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## **The Adverse Implications of Environmental Degradation on Food Security: The Case of Werebabo Wereda Ethiopia**

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### **Abstract**

This study was conducted to investigate the effects of environmental degradation on food security in werebabo wereda. To achieve the objectives of the study descriptive case study was used by the researchers. The necessary data for this study was collected from primary and secondary sources. In this case, primary data were collected from respondents through interview (structured and unstructured), focus group discussion and personal observations. On the other hand, this study used non-probability sampling technique to select the target sites. Among the non-probability sampling techniques researchers used purposive (judgmental) sampling to get the resourceful persons on the issue at hand and to identify the study areas. Accordingly, three kebeles, namely Gedida, Arabati and Chali were selected based on the level of vulnerability to environmental degradation and its severe effect on societal livelihoods. Consequently, the data gained from respondents through primary and secondary sources was analyzed qualitatively in words (through descriptive manner via triangulations). Furthermore, the finding of this study shows that the main factors contributed to environmental degradations were identified as man-made and natural causes, including high population growth, free grazing, deforestation and landslides. On the other hand, the study reveals that desertification, migration, social conflict, unemployment and poverty were the main effects of environmental degradation on food security in the study area. Besides this, Proper land use, integration of farming practices at grassroots level, planting trees and integrated/holistic disaster risk reduction and early warning system were suggested to mitigate the challenges.

**Keywords:** Environmental degradation; Food security; Migration; Social conflict; Unemployment.

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## **1. Introduction**

The term environment is most commonly used to describing natural environment which consists of sum of all living and non-living things that surround human beings. Environment can embrace all elements, factors, and conditions that have some effects on growth and development of certain organism including mankind [4]. The history of mankind was highly influenced by means of environment. The speedy development of industrialization, urbanization and the expansion of population at the global level are the great temptations of human beings in contemporary times. The discharge of untreated waste, the effluents, the widespread neglect of environment, and use of open spaces near rivers as public conveniences is resulting in the pollution of major rivers, estuaries, sea-fronts, creeks and water channels. So that, such factors upon natural resources have a negative impact on food security.

Consequently, global environmental change including land degradation, loss of biodiversity, changes in hydrology, and changes in climate patterns resulting from enhanced anthropogenic emission of greenhouse gas emissions, will have serious consequences for food security, particularly for more vulnerable groups. In other words, growing demands for food in turn affect the global environment because the food system is a source of greenhouse gas emissions and nutrient loading, and it dominates the human use of land and water.

Most research linking global change and food systems focuses solely on the impact of climate change on agricultural production, or the impact of agriculture on land use, pollution and biodiversity. Interactions with other aspects of the food system such as food processing, packaging, transporting and consumption, and employment derived from these activities are often overlooked. Addressing food systems holistically, rather than separate components such as agriculture, markets or nutrition, demands the engagement of multiple disciplines and researchers to understand the causes and drivers of vulnerability.

In many rural areas of the developing countries, land, forest and water resources are under serious threat of degradation[2]. These and other type of environmental crisis which endanger the life of human beings, species of plants and animals have been on the global agenda since the 1972 Stockholm Environmental Conference. People, being users, victims and managers of natural resources, the impacts of natural resource degradation on them is also getting worldwide recognition these days.

According to[6] natural resource degradation directly affects the livelihood of the rural people in the developing countries by operating from two directions. Moreover, he pointed out that resource degradation results in reduced supply of energy for rural households with a consequence in reduced caloric intake and, on the other, the short supply of these resources require rural people to work harder than before and to expand additional energy. It is very essential to raise and discuss the arguments of Yeraswork in relation to energy supply-demand in the face of resource degradation. On one hand, he noted that the ongoing natural resource degradation reduces the supply of energy for the rural households resulting in reduced caloric intake. Because the effects of natural resource degradation result in low agricultural production, fewer per capita animal holding, shortage of fuel wood and water which means, the rural households will have less income.

In Ethiopia, climate change poses particular risks to poor farmers and pastoralists who have an immediate daily dependence on climate sensitive livelihoods and natural resources. The limited economic, institutional and logistical capacity to mitigate and adapt to climate change exacerbates the vulnerability of people in the country. The impacts range from recurrent drought and loss of biodiversity, rangelands and soil nutrients, to catastrophic floods and declining livestock and food production. Despite the vulnerability of Ethiopia to the impacts of climate change and weather extremes, little is known regarding the local level impacts and adaptation strategies [1].

According to [5] food insecurity is unswervingly related to environmental degradation. Food insecurity is a result of lack of income and access to food, which is driven by poverty. Global food insecurity can be addressed through a more equitable distribution and access to food. For example, in Ethiopia there is a vicious cycle of natural resource degradation and food insecurity driven by absolute poverty and population growth. The country is caught up on in poverty, environmental degradation and food insecurity circles.

Food security defined as: assuring to human beings the physical and economic access to the basic food they need, is a broad, crosscutting issue, which has implications for a number of different sectors in the economy. Food Security is often associated with food self-sufficiency and the need to grow more food. However, in reality it has much stronger links with issues of poverty, employment and income generation. For low-income economies, where a large percentage of the population lives in the rural areas and depends on agriculture for its income, increasing food production may be an important element in increasing food security[3].

Finally, as the researchers investigated different research findings, most researches are focused on the global impacts of environmental deterioration and little attention is given to the local level effects of environmental degradation on societal livelihoods. Therefore, this study focused on werebabo wereda which is given less attention by researchers so far to deal the adverse implications of environmental degradation on food security.

## **2. Objectives of the study**

1. To identify the causes of environmental degradation in the study area
2. To elaborate the adverse implications of environmental degradation on food security in werebabo wereda
3. To describe the mechanisms used by the house holds to mitigate the effects of environmental degradation on food security in the study area.

## **3. Methods**

This study was conducted based on qualitative approach. This is because; qualitative research provides researchers rich insights that could shape up the results. It can also offer information and ideas beyond what researchers could have captured through primary and secondary sources of data. To effectively investigate the adverse implications of environmental degradation on food security, the researchers were applied case study. The rationale behind using this design is the researchers' need to see the case in depth and to analyze the data in its natural setting. This type of research design is more appropriate for individual researchers since it gives an

opportunity for one aspect of a problem to be studied in some depth within a limited time scale. Geographically, the study area is located in Werebabo wereda which is found in south wollo zone, Amhara region of Ethiopia. Its distance is 447 k.m from Addis Ababa, the capital of Ethiopia. According to the 2007 national census conducted by the Central Statistical\_Agency of Ethiopia (CSA), the woreda has a total population of 100,530; from 50,459 are men and 50,071 women. The agro ecological zone of the area is dominated by Woinadega and Kola. The major crops produced are barely, wheat, sorghum, teff and maize. There are also horticultural crops like papaya, mango, banana and oranges. To generate the necessary data, the researchers were utilized both primary and secondary sources. In this case Primary data were obtained through interview (using structured and semi structured interview questions), focus group discussion and observation. Whereas secondary data were collected by means of document analysis. More importantly, to select the study sites non-probability sampling technique was utilized. From non-probability sampling technique, purposive (judgmental) sampling was used. Based on the level of vulnerability to environmental degradation and its effect on food security Gedida, Arabati and Chali kebeles were selected by the researchers. Although, the Wereda as a whole is exposed to environmental degradations, the problem is highly intensified in these three kebelles. Finally by using the result of primary and secondary sources, the data was analyzed qualitatively through triangulating the opinions of interviewees and documentary sources. To triangulate the data the researchers used narrative or descriptive techniques.

#### **4. Results and Discussions**

As it is stated under the introduction part, environmental degradation is one of the largest threats that are being looked at in the world today. The United Nations International Strategy for Disaster Reduction characterizes environmental degradation as the lessening of the limit of the earth to meet social and environmental destinations and needs. Environmental degradation can happen in a number of ways. At the point when environments are wrecked or common assets are exhausted, the environment is considered to be corrupted and harmed. According to the data collected from respondents through different techniques the following basic issues are discussed with regard to the effects of environmental degradation on food security in werebabo wereda.

##### ***4.1. Causes of Environmental Degradation in Werebabo wereda***

Among many factors the following man-made and natural factors are identified as the main sources or causes of environmental degradation in werebabo wereda.

###### ***4.1.1. Population growth***

According to the agricultural office of werebabo wereda, rapid population growth puts damage on natural resources which results in degradation of the environment. The increased number of population has vigor the demand for food, clothes and shelter. Therefore, the dependant nature of large number of people to a limited land or environment to sustain their livelihood makes the environment to be degraded.

###### ***4.1.2. Deforestation***

According to focus group discussants the clearing or removal of the trees by humans for human use, including wood products and for croplands and grazing lands. In the practice of clear-cutting, all the trees are removed from the land, which completely destroys the forest. In some cases, however, even partial logging and accidental fires thin out the trees enough to change the forest structure dramatically. On the other hand Rapid growth in population and urban sprawl are two of the major causes of deforestation. Apart from that, use of forest land for agriculture, animal grazing, harvest for fuel wood and logging is some of the other causes of deforestation.

#### **4.1.3. Natural Causes**

Degradation is most commonly associated with the activities of human beings; the fact is that environments are also constantly changing over time. With or without the impact of human activities, some ecosystems degrade over time to the point where they cannot support the life that is meant to live there. As the data obtained from the office of environmental protection authority, the most common natural phenomenon that contributed to the degraded nature of the land in werebabo wereda are landslides and wildfires that are usually destroy local plants and animal communities to the point where they can no longer function and this lead to the vulnerability of the environment.

#### **4.1.4. Free grazing**

According to interviewees, free grazing occurred when more animals are concentrated at the piece of land to grazing purposes. This caused serious damage to the land when too many animals are allowed to graze on a piece of land. When many animals are released and the grass is eaten down to the roots faster than it can grow back. As a result of this, overgrazing caused and accelerated soil erosion and loss of soil fertility in the study area. As a researchers practically observed, Gedida kebele large number of animals are concentrated around one particular land. This results the soil being unable to retain as much moisture as it needs. Once animals have overgrazed the land, it is left barren with no protection and the wind blows away the soil. Finally, the land is remained unproductive and threatens peoples' livelihood.



**Figure 1:** The land over grazed by animals

**Source:** Werebabo Wereda Environmental Protection Authority (2016).

#### **4.2. The Effects of environmental degradation on food security in the study area**

As stated above population growth, natural disaster and deforestation are the main factors that significantly contributed to environmental degradation in werebabo wereda. According to the results of this study, the following effects of environmental degradation on food security are discussed.

##### **4.2.1. Desertification**

As respondents pointed out desertification occurred in Werebabo Wereda when productive lands are turned into non-productive desert as a result of poor land management. This occurred when dry land ecosystems are extremely vulnerable to over exploitation by the society and inappropriate land use that results in underdevelopment of economies and in entrenched poverty within the Wereda residents. In addition to this, as we personally observed vulnerable kebelles over cultivation, inappropriate agricultural practices, overgrazing and deforestation have been the major causes of land degradation and desertification. It is in fact a result of much deeper underlying forces of socio-economic nature, such as poverty and total dependency on natural resources for survival by the poor.

Desertification in Werebabo Wereda reduces the land's resilience to natural variations in climate. It disrupts the natural cycle of water and nutrients. It intensifies strong winds and wildfires. Desertification is not only a means to hunger in Werebabo Wereda but also becomes an increased threat to national security for everyone because of its nature of spillover effects. Due to this, peoples failed to produce agricultural crops and they leave their home to search better life in another area.



**Figure 2:** The picture shows the environment which is exposed to desertification

**Source:** Werebabo Wereda Environmental Protection Authority (2016).

##### **4.2.2. Migration**

According to werebabo wereda office of food security, the notion of migration involves complex patterns of multiple causalities in which natural and environmental factors are closely linked to economic and social issues. The office expressed, people migrated outside their home land due to different reasons and implications. When environmental damage reaches the point where it leads to a reduction in people's standard of living, out-migration from the area is a common response. There is a range of social and environmental ramifications of such population movements.

The effects of environmental degradation extend beyond the affected dry land areas. Due to the combined effects of desertification and socio-economic susceptibility or vulnerability increased, the greater human migration is common in the study area. When large numbers of displaced people are temporarily resettled, they often clear away vegetation for farming and firewood and this invariably lead to deforestation and soil erosion.

Deterioration of environment displaced people and forcing them to leave their homes and lands in search of better livelihoods. This is because of environmental change or degradation process affecting people who are directly dependent on the environment for their livelihood and causing them livelihood stress.

On the other hand, Seid argued that population movements have social and environmental implications in areas of out migration. This is based on an assumption that, migration may provide remittances, enabling rural communities receiving them to undertake productive activities other than overexploiting natural resources.

Due to this and other factors, young girls and boys are seen leaving their rural areas to nearby towns. In addition to this, these young girls and boys are migrated to Arab countries to search better life. As parents of migrated boys and girls stated, youngsters are leaving their home due to environment related poverty and unemployment. However, due to the illegal nature of migration to different countries, particularly to Middle East countries through crossing borders on foot, without water and food exposed them to lead misery life and even death.

#### **4.2.3. Social conflict**

As the wereda security office stated, there are conflicts which are environmental induced. The contradictions that occurred among people are over grazing land and over cattle .There are also conflicts over cultivable land amongst peasant farmers within the same ethnic groups. However, most of these rural conflicts over land and cattle have been going on over a long period, with very little attention given to them. Even today such conflicts go unnoticed and unreported unless large-scale killing and injuries takes place and the state intervenes militarily. Furthermore, environmental deterioration in land productivity and scarcity of water has contributed to the intensity of competition in the study area.

Disputes among peoples, occupational and resident groups resulted in destruction of farmlands. With the destruction of farm crops and in some cases retaliation or revenge by the cultivator to killing livestock owned by the herdsmen hampers the overall food production, both in crops and meat, which increased hunger, disease, and malnutrition. Another important potential human security effect of environment conflict

linkages in the study area is economic decline which further impoverishes the whole residents. As the researchers personally observed the study site, economic productivity has influenced environment-conflict disruption of valuable property, or stagnation of productive activities or indirectly via other economic related effects such as decreased in agricultural production.

It is evident that armed conflicts can lead to environmental problems in terms of both resource scarcity and environmental degradation. However, those environmental problems, whether caused by armed conflict or by other means are increasingly understood to play an important role in generating or exacerbating disputes that might lead to loss of life and property.

Aside from a scarcity of land, one of the main causes of social conflict in the study area is joblessness and financial problems. Other indirect drivers in social conflict are inefficient farming and stock raising systems affected by and in turn, promoting environmental degradation which in turn, leads to unemployment and shortage of money. The social conflict occurred in the study area created instability and disrupts production systems and marketing channels, destroying jobs and infrastructures..

Particularly, the Afar pastoralist societies have migrated with their animals, from water source to grazing lands in response to drought as well as part of their normal mode of life to borders of Werebabo Wereda. During this time, the Amhara ethnic groups carried guns to move back to pastoralist animals and to protect their agricultural production from free grazing.

As a result of this, people are died in both sides and properties are damaged, particularly homes are burned and families are migrated to nearby kebelles. While the people are died and displaced, the Wereda administration has given little attention to overcome the problem peacefully.

#### ***4.2.4. Lack of job opportunity or unemployment***

According to the information obtained from the Wereda agricultural and rural development office, among the total population of the Wereda residents most of them are youngsters and currently dependent on their families and they are unemployed. This implies majority of the local communities earn their livelihood directly or indirectly from agricultural production. Those who are land less or do not have adequate land suffer from unemployment. With the exception of underemployment engendered by a scarcity of land, unemployment is a product of the Wereda's inefficient agricultural and livestock raising sector. Particularly, insufficient farming and stock raising systems are creating underemployment with idle workers unable to find off-farm employment and other activities. Regarding the level of unemployment, the office of food security forwarded the following statement: "Safety net program has taken as a major job opportunity in the study area. Poor and large number of individuals have participated and earned their income from this project. However, the continuity of the project is under question and it will not be considered as a reliable source of income generating activity. Rather, it is a short term project which cannot overcome peoples' livelihood in the long run"

#### ***4.2.4. Poverty***



According to respondents, poverty was analyzed both a cause and effect of environmental degradation in the study area. The circular link between poverty and environment is an extremely complex phenomenon in WerebaboWereda. In the study area, inequality fosters unsustainability because the poor who rely on natural resources more than the rich deplete natural resources faster as they have no real prospects of gaining access to other types of resources. Moreover, the degraded environment accelerated the process of impoverishment, again because the poor depend directly on natural assets. As a result of this, poverty is a major contributing factor to land degradation as it forces people to destroy the resources that are around them for the sake of survival and security. As the researcher observed, poor people who do not have access to land, subjected to depend on the most fragile areas and resources for farming activities. This situation implies that they have no other choice other than to use what resources are available to them, even if these result in the degradation of the land and threaten societal security. As FGD stated, unfair land allocation in the study area is also the root of land degradation and is closely linked to poverty. This is because poor people often have little choice over how to use their land. In conditions of poverty people do not have access or money to purchase the most appropriate or effective resources for farming. Due to this and other inconveniences, the exploitation of existing natural resources highly exposed to be degraded.

#### ***4.3. Interventions taken to alleviate the effects of environmental degradation on food security in the study area***

According to respondents, farmers used crops which can sustain desertification and modern fertilizers to increase production capacity. Beside this, diversification of incomes through livestock, bees and poultry activities are undertaken to mitigate the problems of food insecurity. On the other hand, education on family planning mechanisms is given by stake holders to reduce the rapid population growth in the study area. In addition, to restore degraded land and protect soil erosion and landslides peoples' are engaged in terracing activities. Finally, to overcome the problems of migration and unemployment, youths are organized in to micro and small enterprises by the wereda's administration through borrowing money from the government.



**Figure 3:** People on terracing

**Source:** Werebabowereda environmental protection authority (2016)

## **5. Conclusion**

The result of this study reveals that environmental degradation has resulted severe impacts on food security in worebabo wereda. According to the result of the study, scarcity and poor management of resources coupled with high competition among the local communities become the sources of environmental degradation and resulted food insecurity among societal livelihoods. Moreover, the poor performance in agricultural farming and production is a major factor in aggravating environmental deterioration and its effect on food security. While agricultural production has declined due to multifaceted problems, people's migration, poverty, unemployment and conflicts are increased and the suffering of people could be the big challenge for societal livelihoods. In general, the combination of man-made and natural calamities such as competition over scarce resources, environmental degradation and local conflicts has put a greater impact on depletion of the people's asset in the study area.

## **6. Recommendations**

Based on the results of this study, the authors forwarded the following actions as possible solutions to mitigate environmental degradation in order to sustain food security in the study area.

- ✚ Conservation practices should practice to increase sustainable farm productivity.
- ✚ Proper land use and farming practices should be integrated at grassroots level for each specific agro-ecological zone.
- ✚ The administration office of worebabo wereda should practice planting trees over degraded land to protect the soil from strong wind and from being washed away by soil erosion.
- ✚ The Wereda should develop integrated/holistic disaster risk reduction and early warning system.
- ✚ The Wereda administration has to develop proactive mechanisms to protect the threats of drought and food insecurity.

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