



Research/Technical Note

Building Resilient Ecosystem and Diversifying Livelihood to Enhance Food Security in Chiro Woreda, Oromia Regional State, Ethiopia

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Abstract: In Ethiopia, famine is not strange. For the past forty years or so, the country has experienced recurring drought that has wiped out crops across the country. Agricultural activities, which hold the lion share of the economy, takes place in often highly degraded and vulnerable environments where there is substantial loss of vegetation, associated erosion and declining soil fertility. Moreover, huge demand for natural capital including biomass fuels exacerbates environmental degradation and affects food production. Unless inclusive response to the ongoing problem is initiated, there are concerns that the progresses that have been made in protecting the livelihoods of the poorest people in rural areas will be undermine the country's gains in poverty reduction. To this end, the project "Integrate Landscape Management to Enhance Food Security in Ethiopia" was initiated by UNDP. It is five years project implemented by federal ministry of Environment, Forest and Climate change in six regions and specifically in two woredas of each region. Chiro woreda is one of the areas selected as project sites from Oromia regional state, Ethiopia. From the total kebeles found in woreda five were selected for the project. All relevant woreda and kebeles stockholder were participated to indentify local community problems and decide the specific interventions to enhance the objective of the project. Accordingly, the survey result has identified the potentials of the woreda to enhance food security and environmental benefits.

Keywords: Ecosystem, Food Security, Livelihood Diversification, Khat, Woreda

1. Introduction

In Ethiopia, famine is not strange. For the past forty years or so, the country has experienced recurring drought that has wiped out crops across the country. In addition, the majority of its populations live in rural areas that are heavily reliant on rainfed agriculture [1] and thus, in years of low rainfall, the threat of widespread starvation is high. In most part of the country farming takes place in often highly degraded and vulnerable environments where there is substantial loss of vegetation, associated erosion and declining soil fertility. Forest resources which are great sources of national economy are being degraded at alarming rate [2, 3] and these

degradation leading to widespread of food insecurity [4, 6]. Moreover, huge demand for natural capital to generate livelihoods exacerbates environmental degradation and affects food production. Ecosystem degradation not only compromise the ability of people to become self sufficient in food production, but also undermine the effectiveness of food security policies [7]. Ultimately, a range of approaches is needed to ensure the resilient ecosystem and continue sustainable development [8]. Unless inclusive response to the ongoing problem is initiated, there are concerns that the progresses that have been made in protecting the livelihoods of the poorest people in rural areas will be undermine the country's gains in poverty reduction.

In response to threat over ecosystem services due to human

activities [9] which leading to food insecurity [10], the project “Integrate Landscape Management to Enhance Food Security in Ethiopia” was initiated in 2017 by UNDP. It is five years project implemented by federal ministry of Environment, Forest and Climate change in six regions and specifically in two woredas of each region. The regions and woredas are Oromia (Chiro and Doba), Amhara (AngolelaTera and Menz Gera), SNNPR (Boricha and Duguna Fango), Tigray (Raya Azebo and Tanqua Abregele), Ethiopia Somali (Gursum and Tuliguled) and Afar (Abaala and Amibara) [11].

The goal of the project is to enhance long-term sustainability and resilience of food production systems by addressing the environmental drivers of food insecurity in Ethiopia. The overarching focus is on integrated landscape management (ILM) to achieve food production resilience in landscapes under pressure. ILM combines land management choices and Integrated Natural Resources Management with water and climate-smart agriculture, value chain support and gender responsiveness [11].

Of fundamental interest in all project efforts is whether a particular intervention is effective in accomplishing its primary objectives. A well-designed intervention is typically based on research evidence that articulates how the intervention's core mechanisms will work to achieve its goals and produce the desired outcomes. The important thing in evaluating the effectiveness of the project in achieving the desired objectives is through knowing the changes that comes after the implementation of the project. Here these changes are going to be documented regularly to scale out and up. Therefore the aim of this study is to identify the potentials of the project areas to enhance the effective implementation of the project.

2. Rationale / Justification

The recurrent drought is detrimental to the livelihood of the people in many parts of the country. According to HDRP [12], 7.88 million people in Ethiopia were required food assistance in 2018. This is exactly true for many lowland areas of Oromia region including west Hararghe where the people suffer from the shortage of rainfall. Chiro woreda is one of these areas where food insecurity problem is widely seen.

The production of cereal crops in combination with cash crop i.e. especially khat is the dominant sources of livelihoods in Chiro woreda. According to the information from local residents and development agents, previously the area was suitable for many types of agricultural activities and even they used to harvest many products from their farm land, including fruits, vegetables, cereal crops and coffee in addition to animal husbandry. Now days, this diversified activities are changing to sole activities; majority of the farmers are shifting their farm land into khat farms. However the area has still the potential for many production activities. The reasons behind shifting of the farm activities to khat production are many of which economic value and environmental factors are some among others according to the view of local farmers. Though khat is the third largest export cash crop next to coffee and oil

seed [13], and expanding to many parts of the country nothing has been done by the government to support its production and marketing system. As there are many studies that identify the importance of khat in society [14] some others [15, 17] criticize it for its health and socioeconomic impacts on human. The topic is left as debated issue whether the positive sides outweigh its negative impacts. Beside these, the farmers are changing the farm land previously occupied by other crops to khat farms. However, in one or the other way farmers' dependency on single production makes them vulnerable to many shocks. Hence, letting the people diversify their livelihood strategies may improve their resilience [4].

In the project site, the surrounding forest lands are deteriorating due tragedy of the commons. In addition, the absence of suitable resource management over the nearby watershed, the runoff and erosion are further degrading the productivity of the farm and arable land. It is this problems that exacerbating the current environmental problems of the area. Therefore, these surrounding landscape and/or watershed needs due attention as it determines the weather condition of that area in particular and other places in general. Here is the picture taken at one of the kebele selected for this project.

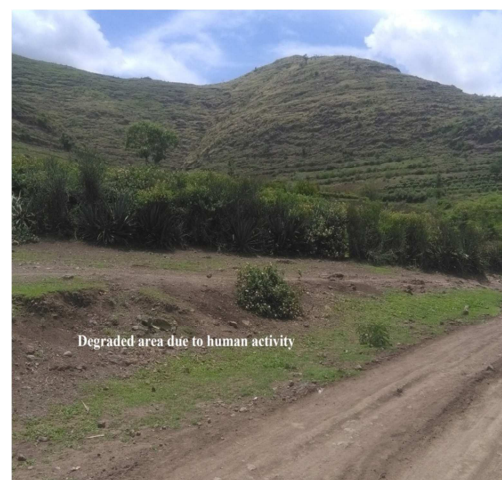
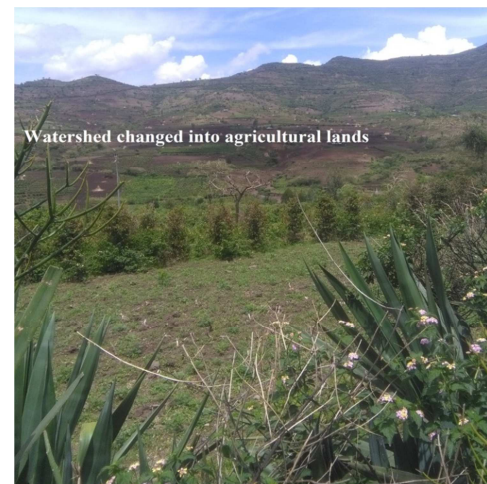


Figure 1. Area under different management system.

3. Methods for Problem Identification

3.1. Description of Project Site

Chiro woreda is one of the areas selected as project sites from Oromia regional state, Ethiopia. It is found 325 km east of Addis Ababa. The altitude ranges from 1,501 to 2,500 m.a.s.l containing 10% weyna dega, 70% dega and 20% kola. The annual average temperature ranges from 27.5°C to 38.5°C whereas annual rainfall across lowlands and highlands ranges from 600 to 1,000 mm. The woreda has undulating topography and mountainous characteristics with low vegetation cover and sparsely vegetated landscapes. Drought, shortage of water, soil erosion, flooding, animal forage scarcity, and lack of income diversity are the main threats to food security and sustainability.

3.2. Methods for Problem Identification

From the total kebeles found in woreda, five kebeles (Medhicho No.3, Yabdo Shembeko, Wachu Limay, Ifabas and Shola) were selected for the project due to widespread of environmental degradation and food insecurity problems. All relevant stakeholders in kebeles, woreda and zone including community representatives were participated to identify local community problems and decide the specific interventions to enhance the objective of the project. The participants represented from Agricultural & Natural Resource Office, Livestock & Fishery Production Office, Micro and Small Enterprise Office, Cooperative, Health office, Disaster Preparedness & Prevention Office, Women & Children Affair Office, Oda Bultum University, Chiro Sorghum Research and Training Center and other concerned bodies from woreda were involved in discussion.

4. Proposed Preliminary Actions for the Project

4.1. Awareness Creation

The problems and causes of environmental degradation need to be understood by the community. The poor management of the forest underlies the reason of ecosystem degradation in many areas. Letting the livestock to graze in the forest and illegal cutting of the forest is a prior problems which the community take as simple and even considering it as their rights. So, well organized and continuous awareness creation has to be made to teach them the probable consequences of environmental degradation. In addition, it's better to improve their knowledge on ways of diversifying their livelihoods to withstand the frequent environmental shocks they facing.

Further, thorough discussion on the project should be made with all relevant stakeholders on the central objectives of the project and on the way forwarded to achieve it. Specially, the communities need to understand the objectives of the project from all perspectives (i.e environmental, economical and social). They don't have to consider it as a 'free cake'

sponsored by some donor organization.

4.2. Specifying Beneficiaries and Area

The total numbers of beneficiaries and the digital map of an area going to be covered by the project have to be identified. This helps to evaluate and compare the real changes to come by the project in all directions.

Basically the issues of watershed management are not only the protection of the physical properties of the area. There might be associated conflicts of interests over resource between the people in the upper part of the watershed with those in down streams. Therefore, active involvement of all nearby communities and making them beneficiaries of the project will help to bring sustainable improvement on specified area.

4.3. Adoption of Participatory Forest Management

Participatory forest management is one of the sustainable resource management mechanisms, which has attained significant consideration at national and international level. In Ethiopia also this management system has introduced and being practiced with intension to deal with the persistent problem of deforestation and forest degradation through the participation of forest dependent society. According to the recent study [18, 19] the participatory forest management diversifies livelihood activities and improve the well being of participant households and also enhances participation in forest management as well as sense of ownership towards the forest [4]. Hence, it is also recommended to include the people in the selected kebeles of the woreda in managing of surrounding landscape and specified watershed. Unless the resource ownership and responsibility to protect the resource is given to the community there will be less management of the resource by the people. The figure below shows the area where the local people involved in resource conservation (a) and not involved actively in conservation (b).



(a)



(b)

Figure 2. Resource conservation with (a) and/or without (b) people involvement.

4.4. Creating Market Linkage

Increasing the production only cannot enhance food security, it require providing it to the consumer at right time. In this regard, working on value chain management and reducing postharvest losses, creating market linkages are required to overcome the problem and achieve the project objectives. Supporting the local farmers' organization to supply directly their products to local markets, i.e Hirna town, Chiro town, Kobo town, and even to the big institutions like Oda Bultum University, will help them to get maximum profit and also remove the involvement of informal brokers in the market.

5. Economic Activities

Diversifying the sources of income is the strategic things to withstand or reduce the vulnerability of households towards recurrent droughts and food insecurity problems. Moving beyond single sector interventions is required in order to restore and increase the resilience of both ecosystems and livelihoods. In this regard, the activities which are suitable and appropriate for the local surrounding are discussed with the surrounding community and experts of different discipline and hence the following are recommended:

a). Vegetables and fruits

Diversifying the economic activities on the farm land is a guarantee for the loss that may happen due to relaying on one activity. In some selected kebeles, the area has the potential to produce vegetables like Onion, Potato, Cabbage, Pineapple and fruit trees like Mango, 'Gishxa', Avocado, Apple and others that can diversify the income rather than simply investing on chat. Further, availabilities of the selected kebeles at adjacent to the main road of Addis Ababa to Dire Dawa and Harar city is another opportunities to easily make it available to the consumers. But the suitability of specified vegetables and fruits needs further study.

b). Animal fattening

In Chiro woreda, animal husbandry is less intensive system in which animals allowed to graze in the nearby forest area. Modern animal fattening system is not common among majority of the people and hence they do not get what they have to get on one hand and destructing forest ecosystem on the other hand. Therefore, it is necessary to apply the best agro-forestry system in which the livestock are supplied with feed from the grass planted to conserve soil and water and other complex feeds. This practice can complement other agricultural activity in increasing the production and even reduce habitat demolition. In such practices special attention should be given to animal dung management because it is the major source of green house gas which can pollute the air.

c). Bee keeping

Making the community to get non-timber forest products from the forest is one way to let people benefit from the resource and then conserve the resource. Introducing modern honey bee keeping systems which will help the people generate an income and develop sense of ownership towards forest resources.

Some of the potential opportunities for the practice are:

1. Suitable climate and agro-ecology
2. Afforestation and natural resource rehabilitation programs help improve bee forage allowing for the expansion of this activity
3. High local demand for honey, and good profit can be made from honey sales
4. Honey can easily be stored and then sold when prices are good
5. Frequent harvests are possible using modern hives
6. Local people's aspiration to change

Probable threats

1. Future droughts/rain-failure
2. Application of pesticides, and the presence of predators (such as honey badger and birds) and pests (wax moths) are challenges to beekeeping activities
3. Knowledge and skills gap in modern beekeeping still exists [20]

6. Conservation Measures

6.1. Soil and Water Conservation

Constructing physical structures and introducing biological soil and water conservation measures to the specified watershed at the upper part will determine the resilience of the local ecosystem and the availability of moisture in downstream areas. The selected watersheds, being highly exposed to erosion, necessary measures need to be taken. However, choosing the appropriate measures needs consideration of specific landscape. Here in the area like shown in the picture below, the biological measures are recommended as it has dual benefit i.e conserving environment and source of animal feeds.



Figure 3. Picture of selected watershed taken during rainfall.

The flood in the above picture flows between the farmer's farm lands. Therefore, there is high probability of eroding top soils from nearby agricultural lands. Some of the appropriate plants for soil and water conservations are: Elephant grass, Pigeon pea etc.

6.2. Tree Planting

An important mitigation measure to reduce the current climate change problem is planting trees which will sequester the green house gases (carbon dioxide) from the environment. Planting fruit trees will serve the community in enhancing food security in addition to its environmental benefits.

6.3. Area Closure

Letting the free grazing of livestock in the forest as well as on the range land will destruct the surrounding ecosystem. Moreover, it's better to manage livestock intensively for the specified period of time than holding large number of animals for long period of time without appropriate care and management. Excluding the entrance of livestock from specified area and applying other conservation measures (both physical and biological) will help to rehabilitate the degraded land and hence increase the resilience of the ecosystem.

7. Conclusion

The study was conducted in Chiro woreda, Oromia regional state with objective of identifying the potentials of the woreda to decide the interventions required for enhancement of food security. To do so, many stakeholders from different organization and representatives of the community were participated in the discussion. Accordingly, the area identified

for the interventions are economic activities and conservation measures. The study revealed as the woreda is potential area to let people engage in production of vegetables and fruits, animal fattening and bee keeping activities to diversify their livelihoods. In addition, to rehabilitate the degraded ecosystem the activities like soil and water conservation, tree planting and delineating the area from external disturbance were identified for intervention. Above all creating awareness on project objectives should be done to enhance the objectives of the project.

Ethical Rules

The research results are solely the works of researchers and do not represent the idea of any organization.

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Project Partners

Ministry of Environment Forest and Climate Change is the main implementing partner of the project. Further the partnerships of the project has established at local, regional and national levels in order to coordinate and establish synergies across sector line ministries, universities, non-governmental and private sector actors. Oda Bultum University is one of the partners for the project implementation. Funding partners are Global Environmental Facility (GEF), United Nation Development Program (UNDP) and Government of Ethiopia (GoE).

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