands and surrounding villages are inundated, local people displaced, and various activities disrupted.

The authority head proposed that a federal agency be designated and mandated to ensure a system whereby Lake Tana is protected, managed, and exploited in a sustainable fashion. The head drew attention to the fact that the interests associated with the lake have regional, national and international dimensions. It therefore takes more than the involvement of two government ministries, water resource and environmental protection, to get this done in an effective and successful manner. In view of the designation of the Lake Tana Area as a growth corridor, a multi-sectoral and multi-disciplinary body needs to be created to coordinate and harmonize the diverse interests associated with the lake and the associated resources.

2.2.2.2.4 Concerns

Tana being a shallow lake, serious concerns are expressed about its future volume. Already, most concerned stakeholders and experts believe that continuing sedimentation and the operations of the Chara Chara Weir have placed the water levels under intense stress. Problems have resulted to human life and activities in previous years and there is the possibility that these will be repeated in the future. However, this is not the only concern. In the planning stage, or under construction, are five dams on each of the main inflows to the lake. These dams are planned to harness water for irrigation. In addition the Tana-Beles Hydropower and Irrigation Project is under development. This will use water from Lake Tana to generate electricity and supply irrigation schemes in the Beles catchment.

There is no doubt that these developments will drain the lake water to a large extent, with possible consequences of alarming proportions. In fact, the head of the authority said that he fears for the future of Lake Tana. He believes that these planned developments pose a

serious threat to the lakes existence. The decline or disappearance of the lake will throw the area into crisis, with extensive damage to life and human livelihoods. The surrounding wetlands will be drained, no more serving as habitats for the diverse animal and plant life there. Similarly, those who have based their livelihoods on the waters of the lake and the vegetation in its surrounding will experience hardship and losses. In addition, the historical and cultural heritage of the lake islands and monasteries will be adversely affected.

2.2.3 Regional Research Institutions– Lake Tana Basin Research Centre (LTBRC) and Amhara Region Agricultural Research Institute (ARARI)

2.2.3.1 Lake Tana Basin Research Centre (LTBRC)

2.2.3.1.1 Interests

The Lake Tana Basin Research Centre (LTBRC) is a research institute that is affiliated with Bahir Dar University. The Centre aims to conduct research on the management of Lake Tana, and inform and influence the formulation of relevant government policies. Brought into existence only one year ago, the centre is a young institution, which has been structured into four working teams, based on different disciplines and interests, namely: biodiversity, environmental, natural resources management, and socioeconomic studies.

2.2.3.1.2 Opinions

According to the director of the research centre, Dr. Ayalew Wondie, the decision of policy makers to authorize the construction of the Chara Chara Weir was not based on the output of relevant studies. Therefore, it is a project that was hurriedly embarked upon, without allowing sufficient consideration of professional opinions and research inputs, in relation to the possible environmental and socioeconomic impacts. The focus was on ensuring the generation of the maximum possible electric power, by enhancing the capacities of Tis Abbay I and Tis Abbay II power plants. This seems to explain the procedures followed in the launch of the project, which proved to be far from transparent and consultative. It was rushed into without due care and concern for the inclusion of the interests of other stakeholders, in what can be described as largely covert circumstances. Proof of the secrecy surrounding the operations is the fact that the records showing the last thirty years average water levels of the lake were obtained in a fashion that lacked transparency and procedural transfer of classified documents between implementers and the information providers, according to the informants. The trends and attitudes that still characterize the project tend to be exclusive of other stakeholders. As a result, the project remains inaccessible to institutions like the Lake Tana Basin Research Centre (LTBRC), which has the mandate of investigating the pros and cons of the venture.

The failure to plan and implement the venture in a well informed and widely participatory basis has also given rise to the emergence or aggravation of the conflict of interests between various stakeholders. As far as the Ethiopian Electric Power Corporation

(EEPCO) is concerned, it's primary aim is the extraction of whatever quantities of the lake water are required to maximise power generation, regardless of the repercussions to other interest groups. On the other hand, there are those who stand to lose from the decline in the water levels and flow regime of both the lake and the river. The Tana Transport Enterprise, local tourism industry, fishers and the Negede minority occupational group are among the stakeholders most adversely affected.

The impact of the Chara Chara Weir on Lake Tana has been intense. It has disrupted the natural water outflow cycle of the lake. This is a consequence of the bulldozing of one side of the natural wall of the lake by means of dynamite. The purpose of this process was to facilitate the discharge of large quantities of water from the lake by means of the weir structure to the two power plants further downstream.

Based on the assessment of the existing situation, the director of the Centre proposes a consultative and participatory approach to resolve current problems, in a manner that accommodates and satisfies all local interests. With the coordination of activities, collaboration between concerned stakeholders and effective planning, it should be possible for power requirements to be met, while maintaining sufficient water to adequately supply other needs. To this end, it is essential that all government agencies with a stake in Lake Tana should be allowed to operate within the scope of their respective mandates. Accordingly, LTBRC should be involved in the process as an information network and research think-tank, a responsibility that has officially been vested in it.

2.2.3.1.3 Concerns

It is a subject of serious professional concern that the Chara Chara Weir is jeopardizing the water levels of Lake Tana. Available data indicates that Lake Tana had a water retention period of sixty-five years, which helped to stabilize the natural ecosystem. This, however, is in a state of rapid change for the worse, the retention period having become shorter, and causing the ecosystem to be less stable. The abstraction of massive amounts of water from the lake by the weir has resulted in a sharp decline in the water storage capacity of the lake, with unavoidable consequences for the biodiversity.

The lowering of the lake results in a chain of actions that is potentially destructive of the environment including to the lake itself. When the lake water recedes, the open water turns into wetlands, inviting farming communities from the surrounding neighbourhoods of Fogerra, Debre Tabor, Kunzila, and Dur Bete to turn these into fields. In a bid to clear extensive areas of land for cultivation and grazing, and find a supply of fuel for fires, they engage in large-scale cutting down or uprooting of the papyrus plants growing along the lakeshores. These activities seriously jeopardize the livelihood of the Negede, whose sole means of survival is the sale of papyrus and green grass or use of the plant as boat construction material. The conflict of interest naturally surfaces over water resource management between the Negede on the one hand, and the farmers and cattle raisers of the nearby villages on the other. As if the impact of the weir structure and the conversion of surrounding wetlands into farm fields were not enough, further threats are looming

over the lake from the planned construction of five dams on the feeder rivers in addition to the Tana-Beles Hydropower and Irrigation Project. Given that Lake Tana is a shallow reservoir by nature, and the mounting pressures to its storage, it is indeed an issue of urgent concern that the lake might eventually dry completely.

Boat transport service being heavily dependent on optimal water levels of the lake, and the only means of travel for inhabitants of the islands and peninsulas, the decline in the water storage of the lake has serious implications. In addition to the inhabitants of the lake islands and peninsulas, local tourism business of wider socioeconomic significance will also be seriously affected. A particularly important subject of concern in this regard is the damaging effect of the weir and associated power plants on reducing the water flow needed to reach the Tis Esat and maintain the natural magnificence and appeal of the scenery.

The accumulation of sediments in Lake Tana, washed into in the feeder rivers and the run-off from the catchments area, is a development that is viewed with a high degree of concern. Unchecked silt deposits can pile up inside the lake to a point where the water levels drop significantly, and cause the lake to dry up and disappear. Hence, extensive watershed management work needs to be seriously considered. Interventions will have to be implemented, with a view to preventing the high rate of sedimentation in the lake. At the moment it is not possible to ascertain the extent of sedimentation.

2.2.3.2 Amhara Region Agricultural Research Institute (ARARI)

2.2.3.2.1 Opinions

Dr. Eshetie Dejene, fish expert and Director of the Amhara Region Agricultural Research Institute (ARARI), explained the opinions of the institute concerning the Chara Chara Weir. He began by stating that the conduct of the stakeholder analysis is untimely. It comes at a time when the project and the associated Tis Abbay II power plant are about to be phased out. The Tis Abbay II power station is thought to be inefficient and uneconomical. Besides its limitation of requiring a large volume of water to produce a relatively small power output, it fails to utilize the water supply for irrigation. In the case of the Tana-Beles project, both of these drawbacks are expected to be overcome. Not only will Tana-Beles require a smaller amount of water to generate more electric power, it is also designed in such a way that it will utilize the same water used for power generation, to irrigate extensive areas of agricultural land. Thus, once the work on Tana-Beles project is complete and it becomes operational, the Chara Chara Weir and the Tis Abbay II power plant will cease to operate. Therefore, the timing of the stakeholder analysis, being undertaken at a time when the life of the concerned project is nearing its end, makes the study irrelevant.

Having said that, the Director looked back on the standard of the structural design of the weir. He lamented that the structure had fundamental engineering faults, being designed and constructed in a manner that did not guarantee or maintain the water level of the lake. The slanting or sloppy position of the structure causes water to flow out of the lake to an

extent that disrupts the natural water level. Another deficiency observed in the design of the weir project is that the process failed to be transparent and consultative; not allowing the involvement of stakeholders, including the local community. Neither was the launch of the project planned and executed in multidisciplinary way, requiring the assessment of possible environmental and social impacts. Furthermore, inadequate meteorological data were used as a basis for the inception of the venture.

The Director claimed that the supposition that the weir is contributing to a reverse in the trends of deforestation is not a sound assessment of the situation. The assumption is that access of the local community to increased electric power supply would reduce the demand for firewood which, in turn, means that the numbers of people engaged in the cutting down of trees would be reduced. However, in reality the cost of electricity, regardless of the increase in output, is beyond the capacity of a large proportion of the population, whose income levels remain very low. Dr. Eshete also challenged the view of the region's tourism bureau that the weir project has not affected the flow of tourists to the area. His contention is that what attracts tourists to the region in large numbers is the Blue Nile Falls.

The Director concluded by stating that no one disputes the importance of perusing developmental programs. However, to be of real value, these programs must be study-based, and managed in a well informed and reasonably risk-free manner. To ensure this, parallel intervention ventures and concerned stakeholders need to be actively involved, so that the necessary coordination of activities and group collaboration is secured. This would facilitate a safe commencement into programs and effective management of the potential adverse impacts.

2.2.3.2.2 Concerns

The future of the biodiversity in and around the lake, the fish species in particular, constitute a vital area of concern for the research institute. It is estimated that fifteen species of fish exist in the lake that are largely migratory. Thus, they follow migratory patterns of reproduction, shifting back and forth between upstream and downstream sections of the lake. It is said that they frequent parts of the lake where water levels are usually at their highest, such as entry points where tributaries flow into, or exit points at which the Abbay River flows out of the lake. In situations where the levels and quantities of the lake water are not maintained at optimal level, the reproduction cycle of the fish will be badly affected in terms of the rates and size of breeding. There is no doubt that the weir has dealt a huge blow to the reproduction of the fish species, with serious impacts on the size of fish catch.

The regression of the lake is also a cause for serious concern. The more the lake recedes, the larger wetlands there will be available for crop cultivation. This encourages farmers to clear an ever-increasing area of the surrounding land to engage in crop production. In so doing they cut down trees and plants, with detrimental effects on the vegetation cover and inevitable consequences to the natural ecosystem. In the process, groups like the

Negede are seriously affected. Related undesirable developments are the cause of conflict between groups of farmers who compete over access to the wetlands.

In view of the fact that the Blue Nile Falls are in a state of jeopardy from the action of the weir, there is no doubt that this impact of the structure causes concern that has to be mitigated or dealt with. If not addressed, the problem will greatly endanger local tourism potential. As far as sight-seeing of the Blue Nile Falls is concerned, the number of tourists has already begun to decline. Tourists who come to the area in anticipation of seeing the Blue Nile Falls are for the most part disappointed. Hence, they pass on to Gonder and Axum, not wanting to stay around longer. Upon the expected arrival of dignitaries and VIPs, instructions are given to release more water to supply the Falls, so that they are restored to their normal force. *“I for one,”* said the Director of the Institute *“strongly object to the poster advertising the Blue Nile Falls as a tourist attraction, together with other sites. I keep telling the concerned people that they will be legally accountable for claiming that something exists as an attraction when it no longer does”*. However, on top of the environmental and tourism side of the issue, the damage caused to the Falls also has psycho-social impacts. The local people seem to view the Chara Chara project as a venture that is working against a heritage that they regard as source of national pride and symbol of local identity.

2.2.4 Stakeholders Related to Tourism and Water Transport Service - The Amhara Region Culture and Tourism Bureau, and the Tana Lake Transport Enterprise

2.2.4.1 Culture and Tourism Bureau

2.2.4.1.1 Interests

The Amhara Region Culture and Tourism Bureau has a stake in the development and protection of the water resources of Lake Tana and the islands and peninsulas. The religious, cultural and historical sites as well as the Blue Nile Falls constitute sites of significant tourist potential. Any development venture that poses a threat to these tourist attractions, the Chara Chara Weir included, is viewed as interfering with the interests of the Bureau.

2.2.4.1.2 Opinions

As a point of departure from the representatives of most of the stakeholder groups interviewed, the Head of the Culture and Tourism Bureau, Ato Mulugeta Seid, spoke of the Chara Chara Weir project in a very positive way. He views the advent of the project as a necessary and desirable development. He explained his stance by saying that, the weir plays a valuable role by harnessing and regulating the excess inflow in the rainy season for power generation purposes. For the Bureau Head, water resource is not the only requirement for the tourism industry to flourish. Increased electric power supply is a vital demand that must be met. This justifies the intervention of EEPSCO. In this way, facilities and catering services that are essential for tourism development are supplied

with electricity. For example, hotels need a constant power supply to keep their services running, which include food production and preservation, the lighting, heating and ventilation of accommodation and the cooling of beverages, amongst many other provisions and processes. Of course, the water resource should be managed and utilized in a balanced manner, taking into consideration the volume of available water at particular periods of time and the needs of other stakeholders.

For a long period, EEPCO had monopolized the Chara Chara Weir project, operating it in a fashion that suited the programs and activities of the Corporation. Unavoidably, this had unwanted effects. There were times when the excess inflow stored by means of the weir in the lake inundated the islands and peninsulas, besides causing flooding of the nearby plains as far as Bahir Dar Town. At present, this problem is declining because the weir is now being managed in a joint and collaborative manner with the involvement of relevant sector organizations like water resource and culture and tourism bureaus. The inundation of islands and villages is not a recent phenomenon; it existed prior to the construction of the Chara Chara Weir structure. Possibly, the weir has aggravated it.

A critical problem experienced in connection with the Chara Chara Weir project was a rare case that occurred in 2003. In that particular year, large parts of the country were in the grip of a severe drought. The rains failed to come and water levels dropped in many rivers and lakes, with some almost drying up. During this period, Tis Abbay I and II power plants needed increased quantities of water supply to make up for the shortfalls in electric power production. Thus, the weir had to abstract more water from the lake than it usually did, causing severe stress to the lake. A water transport crisis resulted, as high capacity boats were unable to sail, seriously affecting the life of island and peninsula inhabitants, whose livelihood is based on travelling and transporting merchandize between their settlements and the surrounding towns. Small boats and canoes, however, were still able to sail, and these are the modes of transport which tourists prefer. Hence, even during this crisis period, local tourism was not seriously affected. In the last two years there has been abundant rainfall and the lake and rivers have been full and consistently replenished. The Blue Nile Falls are also back to their original shape and state, according to the head of the tourism bureau. Upon the completion of the Tana-Beles project, expected to be operational soon, the weir and associated power plants will mostly be suspended. That will enable the Blue Nile Falls to regain and maintain their original grandeur and appeal.

In sum, the Bureau Head is of the opinion that tourism in the area not only has significant potential for further expansion, but has not been negatively affected by the Chara Chara Weir. Although the Blue Nile Falls and the islands of Lake Tana together with their heritage sites are major tourist attractions, they are not the only points of interest that draw a flow of tourists to this region. Actually, Bahr Dar is the hub of tourism serving as a transit point for a large number of tourists who travel further north to visit Lalibella, Gonder, and Axum. For this reason, tourism in the area is growing rapidly. It is not declining. The rate of increase is between 20 and 30 percent annually, according to the statistics.

2.2.4.2 The Tana Transport Enterprise

2.2.4.2.1 Opinions

The Head of the Tana Transport Enterprise (TTE), Ato Ewnetu Taye, said that, although a major stakeholder, the Enterprise was totally ignored in the Chara Chara dam project design and implementation. It has not been consulted, nor informed, at any time since the project inception. As the project document states, work was begun on the assumption that the maximum height of Lake Tana above sea level during the wet season is 1,787 meters, the lowest point being 1,784 meters above sea level. The intention was that the 3 meters height of the lake in excess of the 1,784 meters could be harnessed and utilized for hydropower generation, without causing disturbance to the natural hydrological regime of the lake.

The Head of the Enterprise, however, took issue with these assumptions. He stated that, to his knowledge, no study has been conducted on potential risks of using the lake water down to 1,784 meters. The impacts for the aquatic biodiversity and the natural ecosystem were therefore unknown. Speaking from his experience, he believed that below 1,785 meters any form of navigation on the lake becomes impossible. Engineers at the water resource bureau defend their position by saying that the 1,784 meters minimum height of the lake is based on fifty years of meteorological data. However, when challenged by making reference to the disaster that occurred in 2003, when the lake height was only at 1,785 meters, the engineers have little to produce by way of a sound defence. During that period, a drop to 1,784.88 meant that the lake was so shallow that rocks almost protruded. Navigation of all forms came to an abrupt halt and three boats are reported to have been wrecked as a consequence of hitting basalt rocks under the water.

As a matter of fact, the level of Lake Tana began to drop in May 2002, declining to an all-time low the following year. The disturbance to the level of the lake was caused by operations meant to ensure constant flow to the Tis Abbay II power plant. The claim that drought was to blame for the decline in the lake height was not completely valid. In actual fact, the average precipitation in that year was not markedly lower than that of the preceding or following years⁶.

Hence, according to the Head of the Tana Transport Enterprise (TTE), Tis Abbay II has been operating at great cost to the navigation services on which both local people and the tourism trade depend. Nothing similar to the 2003 disaster has been repeated. In his opinion, this is because of the weight of pleas and concerns that fellow stakeholders and the TTE have brought to the attention of relevant government authorities. Still, the lake water levels have not returned to what they were prior to 2003. There was a slight improvement in the wet season of 2006, but levels still remain below what they were prior to 2003.

⁶ This may be true, but it should be noted that EEPSCO claim that it was drought in other regions of the country (and hence less electricity generation in other hydropower stations) that necessitated maximising power production from the Tis Abbay power stations.

2.2.4.2.2 Concerns

As a transport company, the main concern of the TTE is that continued disturbance to the level of the lake will seriously disturb the life of the population inhabiting the islands, peninsulas and shoreline. The majority of these are farmers for whom the navigation service is almost indispensable. Many use boats on an almost daily basis to attend school, appear in courts, visit health facilities, or attend to other business. The Dek Island, the largest with an estimated population of 10,000, is a primary producer of mango fruit. The livelihoods of the islanders would be badly affected, if there was a major disruption or complete stoppage to navigation. In the worst situations, it will be difficult for these people to get around themselves and transport goods and produce in and out of their villages. Even if they found alternatives, these would be costly, time-consuming and physically demanding. Another serious concern is that local tourism will inevitably suffer, as it did in 2003. During that period, the unprecedented navigation crisis forced the tourist movement to cease for four months, preventing visitors from reaching the islands and the cultural, historical and religious sites⁷. Also negatively affected were the numerous sand mines that supply the construction projects in the towns.

The aquatic ecosystem stands in the frontline of the natural factors that come under intense pressure from the constant disturbance to the average lake level. Available statistics indicate that there has been a 70% decline in existing fish varieties since the major shock in 2003. The damage done to the entire aquatic biodiversity is said to have been phenomenal. The accompanying retreat of the lake particularly on the northern shore, exposing large areas of shoreline swamps and wetlands for recession cultivation, is a development that poses a serious threat to the aquatic ecosystem and the future of the lake. Surprisingly, the distribution of lake retreat wetlands to thousands of landless peasant farmers in Denbia Woreda, North Goder, was covered as major news-item in the media. However, the dangers of the lake retreat to the ecosystem and the water body as a whole have not been taken into account.

As the Head of the Tana Transport Enterprise predicts, the grim fact is that, were the Tis Abbay II and Tana-Beles projects to utilize the water resources of Lake Tana for themselves alone, the projects would go without water and operations would be forced to cease. He believes that it is ridiculous that stakeholders like the Amhara Region Agricultural Research Institute, the Fish Resource Development Corporation, and the TTE, which voice genuine concerns are viewed as resisting development interventions.

Unfortunately, development decisions are in many cases responsible for the environmental problems. These result whenever intervention projects are introduced without adequate prior socioeconomic and environmental impact assessments. The Chara Chara project can be cited as an example of this. It is true that the government hopes to achieve development by means of projects that utilize water resource potential such as that found in Lake Tana. However, the issue requiring prime attention is not only how to exploit the water potential for development purposes, but more importantly how to utilize the water in a sustainable fashion. The continuing problem of sedimentation is a matter of

⁷ This is, of course, in conflict with what the head of the tourism bureau stated.

serious concern that poses a real threat to the future of Lake Tana. It is reported that 5,000 tons of sediment are transported into Lake Tana per annum. This trend can only be reversed by means of proper watershed management. This should be undertaken with the same degree of seriousness as the hydropower and irrigation projects. In the absence of such interventions, there is no reason why the worst case scenario should not be anticipated. .

As a result of concerns, those stakeholders for whom the impending threat has caused the greatest concern have come together to establish what they call the Lake Tana Basin Protection Association. Members of the interest group include people from the TTE, Bahir Dar University, Agricultural Research Institute, Environmental Protection Authority, public figures, students, and civil servants. Although viewed with skepticism by certain government stakeholders, the Association has nonetheless been issued with a legal certificate.

2.3 Private Sector Groups

2.3.1 Bahir Dar Ghion Hotel

2.3.1.1 Opinion

According to Ato Bisrat Woldu, General Manager of the Bahir Dar Ghion Hotel, business interests are affected by the fluctuations in water levels in Lake Tana. In the opinion of the hotel management, it is strongly recommended that the lake be exploited for development purposes in a manner that maintains its natural values.

2.3.1.2 Concern

The hotel manager said that, when the lake overflows, as it did back in the wet season of 1996, when the construction of the Chara Chara Weir was completed, sanitary problems occur. In that year, the lake experienced an unusual overflow because the newly constructed dam was not properly regulated to release the excess flow from the incoming rivers, the run-off and torrential rain. The overflows resulted in wide areas of the surrounding land becoming inundated. This caused the lake to collect filthy water that gave off an offensive smell. The water supply which the hotel used to flush toilets and for gardening proved to be unsanitary and very smelly.

Following the advent of the Chara Chara Weir, white-water rafting, an adventure sport undertaken between the end of October and the end of December, downstream of the Blue Nile Falls, has virtually ceased. This is a direct impact of the Chara Chara dam on the size and power of the Abbay River flow. As a result, the Abbay River has now lost its importance as a major tourist site where white-water rafting takes place.

There is a belief that the hotel business has suffered in the form of lost revenues, because of the decline in the number of tourists who choose to come primarily to view the Blue Nile Falls and undertake the white-water rafting. For this reason, tourists shorten their

stay in Bahir Dar. The Tana Transport Enterprise has also experienced operational problems, connected with the decline in the height of the lake.

The shrinking of the lake due to the withdrawal of large quantities of water by the weir is bound to have a big impact on fish production. For example, 2003 saw a major crisis associated with a significant drop in lake levels. The fish resource was seriously affected. Particularly a fish variety called tilapia, which the hotel uses for its catering service, was at its lowest levels ever, seriously jeopardizing this aspect of the business.

A further and more serious concern for the hotel management are the stories about planned projects for the construction of higher capacity dams for irrigation and hydropower production on the lake's feeder rivers. The concern is that the more projects there are to compete over the water of the lake, the greater will be the pressure on resources and finally it will become unable to supply other needs such as tourism and the hotel business.

2.3.2 Bahir Dar Tana Hotel

2.3.2.1 Concerns

Ato Kassaye Kebede, General Manager of the Bahir Dar Tana Hotel, focused on the concerns of his enterprise, associated with the fluctuations in the level of the lake. He recalled the inundations caused to the Fogerra Plain and the neighbourhood of the Saint Michael Church in Bahir Dar Town in 1999. The problems resulted when the lake overflowed due to operational errors in the regulation of excess water by the Chara Chara Weir.

However, the major difficulties experienced are when the lake levels drop as a result of the abstraction of a large volume of water for hydropower generation. In such cases the mobility of boats, large and small, is seriously hampered. This necessitates constant process of readjustment, relocating the docks closer to shrinking water.

As far as tourists are concerned, it is hard to say that they are satisfied with the general state of affairs, especially in relation to the Blue Nile Falls. They complain that they have not found things to be as described in tourist handbooks. The falls no longer retain the natural beauty and attractiveness that the books claim. The most likely negative outcome of the disappointment experienced by some tourists is that others who hear of it will not be motivated to come to the area. This is especially true of what are known as educational tours, conducted as a means of promoting tourism. These tours are organized by foreign-based tour companies for the staff of airlines, hotels, and tour operating agencies, to visit tourist attractions, so that upon return they will promote the sites they visited. In the case of the Blue Nile Falls, it will be difficult for the participants of the educational tours to promote a site that does not possess, or is at the risk of losing, the natural appeal for which it is famous. A proposed operational procedure seems to highlight the gravity of the problem and associated concern. It is reported that at one time, the then president of the Amhara Regional State suggested the regulation of the lake by the Chara Chara Weir in

such a way that an alternate uses of the outflow could be made; tourism during the day and hydropower generation during the night⁸.

3. Summary of Key Findings

In accordance with the government's overall program to expand the national hydropower output, the Ethiopian Electric Power Corporation (EPCO) constructed the Chara Chara Weir across the Abbay River at the outlet of Lake Tana. Completed in 1995/1996, the weir became operational in the same year. The purpose of the weir is to control and regulate the outflow of Lake Tana with the intention of providing a regulated supply to the Tis Abbay I and Tis Abbay II power plants located downstream.

Since its construction, the weir has had impacts on local livelihood groups, business interests, and the government and private sectors. The dimensions and implications of the impacts vary widely according to the interests, opinions and concerns of the stakeholders involved. This analysis was conducted with the aim of exploring and gaining insights into the range of issues perceived as important by the various stakeholders in relation to the weir and the developments that have unfolded since its construction. The findings of the analysis have shown that the attitudes and positions of the major stakeholder groups either overlap or conflict with each other as can be seen from Table 1 below. Some concerns are widely crosscutting and overarching whilst others are specific to only one or two groups. In this section, emphasis has been given to highlighting the findings from the perspectives of major stakeholder interests.

⁸ It should be noted that whilst this might restore the aesthetic attraction of the Falls, the rapid fluctuations in the flow of water that would result from such a scheme, would most likely be seriously detrimental to the riverine ecology. Certainly in other locations hydro-peaking has had devastating ecological impacts.

Table 1: *Chara Chara Weir – summary of issues identified/concerns raised by different stakeholders*

Stakeholders	Issues Identified								
	Reduced lake levels in the dry season	Wet season flooding	Increased dry season flows in Upper Abay	Reduced downstream flooding	Lack of warning of high flows downstream	Reduced flow over the Tis Issat Falls	Loss of vegetation around the lake	Declining lake fish population	Electricity produced
Upstream Farmers/communities	+ ve	- ve	NC	NC	NC	NC	-ve	NC	NC
Downstream Farmers/communities	NC	NC	+ ve	+ ve	-ve	- ve	NC	NC	- ve
Fishers	- ve	NC	NC	NC	NC	NC	- ve	- ve	NC
Negede	-ve	NC	NC	NC	NC	NC	- ve	- ve	NC
Tana Transport Enterprise	- ve	NC	NC	NC	NC	NC	NC	NC	NC
Tour boat operators	- ve	NC	NC	NC	NC	NC	NC	NC	NC
Hotel owners	- ve	- ve	NC	NC	NC	- ve	NC	- ve	+ ve
Amhara Culture and Tourism Bureau	- ve	- ve	NC	NC	NC	NC	NC	NC	+ ve
Amhara Region Bureau of Water Resources	NC	-ve	NC	NC	NC	NC	NC	NC	+ ve
Amhara Environmental Protection, land use Authority	- ve	NC	NC	NC	NC	- ve	- ve	- ve	NC
Amhara Parks Development and Protection Authority	- ve	NC	NC	NC	NC	NC	- ve	- ve	NC
Lake Tana Basin Research Centre	- ve	NC	NC	NC	NC	- ve	- ve	- ve	NC
Amhara Region Agriculture Research Institute	- ve	NC	NC	NC	NC	- ve	- ve	- ve	NC
EEPCO	NC	NC	NC	NC	NC	-ve	NC	NC	+ ve

NC = not an expressed concern

3.1 The Perspectives of Local Livelihood Groups

3.1.1 Overlapping Interests

Both fishers and the Negede minority group share the view that the Chara Chara Weir is wreaking havoc on their livelihoods. Perceived increases in the drawdown of the lake, due to the withdrawal of large volumes of water for hydropower generation is, they believe, leading to the conversion of extensive areas of the surrounding wetlands into fields. As a result, the water resource and the vegetation cover, mainly the papyrus plant,

are in a state of continuing decline, seriously jeopardizing the livelihood base of both fishers and the Negede community.

3.1.2 Conflict of Interest

Farmers who practice wetland cultivation stand to benefit from the increased drawdown of the lake. The availability of an expanding area of wetland rich in silt deposits gives them an opportunity to grow horticultural and cereal crops. Downstream farmers also benefit as a consequence of the increased dry season flows which facilitate irrigation. Hence, the disturbance to the natural ecosystem, manifested in the loss of biodiversity, fauna and flora, does not seem to seriously concern them.

3.1.3 Crosscutting Concerns

A persistent decline in lake water levels cannot be dismissed as a remote concern, even by the farming groups, who reap immediate benefits from the retreat of the lake. Therefore, all three community stakeholders: fishers, the Negede, as well as farmers, view the disturbance of the hydrological regime of the lake as a threat to their survival, albeit with widely varying degrees of concern. In the light of this, they associate the Chara Chara Weir project with the stark reality of an ecological disaster that is looming over the horizon in the area, and the wider region.

3.2 The Perspectives of Government Sector Organizations and Research Institutions

3.2.1 Overlapping Interests

(A) It is a closely shared interest of the Amhara region Ethiopian Electric Power Corporation (EEPCCO), Bureau of Water Resource (BWR) and Culture and Tourism Bureau (CTB) that the expansion of hydropower production is essential to the enhancement of multi-sectoral national development. So much importance do they attach to the economic expediency of the electrification program that they insist on pursuing its implementation, as a priority development agenda. Therefore, they subscribe to the position that the existing national water resources including those of Lake Tana and the Abbay River should be exploited to the greatest limits possible, although they still advocate balanced and rational utilization of existing potentials.

(B) The Amhara Region Environmental Protection, Land Use and Administration Authority (EPLUAA), Parks Development and Protection (PDPA), Lake Tana Basin Research Centre (LTBRC), Agricultural Research Institute (ARI) and Tana Transport Enterprise (TTE), which is a parastatal company, are similarly in favour of the promotion of regional and national development, through the exploitation of the available water resources. However, they diverge from the first three government stakeholders in that they object to development projects that disregard the impacts caused to the environment and sustainability of economic activities forming the livelihoods of local population. In the light of this, they view the Chara Chara Weir project as a development intervention

that was embarked upon without proper prior environmental and socioeconomic impact assessments. As a result, the scheme has caused shocks to the natural ecosystem and livelihood structures, with potentially grave future consequences.

(C) Regardless of their divergence in the degree of emphasis they place on the promotion of development or the protection of the environment, all the government stakeholders, the developmentalists and environmentalists, nonetheless agree that the venture into the Chara Chara Weir Project lacked sound and study-based planning in the form of stakeholder analysis and an environmental impact assessment. They are also in agreement that, as a result, the possible negative impacts of the dam structure were not adequately analyzed and foreseen.

3.2.2 Conflict of Interest

Government stakeholders that are more developmentalist tend to regard perceptions of the weir project that it is doing more harm than good as unfair, less rational and failing to balance the pros and cons of the scheme. For their part, the institutions that adhere to the environmentalist approach draw attention to the impacts of the weir project already in evidence and not in tune with the needs of particular segments of society. Cases of such are evident depletion of vegetation cover, the drying out of the wetlands, disruption in reproductive cycle of fish, shocks to livelihood systems (e.g. the Negede), loss of the appeal of the Blue Nile Falls and the unprecedented 2003 crisis in navigation.

3.2.3 Crosscutting concerns

(A) All actors associated with Lake Tana and the Abbay River are convinced that the water resources should be utilized to the benefit of the people, and that there is little hope for national development without doing so. They are also agreed in principle to the position that a sound balance needs to be struck between the exploitation of resources and the possible impacts that may result. However, they differ in the importance that they attach to local development, as compared with national development. That is to say, in relation to a cost benefit analyses, the project is worth implementing provided that the costs incurred to the local people are less, compared with the expected overall national development.

(B) Similarly, there seems to be consensus among the stakeholders that the launch and operations of the Chara Chara project was marked by secrecy, giving rise to wide suspicions of the motives behind it, and the circulation of different conspiracy theories. In addition, the concerned groups converge on the idea that practical errors were committed, by excluding relevant local stakeholders (including community grassroots) from the entire process. They recognize that the non-accommodation of these interest groups has resulted in widespread dissatisfaction in the conduct of the operations, which could negatively impact the future success of the initiative

(C) Stakeholders identified both as developmentalist and environmentalist share the stance that an effective, all-inclusive, monitoring system should be put in place. This

would ensure the proper regulation of the water to avoid possible extreme scenarios. The proposed body needs to be one that operates in a scientific and well informed manner, keeping track of specific details of hydrological processes. It should be able to determine the size of inflow into the lake, the amount of outflow needed, the corresponding measures to be taken to regulate and optimize levels of storage, as well as forecasting future trends based on sound analysis of associated empirical data.

(D) Expanded hydropower generation, by means of the Chara Chara Weir and Tis Abbay II power plant was anticipated to contribute toward the reduction of deforestation. Nonetheless, not much has been noticed. In fact, dependence on biomass fuel is apparently not reduced. All the relevant stakeholders, developmentalists and environmentalists, agree on this issue. The only point of difference lies in the explanations they give. For the developmentalists (e.g. EEPCO), people still resort to biomass fuel for lack of know-how and finance needed to procure and employ electrical appliances. The environmentalists (e.g. ARARI) view the underlying problem differently. They insist that, contrary to the claims that electrification is being expanded at unprecedented pace, the costs incurred in obtaining and maintaining access to the service remain unaffordable for ordinary citizens.

(F) A final but vital point that crosscuts the interests and perceptions of all stakeholders involved is that an autonomous body needs to be brought into being that administers and coordinates the affairs of Lake Tana. This body should be authorized to regulate, supervise, and hand down decision regarding activities undertaken on the lake and in the catchment. The intention would be to harmonize the varied stakeholder interests, and ensure that the minimum possible damage is caused to the lake, the ecosystem and livelihood structures of the area. The concerned groups have unanimously hailed the work of the Federal Ministry of Water Resource, which is reported to be currently drawing up draft legislation aimed at the creation of such an independent government body.

4. Concluding Remarks

The research conducted has highlighted the divergence in values, needs and interests of individuals and different stakeholder groups. It has shown that the construction of the Chara Chara weir has had a significant effect on the natural and social landscape of the Lake Tana catchment and the upper reaches of the Abbay River. The changes caused by the weir have affected the customary and *de facto* entitlements to natural resources, environmental quality and social-cultural integrity experienced by communities living both upstream and downstream of the weir. Clearly some local people have gained through its construction. However, little or no consideration has been given to those who have been adversely affected by the weir and the way it is operated.

It is apparent that decisions pertaining to the construction of the weir and its operation have been made in isolation by the government and EEPCO without any form of public consultation. It is even possible that some information (e.g. in relation to the natural lake

water-level regime) has been deliberately withheld from concerned stakeholders. This study indicates that this form of decision-making has fuelled controversies and resulted in wide-spread rumours and speculation about the function of the weir and the resultant impacts.

Clearly the concerns relating to the weir are complex, encompassing a number of interlinked social, economic and ecological dimensions. Future decision-making in relation to weir operation should ideally consider not only economic concerns relating to hydropower generation, but also the full range of social and ecological concerns. It is important to increase stakeholder involvement in the decision-making process. It is to be hoped that the proposed autonomous *Lake Tana Water Authority* will enable these wishes to be fulfilled.

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Appendix A

List of Interviewees and Focus Group Discussion (FGD) participants (Chara Chara)

Section I. Interviewees of Relevant Offices and Bureaus

1. Ato Muluken Lakachew , Deputy Head of the Amhara Region Bureau of Water Resources
2. Ato Getachew Teshager, Head of the Ethiopian Electric Power Corporation-North West Region Operation
3. Ato Alemayehu Getaneh, Operation Unit, Ethiopian Electric Power Corporation-North West Region Operation
4. Ato Ewnetu Taye, Head of the Tana Transport Enterprise
5. Ato Mulugeta Said, Head of the Amhara Region Tourism Bureau
6. Dr Tadesse Eshete, Head of the Amhara Region Environmental Protection Land Use and Administration Authority (EPLUAA)
7. Ato Woldegebriel woldekidan, Head of the Wildlife and Protected Areas Unit, EPLUAA.
8. Dr Eshete Dejen, Head of the Amhara Region Agricultural Research Institute (ARARI)
9. Ato Seleshi Abraham, General Manager of the Number 1 Bahir Dar Multi-Purpose Fishers Cooperative.
10. Ato Bahiru Ayele, Head of the Bahir Dar Branch of the National Fish Resource Marketing Agency
11. Ato Mulugeta Tamrat, Head of the Amhara Region Parks Administration Authority
12. Dr Zerfu Hailu, Representative of the Global Environmental Fund, Bahir Dar
13. Dr Ayalew Wondie, Head of the Lake Tana Basin Research Centre- Bahir Dar University
14. Wro Sewmehon Demissie, Director of the Bahir Dar Fishery and Other Aquatic Life Research Centre
15. Ato Gashaw Ayalew, Head of the Dera Wereda Natural Conservation Desk

Section II. Participants of Focus Group Discussions

1. Focus Group Discussion with a group of farmers who live adjacent the lake- Dera Wereda, Korata Kebele. The participants were Ato Tesfu Endayew, Ato Endayew Workneh, Ato Tesfa Gebru, and Ato Berihun Mekonen.
2. Focus Group Discussion with a group of fishermen, Bahir Dar. The participants were Ato Tilahun Ayele, Hulgize Temesgen and Maru Chanie.
3. Focus Group Discussion with a minority group known as, the *Negedes*, who make a living by building and selling boats, and selling papyrus plant and grass. The participants were Ato Idris Adem and Ato Jibril Semahegn.
4. Focus Group Discussion with Farmers found midstream between Chara Chara and the Tis Abbay I and Tis Abbay II stations. The participants include Takele Yitay, Muluken Kefyalew, Dessie Weygela and Zewdu Melisew.

5. FGD with farmers who live on the Zege Peninsula. The participants include Ato Gashaw Guade, Anteneh Alehegn, Worku Genet and Sintayehu Awlaw.
6. FGD with Tour guides based in Tis Abbay. Participants include Abebe Ambachew, Wozader Aysheshim, Kassa Mitike and Wase Wrku.

Section III. The Private Sector

1. Interview with Ato Bisrat Woldie- General Manager of the Bahir Dar Ghion Hotel
2. Interview with Ato Kassaye Kebede- General Manger of the Bahir Dar Tana Hotel