

Addis Ababa University School of Graduate Studies

A HISTORY OF STATE FARM AND

SUGAR FACTORY IN FINCHA'A

VALLEY (1974 - 2012)

**A Thesis Submitted to the School of Graduate Studies of
Addis Ababa University**

**In Partial Fulfillment of the Requirements for the Degree Master
of Arts in History**

by

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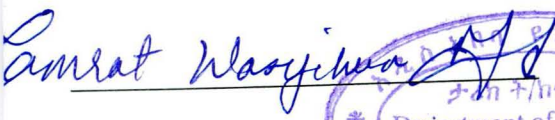
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Acronyms

EELPA	Ethiopian Electric Light and Power Authority
EEPCo	Ethiopia Electric Power Corporation
FHEP	Fincha'a Hydro Electric Power
FHEPP	Fincha'a Hydro Electric power Project
FSF	Fincha'a Sugar Factory
GDP	Growth Domestic Product
GIS	Geographic Information System
H.V.A	Handles Vereening Amsterdam Dutch Company
ha	hectare
HEP	Hydro Electric Plant
LARS	Lake and Catchment Research Symposia
MSFD	Ministry of State Farms Development
MW	mega watt
US	United States
MWH	Montgomery Watson Harza

Abstract

My thesis focuses on a history of agriculture and the sugar factory in Fincha'a Valley from 1974 to 2012. Fincha'a Valley is located in the Oromia Regional State in Horro Guduru Wollega Zone, Abay Choman Woreda.

Fincha'a, Amarti and Nashe dams were constructed in Horro Guduru Wellega Zone in 1973, 1987 and 2013 respectively. They generate 225MW hydroelectric power. The water of these dams is used for irrigation agriculture in the Fincha'a Valley. Fincha'a State Farm was established in 1974 to overcome the shortage of food the country had faced at the time. Plantation of sugar cane was started in 1991. However, the construction of the factory was delayed up to 1998/1999 due to the lack of money and change of government that took place in 1991. Its construction was completed and the factory was inaugurated in 1999.

All the three developments (the dams, Fincha'a State Farm and Fincha'a Sugar Factory) contribute a lot to the economic development and job creation for Ethiopian citizens. Many Ethiopians are employed in the Hydropower plants and the sugar factory. The State Farm, Hydropower Plants and Fincha'a Sugar Factory became source of government revenue. At the same time the development of the dams and the sugar factory challenged the life of the local people and also caused diverse and far reaching impacts on the local environment. About 44,000 people were evicted from their farm and grazing lands. As a result most of them became poor and homeless. Natural vegetations were cleared. Severe land degradation is going on. Wild animals escaped from that area. Totally, both positive and negative effects of these developments are seen in the area. Today Fincha'a Valley became a home for 60,330 people and also the center of agro industry.

CHAPTER ONE

INTRODUCTION

BACKGROUND

Fincha'a Valley is located in Oromia Regional State of Horro Guduru Wollega Zone at about 350kms north-west of Addis Ababa. The valley covers some parts of the territories of Ababo Guduru, Abbay Choman, Horro and Jarte Jardega *woredas*. Fincha'a Valley is part of the Nile Basin. The width of the valley increases from south to north at an average size of 25-30kms². It is surrounded by escarpment along its southern, eastern and western sides, which rises approximately 700-850m above the valley floor¹.

The former Fincha'a State Farm and the current Fincha'a Sugar Factory are located in this valley. The factory was bounded by escarpments from east, west and south within general boundaries of latitudes 9⁰30'N to 10⁰ 00'N and longitudes 37⁰15' to 37⁰30' East with an altitude between 1350m and 1600m above sea level.² One can reach Fincha'a Valley project "...via the main high way from Addis Ababa to Gedo (192km West of Addis Ababa) and then after that by means of an all weather gravel road from Gedo to Fincha'a Dam (95km North west of Gedo); then after,47km to the north direction from Fincha'a town."³

There is a problem of road from Fincha'a town to the Fincha'a Valley project site. The gravel road runs along the top of the escarpment before it descends very steeply to enter

¹ Getahun Kitila, "Land Use Changes Induced by Irrigation Development in the Fincha'a Sugar Estate, Blue Nile basin, Ethiopia", *Journal of Biodiversity and Environmental Sciences (JBES)*, vol. 3, No.11, (2013): 35; Bayissa Chala, "Assessment of Malaria as a Public Health Problem in Fincha'a Sugar Fctory Based on Clinical Records and Parasitological Surveys"(MA thesis, Department of Biology, Addis Ababa University, March 2007), 23.; Girma Teferi, Soils, "Irrigation and Mechanization", *Review of Sugarcane Research in Ethiopia(1963-1998) vol. I* Ambachew Damte and Girma Abejehu (ed.), (Addis Ababa: Ethiopian Sugar corporation, 2000), 123.

² Michael M. Girma and Silashi B. Awulachew, *Irrigation Practices in Ethiopia: Characteristics of Selected Irrigation Schemes* (Colombo: International Water Management Institute, 2007), 42.

³ Burayu Wayu, *Agro Ecological Conditions and Background Information on Finchaa Sugar Project Site* (n.p: Finchaa Sugar Factory, 1995), 2.

the project area from the west. It is subjected to occasional closure when sections are dammed due to land slide or submerged and gully formation. This is mainly observed during the rainy season between June and September⁴.

Concerning human settlement in the valley there are different views. Some literature describes the valley as uncultivated and unsettled place before the establishment of the state farm in 1974. Contrary to this idea, others state that the valley was occupied by large number of settlers long before that. For instance Zeleke and Burayu reported that the valley was the residential place for many people. Due to drought which prevailed in the surrounding highlands around 1920, large number of people migrated to the valley in search of water and grass for their cattle and themselves. The period was known as *bara jeejee* in Afan Oromo which literally means “time of starvation”.⁵ These settlers led their life by herding Cattle; cultivating land and producing crops like maize, *teff*, *noug* and sorghum.⁶ Later on the number of their cattle was reduced because of the prevalence of trypanosomiasis. Besides cattle disease, malaria epidemic also challenged the life of the habitants. These problems forced the habitants to leave the valley and to settle permanently in the highlands.⁷

To evaluate the two contradictory ideas, I have interviewed local elders. According to these elders, there were many inhabitants who were involved in herding cattle, collecting honey, and cultivated the land. In such mixed farming activities they also produced cotton, millet, maize, *teff*, *noug* and sorghum.⁸

The first group, who stated the valley as uncultivated and unsettled, was misled due to lack of proper information concerning the valley. They depended on aerial photograph made during the feasibility study in the 1960s and 1970s. As I have already indicated in

⁴ Burayu Wayu, *Agro Ecological Conditions and Background...*, 2.

⁵ Burayu, Wayu, *Agro Ecological Conditions...*, 4. ; Zeleke Kebebew, “GIS and Remote Sensing in Land Use and Cover Change Detection in Fincha’a Valley area, East Wollega”, (MA thesis submitted to department of Geography Addis Ababa University, 2005), 13.

⁶ Zeleke Kebebew, “GIS and Remote Sensing in...”, 13.

⁷ Burayu, Wayu, *Agro Ecological Conditions...*, 5

⁸ Interview: Ato Tadesse Tesfaye.

the 1960s and 1970s when the aerial photographs were developed, the inhabitants of the area had completely left the valley. That is the reason why the first group concluded that the area was unsettled and uncultivated. The feasibility research report was presented to Emperor Haile Selassie in 1963 stated that the project area was uncultivated and unsettled at that time. “The project area, at the present time, is uninhabited and uncultivated, although the highlands on the plateau surrounding the area are populated and extensively farmed. The project lands are covered with low-growing trees, bush, and tall grass that would be removed as the project is developed.”⁹

The report indicated that during the feasibility study there were no people who lived in this valley. However, it informs us with the existence of evidence of former cultivation, even though it did not describe the evidence. Studies justify the reasons why the valley was not cultivated and unsettled at that time. As they explained, the reason was the prevalence of animal and human diseases in the area under discussion before the work of feasibility.¹⁰ Shortly, “The presence of such inimical insects as the *Anopheles* malarial mosquito and the tsetse fly, which can transmit encephalitis or sleeping sickness, keep the valley empty of human habitation.”¹¹

Even after they left the valley, the local people took their cattle to the valley for grazing during summer season. During summer period the valley was covered with long grass. The people stayed there only for two months (July and August). Then before the begging of malaria season they left the valley and went back to their homes.¹²

Another important thing that was found in this valley was *hora*, mineral water. It was used as medicine for both human and different animal diseases, and also helped to fatten cattle. Informants indicated that *hora* is a medicine for human sexually transmitted diseases such as gonorrhoea and syphilis, and also for intestinal disease. If a cow drank *hora*, it could have a healthy calf. Generally, the importance of *hora* was not simple among the local people. They traveled long distance to take their cattle to the valley. After the

⁹ United States Department of the Interior Bureau of Reclamation, *Land and Water Resources of the Blue Nile Basin, Ethiopia: Fincha'a Sub-Basin* (Washington DC: United States Department of the Interior Bureau of Reclamation, 1963), 6.

¹⁰ United States Department of the Interior Bureau of Reclamation, *Land and Water*..., 10

¹¹ *Ibid.*, 14

¹² Burayu, Wayu, *Agro Ecological Conditions*..., 4. ; Zeleke Kebebew, “GIS and Remote Sensing...”, 13.

establishment of the state farm, the local people could not get such access to *hora*. The area was changed to farm land. Formerly, there were many *hora* sites in the Fincha'a Valley. These were known as Sorga, Sonsa, Omocho and Abaya.¹³

Fincha'a Valley was covered with dense tropical Savannah woodland. The streams which were tributaries of Ficha'a River supported the growth of dense tall trees, which reach a height of 30 meters. United States Department of the Interior Bureau of Reclamation and Ahmed Amdihun Mohamod reported it as follows.

*Finchaa valley in the pre 1975 years was virtually under natural vegetation cover. The tall savanna grasses mixed with short and medium trees dominated the elevation below 1600m. The steep escarpments and the far down stream areas experience dense vegetation growth. The gallery forests occupy the networks of major rivers and their tribute areas. As it is evident from the MSS satellite image of 1972 there was no apparent human intrusion to the valley*¹⁴.

The local people used to collect honey from this forest. Using the income they obtained from that, they changed their life. Some of the trees found in Fincha'a valley were identified by Burayu as indicated in Table 1.

¹³ Burayu, Wayu, *Agro Ecological Conditions...*, 4.

¹⁴ Ahmed Amdihun Mohamod, "GIS Remote Sensing Integrated Project in Fincha'a Valley Area". *Catchment and Lake Research, LARS*, (2007): 120; United States Department of the Interior Bureau of Reclamation, *Land and Water...*, 14.

Table 1: Some Important Trees Found in Fincha'a Valley.

Local name	Scientific name
Aleltuu	Salia Subserrata
Harbuu	Ficus Spp
Baddessaa	Syzigum Commini
Danbii	Ficus Spp
Diddiksaa	Sclerocarya birrea
Doddota	Accacia Gerrasdi
Goraa	Petrollobium STellatum
Laftoo	Acacia Amythethophylla
Meexxii	Phonix
Mi'eessaa	Prunus Africana
Muka -Arbaa	Senna Alexandrina
Muka Bokee	Entanda Abyssinia
Odaa	Ficus Spp
Qilxuu	Ficus Vasta
Waddeessa	Cordia Africana

Source: Burayu Wayu, 5.

These trees were used for different Purposes. Some of them were used as Source of food. For instance fruits of *Harbuu* (*Ficus Spp*), *Baddessa* (*Syzigum Commini*), *Gora* (*Petrollobium STellatum*) and *Waddeessaa* (*Cordia Africana*) were edible. Trees like *Muka-Bokee* (*Entanda Abyssinia*), *Waddeessaa* (*Cordia Africana*) and *Qilxuu* (*Ficus Vasta*) were used for lumbering. The rest were also used for other purposes.

Different wild animals also lived in this forest and in the tall grass. Based on information he had gathered from informants, Burayu listed some of those games with their scientific names.¹⁵ These animals are listed in Table 2. When the valley was selected by the Ethiopian government in 1974 for State Farm and later on for sugar cane plantation and sugar factory, extensive forest clearing was undertaken and as the result the animals emigrated elsewhere or were killed by people who settled in the area.

¹⁵ Burayu, Wayu, *Agro Ecological Conditions...*, 8.

Table 2: Important games in Fincha'a Valley

Afaan Oromoo	English
Leenca	Lion
Qeerransa	Leopard
Xirinyii	Civet Cat
Nacha	Crocodile
Bofa	Snake
Jawwee	Python
Yeeyyii	Wolf
Warabboo	Water bug
Qocaa	Tortoise
Bosonuu	Bigger Antelope
Quruphee	Smaller Antelope
Karkaro	Boar
Jaldessa	Monkey
Qamalee	Ape
Booyyee	Wild Pig

Source: Burayu Wayu, 8.

Source and Methodology

When I started to conduct the research what I intended to do was to reconstruct the history of Agriculture and sugar Factory in Fincha'a valley (1974 - 2012). For this, I looked for archival materials in various areas. One of the areas where I visited was the Library of Addis Ababa University. The other places were Fincha'a Sugar Factory Research Center and record Office, Fincha'a Hydropower Plant, Ethiopian Sugar Corporation, and Hagmaasa 01 *Kebele*. Besides these I also searched for documents on different Websites. I also organized group discussion with people that have good knowledge about Fincha'a state farm and Fincha'a sugar factory. I visited the Horro Guduru Wollega Zone Agriculture and development office to find documents on Fincha'a state farm. But, there were no documents in relation to Fincha'a State Farm. It did not keep the documents.

The Fincha'a Sugar Factory Research Center and Documentary Office is rich in terms of Archival materials for the study of the establishment and development of FSF. In most

cases the documents are placed in tables and figures. Given the time span that was allocated for the research, it became impossible to look through all the folders in search of the necessary documents. In addition to this because of the distance of my work place from the location of the factory, I faced shortage of time for the study. Initially when I have chosen this research topic, I was at Abay Choman *woreda* where the factory is located. But, in September 2016 I was transferred to Western Shewa Ada'a Berga *woreda* Reji Secondary School which is 350km far from the location of Fincha'a Sugar Factory. This made my work difficult in travelling to collect data. However, I went there three times and collected some important data.

The Universities of Addis Ababa and Wollega libraries have also some important researches such as the geographic location of Fincha'a State Farm and the assessment of the socio-economy of Fincha'a State Farm were done on different aspects of Fincha'a state farm and Fincha'a sugar factory. As a result I have collected some important data from there.

I could not get many documents on Fincha'a State Farm. Both Fincha'a Sugar Factory and the then Horro Guduru district didn't keep written documents about this state farm.

I used different research works conducted by different persons and International organizations on different aspects of Fincha'a Sugar Factory which are available on different web sites. But I used only the documents which have authors as well as publishers.

In addition to these documents I also organized group discussion with some local people and those who have served as workers of Fincha'a State Farm and Fincha'a Sugar Factory. These individuals are eye witness for the developments of these institutions and other developments in relation to the institutions.

The Ethiopian Sugar Corporation is another source of data I have used in my research work. Different sugar factories are under the administration of this corporation and different sources that describe these factories are available there.

Generally, I have done my research based on data gathered from these sources. I believe that this research is very significant. Because it brings to light the historical development of Fincha'a State Farm and Fincha'a Sugar Factory. By doing that, it becomes an important input to reconstruct the economic and social history of the Horro Guduru Wellega Zone. It is clear that, in the past the written history of Ethiopia was mainly political history. It didn't give much attention to the economic and the social history of the masses of people. Then this thesis helps the historians to fill such gaps.

The other significance of this thesis is that, it can be used to design and organize curriculum for social study in lower grades. The thesis gives brief discussion on the economy, the climate, the drainage system, the distribution of wild animals and plants in Fincha'a Valley and its surroundings. In addition to these, it can be used by government to give attention to Environmental changes and to oversee the effects of dams which were constructed in the local areas and take remedial measures.

The thesis attempted to answer the research questions raised in the proposal. Fincha'a Valley was selected by the government first for state farm and later on for sugar factory because of the presence of natural resources which are suitable for irrigation activities. These include fertile soil, rivers like Fincha'a, Amarti and Nashe, suitable climate and uncultivated vast land. Sugar cane and other crops are cultivated in Fincha'a Valley. The Sugar Factory produces sugar, ethanol, molasses and Bagasses. The country collects revenue from the sales of these products. This is the economic significance of the factory in terms of economic development. The other significance of the factory is that, it creates job opportunity for many Ethiopian citizens.

The Fincha'a-Amarti-Nashe dams also became the source of government revenue. Energy that emanates from these dams is used to run machines in other industries. Following the construction of these dams and the Gedo-Hagamsa (in the Fincha'a Valley), different towns and villages emerged. For instance, Goban, Wayu, Fincha'a and Hagamsa are towns and villages that emerged as the result of these developments.

CHAPTER TWO

THE BEIGINING OF FINCHA'A STATE FARM AND ITS CONTRIBUTIONS

The Beginning of State Farm and Irrigation Schemes and Their Economic Significance in Ethiopia

Agriculture has always been the backbone of the Ethiopian economy. This sector of the economy produces export goods, food for the people of Ethiopia and raw materials for industries. But this basic economic sector has not been given sufficient attention by past governments of Ethiopia in the past. As Gebru Mersha described, agriculture was and still is of fundamental importance to the national economy. Nearly 90 percent of the population lived in the rural areas and derived its livelihood from agriculture and related activities. The sector's contribution to the Gross Domestic Production (GDP) in 1995 was over 45 percent.¹ Even after twelve years in 2007, Sushil Kumar indicated that the contribution of agriculture in GDP was 48.60%.² Again as it was expressed in the Ethiopian Herald News Paper in 2016/17 its contribution was 39%.³ Even though the figure is different for the authors, agriculture remains as the dominant economic activity of the Ethiopian from the past until today. In Ethiopia, agriculture is the oldest economic activity when mankind turned to tilling the land in addition to hunting and gathering. But, in Ethiopia agricultural technology is still not advanced. Today most Ethiopian farmers till their farmland using ox-drawn ploughs; as a result production remained low.

According to J.K. Kabera, an attempt to improve the agricultural sector of the economy was started by Emperor Haile Sellasie I.⁴ His regime introduced five year economic and

¹ Gebru Mersha, *State Farms in State Centered Accumulation Strategies in Socialist Africa: The Rationale and Critique* (The Hague: Institute of Socialist Studies, 1995), 280.

² Sushil Kumar, *India's Development Cooperation with Ethiopia in Sugar Production: An Assessment*, Discussion paper # 198. (New Delhi: Research and Information System for Developing Countries, August 2015), 4.

³ The Ethiopian Herald, "Addressing Quality and Gaps", vol. LXXIII No284, (9 August 2017):1.

⁴ J.K. Kabera, (ed.), "Regional Development in Ethiopia". *The East African Geographical Review*, (Kampala). No.15. June, (1977): 90. ; James Pickett, *Economic Development in*

social development plans in the 1950s and 1960s. The first five year development plan was from 1956 to 1961. In this five year development plan the government gave more attention to the improvement of the infrastructure, mainly roads. In the second five year development plan (1963-1968), the government focused on establishing and expanding production and industry.⁵ It was only in the third year development plan (1968-1973), that the government finally gave priority to agriculture. Ethiopia was importing food from abroad in large quantity. "Over the same period cereal imports rose sharply, from 50,000 tons in 1960 to 114,000 tons in 1973."⁶ The aim of the third five year development plan was to raise food production and to raise rural income and purchasing power.

In Ethiopia there is no documented history of irrigation.⁷ Because of the lack of resources, it is unknown when and where the first irrigation was started in the country. There was a report from Tigray probably where the earliest use of water storage for none irrigation was practiced. The beginning of formal irrigation goes back to the 1950s when private concessionaires established some irrigation schemes in upper and lower Awash River Basin. The government of Haile Selassie introduced investment proclamation in 1966.⁸

As Shiferaw Bekele indicated, following this investment proclamation, foreign private investors as well as indigenous investors began to invest in agriculture by establishing commercial irrigation farms. As a result, commercial farms were set up in different parts of the country.⁹ They cultivated commercial crops like cotton, sugar cane and

Ethiopia: Agriculture, the Market and the State, (Paris: Organization for Economic Co-operation and Development, 1991), 104.

⁵ James Pickett, *Economic Development in Ethiopia: Agriculture...*, 104.

⁶ James Pickett, *Economic Development in Ethiopia: Agriculture...*, 106.

⁷ Seleshi Bekele, et al, "Impact of Irrigation on Poverty and Environment", *Draft Proceeding of the Symposium and Exhibition*, (2007), 6.; Irit Eguavoen, *The Acquisition of Water Storage Facilities in the Abay River Basin, Ethiopia* (Bonn: University of Bonn, 2009), <http://WWW.lit-verlag.de/reihe/ze>

⁸ Ethiopian Sugar Corporation, *Sugar Industry in Ethiopia* (Addis Ababa: Ethiopian Sugar Corporation, December 2017), 1

⁹ Shiferaw Bekele (ed.), *An Economic History of Ethiopia: The Imperial Era, 1941-1974*, vol.1. (Decara: The CODESRIA Book Series, 1995), 2.

horticultures. The objective of these concessionaires was not to produce food crops. At that time, the government gave less attention to tenant farming than to commercial agriculture.¹⁰

In Ethiopia state farms were introduced for the first time during the reign of Haile Selassie I in the 1960s.¹¹ A state farm is a large scale farm owned by the state which produces different kinds of agricultural products. Kabera indicated that the government set up state farms in different parts of the country. The main objective of these state farms was to increase crop production.

Political change in 1974 had far reaching impact on the economic and an economic management. Lionel Robbins quoted in James Pickett "the key sectors of them were brought under state control, enabling the state to utilize the surplus thus generated for the improvement of the quality of life of the working people."¹² Darg nationalized about 448 large scale commercial farms and plantations that covered an area of 131,000 hectares of land. It also transferred 77,200 hectares to peasant associations and used part of the land for resettlement projects. The remaining portions of the farms remained under the control and management of the government.¹³ Darg ended the domination of private companies that started some irrigation schemes. Silesh Bekele explained it as follows:

During the Darg era, all private farms were nationalized to establish the so-called state farms, thereby ending the embryonic private sector. The government pursued the development of medium and large-scale irrigation schemes in a number of river basins in addition to expansion in the Awash Valley. The Amibara Irrigation Project in the Middle Awash, Alwero Irrigation Project in Gambella, Gode-West Irrigation near Gode town, the Omorrate Irrigation scheme in Southern Omo, the Tana Beles, the Fincha Suger State, etc are some of the expansions, most of which are suspended currently.¹⁴

¹⁰Kabera, "Regional Development in Ethiopia", p. 90.

¹¹ *Ibid.*

¹² James Pickett, *Economic Development in Ethiopia: Agriculture...*, 107.

¹³ Gebru Mersha, *State Farms in State Centered...*, 264.

¹⁴ Seleshi Bekele, *the Impact of Irrigation on Poverty...*, 6.

Darg followed a command economic system in which all authorities of the economic system was controlled by the state. The activities like production, distribution and marketing were directly decided by the state. The state farm in all its activities was under the control of the government. The state farms couldn't sale their produce to other places or markets, but only to the Agricultural Marketing Corporation with prices determined by the government.¹⁵

Until 1978, the *Darg* did not clearly state the objective of state farms. It explained this in 1978. According to its explanation the objectives of state farms were to liberate the country's economy from imperialist dependency, achieving food self-sufficiency by overcoming food shortage problems, and facilitating development study and exploitation of new areas with immense agricultural potential. Irrigation agriculture has made production more unwavering than the rain fed agriculture.¹⁶ Gebru reported the *derg* attempt of expanding state farm as follows.

*In 1979, the government established the Ministry of State Farms Development (MSFD), and the Ministry of Coffee and Tea Development. The Ministry of State Farms Development (MSFD) was given the responsibility to expand the state farms, establishing other necessary organizations and to intervene in the market of grains and livestock production.*¹⁷

Most of the state farms are irrigation farms. In Ethiopia there are different types of irrigation schemes.

In Ethiopia, Small-Scale Irrigations which those managed by individual farmers has relatively a long history than the large scale irrigation. Large scale irrigation started in the 1970s as part of the government owned state farms. Broadly, irrigation schemes in Ethiopia can be of any of the following four types.

- *Traditional small-scale schemes of up to 100 ha in area, built and operated by farmers in local communities;*

¹⁵ Makonnen Fite, "Geographic Study of Fincha'a State Farm" (paper Submitted to Department of Geography Addis Ababa University, 1996), 5; James Pickett, *Economic Development in Ethiopia: Agriculture...*, 106 and 136..

¹⁶ Gebru Mersha, *State Farms in State Centered...*, 266.

¹⁷ Gebru Mersha, *State Farms in State Centered...*, 267.

- *Modern communal schemes of up to 200 ha, built by government agencies with farmer participation;*
- *Modern private schemes of up to 2,000 ha, owned and operated by private investors individually, in partnership, or as corporations;*
- *Public schemes of over 3,000 ha, owned and operated by public enterprises as state farms.*¹⁸

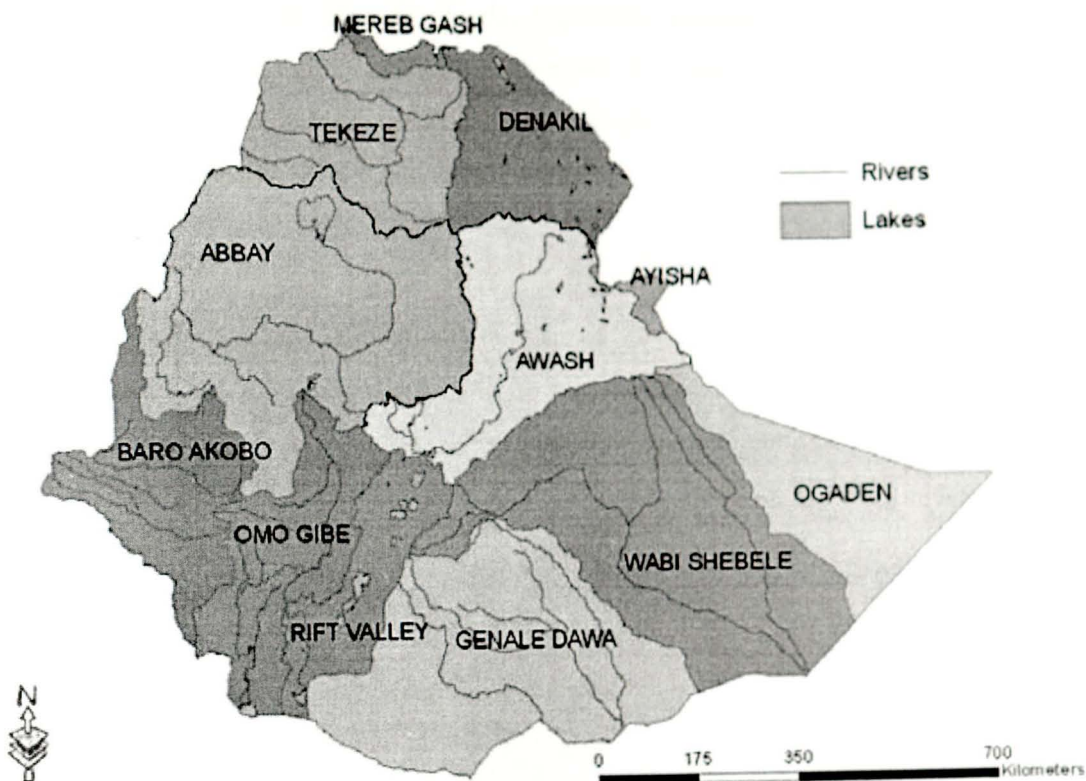
After the down- fall of the *Darg*, the current government did not engage in the expansion of State Farms and the construction of medium and large scale irrigation schemes until 2003/04. In 2002/03, severe drought caused food shortage. About 15 million people were strongly affected by lack of food. Following this problem, the government began to cultivate the previously exist State Farms and has tried to expand irrigation agriculture to alleviate food shortage.¹⁹ Ethiopia has twelve river basins. The 1995 Master Plan stated that about 3,731,222ha in different river basins was identified for irrigation agriculture.²⁰ About 815,581ha (27%) of the potential of the country was located in the Abbay basin.

¹⁸ Seleshi Bekele, et al, "Impact of Irrigation on Poverty and ...", 118.

¹⁹ *Ibid.*

²⁰ Seleshi Bekele, et al, "Impact of Irrigation on Poverty and ...", 6. Irit Eguavoen, *The Acquisition of Water Storage Facilities....*, <http://WWW.lit-verlag.de/reihe/zef>

Figure 1: Ethiopia's River Basins



Source: The National Water Resources Master Plan (WAPCOS, 1995) in Seleshi Bekele, et al, p.7.

The country has made extensive researches and has identified about 3.7 million hectares of land favorable for irrigation. Of these today the country has cultivated only 386,603 hectares which is only ten percent.²¹ The potential of land for irrigation in the twelve river basins is indicated in Table 3.

It is a fact that irrigation is ultimately needed to solve water shortage for consistent growth of both food and commercial crops. It is used mainly in the arid and semi-arid areas where scarcity exists. It is also used during the dry season in areas that have even

²¹ Seleshi Bekele, et al, "Impact of Irrigation on Poverty and ...", 6.

sufficient rain fall. Its objective is to increase production in addition to rain fed agriculture. Irrigation traditionally has long history in its existence. The ancient peoples who lived in river basins of the Nile, Tigris, Euphrates, Ganges and Yellow Rivers produced different types of crops. Just like other peoples in different corners of the world, Ethiopians have also used traditional irrigation to produce cereal crops and different kinds of fruits and vegetables.²²

²² Dereje Chimdessa, "Assessment of the Socio-Economic Impacts of Irrigation in Fincha'a Valley", (Ma thesis submitted to department of Geography Addis Ababa University, 2005), 12.

Table 3: Irrigation potential in the river basin

Basin	Catchment area(Km ²)	Irrigation potential				WAPCOS,1995		
		Small scale	Medium scale	Large scale	Total	Total drainage area	Irrigable area	% Irrigable area of the country
Abbay	198,890.7	45,856	130,395	639,330	815,581	201,346	100,100	27
Tekeze	83,475.94	N/A	N/A	83,368	83,368	90,001	317,000	8.5
Baro Akobo	76,203,12	N/A	N/A	1,019,523	1,019,523	74,102	985,000	26.5
Omo_Ghibe	79,000	N/A	10,028	57,900	67,928	78,213	443,000	12
Rift Valley	52,739	N/A	4000	45,700	139,300	52,739	139,000	3.7
Awash	110,439.3	30,556	24,500	79,065	134,121	112,697	205,000	5.5
Genale_Dawa	172,133	1,805	28,415	1,044,500	1,074,720	117,042	423,000	5.4
Dankil	63,852.97	2,309	45,656	110,811	158,776	74,102	—	—
Ogaden	77,121				—	77,121	—	—
Ayisha(Gulf of Aden)	2,000				—	2,000	—	—
Total	1,118,074.53				3,721,222	982,060	3,715,000	100

Source: The National Water Resources Master Plan (WAPCOS, 1995) in Seleshi Bekele, et al, p, 8.

Before 1990, the irrigation activities were very rare. Even though the country has more potential natural resources, the governments didn't use this gift (natural resources). The

country was affected by recycles of drought occurrences. This is briefly discussed in Nile water storage Atlas as follows:

Hydrological variability seriously undermines growth and perpetuates poverty in Ethiopia. The economic cost of hydrological variability is estimated at over one third of the nation's average annual growth potential, and these diminished rates are compounded over time. During the 1984–5 drought, for example, GDP declined by 9.7%, agriculture output declined by 21%, and gross domestic savings declined by 58.6%. Drought also severely undermines hydropower generation, Ethiopia's main source of electricity. If rains fail, or simply come too early or too late, the entire agricultural cycle can be disrupted, because there is inadequate water storage capacity to smooth and schedule water delivery. Flooding meanwhile causes significant damage to settlements and infrastructure, and the inundation and water-logging of productive land undermines agriculture by delaying planting, reducing yields, and compromising the quality of crops, especially if the rains occur around harvest time.²³

Today, irrigation has got more emphasis by governments, Nongovernmental local and International organizations to feed the over growing population and to halt environmental changes that challenged crop production. Metthew et al, quoted in Dereje discussed the importance of irrigation and its necessity as follows:

The settled agricultural production in arid areas is possible only by irrigation;

- *Intensification of cropping, higher output per unit of land and diversifications in semi arid zones are effectively possible through irrigation technology;*
- *The large agricultural productions depend on irrigation in wetter areas of unpredictable and variable conditions of rain;*
- *Some crops like sugarcane require high amount of water for good harvest; and*
- *Irrigation also facilitates the harvesting of some root and tuber crops from dry soils.²⁴*

²³ Nile Basin Initiative, “Water Demand, Use and Hydraulic Infrastructure” *Nile Basin Water Resources Atlas*, 175.

²⁴ Dereje Chimdessa, “Assessment of the Socio-Economic...”, 14.

The beginning of commercial state farms had a positive impact on national economic development. It improved the nation's production of export items. Irrigation has much contribution in Ethiopia's economy. Following the establishment of state farms different manufactures and industries were set up in these farm areas. Wonji and Ficha'a Valleys were among areas where state farms were set up. In these valleys sugar factories were also established. Because of the establishments of these factories different infrastructures were built and town centers also emerged in these areas.

Shiferaw Bekele indicated some problems which appeared following the establishment of commercial farms. Farmers of the areas where commercial farms were established were evicted from their farmland and grazing areas and their homes. These evicted peasants migrated to towns and suffered from difficult living conditions.²⁵

Fincha'a State Farm and Its Economic Contribution

Fincha'a State Farm was one of irrigation schemes that were owned and operated by government. In Fincha'a Valley about 91,000ha of land is identified for irrigation farm.²⁶

Both irrigated and rain fed agriculture are important in the Ethiopian economy but virtually all food crops are rain fed with irrigation accounting for only about 3%. Export crops such as coffee, oilseeds and pulses are mostly rain fed but industrial crops such as sugar cane, cotton and fruit are irrigated. Other irrigated crops include vegetables, fruit trees, maize, wheat, potatoes, sweet potatoes and bananas. Sugarcane is mainly cultivated as part of the Fincha'a sugar estate that also includes the Amerti-Neshe scheme. There is a marked value added in irrigated agriculture. The total annual water use for irrigation in Ethiopia is estimated at 1.5 BCM. Growing population pressure in the highland areas of rain fed agriculture on a rapidly declining natural resource base has secured irrigated agriculture a prominent position in the country's development agenda.²⁷

²⁵ Shiferaw Bekele (ed.), *An Economic History of Ethiopia...*, 10.

²⁶ Nile Basin Initiative, "Water Demand, Use and Hydraulic ...", 184.

²⁷ *Ibid.*

Fincha'a State Farm was one of those state farms that were established during the regime of Haile Selassie and continued until it was changed to sugar cane production. Why was the valley selected for irrigation? There were different reasons for the selection of the valley for irrigation purpose. The availability of suitable climate, water source for irrigation, fertile soil and vast plain area in the valley are the main reasons for its selection. The valley situated about 1500m above sea level and.²⁸

The initiation was raised in the 1960s. The first feasibility study was conducted by the US Department of Interior Bureau of Reclamation. In 1963, the first feasibility study of Fincha'a and Amarti -Nashe projects was conducted and the final report was presented to the Imperial government in 1968. It was conducted by the United States Department of Interior Bureau of Reclamation. The study was focused on investigating the suitability of Fincha'a Valley for irrigation purpose and the Fincha'a, Amarti and Nashe Rivers to generate hydroelectric power and for irrigation of down streams in the Fincha'a Valley.²⁹ This and other subsequent researches that had been conducted to test the suitability of the climate, water and soil of the valley, reported that the valley was very much suitable for irrigation scheme. They reported that the valley has suitable climate, fertile soil and good drainage system. "The climate in the lower valley, where the project development is contemplated, is warm and subtropical, favorable to the raising of a wide variety of crops, including such subtropical types as oil seeds, cereal crops, and coffee. Average annual precipitation is uncertain, but is estimated at 100 centimeters, the bulk falling in the rainy season--July through September."³⁰

Based on thirty years (1979-2011) long observation, similar to USA, Burayu also identified the climate of Fincha'a Valley as tropical climate. It is basically characterized by an alteration between wet and dry seasons. The data was collected statically from the Fincha'a Valley metrological station which was founded in 1979. On an average, the

²⁸ United States Department of the Interior Bureau of Reclamation, *Land and Water Resources of the Blue Nile Basin, Ethiopia: Fincha'a Sub-Basin* (Washington DC: United States Department of the Interior Bureau of Reclamation, 1963), 14.

²⁹ *Ibid.*, 16.

³⁰ *Ibid.*, 32.

maximum and minimum monthly temperature of the area is 30.6°C and 14.5°C in their order. March (34°C) is the hottest month followed by April (33.8°C) and February (33.4°C). Where as July and August are cool months with 26.6°C and 26.2°C, respectively. About 63% (804mm) of annual rainfall is obtained during; summer season with the highest rainfall in July (333.6mm). The annual sum of evaporation is 1503mm. Evaporation exceeds rainfall from mid-September to mid-June where as from mid-June to mid-September rain-fall becomes 2.6 times of evapo-transpiration. This climate situation is suitable for different crop production.³¹

Table 4: Long year weather data of Fincha'a valley

Description	Months											
	Jan	Feb	Mar	Apr	Ma y	Jun	July	Aug	Sept	Oct	Nov	Jan
Maximum temperature (°c)	31.1	33.4	34	33.8	32.5	29.8	26.6	26.2	27.7	29.3	30.6	31.4
Minimum temperature(°c)	11.8	13.8	16.7	17.5	17.2	16.3	15.7	15.6	14.8	13.2	12.2	11.4
Rain fall(mm)	3.14	6.26	31.6	54.6	106	216	333.6	269.8	182.2	85	8.2	7.49

Source: Fincha'a Sugar Factory Research Center, Metrological Station

Irrigable fertile land and the presence of rivers for irrigation are other potential of the valley for irrigation agriculture. The main rivers which originate from highland and flow into this valley are: Fincha'a, Amarti and Nashe Rivers. Many researches were conducted to identify the quality of water of these rivers for irrigation practices. They all concluded that the water of these rivers is much suitable for irrigation project.³² United States

³¹ Burayu Wayu, Agro Ecological Conditions and Background Information on Finchaa Sugar Project Site (n.p: Finchaa Sugar Factory, 1995), 15.

³² United States Department of the Interior Bureau of Reclamation, *Land and Water* ..16.; Seleshi Bekele, et al, "Impact of Irrigation on Poverty and Environment", Draft Proceeding of..., 380.

Department of the Interior Bureau of Reclamation gave brief description on the quality of water of Fincha'a River as follows.

*Quality-of-water samples were taken throughout the annual fluctuation of the three rivers. They all show good to excellent quality for irrigation purposes, primarily because most of the bedrock in the upland area is basic, igneous material which does not produce deleterious amounts of salt, and also because the steep, fine grained, soil mantle produces high percentages of surface runoff, so that there is a minimum exposure of subsurface flow to rocks which could produce significant amounts of dissolved salts in the total flow. Both the Fincha'a and the Amarti-Neshe Projects fit this general description.*³³

Similar researches were undertaken from time to time as the sugar cane plantation is expanded in the valley. Most of the researches showed similar results about the suitability of water of Fincha'a, Amarti and Nashe Rivers. Water quality, regarding the physical as well as chemical parameters, of Fincha'a Valley Sugar Estate can be rated as very good for irrigation purposes.³⁴

The other area of study was soil quality of the valley. To test the soil quality of the valley, many researches were conducted by different bodies; including individuals and organizations. They summarized that the soil of Fincha'a valley is grouped in to two main types of soil. These are Luvisols (Chromic, Haplic, Gleyic) and EutricVertisols. These soils are developed from alluvial colluvial deposits.³⁵ These soil types are very suitable for irrigation farm. Because they are free from salutations(soil acidity). "The soils are well suited to irrigation development and are capable of producing sustained high yields. The soils contain no salts that would be harmful to growing plants, and it is not anticipated that any serious problems in subsurface drainage would develop if irrigation water is properly applied and normal precautions are taken."³⁶

³³ United States Department of the Interior Bureau of Reclamation, *Land and...*, 16.

³⁴ Seleshi Bekele, et al, "Impact of Irrigation on Poverty and ...", 380.

³⁵ Girma Teferi, "Soils, Irrigation and Mechanization", *Review of Sugarcane Research in Ethiopia (1963-1998)*, Ambachew Damte and Girma Abejehu (ed.), vol. I, (Addis Ababa: Ethiopian Sugar Corporation, 2000), 124. ; Seleshi Bekele, et al, "Impact of Irrigation on Poverty...", 380.

³⁶United States Department of the Interior Bureau of Reclamation, *Land and...*, 6.

Ahmed Amdihun also arrived at the same conclusion with this study. "There are two dominant soil types in the project area, which are the luvisols and vertisols respectively. Luvisols covers 75 percent of the irrigated land and they are partly made of alluvial and colluvial materials from the surrounding escarpments. Luvisols has limited fertility and agricultural suitability."³⁷

The three Rivers (Fincha'a, Amarti and Nashe) flow parallel to each other. After they fall from the escarpments that surrounded the Fincha'a Valley, they merge and flow into the Abay River. The main tributary Rivers of Amarti are Bol'o (starts near Shambo town on the Eastern side), Oddo (emerged from small Rivers near Shambo and Sakala) and Sholoko Rivers. These Rivers merge west of Tullu Kokor (a historical place where Oromo patriot called Abishe Garba was captured by King Tekle Hymanot of Gojjam).³⁸ After that the two rivers are called Amarti River. Nashe River originates from high land near Sakala Town. The USA Department of the Interior Bureau of reclamation conducted research on Fincha'a Valley using Arial Photographs and climatologically date it collected from Ambo Agricultural College. The results of the Arial Photographs show that,

*The Fincha'a River Sub-Basin occupies an area of 3,500 square kilometers south of the Blue Nile in Wellegga province. The Fincha'a and its two main tributaries rise in large swamps on the high plateau and drop over a sharp escarpment into the deeply eroded lower Fincha'a valley, which contains the lands considered in the development of a multipurpose power and irrigation project in this area.*³⁹

Fincha'a River is suitable to generate hydroelectric power and for irrigation farm. The study was conducted to identify the presence of conducive environment for multipurpose projects of Fincha'a, as one and Amarti-Nashe as the other project. The two projects were designed to use these rivers to generate hydroelectric power and for irrigation down the streams in Fincha'a Valley. The report of United States Department of the Interior

³⁷ Ahmed Amdihun Mohamad, "GIS Remote Sensing Integrated Project in Fincha'a Valley Area". *Catchment and Lake Research, LARS*, (2007): 122

³⁸ Interview: Ato Amanu Mijana.

³⁹ United States Department of the Interior Bureau of Reclamation, *Land and Water ...*, 5.

Bureau of Reclamation indicated that the Fincha'a Project would include a storage dam, a power diversion dam, a tunnel and penstocks to carry the water to a powerhouse in the lower valley, a diversion dam for irrigation, and canals and laterals to irrigate about 15,000 hectares of land.⁴⁰ According to this finding the total cost of Fincha'a project was estimated to be 86,127,000 *birr*.⁴¹ Based on this report the Imperial regime planned and decided to establish dams on Fincha'a, Amarti and Nashe Rivers. Then the Fincha'a dam was constructed on Fincha'a River in 1974.⁴²

In the Fincha'a and Amarti-Nashe projects, the second project was the construction of dams on Nashe and Amrti Rivers. Amarti River flows parallel to the Fincha'a River and the two rivers are used to generate hydroelectric power and provide water for irrigation in Fincha'a Valley and they are also used for fishing.

Construction of Fincha'a Dam

Before the construction of Fincha'a dam, Fincha'a sub-basin which is part of the Blue Nile basin was "distinguished by the Choman swamp, a vast flat area lying the plateau at an elevation of 2210m above sea level; the Choman swamp is fed by a number of small streams which head in the high hills and emerge at the north eastern end of the swamp as the Fincha'a River."⁴³ Fincha'a River falls from high hill down to the foot of the hill. The name *Fincha'a* in Afan Oromo is derived from the fall of this water.⁴⁴

Emperor Haile Sellasse I laid the cornerstone of Fincha'a Hydroelectric power plant on November 28, 1973. On this occasion, he underlined the economic significance of this hydroelectric power plant in the development of the nation's economy. He further discussed that the construction of the dam opened a new chapter in the development of Ethiopia. The Emperor argued that the power plant would double the energy power of the country. It would provide energy to run machines in different industries; and its water could be used for irrigation down the stream in Fincha'a Valley.⁴⁵

⁴⁰ United States Department of the Interior Bureau of Reclamation, *Land and Water Ibid...*, 5.

⁴¹ *Ibid.*

⁴² Ethiopia Electric Light and Power Authority, *Finchaa Hydroelectric Power Project* (Addis Ababa: Addis Ababa Artistic Printers, 1973), 26.

⁴³ United States Department of the Interior Bureau of Reclamation, *Land and Water Resources of ...*, 13.

⁴⁴ Interview: Ato Amanu Mijana.

⁴⁵ Ethiopia Electric Light and Power Authority, *Fincha Hydroelectric Power...*, 4.

The construction of this dam was started in 1973 and was completed in 1974. The total construction cost of the Fincha'a project was Eth.\$81,153,000.00.⁴⁶ The source of this fund was the International Bank for Reconstruction and Development for external cost of the project. This is illustrated in Fincha Hydroelectric Power Project:

A total of Eth. \$2,869,257.63 had been withdrawn from a US AID loan secured in 1966 to finance the initial phase of the Consulting Services for Fincha'a Project. In 1968 US Bids for the project were rejected because the lowest Bid for the main construction was excessively higher than the estimated cost of the Project and as the result no further withdrawals were made from this loan. In 1969, the authority secured a loan US \$23,100,000.00-from the International Bank for Reconstruction and Development for external cost of the project.⁴⁷

The Fincha'a Hydroelectric power project included construction of 97km Access Road from Gedo to Fincha'a power house, a rock and earth fill dam, a 3525 meters tunnel, and construction of Fincha'a Hydropower Plant that could generate 100KW hydroelectric power. The dam is 340 meters long and 22.2 meters high.⁴⁸

The Gedo-Fincha'a Access Road was constructed first and then it paved the way for the rest of the works of the project. The Access Road from dam to power house is earth cut and tunneled. The tunnel is 6.0 meters wide and 6.0 meters high.⁴⁹

Different contractors were involved in the construction of Fincha'a Hydropower plant. These contractors were engaged in different works. These were:

1. Operators Village Contractor- A Moroni & Company of Ethiopia,
2. Gedo-Fincha'a Access Road Contractor- Zorzi Giuseppe & Ethiopian earthmoving company of Ethiopia,
3. Dam, powerhouse and appurtenances General Contractor- Impresit- Recchi (Ethiopia) of Italy.
4. Turbines Contactor- Bell Engineering Company of Switzerland,
5. Generators Contractors- Norsk Elektrisk and Brown Boveri of Norway,

⁴⁶ Ethiopian Electric Corporation, *Fincha'a-Amarti-Nashe...*, 25.

⁴⁷ Ethiopia Electric Light and Power Authority, *Fincha Hydroelectric Power...*, 25

⁴⁸ Ethiopia Electric Light and Power Authority, *Fincha Hydroelectric Power...*, 10

⁴⁹ *Ibid.*, 13

6. Transformers Contractor – Mitsubishi of Japan,
7. Transmission Line Contractor- Energoinvest of Yugoslavia and
8. Substations and power Line Carries Contractor- Brown Boveri and Company of Switzerland.⁵⁰

The construction of Fincha'a dam, Gedo-Fincha'a-Fincha'a Valley road and Fincha'a hydropower Plant were built before the establishment of the Fincha'a Valley State Farm. According to Temesgen Burka, the construction of the Gedo –Fincha'a road was completed in 1970- at the cost of Ethiopian *birr* 6-8 million.⁵¹ The construction of the road created access to the area and made the work of the construction of Fincha'a Dam easy. The construction of the dam enabled the generation of Electricity at Fincha'a. Its water also used in the Fincha'a Valley irrigation.

The entire area draining toward this dam is called the Fincha'a water shad and its total area is 3,251Km².⁵² The Fincha'a watershed is located in the Horro Guduru Wollegga Zone, Oromia Regional State, Ethiopia, between 9⁰10'05''N to 10⁰00'59''N and 37⁰00'16''E to 37⁰33'20'' E. The Fincha'a watershed, with an area of 3,251 km², is one of the sub-basins of the Nile River Basin. The topography of the watershed is rolling to hilly and ranges in elevation from 1,043 to 3,196 m above sea level (asl). Its climate is 'tropical highland monsoon' with the annual rainfall ranging from 960 mm to 1,835 mm having peaks during June to August. The mean monthly minimum and maximum temperatures of the area vary from 6.0 to 16.0°C and from 19.5 to 31.5°C, respectively.

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⁵⁰ *Ibid.*, 28.

⁵¹ Temesgen Burka, "A History of Fincha Hydroelectric Power From Its Foundation to 2000", BA thesis submitted to History department, Addis Ababa University, (2000), 19.

⁵² Buzayehu Tefera and GeertSterk, "Environmental Impacts of a Hydropower Dam in Fincha'a Water Shade, Ethiopia: Land Use Changes, Erosion Problems, and Soil and Water Conservation Adoption." *Sustainable Slopping Lands and Water Shade Conference* (Wageningen: Wageningen Univesity, 2006b): 89.

⁵³ Abdi Boru Ayana and Ekasit Kositsa Kulchai, *Land Use Change Analysis Using Remote Sensing and Markov Modeling in Finha'a Water Shade, Ethiopia* (Kamphaeng: Kasetsart University, 2012), 136

Fincha'a reservoir initially covering an area of about 100 km², but a few years later, the area of the lake had increased to 149km² because of the construction of new dam on Amarti River in 1986. Water of this dam flows into Fincha'a water shade through tunnel constructed at a place called Homi in Abay Choman *woreda*. Because of the flow of water of Amarti dam into Fincha'a dam, the water volume of Fincha'a dam which was 950 million cubic meters in 1973 was raised to 1.115 billion cubic meters.⁵⁴ It had also raised the Hydroelectric Power generating capacity of Fincha'a dam from 185 millionm³ to an estimated 460 million m³. Water of the two dams covered over 1536km² of Fincha'a water shade. Fincha'a hydroelectric Power plant generates 134MW hydroelectric power.⁵⁵

"The Ethiopian power stations Currently connected to the ICS [interconnected grid system] have a total installed capacity of 731MW; of which Hydropower has more than 98⁰/₁₀ of the total production, thus the production from Fincha'a benefits this inter connected system as well as the local system."⁵⁶

Fincha'a dam became the base for both the Fincha'a hydroelectric Plant and Fincha'a State Farm. The natural water fall favored production of Hydroelectric Power. In the beginning of 1973, the Fincha'a HEP plant generated 99 megawatts (MW) of electric power. In 1988 even though it was raised to 609 million kilowatt-hours (KWh), later on in the following year it abruptly went down to 486 million KWh, for reasons not known. However; it reached 841 million KWh in 1998. To increase the power production of Fincha'a HEP additional dam construction on the Amarti River was started in September 1983 and was completed in December 1986. Fund for this project was obtained from the European Economic Commission through the European Economic Development Fund.

⁵⁴ Buzayehu Tefera Olana, people and dams: "environmental and socio-economic changes included by a reservoir in Fincha'a water shade, western Ethiopia", *Tropical Resource Management papers*, No.75 (Wageningen: Wageningen University, 2006): 90.

⁵⁵ Nile Basin Initiative Regional Power Trade Project, "Review Hydropower Multipurpose Project Coordination Regimes: Best Practice Compendium", (Workshop, June 2008), 50.; Irit Eguavoen, *The Acquisition of Water ...*, <http://WWW.lit-ver.lag.de/reihe/zef>

⁵⁶ Nile Basin Initiative Regional Power Trade Project, "Review Hydropower Multipurpose ... 52.

The Contractor was Rush and Tompkins B.V.Co.Ltd. of England under the consulting Engineer Salzigter GMBH⁵⁷

The other significance of Fincha'a dam has been the use of its water for irrigation Agriculture in Fincha'a Valley. The water of the dam is taken to the irrigation field by canal. Fincha'a dam also provides water for Fincha'a town and downstream towns and villages. In addition to these, the dam also serves to protect high flood down the stream.⁵⁸

Construction of Nashe Dam

For the construction of the Nashe dam, prefeasibility and feasibility studies were carried out in 2004/05 by Montgomery Watson Harza (MWH), an American International Consulting firm.⁵⁹ The dam was constructed on Nashe River, located west of Fincha'a River. Nashe River joins Fincha'a River in Fincha'a Valley.

The source of finance for this project was USD EPC/Turkey. The project was executed by China GEZH OUBA Group Company (CGGC). The project has two major objectives: Electric production and irrigation in Fincha'a Valley. It is a multipurpose project.⁶⁰

The Nashe Hydropower plant generates 97MW. Water discharged from the plant is used to irrigate about 6000 hectares of land in Fincha'a Valley for sugar cane production. The Nashe 230Kv transmission line is linked to the National Grid via Gedo to Gefersa substation. Commercial operation of Nashe plant started in July, 2011.⁶¹

The total water storage capacity of Nashe dam is 448,000,000m³ and its reservoir has an area of 29.2km². The dam is 5.5km from Amarti and 15km from Fincha'a sugar factory.⁶²

The Begging of Fincha'a State Farm

According to the plan designed For Fincha'a Valley project; the project would render economic and social benefits to both local communities and communities outside the

⁵⁷ Temesgen Burka, "A History of Fincha Hydroelectric...", 27

⁵⁸ Interview: Ato Tesfaye Shiferew.

⁵⁹ Ethiopian Electric Corporation, *Fincha'a-Amarti-Nashe ...*, 12.

⁶⁰ Ethiopian Electric Corporation, *Fincha'a-Amarti-Nashe...*12

⁶¹ *Ibid.* , 14.

⁶² *Ibid.* , 16.

project area. It would provide job opportunity for labor workers, farmers, merchants and workers of the state farm.

*Improvements in more efficient use of the natural resources of the Nation to bring about greater production of agricultural products, improve the national economy, and create additional employment opportunities for the national labor force. At the same time, such development should also establish a system which will permit the emergence of a class of farmers who can successfully own and operate commercial farms and make independent managerial and cultural decisions. Such farmers would hold title to their lands, enjoy the benefits of a higher standard of living, and have a voice in the conduct of affairs of their community.*⁶³

Such as housing and diet, in sanitary and medical facilities, the increased opportunity to educate the children, the beginning of a rural land market, and enhance to acquire and practices of new skills would have important gains expected of the Fincha'a Valley project.

Theoretically, the project was designed to settle farmers on irrigation site and then they could cultivate it and would develop into owner of commercial farm. However; when the farm was started in 1974, it became state farm and was placed under the state. It was state owned commercial farm.

The farm was established in 1974 by *Fetan* farm monitored for Ministry of Agriculture and Land preparation started. Cleaning of land and removal of natural Vegetations was done by human labor. Traditionally it was known as *Guto nikela*, uprooting or avoiding trees with their roots. As the result a large number of people moved into the valley and were employed in the work. They were paid 1.95 *birr* daily.⁶⁴ The informants explained that these laborers shouldered burdens and led difficult living conditions. They had no living room; they simply leaved in open spaces. They were also exposed to hot temperature during day and cold at night. They were also exposed to mosquito's bit.⁶⁵

⁶³ United States Department of the Interior Bureau of Reclamation, *Land and Water Resources of the ...*, 219.

⁶⁴ Interview: *Ato Amanu Geleta*.

⁶⁵ *Ibid.*

Later Different camps were established and houses were also constructed. Deforestation was intensified. When camps were built, original names of the area were changed and renamed. Burayu listed the former names of the places with the new ones.⁶⁶ The name of the valley was also changed to *Lemlem Bereha*, meant war low land. But, formerly the local people called it *Gammoji Agul*, which meant Agul lowland.⁶⁷

Table 5: The Original and versed name of different locations in Fincha'a Valley.

Original name	Versed name
Baaroo	1 st and 2 nd camps
Booyyee	3 rd camp
Diimtuu	4 th camp
Dachas, daawaraa	5 th camp
Laga Odaa	Fakare stream
Duboo	7 th camp store house
Leencoo	Daggitu
Harbuu Danbii	7 th camp, main office
Luuccaa	8 th camp, store house
Caamiir	9 th camp store house
Giraanjii	9 th camp
Qunnii	Village B
Dugda DHungii	10 th camp
Hagamsa	Main camp

Source: Burayu Wayu, *Agro Ecological Conditions and Background Information on Finchaa Sugar Project Site* (n.p: Finchaa Sugar Factory,1995), 5.

Fincha'a State Farm which was established in 1974 was followed by construction of infrastructures like roads, settlement camps, clinics, school and so on. During this period a relatively large number of people immigrated to the valley from different parts of the country in search of employment opportunities in the state farm. They were employed as permanent, laborers and contract workers. In years between 1985/86 and 1986/87, there

⁶⁶ Burayu Wayu, *Agro Ecological Conditions and Background...*, 5.

⁶⁷ Interview: Ato Amanu Geleta.

were a total of 1129 permanent workers at the state farm. 1081 were male while the rest (48) were female workers.⁶⁸

Table 6: Permanent Workers of Fincha'a State Farm by Department in 1985/86 and 1986/87.

Department	1985/1986	1986/1987	total
Management and Administration	192	237	429
Information	3	3	6
Financial	8	7	15
Store	27	27	54
Farm	864	771	1635
Technical	234	247	481

Source: Makonnen Fite, "Geographic Study of Fincha'a State Farm" (paper Submitted to Department of Geography Addis Ababa University, 1996), p.22

To increase production, state farm used fertilizers (DAP and Urea), different herbicides, Insecticides and Selected Seeds. Insecticides and herbicides were applied to the farm. The farm received selected seeds from Ethiopian Seed Corporation.⁶⁹

Different farm machines were introduced and the state farm became Mechanized Farm.⁷⁰ Machineries like Tractors (63), Combiners (13) and Trails (19) were also used in land preparation for seeds and harvesting crop. Maize, sorghum, soybean, pepper and sunflower were the main crops cultivated at the state farm.⁷¹ Besides this, local people were also engaged in traditional irrigation along Fincha'a River and its tributaries. Using this, they have produced vegetables like cane, green paper, cabbage, onion, tomato, and crops like maize, sorghum, millet, noug etc by clearing forest.⁷² At the beginning of the

⁶⁸ Makonnen Fite, "Geographic Study of Fincha'a State....", 16.

⁶⁹ Makonnen Fite, "Geographic Study of Fincha'a State....", 32.

⁷⁰ Interview: Ato Belay Kasa.

⁷¹ *Ibid.*, 34.

⁷² Interview: Ato Tadese Tesfaye.

state farm, in 1976/77, 1316 hectares of land was covered with different kinds of crops. Since then up to 1982/83 the size of the farm land increased yearly and after that began to be reduced until totally it was handed over to Fincha'a Sugar Factory. This is indicated in Table 7.

Table 7: Cultivation of Different Crops in Fincha'a State Farm (in hectares) from 1976/77 to 1985/86.

Types of crops	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86
Maize	1229	1250	1610	1588	2221	3146	3590	2799	2831	2822
Sorghum	—	530	642	800	968	400	172	19	—	23
Soybean	—	—	—	367	540	117	—	—	—	71
Pepper	15	—	—	160	122	68	132	145	200	—
Teff	60	130	40	48	60	93	—	—	—	—
Haricot bean	12	—	—	—	—	231	—	—	—	—
Noug	—	84	58	30	—	—	—	—	—	—
Sesame	—	—	96	—	—	—	—	—	—	—
Sisal	—	—	—	28	10	—	—	—	—	—
Chickpeas	—	40	—	—	—	—	—	—	—	—
Groundnut	—	—	—	15	25	—	—	—	—	—
Sunflower	—	—	—	—	2	88	—	—	—	—
Total	1316	2034	2446	3008	3964	4065	3982	2963	3031	2927

Source: Makonen, Makonnen Fite, "Geographic Study of Fincha'a ...", p. 40

From this Table concluded that, maize covered large portion of the farm land. It covered 77.66% of the total farm land and it was followed by sorghum (11.96%) and soya bean (3.68). Covering wide farm land with crop is not a guarantee for more yields. But, the

amount of crop gained from such size of land. For this purpose it is necessary to see harvested crops each year.

Table 8: Production of different crops in *quintal* from 1976/77 to 1978/79

Types of crops	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86
Maize	21,314	44,928	50,740	85,350	74,920	62,912	66,239	61,209	83,384	103,361
Sorghum	—	5185	7785	11,353	10,168	9,436	1,382	104	—	1348
Soya bean	—	—	—	987	2011	254	—	—	—	279
Pepper	29	—	—	427	467	462	338	709	534	—
Teff	440	—	470	376	346	696	—	—	—	—
Haricot bean	53	869	—	—	—	806	—	—	—	—
Sesame	—	490	—	—	—	2	—	—	—	—
Sisal	—	—	—	—	100	60	—	—	—	—
Noug	—	336	243	180	—	—	—	—	—	—

Source: Makonnen Fite, "Geographic Study of Fincha'a ...", p. 42

In the case of production maize was the first while sorghum and pepper were the second and the third respectively. The state farm didn't sale its produce directly to the market or to those whom it wanted to sale. It sold the products to Agricultural Marketing Corporation with the price decided by the government. As the result the cost of production was three fold of its gain. The state farm ran its farm activities with little or no gain. The plan of the government was not to gain more profit (income) but to achieve its desire to cover food shortage.⁷³

Makonnen indicated the price of different crops cultivated in Fincha'a Valley. Accordingly pepper was relatively the most expensive than the rest of the crops. Its cost

⁷³ Interview: Ato Korenti Yabesa.

for 100 kilos was 300 Ethiopian *birr*. It was followed by sesame and sisal. But the cheapest one was maize even though; it was the first in its production.⁷⁴

Table 9: The price of different crops in *birr/Quintal*.

crop s	Maize	Sorghum	Soy a bean	Peppe r	Tef f	Harico t bean	Sesam e	Sisa l	Nou g	Chic k peas
price	31	40	45	300	55	50	150	150	60	52

Source: Makonnen Fite, "Geographic study of Fincha'a .., p.54

Makonnen also gave the summery of the total gain of the state farm as follows.

Table 10: Gain from sales of different crops.

year	Income from sales	Cost of production	difference
1980/81	330,675.00	6,149,997.80	5819322.80
1981/82	2,994,540.00	5,499,384.30	2,504,844.30
1982/83	2,485,050.00	6,887,552.60	02502.60
1983/84	2,253,579.00	7,1339,874.50	4,886,295.50
1984/85	199,032.00	722,128.10	523,096.10
1985/86	2,746,3040	4,796,824.40	2,050,520.40
Total	11,009,180.00	31,195,760.00	20,186,581.70

Source: Makonnen Fite, "Geographic Study of Fincha'a State .., p.p. 55

The cost for The total income the state had got from sales of different crops from 1980/81 to 1985/86 was 11,009,180.00 *birr* and its cost of production that was the money paid : as salaries for workers, supply of Fertilizers and different chemicals, machines and selected seeds. The difference of the two was the loss the state farm faced.

⁷⁴ Makonnen Fite, "Geographic Study of Fincha'a State...., 54.

In 1984, the state farm had occupied about 2,927Km² area of land. But, due to expansion of sugarcane field, the state farmland decreased to 12.2Km².⁷⁵ As I have indicated the state farm under took its work with little or no gain. This was one possible reason for the change from state farm to sugar estate. The other reason was the high demand for sugar at that time.⁷⁶

⁷⁵ Getahun Kitila, "Land Use Changes Induced by Irrigation Development in the Fincha'a Sugar Estate, Blue Nile Basin, Ethiopia", *Journal of Biodiversity and Environmental Sciences (JBES)*, vol. 3, No.11, (2013): 37.

⁷⁶ *Ibid.*, 40

CHAPTER THREE

THE ESTABLISHMENT OF FINCHA'A SUGAR FACTORY

The Beginning of Sugar Production in Ethiopia

The beginning of sugar production in Ethiopia goes back to 1951 when the government of Ethiopia signed contract agreement with HVI-International. HVA-Handle Vereening of Amsterdam, Dutch Company was a Company that had extensive experience in sugar plantation in Java-Indonesia. It was also known as "Dutch East Indies sugar industry for most in the world".¹

In this agreement the Company and the Ethiopian government agreed on the establishment of sugar Factory at Wonji with its own plantation. The Ethiopian government agreed to provide the Company with 5,000 hectares of land for the cultivation of sugar cane. This area is located on the Upper Awash basin at a distance of 100kms south-east from Addis Ababa.²

The Company was given the following advantages:

- Monopoly right over 160kms radius to expand sugar Industry;
- Exemption from import duties on imported capital goods; and
- Right to withdraw 10 % of capital net income every year.³

Following the agreement, HVA Company established the first sugar factory at Wonji in 1953/1954. At its initial stage this factory had produced 750 tons of sugar per day. Until 1961/62 the factory was monopolized only by the Company. Since 1962/63 few

¹ United Nations Economic Commission for Africa, "Successful cases among public enterprises in Africa: case studies of the Ethiopian Sugar Corporation (Ethiopia) and the national Development Corporation (Tanzania)", October 1990, 6.; Sushil Kumar, *India's Development Cooperation with Ethiopia in sugar production: An assessment*, Discussion paper # 198. (New Delhi: Research and Information System for developing countries, August 2015), 2. ; Ethiopian Herald by Yared Gebremeden, "Ethiopia towards Sugar development", vol. LXXIII No 109, (15 January 2017):5.

² United Nations Economic Commissions for Africa, "Successful cases among public...", 6.; Ethiopian Herald by Yared Gebremeden, "Ethiopia towards Sugar .., 5.

³ Ethiopian Herald by Yared Gebremeden, "Ethiopia towards Sugar .., 5.

Ethiopian share holders began to involve in the production of sugar cane and sugar production. As the result of that the name of the Company was changed to HVA-Ethiopia.⁴ The Ethiopian government signed additional agreement with the same Company to establish another sugar factory, Shewa Sugar Factory in Shewa. There were different factors that led the Company to set up the second factory.

The factors that led the Company to establish sugar factories were: high domestic demand for sugar in Ethiopia, availability of natural and human resources together with favorable climate for sugar cane production and prevalence of infrastructural facilities within Awash Valley.⁵ On the basis of this agreement the company established the second sugar factory called Shewa sugar factory. The factory started production of sugar in November 1962. It produced sugar cane on 1,600 hectares of land and produced 34,749 tons of sugar per year.⁶

Table 11: Sugar Production of Wonji, Shewa and Metehara Sugar Factories (in tons) from their Establishment to 1988/89.

year	Wonji	Shewa	Metehara	Total
1954/55	15,840	—	—	54,840
1962/63	34,749	24,463	—	59,212
1972/73	32,190	42,343	57,249	131,782
1977/78	35,326	41,135	70,205	146,666
1982/83	39,016	40,176	98,154	177,746
1983/84	37,833	42,420	105,871	186,124
1984/85	31,279	42,397	106,653	180,329
1987/88	36,888	42,491	95,705	175,084
1988/1989	34,422	46,987	96,566	177,975

Source: United Nations Economic Commission for Africa, "Successful Cases Among ..", p. 32.

⁴ Ethiopian Herald by Yared Gebremeden, "Ethiopia towards Sugar ..", 5.

⁵ .Sushil Kumar, *India's Development Cooperation...*, 3.

⁶ . United Nations Economic Commissions for Africa, "Successful cases", 6.

Even though the three factories produced such amount of sugar, the production did not match the demand. As the result the government decided to setup additional sugar factory in Fincha'a valley in 1998/99.⁷

Construction of Fincha'a Sugar Factory

In the late twentieth century and the beginning of twenty-first century Ethiopia gave due attention to the establishment of new sugar factories and expansion of the existing factories. During this period the demand for sugar increased locally and international.⁸ That was a factor that pushed Ethiopia to produce more sugar than what she produced before. Until 1998 there were only two sugar factories: namely Wonji- Shewa and Metehara sugar factories (Wonji and Shewa came under one administration).

In 1976 the Ethiopian government made great move in establishing new sugar factory to overcome shortage of sugar domestically and also for export. Accordingly, it under took different researches of identifying areas that were suitable for sugar cane cultivation. Then the government concluded agreement with Booker Agriculture International Ltd (BAI), British company, for this purpose. The Company made research and identified areas which were suitable for sugar cane production. Accordingly, Fincha'a, Angelele, Gambela and Amaro were identified in April, 1977. For that time Fincha'a was taken as a more suitable site than the rest of the areas for sugar production.⁹

Sugar cane is a crop that could be cultivated at a place that has tropical climate and good drainage system. It requires at least 1525mm annual rain fall with uniform distribution. But like other places there is no uniform distribution of rain fall in Fincha'a Valley. This couldn't be an obstacle in this area because of the presence of good drainage system in the valley. Fincha'a Valley satisfied the conditions and became suitable for sugar cane production.

⁷ Michael M. Girma and Silashi B. Awulachew, *Irrigation Practices in Ethiopia: Characteristics of Selected Irrigation Schemes* (Colombo: International Water Management Institute, 2007), 42.

⁸ Sushil Kumar, *India's Development Cooperation with Ethiopia in Sugar ...*, 7.

⁹ Michael M. Girma and Silashi B. Awulachew, *Irrigation Practices in ...*, 43

The Fincha'a Sugar Factory Project was designed to be accomplished in two phases to produce a total of 127,000 tons of sugar and 12,000 cubic-meters of ethanol, and develop 93,000 hectares of land in the Wollega administrative region in Horro Guduru *Awraja* (today Horro Guduru Wollega Zone) on the bank of the Fincha'a River. The project was expected to create job opportunities for 7,000 Ethiopians eventually. The estimated cost was *birr* 410million. The main objective of the establishment of Fincha'a sugar factory is to produce quality and crystallized white sugar for domestic markets.¹⁰ In 1978, the Ethiopian sugar corporation put Fincha'a sugar project under its control and under- took the task of land preparation. From 1976-1980 soil and topography of the land was studied. The study identified the presence of suitable climate, soil and unsettled land and sufficient water for irrigation.¹¹ Fincha'a sugar factory was established in according to the Ethiopian Government proclamation Number 25/1984 and the Council of Ministers Regulation Number 1995/1986. It was inaugurated in 1999.

In 1981, Ethio-Libiya joint venture was established to fund the construction of Fincha'a Sugar Factory. However; the project was closed from 1983-1989 due to lack of finance. The problem was solved when fund was gained from African Development Bank and the project was started.¹² The construction of Fincha'a Sugar factory started with 1.8billion *birr* and it was completed in 1999. It was financed by government equity capital, Soft loan and grants obtained from different governments, international financing institutions, Local Banks and the Ethiopian government. 35% of it was financed by Ethiopian government while the rest (65%) was financed by other institutions. The major sources of finance were African Development Bank and African Development fund. In addition to

¹⁰ United Nations Economic Commissions for Africa, "Successful Cases Among, 13.: Irit Eguavoen, *The Acquisition of Water Storage Facilities in the Abay River Basin, Ethiopia* (Bonn: University of Bonn, 2009), <http://WWW.lit-verlag.de/reihe/zef>

¹¹ Burayu Wayu, *Agro Ecological Conditions and Background Information on Fincha'a Sugar Project Site* (n.p: Fincha'a Sugar Factory, 1995), 6.

¹² Fincha'a Sugar Factory, *Profile of Fincha'a Sugar Factory*, (Addis: Fincha'a Sugar Factory, 1995).

these institutions, the governments of Swedish, Australia and Spain also had taken part in funding the factory.¹³

Different contractors had participated in the construction of Fincha'a sugar factory. These were both local and foreign contractors including the American based F.C. Schaffer and Associations Inc; Batu construction Enterprise; Tikur Abay Construction; H.V.A Varco joint Venture; British based , Tate and Lyle technical Services, Ltd; Ethiopian Electric power corporation and S.B. Consult. These contractors and subcontractors executed various activities. F.C Shaffer and Association Inc. has erected and commissioned the sugar and the ethanol manufacturing plants with sub contractor, Dutch based company DEWETO. Batu Construction Enterprise has participated in the construction of all housings and development of infrastructure. Tikur Abay construction has taken all civil works installation of cannel pipes. H.V.A. Varco joint Venture had performed construction of irrigation of cannel and Access roads. Ethiopian Electric power Corporation has installed all electric lines and substations. Tate and Lyle Technical Services, Ltd. has served as Consulting Engineer in major constructions of the factory. S.B. Consult has also actively involved in the construction of all housing development of infrastructures.¹⁴

Fincha'a Sugar Factory was established to implement four major objectives. These are:

- Planting and growing Sugar cane and other plants that can produce sugar.
- Producing commercial plantation white sugar and other products including molasses, ethanol, etc. from its by-product.
- Aggressively market its products.
- Performing other jobs that would help it realize its main objective.¹⁵

¹³ Fincha'a Sugar Factory, Fincha'a Sugar Factory Inauguration Bulletin, "Ye Fincha'a Sukar Fabrika atekalay getsita", April 24 1999., 11

¹⁴ Fincha'a Sugar Factory, *Profile of Fincha'a Sugar Factory...*

¹⁵ *Ibid.*

Table 12: Sources of fund for the construction of Fincha'a Sugar Factory.

NO	Source of capital	Amount of money in birr
1	African development Bank	646,707,089.25
2	African development fund	98,127,365.60
3	Australian government	90,871,155.60
4	Spanish government	123,504,000.00
5	Swedish government loan	19,669,623.14
6	Swedish loan	356,858,000.00
7	Ethiopian government	682,941,581.59
8	Ethiopian development Bank	144,514,310.00
	total	1,842,020,925.18

Source: Fincha'a Sugar Factory Inauguration Bulletin, "Ye Fincha'a Sukar Fabrika atekalay getsita", April 24 1999, p.11

The Production of Sugar Cane and Sugar by Fincha'a Sugar Factory

Ethiopia has suitable climate and soil for sugar production. The county has 69.66 million hectares of land which is suitable for sugar cane production.¹⁶ Of this land until 2012, the county planted sugar cane only on 14.985 million hectares of land which is 21.51 percent of the available land. This indicates that the country has more land for investment in sugar cane production. Fincha'a Sugar factory was planned to produce 127,000 tones of sugar and 12,000 Cubic-meters of ethanol and to cultivate sugarcane on 93,000 hectares of land.¹⁷ In the process of sugar cane production, land is prepared by dozer, Agricultural machine and tractors. The irrigation is totally mechanized and modernized one. Preparation of seeds and plantation of sugarcane is done by human power.¹⁸ At the beginning plantation of sugar cane started on 55.74 hectares of land in 1991/92. In 1992/93 the land coverage increased to 129.90 hectares.¹⁹ "The Factory has started commercial white sugar production in February, 1998 with a performance trial conducted in March, 1999, which proved that the Factory could comfortably crush more than 50,000

¹⁶ Getish Tekle, *Local Production and Use of Bio-Ethanol for Transport in Ethiopia, Status, Challenges and Lessons* (Lund University: IIIIEE, 2008), 40.

¹⁷ United Nations Economic Commissions for Africa, "Successful Cases Among ...", 13 and 56.

¹⁸ Fincha'a Sugar Factory Inauguration Bulletin, "Ye Fincha'a Sukar Fabrika ...", 15.

¹⁹ *Ibid.*

qts. of cane/day, 25% in excess of its design capacity.”²⁰ It also produces 8,000,000 liters of ethanol, from its by-product molasses, a new product to the local market that can be blended with benzene (90%) to be used as a motor fuel without engine modification and also blended with Kerosene (50%) to be used as house hold cooking fuel.²¹

Table 13: Sugar Cane Plantation at Fincha’a Irrigation Scheme.

Year	Land covered with sugar cane in ha.
1991/92	55.74
1992/93	129.90
1993/94	245.90
1994/95	295.45
1995/96	2046.78
1996/97	2015.78
1997/98	251.79
1998/99	179.08
total	5220.42

Source: Fincha’a Sugar Factory, Inauguration Bulletin, p.14.

²⁰ Fincha’a Sugar Factory, *Profile of Fincha’a Sugar Factory...*

²¹ *Ibid.*

Figure 2: Cultivation of Sugar Cane in Fincha'a Valley.

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Source: Fincha'a Sugar Factory Background, picture 374.

The establishment of Fincha'a sugar factory boosted sugar production in the country. When I compare Fincha'a sugar factory with the previous two factories, it stands second in sugar production and it is the only sugar factory in the nation to produce ethanol. The Wonji and Shewa Sugar Factories were closed in 2011 and 2012 respectively. In a new form, the Wonji-Shewa Sugar Factory was established in new form and replaced the two previous factories. The New Factory started production in 2013.²²

Fincha'a sugar factory produced 85,000tons of sugar per year while Wonji- Shewa and Metehara sugar factories produced 700tons and 120,000tones yearly respectively.²³ The Ethiopian Sugar Corporation notified the production of the three sugar factories namely Wonji/ shewa, Metehara and Fincha'a factories as indicated as follows:

²² Ethiopian Herald by Yared Gebremeden, "Ethiopia Towards Sugar"
²³ Michael M. Girma and Silashi B. Awulachew, *Irrigation Practices...*, 46.

These three sugar factories have a production capacity of 280,000 tons of sugar annually. The total area developed by these factories is 23,769 hectares. The area developed at Wonji/Shewa is 7050 hectares (5930 hectares estate and 1120 hectares out grower farms) capable of producing 80,000 tons of sugar per annum. The Metehara Sugar Factory, which was brought on stream in 1969 by HVA at Metehara, developed 9919 hectares and has a capacity to process 115,000 tons of sugar annually. The Finchaa Sugar Factory (in East Wellega zone of the Oromia National Regional State) which was completed in 1998 developed 6800 hectares and has a production capacity of 85,000 tons of sugar per annum.²⁴

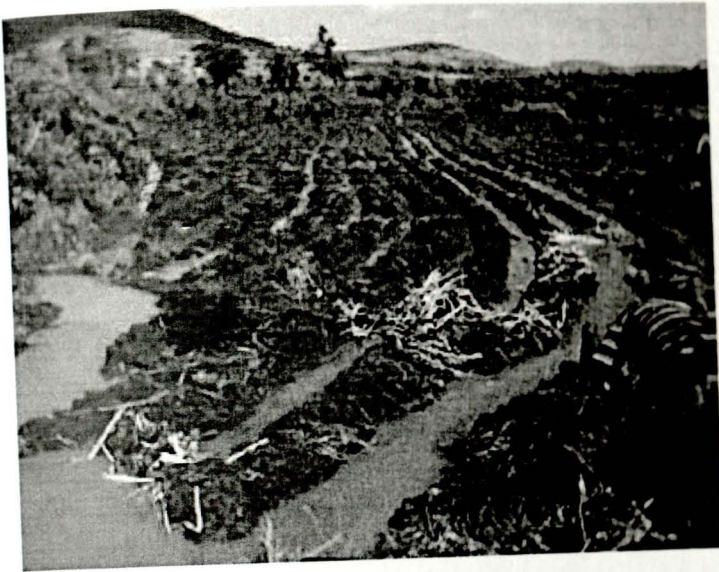
In both sugar plantation as well as sugar and ethanol production, Fincha'a sugar factory utilizes latest technology plants including sprinkler irrigation system, high-tech computer based control systems and ethanol production process unlike the old three factories which use furrow irrigation system, manual and pneumatic controlling systems with no ethanol plant. Furrows are narrow ditches dug on the field between the rows of crops. The water runs along them as it moves down the slope of the field and is gradually absorbed into the bottom and the sides of the furrows wetting the soil. Furrows are generally used on farms with large uniform fields where long furrows can be formed at regular intervals between the crop rows.

Sprinkler method is more suitable than the furrow type which is used at Wonji-Shewa and Metehara irrigation schemes. This is due to the structure of soil found in the valley. Fincha'a River is diverted to cane fields near the power house in the upstream area through concrete canals. At present the west bank canals run for about 44 kilometers. Water from the canal is pumped to irrigation fields and finally sprinklers shower the water to the growing cane.²⁵

²⁴ Ethiopian Investment Agency, "Investment Opportunity Profile for Sugarcane Plantation and Processing in Ethiopia", (June 2012), 1.

²⁵ Ahmed Amdihun Mohamod, "GIS Remote Sensing Integrated Project in Fincha'a Valley Area" *Catchment and Lake Research, LARS*, (2007): 124.

Figure 3: Furrow Irrigation System



Source: Michael M. Girma and Silashi B. Awulachew, *Irrigation practices in Ethiopia: Characteristics of Selected Irrigation Schemes*, p. 23.

Figure 4: Sprinkler Irrigation



Source: Michael and Silashi, *Irrigation Practices...*, p.46.

Sugar cane requires more water during its growing age; but it doesn't need much water at the harvesting time. The soil types found in the area is erodible. That is the reason why sprinkler is preferred to furrow in this area. With the exception of the Fincha'a irrigation scheme, which uses sprinkler system, all irrigation in Ethiopia in the Nile Basin, rely on surface gravity method for water conveyance and application.²⁶

²⁶ Girma Teferi, "Soils, Irrigation and Mechanization", *Review of Sugarcane Research in Ethiopia (1963-1998)*, Ambachew Damte and Girma Abejehu (ed.), vol. I, (Addis Ababa: Ethiopian Sugar Corporation, 2000), 130. ; Michael M. Girma and Silashi B. Awulachew, *Irrigation Practices...*, 45

The 2002 survey of sugar production shows that Ethiopia is the second in the World in sugar cane production with a yield of 113.6 tons per hectare of land. The country has high potential natural sources to establish more additional sugar factories and to increase her sugar production capacity.²⁷ To increase the growth production of sugar, Ethiopia increases the number of sugar enterprises from year to year. The number of enterprises which was 283 in 1991 has increased to 2209 in 2009. With this, the growth value of sugar production also increased more than twofold. Sugar manufacturing accounted for 4.58 per capital of total capital formation in 2009.²⁸ But still there was great gap between demand and production domestically.

Table 14: Production and Consumption of Sugar in Ethiopia 2004 to 2011.

Year	Production(million tons)	Consumption(million tons)
2004	0.33	0.30
2005	0.35	0.32
2006	0.36	0.35
2007	0.34	0.37
2008	0.34	0.39
2009	0.32	0.42
2010	0.32	0.43
2012	0.35	0.44

Source: Sugar year book 2012, International Sugar Organization, in Sushil Kumar, *India's Development Cooperation with Ethiopia in Sugar Production: An Assessment*, Discussion paper # 198, p. 7.

In the years from 2004 to 2006 sugar production was less than what was demanded.

Ethiopia's domestic sugar consumption is considerably higher (1.26 times) than its production. To solve the problem, the country has under-taken two majors; one importing sugar from abroad, and second expanding the existing sugar factories and also establishing new 10 Sugar factories.

²⁷ John Sutton and Nebil Kellow, *An Enterprise Map of Ethiopia* (London: International growth Center, may 2011), 111.

²⁸ Sushil Kumar, *India's Development Cooperation with Ethiopia in...*, 4.

Since 2007 to 2012 the problem was solved to some extent. Ethiopia imported about 152,000 metric tons of sugar per year.²⁹

The country has also expanded Fincha'a, Wonji-Shewa and Metehara sugar factories and established new Tendaho sugar factory. The expansion project increased Metehara Sugar Factory sugar production capacity to produce 136,692 tons of sugar yearly. The factory started the production of ethanol since mid of 2010. It produces 12.5 million liters per annual.³⁰

Ethiopia has received funds from India for the expansion of the existing Sugar Industries and to establish new ones. Ethiopia received a US\$ 640 million line of credit from India for the expansion of Wonji-Shewa and Fincha'a Sugar Factories, and for the establishment of Tendaho Sugar Factory.³¹ The expansion of Wonji-shewa was completed in 2013. It was done by Uten Socratech Company. After the expansion, the factory has a capacity to crush 6,250 tons of cane/day to produce 174,000 tons of sugar per year.³²

This Company also started the construction of Tendaho Sugar Factory in 2006. The new factory has the capacity of crushing 6,600 ton of sugar cane per day. It also produces 600 thousand quintal pure white crystal sugar.³³ The first phase of the factory started production in 2015. The expansion of these two factories with the establishment of Tendaho boosted the Ethiopian sugar production. The expansion enabled Wonji-Shewa, Metehara and Fincha'a Sugar Factories to produce 75,000, 136,692 and 110,000 tons of sugar respectively in one year.³⁴

²⁹ Sushil Kumar, *India's Development Cooperation with Ethiopia in...*, 5.

³⁰ Ethiopian Sugar Corporation, *Sugar Industry in Ethiopia* (Addis Ababa: Ethiopian Sugar Corporation, September 2017), 17.

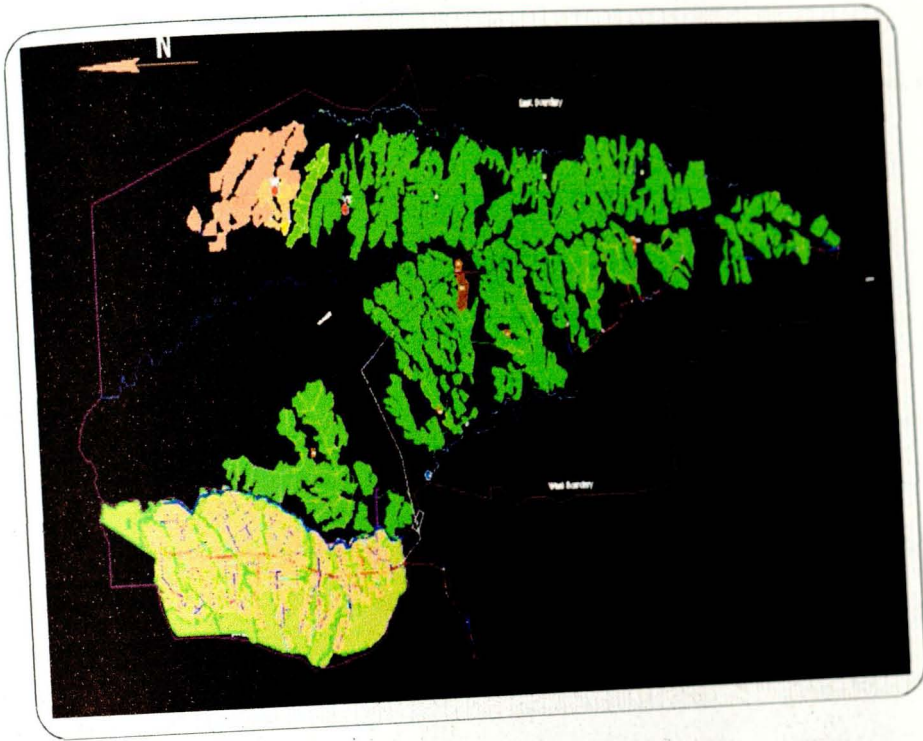
³¹ Sushil Kumar, *India's Development Cooperation with Ethiopia in...*, 16.

³² Ethiopian Sugar Corporation, *Sugar Industry in...*, 15.

³³ *Ibid.*, 19.

³⁴ Ethiopiansugar.com/index.php/en/about;

Figure 5: Expansion of Irrigation land in Fincha'a Valley.



Source: Fincha'a Sugar Factory, Fincha'a Sugar Factory profile: Sugar Cane Plantation Expansion Project.

The 2011/12 major expansion of Fincha'a Sugar Factory aimed to produce 2.7 million *quintals* of sugar on 21,000 hectares of land, 20 million liters of ethanol and 40,000mwh electricity.

The expansion project included:

- Sugar cane plantation field
 - 7500 ha from Fincha'a East Bank,
 - 4750 ha from Nashe West Bank,
- Factory expansion to 12,000 TCD,
- Construction of ethanol plant and

- Construction Infrastructural development.³⁵

The sources of fund for this project were Ethiopian government (30%) and bidder (70%). Accordingly,

EXIM 124 million US\$,

CBE 1.4 Billion birr, and

SIDE 2.4 Billion birr.³⁵

Table 15: The summary of sugar production of Fincha'a sugar factory from 1997/1998 to 2011/12.

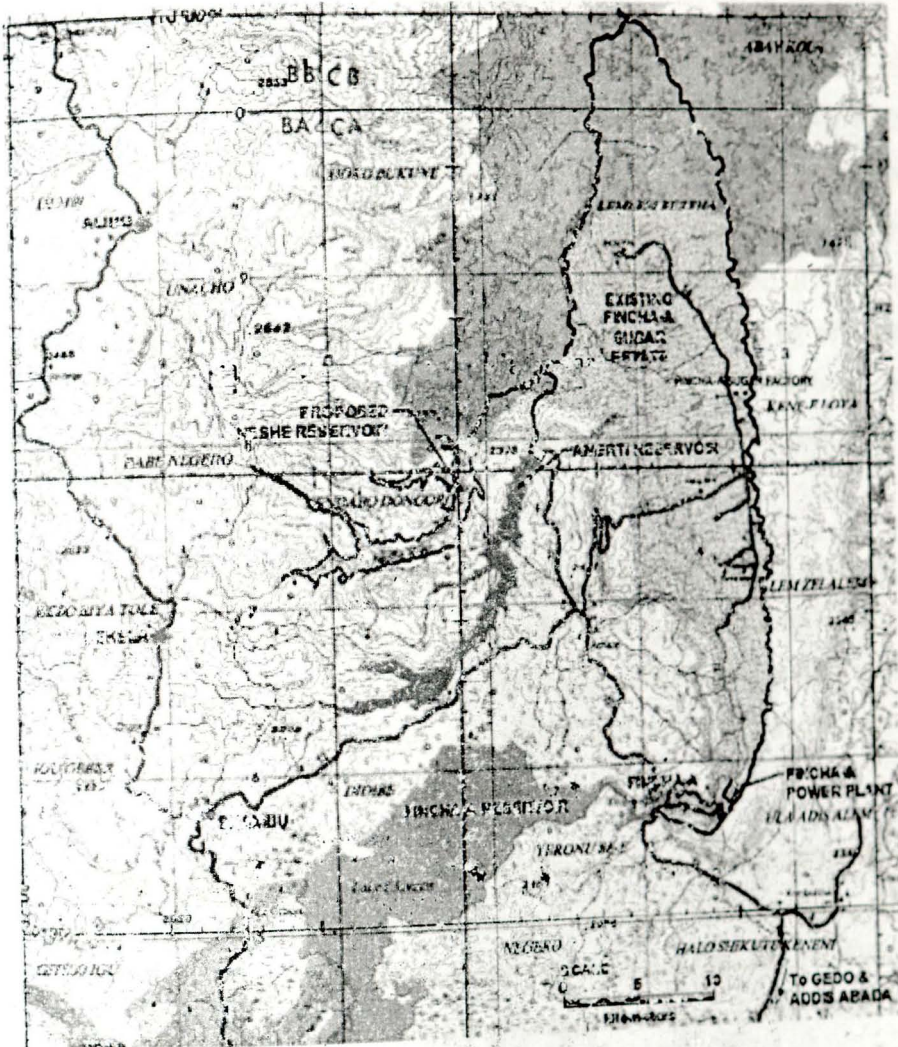
S/No	Year	Cane yield (quintal/hectare)	Sugar production in quintal
1	1997/98	1,219	100,731
2	1998/99	1,520	525,110
3	1999/00	1,327	651,476
4	2000/01	1,235	645,918
5	2001/02	1,339	722,361
6	2002/03	1,318	774,532
7	2003/04	1,385	804,499
8	2004/05	1,395	864,223
9	2005/06	1,378	929,740
10	2006/07	1,376	871,010
11	2007/08	1,300	833,674
12	2008/09	1,369	1,018,904
13	2009/10	1,359	1,105,596
14	2010/11	1,335	987,231
15	2011/12	1,336	1,016,040
16	2012/13	1,289	1,117,316

Source: Fincha'a sugar factory, 19 years' data.

³⁵ Fincha'a Sugar Factory, *Profile of Fincha'a sugar Factory*, (Addis: Fincha'a Sugar Factory, 1999) ...

³⁵ *ibid.*

Figure 6: Geographical view of Fincha, Ethiopia



Source: Fincha's Sugar Factory, Fincha's Sugar Factory Background

While Wonji and Metehara sugar factories, Fincha's Sugar Factory doesn't export sugar compared to the other sugar factories. However, it sells sugar directly to the local markets through the ESISC. The price of sugar from three factories: Wonji-Shewa, Metehara and Fincha's sugar factories was determined by ESIS through bidding. The winners of the bid

to take...
to the...
50

transported sugar from factories with the same price without the consideration of the distance that the factories have from the capital.³⁷

There are different factors that affect sugar cane production. To list them, weeds, sugar cane varieties and crop disease are some of them. Weed is a plant growing where it is not desired. Weeds play a significant role on the yield and quality of the crop by competing mainly for moisture and nutrients. By doing so it reduces the yield and quality of sugar cane. Fincha'a Sugar Factory conducted many researches to identify and use effective herbicides.³⁸ One of the factors that affect the quality and quantity of sugar and sugar cane production is type of sugar seeds used in the production. Different sugar canes have different amount of sucrose content in them. They are also different in their adoption to different climate and soil type.

In commercial cane sugar production, varieties play a vital role and other imputes though are very essential to obtain high yield and improved quality cannot bring better outputs beyond the potential limit of variety. Obviously using superior cane cultivators is a primary requirement for maximum profitability, and in many countries substantial yield increases due to Variety improvement achieved.

The sustainability of high yield of cane in commercial cultivation can only be assured by the presence of sugar varieties, which are well adapted to the driveling agro-ecological conditions.³⁹ In the 2013 Annual Research Report, it was stated that in Ethiopia the sugar Industry didn't have its own breeding program. It has always been dependent on importing sugar cane varieties and locally evaluating their performance on yield and disease. Accordingly, seven sugar cane varieties that could adapt to the soil, water and

³⁷ Michael M. Girma and Silashi B. Awulachew, *Irrigation Practices in Ethiopia: Characteristics...*, 46.

³⁸ Abera Tafeses, "Herbicides Against Weeds in Sugarcane Plantations of Wonji-Shoa, Metehara Fincha'a", *Review of Sugarcane Research in Ethiopia : Crop Protection(1970-1998)*, vol. II (June 2001): 57.

³⁹ Sugar Corporation Research and Training, *Annual Research Report: Completed Research* (Addis Ababa: Ethiopian Sugar Corporation Research and Training Center, 2013), 30.

climate of Fincha'a Valley were identified and are being used.⁴⁰ These sugar canes are identified based on their appropriate variety. Sundara quoted in Sugar Corporation Research and Training, "Appropriate varieties are: cane yield, Juice quality, age group, suitability to the growing condition (i.e. soil type, irrigation level, season, etc) rationing potential, and resistance to disease pest adverse growing condition."⁴¹

Insects are still other factors that affect crop production. Researchers reported that Black Beetle (*Heteronycus licas*) (at Wonji-Shewa and Metehara) and Termites at Fincha'a are insects that are manifested and caused some damages on sugar cane. Black Beetle was recorded around 1956 from Wonji-Shewa sugar cane plantation.⁴² Taylor and Cackett in Tesfaye reported that, both the larva and adult stages of the Beetle feed on underground part of cane plant.⁴³

Other insects are Termites. Termites are social insects that have been causing a serious problem at Fincha'a sugar state since 1976. Ars in Tesfaye stated that, "They posed a threat to sugar cane plant, forest seedlings, fruit and vegetable gardens, wooden structure of buildings; and they created obstruction in mechanical operation of cane fields."⁴⁴ To avoid these insects at farm land, the sugar factories have conducted different researches and identified possible mechanisms that could be employed. These are Biological mechanism and using effective insecticides. Accordingly, Chlorpyrife and lindane Insecticides are the identified insecticides to be used against Termites at Fincha'a Sugar State, While, Biological mechanism is proposed against Black Beetle.⁴⁵ Fincha'a Sugar Factory produces other products in addition to sugar.

⁴⁰ Shifera Jarso, "Report Presented to 23rd ISO Seminar", 2013, 39.

⁴¹ Sugar Corporation research and Training, *Annual Research Report...*, 30.

⁴² Tesfaye H. Michael, "Insecticide Screening Against Sugarcane Black Beetle in Ethiopia" *Review of Sugarcane Research in Ethiopia: Crop Protection (1970-1998)*, vol. II (June 2001): 39.

⁴³ *Ibid*

⁴⁴ *Ibid.*, 53.

⁴⁵ *Ibid.*, 43, 53.

Other Products of Fincha'a Sugar Factory

Even though, the main product of Fincha'a Sugar Factory is sugar, the factory also produces additional products like sweet and Ethanol. Ethanol is produced from byproduct of sugar called molasses. Until 2010, when Metehara Sugar Factory started ethanol production, the factory was the sole producer of Ethanol in Ethiopia.

Different scholars in the field discussed advantages of Bio-ethanol. Accordingly, Bio-ethanol could be used domestically as fuel in transportation and cooking at home. Further, it could be exported to world markets to make revenue. Using Bio-Ethanol as a fuel has diverse advantages. Using Ethanol as fuel in transportation is one mechanism that helps to reduce the green house effects; because it is free from gasses that cause air pollution. Using Bio-Ethanol has also its contribution in halting import bill. EPE quoted in Getish, "A decade ago, the expenditure on petroleum products was 1.5 billion Ethiopian *birr*. In 2007 this figure rose to 9 billion *birr*. The same source estimated the value to reach 11 billion *birr* in 2008."⁴⁶

Using bio-ethanol as the source of energy is taken as a means to reduce the quantity of imported petroleum. In addition to these, using Bio fuel as the source of energy benefits the country in "--- diversifying energy sources, expanding rural development through job creation in feedstock production, transport and distribution; reducing the harmful substances from vehicle exhaust; reducing green house gas emission; soil and water conservation; and building local industries."⁴⁷ Using of molasses as the source of energy reduces the people's dependence on firewood which is associated with massive deforestation and the resultant land degradation. Bio-Ethanol could be obtained from two types of feedstock. These are first generation feedstock including sugar cane and starch bearing plants, and the second generation includes stalks, grains and tubes.⁴⁸ The first generation feedstock (sugar cane) gives the highest yield than other sources.

In 1999, ethanol plant was built at Fincha'a sugar mill to produce ethanol from molasses by fermentation. Fincha'a Sugar Factory uses sugar cane which it produces on its own

⁴⁶ Getish Tekle, *Local Production and Use of Bio-Ethanol...*, 2.

⁴⁷ *Ibid.*

⁴⁸ Getish Tekle, *Local Production and Use of Bio-Ethanol...*, 13.

farm for the production of about 1 million tons of sugar and Molasses. Molasses, the by-product from sugar production, is used to produce about 8 millionm³ of ethanol. This plant currently produces about eight million liters of ethanol per year, of which about two million liters are used by local industries. Getish pointed out that the Fincha'a sugar factory didn't use its potential of producing ethanol. It has a potential to produce one billion liters in a year. According to his discussion, it was due to the lack of market for ethanol. The little market that is available for the sale of ethanol is beverage industries and private cattle fattening individuals.⁴⁹ The factory produces two kinds of alcohol that can be used for power and drinking purposes. The demand for ethanol from local liquor factories is growing and it is currently beyond the capacity of the factory.⁵⁰ Later on the factory signed the agreement with an Italian company called Silcompa. The factory agreed to provide 6 million liters of the hydrous Bio-ethanol to the company yearly. The company also agreed to pay \$ 0.202 per liter. This agreement continued until the recent government decision that has banned the export in order to accumulate for local gasoline blending.⁵¹ Fincha'a Sugar Factory produced 8 million liters of Ethanol in one producing year. The company exported Bio-ethanol to overseas markets.⁵²

Another byproduct of sugar that is used as source of energy is Bagasse. It could be used to reduce people's dependence on indigenous sources for fire wood and money paid to import fuel.⁵³ Bagasse could be used in household or industrial sectors. It is also usable in the manufacturing of particle board (chipboard). If it burns, it would generate electricity for sugar mills or it could be sold to national grid. It is also used in local paper industry as a pulp feedstock.⁵⁴ Fincha'a Sugar Factory has been under expansion to increase ethanol production to 16 million liters of ethanol per year.⁵⁵

⁴⁹ Getish Tekle, *Local Production and Use of Bio-Ethanol...*, 45.

⁵⁰ Michael M. Girma and Silashi B. Awulachew, *Irrigation Practices in Ethiopia: ...*, 46.

⁵¹ Getish Tekle, *Local Production and Use of Bio-Ethanol...*, 45

⁵² *Ibid.*, 3.

⁵³ United Nations Economic Commissions for Africa, "Successful Cases among Public Enterprises in...", 1.

⁵⁴ *Ibid.*

⁵⁵ Muluqen Yewondwossen, Ethiopia-Ethanol Production to Increase 16 fold. (Introduction part)

CHAPTER FOUR

ECONOMIC, ENVIRONMENTAL AND SOCIAL IMPACTS OF FINCHA'A -AMARTI-NASHE DAM AND FINCHA'A SUGAR FACTORY

The Benefits of Fincha'a Sugar Factory and Fincha'a-Amarti-Nashe Dam.

Unreliable rainfall, recurrent drought and limited use of the available water resources, coupled with heavy reliance on rain-fed subsistence agriculture, have contributed adversely to the economy of Ethiopia.

Different literature explains the economic, social and environmental impacts of irrigation. According to their explanations, irrigation has both positive and negative consequences.

Seleshi reported that Irrigation development can enhance economic development. Irrigation schemes can facilitate multiple uses of water that combine agriculture with livestock, fisheries, and other income-generating activities to enhance rural incomes and sustainability. Investment in irrigation is also needed to keep up with global demand for agricultural products and adapt to changing food preferences and societal demands, to adapt to urbanization, industrialization, and increasing allocations to the environment and to respond to climate change. Climate variability and extreme events will require water resources development, large water storage facilities, further irrigation development, and changes in the operation of existing schemes.¹ Haise and Hagan in Seleshi also discussed that Irrigation is one means for a good farm husbandry, better land utilization and stable and higher crop production.

Sustained growth and dynamism in agriculture is a fundamental necessity to meet the increasing demand for food and other products in view of the growing population. Irrigated agriculture plays a major role in reaching the broader development vision of the country in achieving food security, poverty alleviation and improvement in the quality of

¹ Seleshi Bekele, et al, "Impact of Irrigation on Poverty and Environment", Draft Proceeding of the Symposium and Exhibition, (2007), Introduction part.

life. The main objective of irrigated agriculture is to provide plants with sufficient water to prevent stress that may cause reduced yields or poor quality of harvest.² Ahmed and Sampath, in Seleshi, discussed that irrigation has much contribution to the national economy in several ways. At the micro level, irrigation could lead to an increase in yield per hectare and subsequent increases of income, consumption and food security. Furthermore, Hussain and Hanjra, in Seleshi indicated that irrigation benefits the poor through higher production, higher yields, lower risks of crop failure, and higher and year round farm and non-farm employment.³

Besides its positive impacts, irrigation also has negative impacts. Barbier and Thompson explained these impacts in Seleshi. Accordingly, irrigation has various effects on environment and on Social life of people.⁴ Regarding the benefits and impacts of dam on the national economy, life of local people and Environment, the San Roque Multipurpose project in the Philippines helps us to evaluate the advantages and disadvantages of construction of dam in our country.

As it was discussed in Nile Basin Initiative regional power project, the San Roque Multipurpose dam was constructed on Agno River in the northern Philippines by a Company called San Roque Power Company in 2003. It was constructed to achieve four major objectives: electricity generation, irrigation, flood control, and water quality improvement. Then according to its objective it generates 345MW hydroelectric power, irrigates 708km² of farm land and improves the quality of water.⁵ At the beginning of the construction of the dam, people who lived in the area where the dam was constructed strongly opposed its construction. Because, the dam caused 2,500 local people to give up their agricultural land, more than 750 families to resettle and the like.⁶

² Seleshi Bekele, et al, "Impact of Irrigation on Poverty and Environment" ..., 28.

³ *Ibid.*, 128.

⁴ *Ibid.*

⁵ Nile Basin Initiative Regional Power Trade Project, "Review Hydropower Multipurpose Project Coordination Regimes: Best Practice Compendium", (Workshop, June 2008), 96.

⁶ *Ibid.*, 96.

Later on, the company implemented a rehabilitation program for those who were affected by the project. In the rehabilitation program, the company constructed school buildings; provided health services; constructed roads, bridges, and foot trails; provided water supply facilities; gave financial assistance to community affairs and activities; and gave due attention. It constructed houses for resettles.⁷ By doing that the company changed the attitude of the people. It created peace with the people. This in-turn created conducive environment.

Contrary to the above practice, some dams caused hazards on the local communities. A good example for this is Kariba dam that was constructed on Zambezi River and caused flooding of an area of 4,000km² and as the result about 57,000 people were relocated and their culture and tradition was also disrupted. In addition to such kind of damages, "The limited compensation made and the failure to make the affected people part of the planning and management initiatives make the construction of many dams less interesting to the inhabitants." WCD; Fujikura et al quoted in Buzayehu.⁸

The best lesson we learn from this practice is that if company that constructs a certain project in a given area could give due attention to the local community by paying sufficient compensation and provides them with different social services and infrastructures, the project will be trusted by the local people. If this is not, its continuity will come under question.

According to the Master Plan Studies of the Ministry of Water Resources, in Ethiopia Existing irrigation is 57,561 ha which is estimated at about 2% of the total agricultural land but contribute over 5% of the agricultural production. Still, the potential of the country is 1,774,676 ha. In order to feed her fast growing population, Ethiopia has to develop her irrigation schemes.⁹ Many successful schemes are providing increased

⁷ Nile Basin Initiative Regional Power Trade Project, "Review Hydropower...", 96 and 97.

⁸ Buzayehu Tefera and GeertSterk, "Environmental Impacts of a Hydropower Dam in Fincha'a Water Shade, Ethiopia: Land Use Changes, Erosion Problems, and Soil and Water Conservation and Adoption." *Sustainable Slopping Lands and Water Shade Conference* (Wageningen: Wageningen Univesity, 2006b): 29.

⁹ Seleshi Bekele, et al, "Impact of Irrigation on Poverty and Environment...", 40.

income, higher productivity, significant job opportunity and considerable contribution to the national economy.¹⁰

Sugar cane, the main raw material for the production of sugar in Ethiopia, is mainly cultivated through irrigation method. Sugar produced in different sugar industries of Ethiopia has more shares in the nation's economic progressive development. Ethiopia produces sugar for two purposes: domestically for consumption and for export. "Sugar manufacturing is the leading sub-sector of food processing sector which accounts for 53% of sales revenue of food processing sector and 57% employment in the food processing sector."¹¹

In the interview he made with the Ethiopian Herald, Gashaw Aychlum, Ethiopian Sugar Corporation Corporate Communication told that the sugar factory created job opportunities to more than 350,000 citizens. The sector has more shares in minimizing unemployment in the country.¹²

The establishment of sugar factories creates job opportunities for many people and it also became the source of the county's revenue. I have summarized this in Table 16.

¹⁰ *Ibid.*,

¹¹ Sushil Kumar, *India's Development Cooperation with Ethiopia in Sugar Production: An Assessment*, Discussion paper # 198. (New Delhi: Research and Information System for Developing Countries, August 2015),4.

¹² Ethiopian Herald by Yared Gebremeden, "Ethiopia Towards Sugar Development", vol. LXXIII No 109, (15 January 2017):5

Table 16: The role of Sugar Industry in Ethiopia's economy from 1991 to 2009.

year	Number of employees	Output(US\$ million)	Valued added (US\$ million)
1991	3610	89.56	68.96
1995	4061	46.08	36.66
2000	6469	119.54	93.98
2001	6113	125.6	102.03
2002	6916	103.59	79.13
2003	7521	135.64	110.74
2004	6937	147.53	110.01
2005	6794	142.1	85.81
2006	8810	170.89	101.53
2007	19620	220	111.92
2008	8296	218.87	109.6
2009	9421	193.4	74.17

Source: Sushil Kumar, *India's Development Cooperation with Ethiopia in Sugar Production: An Assessment*, Discussion paper # 198, 2015. p. 6.

With regard to employment, in 2008/09 Fincha'a Sugar Factory had about 2,200 permanent and 5,000 temporary employees and Wonji-Shewa Sugar Factory had about 2,750 permanent and 1,430 temporary employees.¹³ This implies that in Ethiopia Sugar industry contributes a lot in employment creation.

There is strong relation between Fincha'a sugar factory and Fincha'a-Amarti-Nashe dam. The foundation of this dam is the basis for Fincha'a sugar factory. These dams provide water for irrigation in the Fincha'a Valley which produces sugar cane for sugar production by the factory. The factory also gets electric energy from Fincha'a-Amarti-Nashe HP plant. As the result of this, it is necessary to see the diverse impacts of Fincha'a-Amarti-nashe hydroelectric power and Fincha'a sugar factory.

¹³ Sushil Kumar, *India's Development Cooperation with Ethiopia in Sugar ...*, 21.

These developments have both positive and negative impacts on the economy of the country and on the socio-economic life of the local people. It is necessary to see these effects separately to have good understanding of the issues.

The project has many socio-economic benefits for the valley and the surrounding people. In addition to these, Fincha'a Sugar factory plays a key role in addressing the current sugar demand on the local market. There are many efforts to exploit the by-products of the factory for additional purposes like using ethanol for fuel. The projects have also an important role in the growth of national GDP.¹⁵

Table 17: The products of Fincha'a Sugar Factory from 2010-2012

S/No	Activities	Unit	2010	2011	2012
1	Sugar production	Ton	110,560	110,000	110,000
2	Ethanol production	liter	7,116,585	8,000,000	8,900,000
3	Electric production	MW	22,926	23,810	23,810

Source: Fincha'a Sugar Factory, Fincha'a Sugar Factory profile pamphlet.

The table shows the economic contribution of Fincha'a Sugar Factory to the national economy. The factory has collected more revenue from the sales of sugar, ethanol and other products. For example, in 2012 the factory collected revenue 1,100,666,535.89 from sugar sale, 40,346,853.93 from ethanol sale and 13,838,665.40 from others. Totally the factory collected 1,154,852,055.22 *birr* in 2012.¹⁶

Another contribution of the factory is the creation of job opportunity for Ethiopian people. It created job opportunity for many Ethiopian citizens. People are employed according to their qualification and as well as laborers. In 1999 it started functioning with 1615 permanent and 2406 seasonal workers. However, as the irrigation farm and capacity

¹⁵ Ahmed Amdihun Mohamod, "GIS Remote Sensing Integrated Project in Fincha'a Valley Area". *Catchment and Lake Research, LARS*, (2007): Introduction part.

¹⁶ Fincha'a Sugar Factory, Fincha'a Sugar Factory Profile Pamphlet.

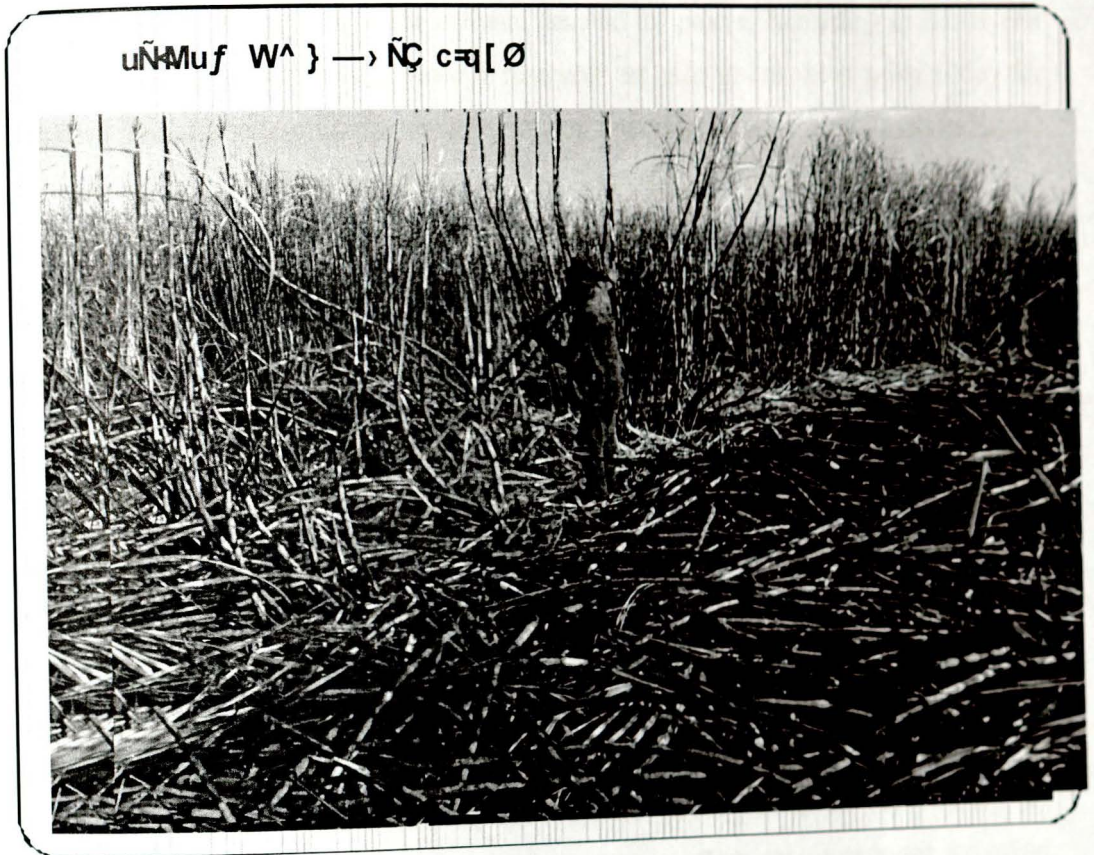
of the factory increased, the number of workers increased to reach 14,000 in 2012. Of this figure, 2,385 were permanent while 8671 were seasonal. The increment of the number of workers is indicated in Table 18.

Table 18: Workers of Fincha'a Sugar Factory from 1999 to 2012.

No	year	Permanent	Seasonal	Total
1	1999	1,615	2,406	4,145
2	2000	1,679	2,833	4,618
3	2001	1,703	2,566	4,380
4	2002	1,679	2,227	4,094
5	2003	1,661	2,818	4,718
6	2004	1,652	2,931	4,881
7	2005	1,705	3,128	5,188
8	2006	1,745	3,323	5,480
9	2007	1,777	4,145	6,444
10	2008	1,778	3,505	5,847
11	2009	1,773	4,322	6,687
12	2010	1,837	3,739	6,232
13	2011	2,546	6,676	9,337
14	2012	2,385	11,615	14,000

Source : Fincha'a Sugar Factory, 19 years data.

Figure 7: labor worker on cutting sugar can



Source: Fincha'a Sugar Factory, Fincha'a Sugar Factory profile

Most of permanent and contract workers are professionals while the temporaries are laborers who engage in plantation of sugar cane, planting seeds, irrigating sugar cane fields, weeding, harvesting, and pilling of harvested sugar cane. Since their work is seasonal their number shows fluctuation.

In 1986 additional dam was constructed on *Amarti* River that flows parallel to *Fincha'a* River and enters the Blue Nile. The purpose of this second dam is to divert water from *Amarti* reservoir to the *Fincha'a* reservoir through a tunnel in order to raise the capacity of *Fincha'a* hydroelectric power generation. As a result, FHEP has an installed capacity of 128 MW and meets 27% of the national demand for power. According to Bezuayehu Tefera, the other benefits of *Fincha'a* reservoir are that it enhances possibilities for irrigation and fishing and the creation of an important wetland; it increases water availability. It also, supplies water to the sugar factory downstream, creates new economic activities and attracts various birds to the area.¹⁷

Generally, the *Fincha'a*-*Amarti* dam plays a significant role in supporting the national economy through electrification, supplying water for sugar factory in downstream and introducing fisheries in the area.

Just like *Fincha'a*-*Amarti* dam, the *Nashe* dam has also many advantages. The plan to utilize *Nashe* River and other future neighboring catchments is the result of the preliminary report done in 1968 on the potential of Blue Nile Basin which necessitated the commencement of *Fincha'a* HEPP in 1974 and diversion of *Amarti* to it. *Fincha'a*-*Amarti*-*Nashe* dam has an installed capacity of 225 MW.¹⁸ According to the study done by Bezuayehu Tefera, the need to meet economic demands of the country and one of the ways through which socio-economic and political developments of the country are realized is the generation of HEP and irrigation schemes from abundant water resources. According to the study done by EEPCo, the main advantage of developing additional power from the combination of *Finchaa-Amarti-Nashe* catchments is to increase the existing power infrastructure at *Fincha'a*.¹⁹

¹⁷ Buzayehu Tefera Olana, "People and Dams: Environmental and Socio-Economic Changes Included by a Reservoir in *Fincha'a* Water Shade, Western Ethiopia", *Tropical Resource Management Papers*, No.75 (Wageningen: Wageningen University, 2006a):43.

¹⁸ *Ibid.*, 90

¹⁹ Ethiopia Electric Light and Power Authority, *Fincha Hydroelectric Power Project* (Addis Ababa: Addis Ababa Artistic Printers, 1973), 12.

Nashe Hydroelectric plant generates 97MW electricity and it also irrigates 5,000 hectares of land in Fincha'a Valley. This increased the hydroelectric power of the region and generally at the nation level. This enabled the country to export hydroelectric power to the neighboring countries.

The Ethiopia Power Export Project (formerly called the Ethiopia-Sudan Interconnection Project) connects the power grids of Ethiopia and Sudan and facilitates cross-border energy trade and optimizes existing and planned generation capacity. This is needed in order to overcome the severe electricity shortage in both countries, which is a major constraint to poverty reduction and economic growth. It is considered a first step toward greater regional power trade. Other Interconnectors promoted by the NBI include: Ethiopia and Kenya 500 kV HVDC interconnection transfer capacity 3.200 MW; Ethiopia to Djibouti 220 kV (282km) interconnection; Ethiopia to Sudan 230 kV transmission line (335 km) from Gambela in Ethiopia to Malakal in South Sudan and Ethiopia – Kenya 500 kV HVAC (1045km).²⁰

The other significance of dams is that they could be used as the sources of tourism. Today different countries established different facilities at dam areas and made dam areas a recreation sites. Local peoples and the countries as the whole get income from it. Recreational facilities, water sports, food and accommodation areas offer income generation option for the local residents. They increase employment opportunities and potential for small business enterprises and enhance economic activities of the area.²¹ E.g Koko dam in Ethiopia serves as a recreation site. But, when I try to assess both Fincha'a dam and Nashe dam, such institutions are not established in these areas even though there are some facilities including road, vast areas and electricity provisions. The presence of these facilities makes Fincha'a and Nashe lakes suitable for Tourism Industry. However; tourism industry is not established at both places.

Another significance of the establishment of factories at a given place is that they would construct or provide different infrastructures and other social services like schools, health

²⁰ Nile Basin Initiative, "Water Demand, Use and Hydraulic Infrastructure" *Nile Basin water resource Atlas*, 179.

²¹ Nile Basin Initiative Regional Power Trade Project, "Review Hydropower ...", 16.

centers, roads and etc, for the services of local communities. There are some trends in some areas in Ethiopia. At the beginning, the establishments of sugar factories were causes for its many adverse effects on the socio-economic environment around them. The period of 1951 to 1970 was known for many ill-effects. The sugar companies uprooted the local people from their land and their home.²² However, through time the companies have established different institutions to serve the local community.

Particularly since the 1974 revolution, the sugar industry has made significant contributions in the Nazareth and Metahara areas by encouraging natural resources utilization, fostering income generating activities in the community around it, stimulating rural industrial development such as the opening up of small industries and services. A good example for such kind of factories is the Wonji Sugar factory which is located in the Awash Basin.

As the result of the establishment of the Wonji Sugar Factory at Wonji in 1951, many maintenance and repairer services, weaving and tailoring food and agricultural enterprises, a commercial bank services have been established there. The sugar industry has given employment to 16,500 Ethiopians who were in turn estimated to support 60,000 dependants. The factory made 1,500 peasants who were in the Wonji/Shewa to become sugarcane out growers on 970 hectares. The change that took place in outlook, consciousness, and standard of living was tremendous; Schools, clinics and service giving enterprises were soon setup and better houses built. The literacy rate was changed within a short period of time as everyone practically carne to attend literacy schools.²³

These were some advantages that the local people have got from the establishment of Wonji-Shewa Sugar Factory in their area.

Just like that of the Wonji, the establishments of Fincha'a-Amarti-Nashe dam and Fincha'a Sugar Factory have brought some developments to the areas. The construction of Gedo via Fincha'a and then Hagamsa (the main camp in Fincha'a Vally) road was one of these developments. My informants told me that before the construction of this access

²² UNDP/World Bank, "Bagasse Energy Survey (Ethiopia): Activity Completion Report", No. 063/86,(December 1986): 37

²³ Ibid., 14

road, they had no access to markets to sale their produces because of the lack of road in that area. They had taken their produces to Gedo using pack animals and by travelling on foot about 97km. That was from the present Fincha'a town to Gedo. This problem was solved when Gedo-Fincha'a road was constructed in 1970 to get access to Fincha'a water shade and Fincha'a Valley. The construction of this road also has led to the establishment of small towns and villages along this road. For example, towns and villages like Goban, Wayu, Gabate, Fincha'a, Migiru Gutane and Hagamsa are the products of this development. Know days some of these towns serve as capitals of their respective *woredas*, (Wayu for Jimmarare *woreda*, and Fincha'a for Abay Choman *woreda*) and they also serve as commercial centers at their respective area.²⁴

In Fincha'a Valley as I indicated in chapter one, there was no permanent settlement in the area before the establishment of Fincha'a Sugar Factory. When Fincha'a state farm and later Fincha'a Sugar Factory were founded, many people from different corners of Ethiopia migrated into the valley to seek job and they settled there. The settlers engaged in different economic activities like trading, labor works and the like. Some of them are also employed in the factory as permanent and seasonal workers. Some of those who took part in small business activities, today they became known Businessmen.²⁵ Today, besides Hagamsa town, 17 villages are established in Fincha'a Valley. Of these villages, nine villages including Hagamsa town are located in Abay Choman *woreda*. The rest six and three villages are in Ababo Guduru and Jardaga Jarte *woredas* respectively. Hagamsa town is the center of factory site. Near Hagamsa town, there is another village known as *Kuyisa*.²⁶

Ato Tena Muleta chairman of the Hagamsa kebele , informed me that there are about 1150 households in this village. Most of them are small businessmen who provide the factory community with food, alcoholic drink and different commodities. They are executing their works in small huts that are constructed of mud, wood and tall grasses. Some of the residents are seasonal laborers in sugar cane cultivation. These laborers are

²⁴ Interview: *Ato Tesfaye Shifera*.

²⁵ Interview: *Ato Dereje Mekonnen*.

²⁶ *Ibid.*

not given housing services from the sugar factory. The village is regarded as illegal settlement by the factory Authorities.

The authorities tried many times to displace and resettle these people at other place far from the factory.²⁷The authorities have done this for the security of the factory. On their part the settlers have not volunteered to accept the decision of these authorities. They told me that if they accept the decision and move to the desired place, they will be far from the people (workers in the factory) and then they couldn't get market for their commodities. Informants told me that, in 1993(1985 E.C.) when the manager of the sugar factory, known as Girma Damise forced the residents to leave the village, he was shot by unknown person while he was travelling in his car to Fincha'a town.²⁸

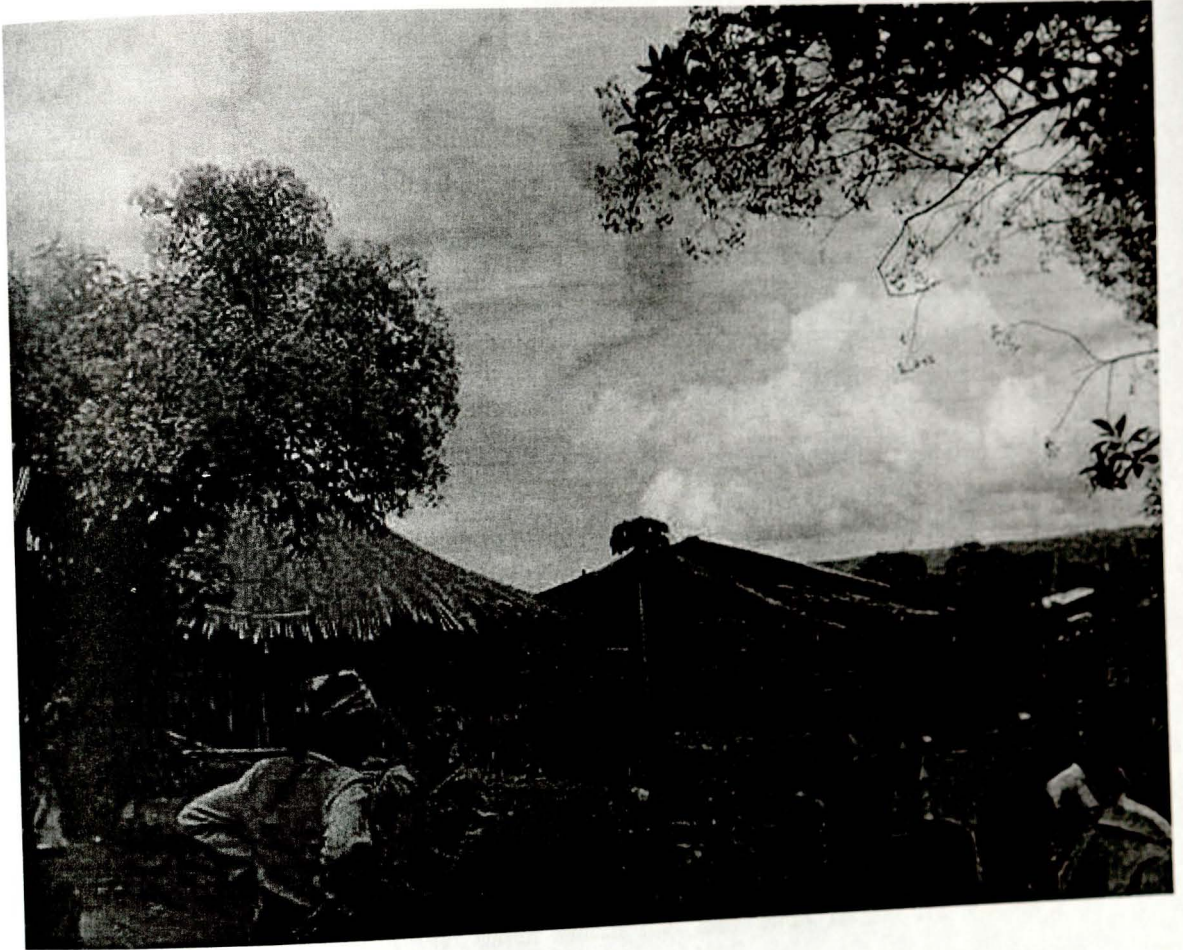
Today the factory has established a new village called Fincha'a-Hagamsa South west of Hagamsa town. The factory has built police station, primary school and high school, and also electricity and pure water as well as clinic at the new village which is established for the resettlement of the Kuyisa Village residents.²⁹ But, up to the time of this research work, there is no one who settled in this village; because the people are not willing to leave *Kuyisa* Village.

²⁷ Interview: *Ato Tena Muleta*.

²⁸ Interview: *Ato Amanu Geleta and Amanu Mijana*.

²⁹ Interview: *Ato Tena Muleta*.

Figure 8: Kuyisa village



Source: Bayissa Chala, "Assessment of Malaria as a Public Health Problem in Fincha'a Sugar Fctory Based on Clinical Record", p. 41.

The rest of the villages are established by the Sugar factory at different places in the valley. Super visors of sugar cane fields and sugar factory workers live there. The villages are provided with pure water, clinics, electricity and primary schools.

The factory provides services of housing with good water supply, electricity and other facilities.³⁰ It has also built primary schools at each village, two high schools (one at Fincha'a-Hagamsa village and the other at Hagamsa town) and 7 clinics at different villages. The schools are administered by the government. The government assigned teachers; provides books and paid salaries for the teachers while the factory provides teachers with house and other facilities. The teachers informed me that they are not happy with their life, because their salary is much less than that of the factory workers' salary.³¹ One hospital is under construction at Hagamsa town. There is also Guest house with clean bedrooms and other services. It is built for guests who come to the area from the Ethiopian Sugar Corporation and from high government officials. But, there are no sufficient hotels and Banks in the valley.

Workers of the factory and private individuals go to different towns like Shambo and Fincha'a which are at 48km distant from the center of the factory site and towns like Kombolcha and Dadu to get banking service. According to the informants, they are exposed to unnecessary payments.

Even though it is not satisfactory, Fincha'a Hydroelectric power and Fincha'a Sugar Factory have constructed few institutions for use of local people. For example, Fincha'a Hydroelectric power constructed one Elementary school at Fincha'a town. It built this school initially for the children of workers of the Fincha'a hydroelectric power plant.³² Fincha'a Sugar Factory built one block which has four class rooms for Fincha'a preparatory school. These are the only significant things the Factory and the power plant did for the local communities who live outside the site of these organizations.

Contrary to this, these organizations have got more advantages from these areas. They have taken more lands from the local peasants, especially Fincha'a Hydroelectric power. The Fincha'a Lake which is the source of water to generate electricity and for cultivation of sugar cane dawn stream in Fincha'a Valley inundated more farm land and grazing land which previously the local people used it. Fincha'a Hydropower also took additional land

³⁰ Interview: Ato Alemayehu W/Giorgis.

³¹ Interview: Ato Dame Gutu

³² Interview: Ato Belay Kasa and Wozero Beletech Biru.

from farmers and planted eucalyptus trees on it. The local communities are not allowed to use these trees. If they cut a tree from the protected area, they are imprisoned soon.³³ These are areas where the two organizations are being criticized by the local people.

There is high dramatic change in the Fincha'a Valley in relation to the population. As I have discussed in the previous chapters of this thesis, when the state farm started in 1974, there was no permanent human settlement in the valley. The opening of the state farm ushered a new era in the History of the valley. With the beginning of the state farm, many people from different parts of the country migrated to the valley to be employed in the state farm (later sugar factory) and others as merchants. According to 1996 House and population Census, the total population of the valley was 18,360. Of this figure, 9,557 were male and females were 8,803.³⁴ But, in 2012 the population number rose to 60,330. This population included workers, their families and other group of society.³⁵

Negative Impacts of Fincha'a Sugar Factory and Fincha'a-Amarti-Nashe Dam

The FAN project is constructed to generate hydroelectric power and to irrigate lands in Fincha'a Valley. As I have discussed in the previous sections of this thesis, the two organizations have contributed much to the national development. On the other hand, they have also caused different negative impacts on the people who live near the projects sites. The *Fincha'a* and *Nashe* hydroelectric power projects have far reaching social, economic, cultural and environmental side effects at local and regional levels. They introduced land use changes in the area. The land that is now submerged by the *Fincha'a*, *Nashe* and *Amarti* Lakes was previously used for crops cultivation and grazing land. It was also sustaining the lives of many farmers and their families.³⁶ Decline of agricultural productivity, environmental degradation in watershed, deforestation, loss of wild animals and soil erosion are the immediate consequences of these dams. Those local people, who

³³ Interview: *Wozero* Jalane Jima.

³⁴ 1996 Population Census

³⁵ Interview: *Ato* Tena Muleta

³⁶ Abdi Boru Ayana and Ekasit Kositsa Kulchai, "Land Use Change Analysis Using Remote Sensing and Markov Modeling in Finha'a Water Shade, Ethiopia", *Kasetsart Journal (Natural Science)* (Kamphaeng: Kasetsart University, 2012), 144. ; Interview: *W/ro* Jalane Jima and *Ato* Hailu Nemera

were relocated due to the constructions of these projects, were not compensated properly; and the benefits of electric power and sugar factory are also not for the zone and local people as it was indicated in feasibility studies. Just let me discuss some social, economic and environmental impacts of the FAN project in the area.

a). Social Impacts: The negative social impacts of the dams are profoundly related to displacement resulting in disruption of their social lifestyles, weakening of cultural ties and continuities, impact of relocation on the population inhabiting new host areas and widening gender gaps related to disproportionate sharing of social costs and project benefits which has a direct and indirect consequence on social aspects of the people.³⁷

Studies showed that more than 24,000 people were relocated and displaced against their will during Fincha'a dam. Again in similar way, during the construction of Nashe dam, about 1,200 households and 4,000 families were forced to leave the project site.³⁸ Local communities were not adequately consulted as outlined in Chapter 10, Article 92 of the 1995 Ethiopian Constitution which states, "People have the right to full consultation and to the expression of their views in the planning and implementation of environmental policies and projects that affect them directly".³⁹ Their view was not given attention and as the result, they were affected with the implementation of this project. Such an inadequate process limits the ability of affected people to influence the resettlement and compensation process, and increases the chances that such processes negatively affecting them.

The government established resident for the resettlement program in Fincha'a valley and allocated 250 million *birr* for the implementation of this program. Accordingly it undertook the construction of residential houses and communal services institutions like primary school, health center, a church, and office for development Aid employee, two flour mills and water wells.⁴⁰ However, people are not interested to settle there. They thought that the resettlement area is not a good place for living. Furthermore they argued

³⁷ Buzayehu Tefera Olana, "People and Dams: Environmental and Socio-Economic...", 41; Interview: *W/ro Tafashe Gerba and Ato Tesfaye Shiferaw*.

³⁸ Ethiopian Electric Corporation, *Fincha'a-Amarti-Nashe Hydropower Project* (Addis Ababa: Sheger Printing Press, 2011), 26.

³⁹ FDRE Constitution, 1995.

⁴⁰ Ethiopian Electric Corporation, *Fincha'a-Amarti-Nashe Hydropower...*, 28.

that this area is full of Malaria and Tsetse fly which would be a dangerous against their health and health of their animals.⁴¹

The displacement of these people from their productive, favorable, and temperate original places to unfavorable areas like in *Fincha'a* valley, steeper areas, etc and urban areas in the zone; disruption of their socio-cultural lifestyle; weakening of social interaction based on blood ship, religion, village to village relations, and the breaking of social associations like *equb*, *idir*, *mahiber*, etc. are some aspects of social problems that challenged the local communities. Cultural complications following rural-urban migration and the need to adapt to new people and environment are also the other aspects of social problems.

The in-viability of the relocation site for human and livestock lives create health problems to these people and their livestock hence these people originally adapted to temperate climate. Additionally, social communications, education systems and access to markets for information and interaction are stopped due to *Fincha'a-Amart-Nashe* dams.⁴² The lakes separated people of the area and made communication difficult. For instance, the *Nashe* dam water has stopped social communications and interactions between communities of *Alshaayyaa Igguu*, *Alshaayyaa Daaddoo*, *Ejersa Maccaa*, *Hoomaa Kulkulaa* and *Sandaaboo Dongoroo*.

Before the creation of the dam, these communities have intensive interactions because they share common markets and social organizations like *idirs*, *ikubs* and *mahibers*. But, today, due to lack of water transportation on *Nashe* water dam these people are unable to go to markets frequently and the previous social ties were stopped. The other point related to lack of modern water transportation is the disruption of educational system in *Nashe* watershed and upper parts of the region. Students from remote areas crossing the water dam are unable to follow their education in schools like *Daaddoo Siree Budoo (1-10 grades)*, *Wandoo (1-8 grades)*, *Gabaa Lagaa (1-8 grades)*, etc.⁴³

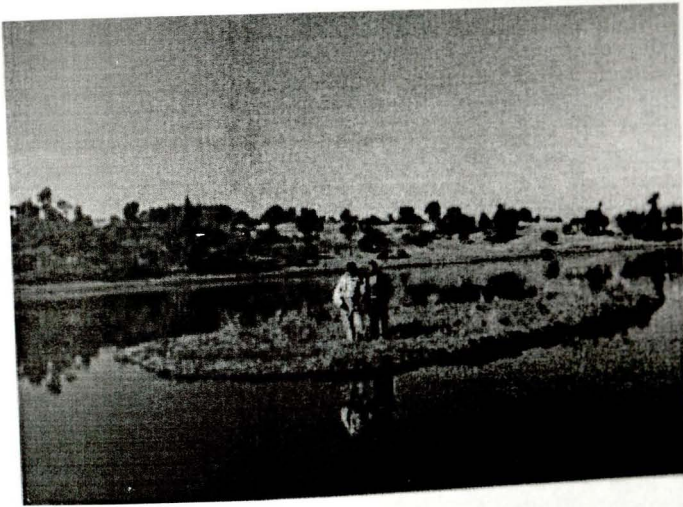
⁴¹ Interview: *Ato Korenti Yabasa*.

⁴² Buzayehu Tefera Olana, "People and Dams: Environmental and Socio-Economic...", 35-36.

⁴³ Interview: *Ato Amanu Geleta*

Modern means of water transportation are not exist on Fincha'a-Amarti-Nashe dam. The local people use traditional means of transportation such as traditional boats and floating grasses known as *saarmalee* for transportation. Both forms of transportation are not safe at all since the wind induced waves often divert travel direction and the methods are constrained by low loading capacity and speed. I have taken its photo in 2016 when I was there.

Figure 9: Floating grass as a means of transportation.



Source: photo graphed by the researcher

The local people informed that at different time many people were sacked at different occasions when they travel on lakes using traditional means of transportations.⁴⁴

b) **Economic Impacts:** The conventional approach of evaluating water development schemes relies on economic arguments. The project has negative impacts (actual and possible) especially on the lives of the local people. The area from which the people were displaced has had agricultural potential. The farmers of this area have been major suppliers of agricultural products in the zone, region and at the national levels.⁴⁵ Buzayehu reported that as a result of the project, the community in *Fincha'a* watershed is

⁴⁴ Interview: *Ato Amanu Mijana* and *Ato Kasahun Belaye*.

⁴⁵ Buzayehu Tefera Olana, "People and Dams: Environmental and Socio-Economic....",38.

nowadays confronted with a decline in crop and livestock production and even recently hit with famine. Before the construction of these dams, the communities were known by the number of cattle they had. There were several families who held more than 100 cattle before the dam and who identified themselves from those with less cattle by 'wearing' a stomach of a cow in public, a so-called "*garaacha uffachuu*". This tradition is not existed today; because no household owns such a large number of animals these days.⁴⁶

c) **Political Impacts:** The political impacts of the FAN dam relies on the matrix of displacement, compensation, resettlement programs and the overall imbalance between benefits and costs of the project. In most cases, these political impacts are the implied or derived from involuntary resettlement of people, disruption of productive systems and lifestyles, inequity in sharing of costs and benefits, affection of the livelihood of the host population, the gender gaps and displacement. There are political debates regarding the project. According to one of the informants, "The project has initially pure development motive. However, now days, it is highly politicized project at all levels of governments."⁴⁷

The fourth national election context has heated political debates. Put differently, at local level, both the local government and the opposition political parties used the project as a means to win election. On one hand, the government has made promises for the local people and particularly for the displaced ones while the opposition political parties has questioned the commencement of the project politicizing as a means to penetrate the area and exploit. The local government publically and structurally limited the opposition from undertaking campaigns and competes in *kebeles* around the project. People around the project couldn't get alternative party to elect.

d) **Environmental Impacts:** one of the key issues during hydropower developments is the environmental issue. The Fincha'a reservoir has inundated a total of 100km² of grazing land, 120km² of swamp, 18km² of cropland and 1.2km² of forest.⁴⁸ The total area that was potentially available for community use was 1,032 km² (78%) in 1957, which

⁴⁶ *Ibid.*, 39. ; Interview: *W/ro* Jalane Jima.

⁴⁷ Interview: *Ato* Solomon Deneke.

⁴⁸ Buzayehu Tefera Olana, "People and Dams: Environmental and Socio-Economic...", 90.

had diminished to 790 km² (60%) in 1980.⁴⁹ The construction of *Amarti* dam in 1987 and its diversion to *Fincha'a* reservoir has accelerated advantages to the national economy on one hand and disadvantages to the people of the zone on the other hand. The increase in the size of displaced people from their original land and the absence of proper compensation for them as well as the loss of natural resources like forest and wild animals, and temperature change are things that due to the expansion of *Fincha'a* hydroelectric power plant and increase in the size of *Fincha'a* reservoir and an independent creation of *Amarti* dam.⁵⁰ Lastly, the environmental degradation as a result of interrelated factors necessitated by the project is the negative impacts.

Abdi Boru and Ekasit researched the land use change in *Fincha'a* water shade by dividing the period from 1985 to 2005. The first portion of that period was from 1985 to 1995. During this period agricultural land and water bodies increased in area by 29,814 ha and 10,476 ha, respectively. On the other hand, forest land, grazing land, swamp areas and shrub land decreased in area by 16,931, 8,642, 12,498 and 2,218 ha, respectively. According to their report, one-third and one-quarter of the increase in the area of agricultural land during the first study period was from forest land and grazing land, respectively. The contribution from shrub land was less than 7%. During the same period, the analysis further indicated that grazing land, swamp and shrub land contributed about 41.44, 11.34 and 18.36%, respectively to the increase in the total area of water bodies in the study area.⁵¹

During the first period, that was from 1985 to 1995, they found that agricultural land and water bodies have increased in the area by 60,606 (53.59%) and 19,184 ha (93.10%), respectively. During this period, tremendous losses in forest, grazing land, swamp area and shrub lands were observed by as much as 36,225 (50.48%), 17,376 (31.23%), 19,948 (51.37%) and 6,240 ha (24.81%), respectively.⁵² These show the extensive deforestation under taken by the farmers whose farm lands were inundated to expand new farm land.

⁴⁹ Buzayehu Tefera and GeertSterk, "Environmental Impacts of a Hydropower...", 96.

⁵⁰ Interview: *Ato* Korenti Yabasa and *Ato* Gurmessa Bayata.

⁵¹ Abdi Boru Ayana and Ekasit Kositsa Kulchai, "Land Use Change Analysis ...", 144.

⁵² Abdi Boru Ayana and Ekasit Kositsa Kulchai, "Land Use Change Analysis ...", 144.

During the second study period from 1995 to 2005 (Table 3), agricultural land and water bodies increased in area by 30,792 and 8,708 ha, respectively. However, forest land, grazing land, swamp and shrub land decreased in area by 19,293, 8,734, 7,450 and 4,022 ha, and respectively.⁵³

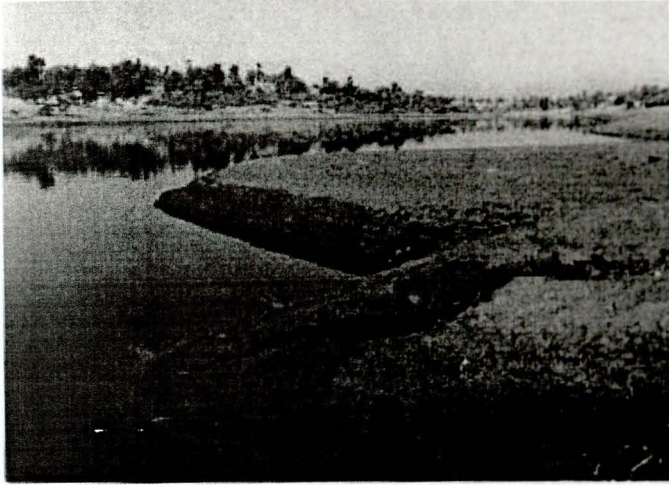
Buzayehu also strengthened the findings of Abdi Boru Ayana and Ekasit Kositsa Kulchai. He reported that apart from the extensive water body, the most important changes in land use were the loss of grazing land and the increase in cropland. Grazing land that occupied 555 km² in 1957 was reduced to 332 km² in 2001.⁵⁴ In the same period, the area of cropland went up from 403 km² to 607 km², indicating large-scale conversion of grazing land into cropland. The increase in water bodies resulted from the diversion of the Amarti River to the Fincha'a reservoir through a 1.5 km tunnel in 1987 which supplies an annual runoff of 138.8 Mm³ to the reservoir. The increase in the total volume of water in the reservoir resulted in an increase in the area of backwater flow that inundated large areas of swamp areas, grazing, shrub and agricultural lands.⁵⁵ Running water at the steep area eroded soil and deposited it in the water shade. This causes deposition of silt in the reservoir and decreases the water storage capacity of the reservoir.

⁵³ *Ibid.*, 145.

⁵⁴ Buzayehu Tefera and GeertSterk, "Environmental Impacts...", 95.

⁵⁵ Abdi Boru Ayana and Ekasit Kositsa Kulchai, "Land Use Change Analysis....", 145.

Figure 10: Sedimentation in Fincha'a hydropower reservoir (Photo: February 2003)



Source: Buzayehu Tefera Olana, "People and Dams: Environmental and Socio Economic....,p. 24.

In 1975 the state farm was established that mainly produced food and commercial crops until 1991. Starting from 1991 up to 2006 more than 8,064 ha of land has been cleared and irrigated for sugar production. "The irrigated field has increased a lot. In 1997/98 about 932.27 hectares of land was harvested and after eight years, i.e.2005/06, it has increased by more than seven folds. By implication the vegetation cover is retreating with the same or even more rate."⁵⁶ In Fincha'a Valley, the size of natural vegetation decreases rapidly due to the expansion of both state farm and sugar factory. Getahun illustrated in his research report the decrease of forest coverage. The forest coverage in 1984, 2005 and 2009, was 63.74% (237.61Km²), 32.61% (122.78Km²) and 8.75% (46.18Km²) respectively.⁵⁷ Causes forest distraction in Fincha'a Valley during the period under discussion were fire, charcoal by local community, and acts of the sugar factory for construction as well as for the expansion of farm land. The clearing of natural vegetations

⁵⁶ Ahmed Amdihun Mohamad, "GIS Remote Sensing Integrated Project...., 121.

⁵⁷ Getahun Kitila, "Land Use Changes Induced by Irrigation Development in the Fincha'a Sugar Estate, Blue Nile Basin, Ethiopia", *Journal of Biodiversity and Environmental Sciences (JBES)*, vol. 3, No.11, (2013): 38.

resulted in land degradation, loss of forests, wild life and emitting green house gases (due to rotten vegetation), changes in water quality and quantity.

Researches that conducted by the department of research of FSF explained the prevalence of erosion problem in Fincha'a sugar cane irrigation farm.

"...sheet, rill or gully erosion has been noted both on the previously cleared state farm and the relatively virgin bush land. Active gully erosion was seen along all water courses."⁵⁸ Soil erosion reduces fertility of the soil and reduces agricultural production. The environmental impact of the project is in progress. Observations made during the field visit indicate that the obvious malfunction of the waste water treatment plant of the sugar factory poses a threat to downstream water bodies, especially to Fincha'a River and its ecosystem.

The Administration of Fincha'a Sugar Factory

Since its establishment up to today Fincha'a Sugar Factory has been under the administration of Ethiopian Sugar Corporation. The Fincha'a Sugar Factory was established by the Council of Ministers following a standard arrangement under which the general manager is directly accountable to the board of directors, which consists of various government officials. The general manager has full operational autonomy.

The Ethiopian sugar industry has passed through different organizational structure. First when the earliest two Sugar Factories were established, they were directly under the administration of foreign company; because, at that time, the factories were the sole properties of this foreign company. Later, in 1962/63 when Ethiopians began to take share in these sugar Industries, the administration system was also changed.⁵⁹ Following the down fall of Haile Sellasie I government, Darge nationalized the three sugar factories:

⁵⁸ Girma Teferi, "Soils, Irrigation and Mechanization", *Review of Sugarcane Research in Ethiopia(1963-1998)*, Ambachew Damte and Girma Abejehu (ed.), vol. I, (Addis Ababa: Ethiopian Sugar Corporation, 2000), 140.

⁵⁹ Ethiopian Sugar Corporation, *Sugar Industry in Ethiopia* (Addis Ababa:

Ethiopian Sugar Corporation, December 2017), 5.

Wonji, Shewa and Metehara Sugar Factories and established the first Ethiopian Sugar Corporation. The corporation assigned to administer the existing sugar factories, and the Addis Ketema and Asmara Candy Factories.⁶⁰

In 1992, the previous Sugar Corporation was dissolved and the three Sugar Factories were established as separate Public enterprises. Again in 1998 The Ethiopian Sugar Industry Support Center was set up and the responsibility to provide support to the Sugar Factories. The Support Center was established as a Share Company of the Development Bank of Ethiopia, Ethiopian Insurance Corporation, and the Wonji-Shewa, Metehara and Fincha'a Sugar Factories. After fifteen years, the Support center was replaced by another newly established organization called The Ethiopian Sugar Development Agency. It was established to assist the Sugar Factories in project development, research and training. The present Sugar Corporation was established 2010 by the Council of Ministers Regulation No.192/2010 replacing the former Ethiopian Sugar development Agency. The corporation is operating under a Board of Management while it is organized under Ministry of Government Enterprises.⁶¹

Some Identified Problems in Fincha'a Valley

One of the identified problems is fire. Irresponsible persons and natural factors are recognized as main factors for the outbreak of fire in the valley. Informants explained that fire is initiated by local wild honey collectors, hunters, lumber producers, fire wood collectors, and moreover Incense collectors around Abay River are always torch fire. The informants also affirm that fire can be caused naturally.⁵⁹ Most of the time, the fire comes from the north direction, low land, and gradually expands to the other directions. The dry savannah serves as fuel. In these months fire reaches every place except river banks and on the tip of the escarpments, nearly all vegetations in the valley are burnt. This process eliminate of all floras, and leads to erosions of the top soil ideal for agriculture at the start of the rain. During rainy season savanna and fire resisting plants (plants with tick trunks)

⁶⁰ Ethiopian Sugar Corporation, Ethiopian Sugar Corporation Profile. Com/index.php/en/about.

⁶¹ *Ibid.*, ; Shifera Jarso, "Report presented to 23rd ISO Seminar", 2013.

⁵⁹ Interview: Ato Korenti Yabasa.

regenerate.⁶⁰ Another problem is Malaria. Malaria is an epidemic disease that caused by minute parasitic protozoa of the genus Plasmodium and transmitted by female Anopheles mosquito that lives by sucking human blood. Warm moisture low land, irrigation canals and using of sprinklers (which keep the area through the year) in the valley create favorable conditions for breeding of mosquito in the sugar factory site.

Bayissa Chala made a case study on the prevalence and spread of malaria at Fincha'a Sugar Factory in 2007. He identified that malaria was a serious human health problem in Fincha'a Valley. According to his finding, in a single year in 2005, 4,986 malaria cases were treated.⁶¹ Dr Sori Raje also explained the severity of malaria in Fincha'a Sugar Factory site in 1990s. During that period out of five identified health problems, malaria stood first. "The 1998 malaria epidemic caused wide spread morbidity to all the people leaving here, though the mortality rate was contained at a very low level by the effort made by the healthy workers of the sugar state."⁶²

Document of Fincha'a Sugar Factory Healthy Center indicates that in 2011/2012, of the identified Top ten diseases, Malaria was at the first place. Of 98,808 patients that visited FSF H. Center, 14,184 (14.5%) was the case of Malaria.⁶³ The fluctuating weather conditions together with the expansion of irrigated fields and ditches can be the factors behind the problem. Alemayehu Bekele, *et al* discussed the correlation of malaria risk with temperature and water storage as indicated here. "The increased malaria risk is partly due to increased temperature and partly due to increased water storage, leading to increased mosquito breeding sites."⁶⁴ The fluctuation in malaria case records arises from the inconsistent use of anti-malaria chemical sprays and expansion of irrigated lands.

⁶⁰ Interview: Ato Korenti Yabasa.

⁶¹ Bayissa Chala, "Assessment of Malaria as a Public Health Problem in Fincha'a Sugar Factory Based on Clinical Records and Parasitological Surveys", (MA thesis, Department of Biology, Addis Ababa University, March 2007), 38.

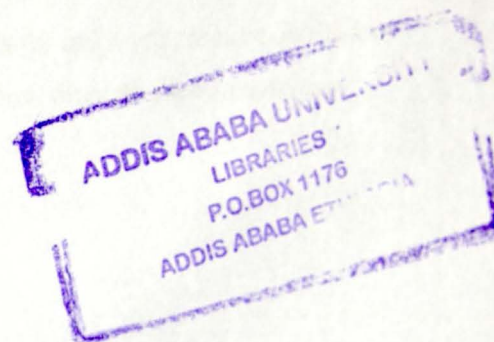
⁶² Fincha'a Sugar Factory Inauguration Bulletin, April 24, 1999, 38.

⁶³ Fincha'a Sugar Factory Health Center, Annual Report, 2011/12.

⁶⁴ Alemayehu Bekele, Aduagna Woyessa(PhD), Wokgari Deresssa(PhD), Tesfaynesh Lema, *Health and Settlement: Impacts, Adaptation and Co-Benefits of Climate Change in Ethiopia*, Seyuom Mengitou(ed.), (Addis Ababa: Ethiopian Academy of Sciences, 2015), 41.

The second and third top health threats are Giardia and Scaries. These intestinal problems in most cases are water born diseases which can be related with unhygienic water use for drinking. The haphazard increment of intestinal parasite and malaria case records can be due to natural or human made reasons. On the one hand the natural set up of the valley and the climatic conditions can facilitate the birth and growth of pathogenic organisms in the area. On the other hand human interference has changed some of the existing natural systems. In other words the expansion of human made environments results in alteration and degradation of the natural ecosystem.⁶⁵ In the sugar state by itself the spread of malaria is not the same. In some areas it is more serious than others. Bayisa listed areas where more residents were affected by malaria.

The of villages like 'E', Kuyisa and 'A' were more affected than the residents of other Villages due to geographical a proximity of these villages to Hagamsa water stream and poor living conditions in the villages. Spatially, the residents of Kuyisa and village 'E' are low paid daily laborers, so, they could not give care to their life.⁶⁶ Due to prevention method taken by clinics of the factory, the effect of malaria has been decreased and its impact is not as such of the 1990s. Medical treatments are given at clinics that were established almost at each village.



⁶⁵ Ahmed Amdihun Mohamod, "GIS Remote Sensing Integrated Project in Fincha'a...", 125.

⁶⁶ Bayissa Chala, "Assessment of Malaria as a Public Health Problem...", 54.

Conclusion

The *Finchaa-Amarti-Nashe* (FAN) development project is one of the newly operating multipurpose projects in Ethiopia. The main justification of the project is its economic benefits at; local, regional and national levels. Using natural resources for development of the country is unquestionable. But the environment and the life of the local people have to get priority. The possible negative impacts of the projects of the Fincha'a-Amarti-Nashe dam seemed to be sound. The displacement and resettlement patterns and the consequent social, cultural and moral disruption thereof of the project are central. Social and cultural disruptions; poor property compensation and resettlement programs; possible climate change and environmental issues cause decrease in the agricultural productivity in the area and at regional level as well. Totally due to the construction of Fincha'a-Amarti-Nashe dam 44,000 people left their lands and gave up their farms and herds. Their households did not benefit from hydropower because there is not electrification yet in some rural *kebeles* even in Abay Choman *woreda*. Thus, there is little interface with national level interest, such as the supply with hydropower for other regions of the country, the creation of a wetland habitat for precious birds or the increase of the national water storage. Besides these decision-making processes took place only at policy and water administration level without any participation of the local stakeholders. Deforestation and water storage (as dams and in canals for irrigation) became the causes for the outbreak of diseases such as malaria and water born diseases such as dysentery.

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3. List of Informants

No	Name	sex	Age	Place and date of interview	Remark
1	Amenu Geleta	M	65	7 th March, 2017 at Fincha'a	He was a professional worker of state farm and factory from 1974 to 2005. He is more knowledgeable in the developments of both the state farm and the Sugar Factory.
2	Alemayehu W/Giorgis	M	61	On 8 th July at Hagamsa	He is a professional factory worker. He gave more important information about the factory activities.
3	Amanu Mijana	M	58	On 7 th March, 2017 at Fincha'a	He worked in different posts of Abbay Choman <i>woreda</i> so; he is intelligent in providing important data about the impacts of Fincha'a-Amarti-Nashe dam.
4	Beletech Biru	F	52	On 7 th , July at Fincha'a	She was born there and She teaches there. She gave important information on the impacts of Fincha'a dam.
5	Belay Kasa	M	68	7 th March, 2017 at Fincha'a	He was a worker of both the state farm and the factory. He is knowledgeable about the state farm and sugar factory.
6	Dame Gutu	M	43	On 8 th July at Hagamsa	He is a teacher at Hagamsa primary school. He gives clear data about life of teachers in Hagamsa.
7	Dereje Mekonnen	M	65	7 th March, 2017 at Fincha'a	He was FSF worker. He knows more about Fincha'a Sugar Factory development.

8	Gurmesa Bayata	M	79	7 th March, 2017 at Fincha'a	He was a worker of both the state farm and Sugar Factory. He has more experiences about the development of the institutions.
9	Hailu Nemera	M	76	On 6 th July 2017, at Fincha'a	He has lived there since the construction of Fincha'a dam. He gave more information on the construction of Fincha'a hydropower plant.
10	Jalane Jima	F	69	7 th March, 2017 at Fincha'a	She lived at Fincha'a water shade for more than 40. She gave detail information about the impacts of Fincha'a dam.
11	Kasahun Ayele	M	75	On 7 th , July at Fincha'a	He was a worker in the Fincha'a hydropower plant for a long years so, is equipped with the information on development of Fincha'a hydropower plant.
12	Korenti Yabasa	M	57	On 7 th , July at Fincha'a	He was a worker of a factory. He is a proper informant in describing the development of the valley.
13	Solomon Deneke	M	43	On 3 rd March at Sakala	He was a member of Oromo National Congress Party. He gives detail information about political impacts of Nashe dam.
14	Tadese Tafese	M	80	On 7 th , July at Fincha'a	He was a worker of both state farm and sugar factory. He knows more about the development of both organizations.

15	Tafashe Gerba	F	56	On 8 th March, at Fincha'a	She is a teacher at Fincha'a primary school. She described about government role in the resettlement program of the Nashe project.
16	Tena Muleta	M	52	On 8 th , July at Hagamsa	He is chairman of Hagamsa town. He gave me important information about the population of the valley as well as about the resettlement program of Fincha'a Hagamsa.
17	Tesfaye Sheferaw	M	45	7 th March , 2017 at Fincha'a	He has served in different departments of Abbay Choman <i>woreda</i> . He is more knowledgeable informant about the development of Nashe dam and the impacts of the Fincha'a-Amarti-Nashe dam.

15	Tafashe Gerba	F	56	On 8 th March, at Fincha'a	She is a teacher at Fincha'a primary school. She described about government role in the resettlement program of the Nashe project.
16	Tena Muleta	M	52	On 8 th July at Hagamsa	He is chairman of Hagamsa town. He gave me important information about the population of the valley as well as about the resettlement program of Fincha'a Hagamsa.
17	Tesfaye Sheferaw	M	45	7 th March, 2017 at Fincha'a	He has served in different departments of Abbay Choman <i>woreda</i> . He is more knowledgeable informant about the development of Nashe dam and the impacts of the Fincha'a-Amarti-Nashe dam.