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Sustainable Development in Ethiopia: Effects of Agriculture on Land and Social Sustainability

Taye Alemu
Lecturer at Ethiopian Civil Service University, Department of Development Management

Abstract
Agriculture which is a key driver of Ethiopian economy is very much dependent on rain and land resources. If land resources are not utilized in a sustainable manner, no doubt that it is impossible to guarantee long term sustainable development. In consequence, ensuring a balance between natural resource utilization and socio-economic development is expected from every growth oriented efforts. In view of that this study has intended to assess sustainable development in Ethiopia in the context of agricultural development. More specifically it sought to review impacts of agricultural practices on land and social sustainability as well as to describe the effects of social variables on land resource. The study was conducted by using secondary data obtained from Central Statistical Agency (CSA) from year 1995 to 2016. The collected data has been analyzed and presented using descriptive statistics such as average, ratio, table and charts. The findings of the research shows that agriculture is expanding and making use of more marginal lands in the highland parts of the country at the cost of natural ecosystem. Agriculture is positively affecting rural poverty and unemployment situation relatively, but it is at the expense of environmental resources. High population pressure in rural areas is also putting pressure on land resources of the country.
Key words: agriculture, land, social sustainability and sustainable development

1. Introduction

1.1 Background and Justification of the Study

Agriculture, which is a source of livelihood for 83% of the population, 50% of domestic product and 90% of foreign currency earning, is a key driver of Ethiopian economy. Nevertheless, agricultural activities and practices in the country are dependent on rain and land resources (Edwards, 2010). If land resources are not utilized in a sustainable manner, no doubt that it is impossible to guarantee long term sustainable development. In consequence, ensuring a balance between natural resource utilization and socio-economic development is expected from every growth oriented efforts (Philor, 2011).

Cognizant of this fact however, the Ethiopian government has already commenced different policies, strategies and programs aimed at enhancing poverty reduction efforts of the country. Since the Rio-dejanero conference, the country has been engaged in major undertakings. One of the key areas of such engagement is improving the agricultural sector in a way that it goes along with sustainable development path (EPA, 2007). In its agricultural development strategies, the government has put land and social sustainability as central objective to eradicate poverty and achieve long term economic growth (MoFED, 2010).

In spite of effort was made to promote agricultural development through conserving land resources, still improving agricultural productivity and ensuring food security remains a difficult task (Georgis, 2015). Productivity of farm land is declining from time to time due to land degradation. As a result, it has left the country to be one of the largest external food aid recipients in Africa and undermined the prospects of fighting poverty (Philor, 2011). Thus, farmers in Ethiopia are caught in a vicious circle of low level of income and productivity even though attempts have been made to address environmental degradation and food insecurity (Menberu, 2014).

From the aforementioned discussion it is clear that there exists an important but neglected research gap needs to be investigated very well. For one thing sustainable development is a long term process which requires continual data analysis to check its progress and provide feedback to decision makers on time. For the other thing, there was no evidence that designate sufficient studies were conducted on the impact of agricultural activities on land and social sustainability in the context of small holder farmers (Di Falco et al., 2011& Georgis. 2015). In the same way, despite effort was made in including agricultural issues on various policy documents, there were no studies made on the balance between components of sustainable development. In consequence, losing a clear insight about that issue will make government's poverty reduction intervention efforts pointless. Moreover, it reduces abilities' of local institutions in ruling-out challenges faced in making sustainable development programs effectively address the negative impacts of agricultural practices.

Thus, the primary objective of the study was to assess the impact of agriculture on land and social sustainability; and suggest possible recommendations. The specific objectives that guide the research process towards the achievement of the overall purpose were to:

1. describe the effects of agricultural practices on land resources sustainability in Ethiopia
2. portray the effects of agricultural activities on social variables in Ethiopia

3. describe the impacts of social variables on land resources sustainability in Ethiopia

1.2 Significance of the Study

Since the objective of the study is closely linked to the impacts of agriculture on land and social sustainability in Ethiopia, it provides indispensible information to evaluate efforts have been made to balance social, economic and environmental sustainability. The findings can also be used as an input to improve similar future plans and agricultural growth strategies. Moreover, local level agencies and ministry of agriculture get benefit from the research as it helps them identify gaps created while they tried to implement sustainable agricultural development programs. The result of this study can also be used as a starting point for other interested researchers to make further detailed research on the area.

1.3 Scope of the Study

The population of the study was limited to all smallholder farmers found within Ethiopia. That is because on one hand the objective of the study is closely linked to agriculture which is dominated (smallholders perform 95% of Ethiopian agriculture) by smallholders. On the other hand, the Ethiopian government agricultural development strategy focuses smallholder farming system. Agriculture is emphasized in this research among other sector because Ethiopian economy is dominated by this sector which is sources of 50% of the GDP and 85% of employment.

1.4 Data and Research Method

Data Type and Sources

The study is mainly empirical in nature that depends on critical analysis of data and literatures. As a result, data required for the study was taken from Ethiopian Statistical Agency (1995 to 2016.) Specifically, time serious data collected on agriculture, household consumption and expenditure, employment and labor force survey was used. Furthermore, secondary data sources consists of government plan, policies, strategies, statistical records, reports and various literatures written on sustainable development have been used.

Techniques of Data Analyses

To make the data ready for use, quantitative data processing techniques such as editing, coding and tabulation have been used. The processed data then was analyzed means of descriptive statistics such as average, ranges, percentage and ratios; and presented by using tables and bar graphs.

2. Literature Review

2.1. Introduction

This chapter mainly devoted to reviewing theories developed on issues related to agriculture, land and social variables with respect to sustainable development. The intention was to provide theoretical foundation serving as a framework to guide analysis of findings. Accordingly, first it concentrates on providing elucidation on concepts and historical background of sustainable development. Then, notions of sustainable development plus nexus between agriculture, land and social variables are presented.

2.2. Concepts of Sustainable Development

Sustainable development refers to a development that meets the needs of the present generation without compromising the abilities of the future generation to meet their own need (World Bank, 2011). Sustainable development can also be defined as a way in which environmental resources are utilized to meet present needs while assuring the long-term productive potential of these resources (Ryden, 2008). In other words, the principle of justice and equity among generation's need should be considered in the use of environmental resources (Harmsworth, 2002). It is also understood as it includes the achievements of three interrelated objectives as maintaining economic growth, social wellbeing and protection of the environment in an integrated and balanced manner (UNECA, 2014).

2.3. Historical Backgrounds of Sustainable Development

Sustainable development has become an important global priority issue for policy discourse and international development assistance in the 21st century (Stringer, 2008). The concept has received its first worldwide recognition in 1972 at the UN Conference on the Human Environment held in Stockholm. In the conference the international community agreed that both the environment and development, which have been addressed as a separate issue, until then, needs to be managed in a mutually beneficial way (Bartlett, 2006).

Even though the conference played a role in promoting sustainable development thinking, its effectiveness was limited because environmental protection and needs for development were seen as a competing need (Camhis, 2006). The notion has gained increasing momentum and popularity across various sectors after the Brundtland commission report made in 1987. The report addressed the severe and negative

impacts of human activities on the planet, that the pattern of growth and development would be unsustainable if it continues unchecked. The report was taken as a starting point for the most current discussion on the concepts of sustainable development (Sharachchandra, 1991).

The ground-breaking step came into existence in 1992 with the first UN conference on environment and development hailed in Rio de Janeiro. Concept and principles of sustainable development have been formulated and accepted by policy makers all over the world. Thereafter, different countries determined to follow sustainable development path that permit them to simultaneously address both socio-economic and environmental concerns (Barbara, 1993).

2.4. Sustainable Development in Ethiopian Context

Right after the 1992 Rio Conference, like most developing countries, Ethiopia launched different policies and strategies (EPA, 2007). Among others, the country developed national conservation strategy and population policy in 1993. In the same way adopted Poverty Reduction Strategic Paper, Plan for Accelerated Development to End Poverty, Growth and Transformational Plan, Climate Resilient Green Economy Strategy. Apart from that, the Ethiopia Strategic Investment Framework for Sustainable Land Management was introduced to improve rural livelihoods by scaling up sustainable land management practices with the objective of restoring and sustaining the productivity of Ethiopia's land resources (Aklilu, 2006).

The basic purpose of all these policies and strategies were to ensure sustainable development by harmonizing the rate of population growth and economic growth with natural resource utilization. Furthermore, strategies recognize that sustainable development in Ethiopia will be achieved if the social, economic and environmental issues going on in a balanced manner and ensuring that benefits accrued are equitably shared among the citizens of the country (MoFED, 2010). Similarly, the country indorsed Agriculture led Industrialization strategy to serve as an engine for economic development and poverty reduction. The strategy has given greater emphasis on agricultural productivity improvement and growth on the basis of smallholder farming system. The basic purpose of the strategy is to balance the social, economic and land sustainability's as a means of reducing poverty and achieves economic development (Pimbert, 2006).

2.5. Dimensions of Sustainable Development

Sustainable development is a continuous process of improvement in terms of people's living standards while maintaining the quantity and quality of environmental resources. It can thus be understood in terms of improved economic, social and environmental well-being (UNECA, 2014). The three pillars of sustainable development are inseparable and need to be pursued in an integrated and balanced manner.

Economic Dimension

Economic growth is achieved, if the capacity is properly preserved. It means in other words that, level of income and employment opportunity are maintained and increased as required along with due consideration for acceptable environmental and social sustainability (Hippu & Sudhakara, 2008). An economically sustainable system must be able to produce goods and services on a continuing basis by avoiding extreme sectoral imbalances which damage agricultural or industrial production (Jonathan, 2000).

Social Dimension

A socially sustainable system provides adequate social services such as health, education, gender equity, political accountability and participation. The social dimension also emphasizes on conditions adaptive to major demographic changes like population change (Maler and Munasinghe, 1996). Social sustainability is judged by whether all citizens of a given society have access to minimum standards of living, security, human rights, basic needs and benefits, including access to affordable health and education services at the place and time they require them (UNECA, 2014).

Environmental

An environmentally sustainable system must maintain a stable resource base by avoiding over-exploitation of renewable resource systems. On other words, it means depleting non-renewable resources only to the extent that investment is made in adequate substitutes (Bayoumi, 2010). This includes maintenance of biodiversity, atmospheric stability, and other ecosystem functions not ordinarily classed as economic resources (Jonathan 2000). Progress towards sustainable development depends on understanding the interactions among these environment, social and economic dimensions and their complementarities (UNECA, 2014).

2.6. Sustainable Development in the Context of Agriculture

The need to feed an ever growing population through agriculture is affecting global land and water systems in a particular way. To achieve sustainable development, on one hand current chimerical intensive production techniques which are leading to serious land degradation and water pollution must be replaced with organic fertilizer and integrated pest management. On the other hand, agricultural growth should go along with social and economic sustainability (Bayoumi, 2010).

Agriculture and Economic Sustainability

Agricultural sustainability requires the improvements of the economic viability of a farm in multiple ways (Wu & Irwin, 2008). In the short run, improving soil management and intensive cultivation can increase yields. However, for such economic benefits to be sustainable across generations improving soil quality and water availability, as well as other environmental benefits from sustainable practices raises the value of the farm and provide for payments for environmental services. Economic viability can also be achieved through reducing machinery, chemical fertilizer and pesticide costs (Pimbert, 2006).

Agriculture and Environmental Sustainability

Sustainable agriculture requires the use of ecologically sound agricultural practices that have little to zero adverse effect on natural ecosystems. From sustainability view point it is expected that such a practice enhances environmental quality and the natural resource base upon which the agricultural economy depends. Typically this is achieved through protecting, recycling, replacing the natural resource base such as land/soil, water and biodiversity that contribute towards conservation of natural capital. Organic fertilizers can be used to supplement natural inputs, as needed. Under sustainable agriculture, synthetic chemicals known to harm soil organisms, soil structure and biodiversity are avoided or reduced to minimum use (Bayoumi, 2010)

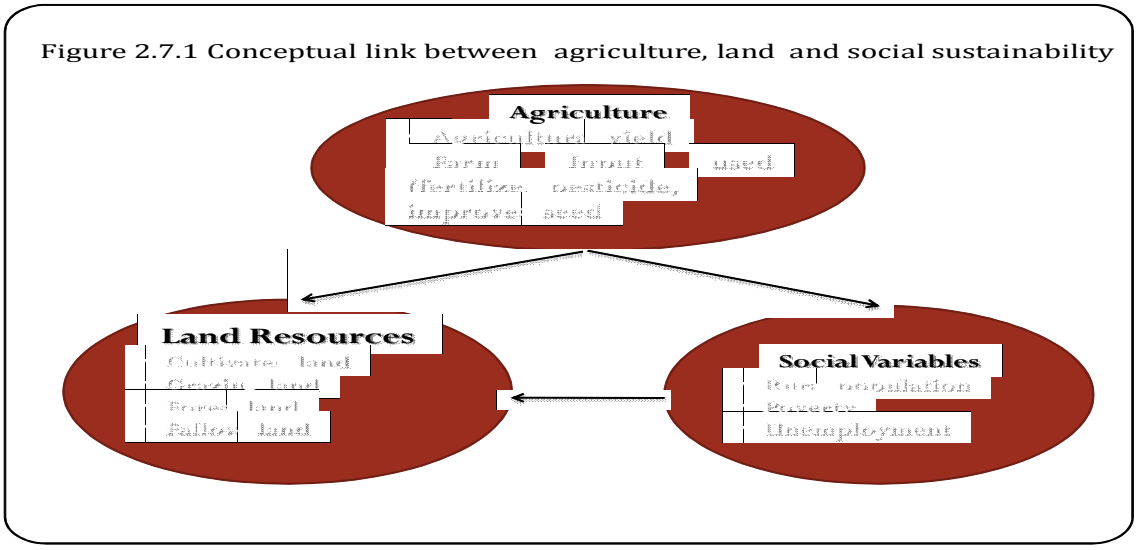
Agriculture and Social Sustainability

Social sustainability relates to the quality of life of those who work and live on the farm, as well as those in the surrounding communities. It includes ensuring equitable revenue or returns to different stakeholders of the agricultural production chain (Pimbert, 2006). In the context of high unemployment, sustainable agriculture can promote sharing of agricultural value added by more members of the community (Kassie & et.al, 2009). The significance of the agricultural sector to poverty eradication is apparent in the magnitude and vulnerability of small-scale farmers (Wu & Irwin, 2008). People typically have low qualifications and education levels can easily get employment in the sectors. Forests play an important role in providing livelihoods and increasing resilience for poor households. People rely on forests for their subsistence and as a source of income by harvested wood products, making charcoal and producing honey (Hippu & Sudhakara, 2008).

2.7. Conceptual link between Agriculture, Land and Social Variables

Theoretically sustainable development is a multidimensional concept that can be characterized and measured by diversified dimensions (Giovanni, Bellù, and Liberati, 2004). However, for some practical reasons (such as to stick to the research objective and difficulty associated with measuring all the indicators at a time) the researcher employed few (OECD, 2000) developed indicators. Accordingly, measures of agricultural practice includes agricultural outputs and land management practice. Social variables were related to population growth, poverty and employment. Land related impacts were linked to change in land/soil, forest and grazing lands. In view of that, the researcher has developed conceptual model that guides him to classify relevant facts and analyze research findings after examining extensive literatures. Accordingly, the subsequent sections represent the discussion of elements indicated in the framework.

Figure 2.7.1 Conceptual link between agriculture, land and social sustainability



Source: Developed by the Researcher

2.7.1. Impacts of Agriculture on land Resources

Agricultural activities determine the extent of food production at the same time the state of the environment (Smil, 2000). Rapid increase in food demand diminishes farm size in rural areas, as a result of which small farmers are forced to expand cultivations into a new areas which are not suitable for agriculture. The

fundamental environmental effect arises from land expansion or conversion of natural ecosystem into agriculture. Agricultural practices adopted for raising yields such as the application of inorganic fertilizer and pesticides can also result in damaging land resources (Pardey & et.al, 2001). Unwise and higher rate of inorganic chemical application on crop land increases nutrients and toxins in ground and surface waters which eventually raises health and environmental cost (Pimbert, 2006).

2.7.2. Impacts of Agriculture on Social Variables

There are multiple ways through which agricultural growth linked with social variables. Such pathways include poverty reduction through real income change, food price regulation, driving off farm income and employment creation among others (Mundlak, 2000). Agricultural growth is more effective in reducing poverty than growth in other sectors because the incidence of poverty tends to be higher in agricultural and rural populations than elsewhere, most of the poor live in rural areas and a large share of them depend on agriculture for a living (World Bank, 2008).

2.7.3. Impacts of Social Variables on Land Resources

Population pressure is an important factor in promoting land degradation including soil erosion and deforestation (Wu & Irwin, 2008). More specifically, the concentration of the rural poor on marginal land leads to resource over-exploitation and land degradation. Rapid population growth and migration can lead to unsustainable living conditions and increased pressure on the environment, especially in ecologically-sensitive areas. The search for better living conditions in urban areas reflects rural unemployment and unavailability of arable land (Menberu, 2014).

3. Data Analysis and Interpretation

3.1. Introduction

To assess the impacts of agriculture on land and social variables, it is imperative to scrutinize how such indicators as poverty, unemployment, arable and forest lands are transformed over a particular period of time. To examine this time series agricultural, household consumption and work force survey data collected by the Ethiopian Central Statistical Agency from 1995 to 2016 was primarily used. In addition, different statistical reports related with the topic under the investigation were included in the analysis. Thus, this paper presents findings and analysis of the combined data obtained from all data sources.

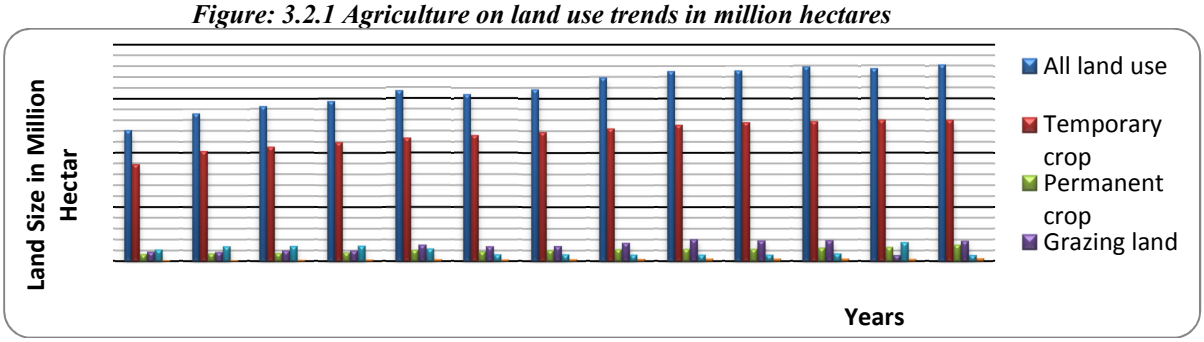
3.2. The Impacts of Agriculture on land Resource Sustainability

Agricultural activities in most parts of Ethiopia determine the extent of food production at the same time the state of the environment (Smil, 2000). Rapid increase in food demand diminishes farm size in rural areas, as a result of which small farmers are forced to expand cultivations into a new areas which are not suitable for agriculture. The fundamental environmental effect arises from land expansion or conversion of natural ecosystem into agriculture. Agricultural practices adopted for raising yields such as the application of inorganic fertilizer and pesticides can also result in damaging land resources (Pardey & et.al, 2001). In view of that, land resource impact of agricultural activities can be measured by the agricultural land use trends (trend and amount of arable land available for agricultural), the intensity of fertilizer and pesticide applications to croplands (Hippu, & Sudhakara, 2008).

3.2.1. Agricultural Land Use Trends

To analyze the impacts of agriculture on the environment, particularly on land resources, it is important to consider how arable land is being utilized. In view of that, figure *3.2.1* shows that most part of the land owned by private peasant is used for agricultural productions. Private holding rose from 12.1 million hectare in 2004 to 18.1 million in 2016, of which 11.6 million hectare (96.29%) operated by around 10.4 million households and 15 million hectare (84%) operated by 17.1 million people were used for agricultural productions respectively (*see table 3.2.1, in the appendix 1*).

Figure: 3.2.1 Agriculture on land use trends in million hectares



Source: compiled from CSA agricultural survey data between 2004 and 2016

Crop land (land that is used to grow temporary crops such as grains, vegetables and root crops as well

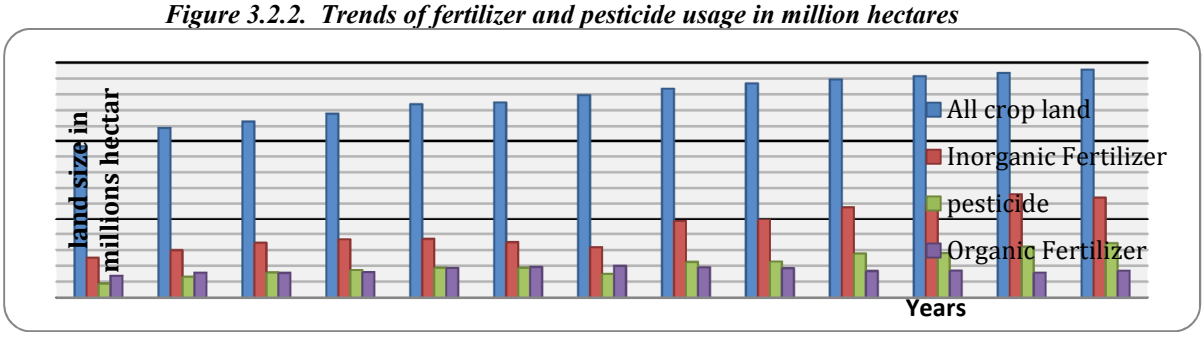
as lands that grow permanent crops such as fruit crops) has increased from 9.6 million hectare to 14.5 million hectare in 13 years time with the average annual growth rate of 3.5 percent (*see table 3.2.2 in the appendix 1*). It is clear from the figure that almost 4.5 million hectare of land is brought into cultivation with natural resources and environment from 2004 to 2016.

At the same time grazing and fallow lands have been changed from 0.89 and 1.01 in 2004 to 0.19 and 0.59 million hectares in 2016 respectively. The existence of fallow land indicates that the land is so much degraded or lost fertility to grow crops. In the same way forest lands which account almost 1% of the total land use remain considerably the same over the last decades with little proportionate change. On the bases of this information one can safely suggest that agricultural practice in Ethiopia is expanding the use of more lands (more than 4.5 million hectare within 13 years time) from time to time as a result of agricultural production.

3.2.2. Agricultural Chemical Utilization Trend

Agricultural chemicals are important in improving crop productivity and production in one hand and in damaging environment on the other hand. Extensive use of inorganic chemical on crop land increases nutrients and toxins in ground and surface water which eventually raises health and environmental costs (Pardey & et.al, 2001). This indicator shows the potential environmental pressure from agricultural activities.

Figure 3.2.2. Trends of fertilizer and pesticide usage in million hectares



Source: compiled from CSA agricultural survey data, 2004 to 2016

As it is shown if *figure 3.2.2* the intensity of fertilizers and pesticides used and the extent of area it is applied is significantly increasing from 2004 to 2016 year. The amount of area covered with fertilizer in 2004 was only 2.5 million hectare that has grown to 6.2 million hectare in 2016 with an average annual growth rate of 11.05 % (*see table 2.2.2 in the appendix 1*). In the same way the land area to which pesticide is applied also increased from 0.89 million hectare to 3.5 million hectare with mean annual growth rate of 13.4 % , while the overall crop land is expanding with 3.5 % per year (*see table 3.2.2 in the appendix 1*). Almost additional 3.7 million and 2.61 hectare of land was brought into where fertilizer and pesticides are applied. This shows increasing use of agricultural chemicals udder Ethiopian smallholding based agricultural system.

3.3. The Impacts of Agriculture on Social Variables

There are multiple ways through which agricultural growth linked with social variables. Such pathways include population growth, poverty and employment creation among others (Mundlak, 2000). Agricultural growth is more effective in reducing poverty than growth in other sectors because the incidence of poverty tends to be higher in agricultural and rural populations than elsewhere, most of the poor live in rural areas and a large share of them depend on agriculture for a living (World Bank, 2008).

3.3.1. Rural Population Growth Trend

Data presented on table 3.3.1 *(see in the appendix 1*) shows that agricultural production increased by 208 million quintal between 1995 and 2013 in just eighteen years time. Out of the total food crop production temporary crop product such as cereals, vegetables and root crops increased by 187 million quintal with mean growth rate of 11.54% per year, while permanent crop increased by 21 million with a growth rate of 60% per year over the same length of time. Correspondingly, the rural population has changed by more than 29 million within the same period of time with an average growth rate of 4.37%.

3.3.2. Rural Poverty Tend

It is a widely held notion that irradiating poverty is one of the most important objectives required to be achieved to bring about sustainable development (UN, 2004). Level of poverty of a household is measured by the head count index, poverty gap index and poverty severity index. The headcount index shows the proportion of population whose income/consumption is below the poverty line. The poverty gap index, on the other hand, measures how far an individual's income falls short from the poverty line. Poverty severity index measures the severity of poverty by giving more weight to the poorest of the poor. Increase in these indicators implies a worsening of the poverty situation which eventually reducing environmental qualities as the poor usually depends on environment for survival either through charcoal making or land cultivation.

Table 3.3.2 portray that rural poverty in Ethiopia is declining overtime. The poverty head count index shows

that the overall proportion of people living below the poverty line was 47.5%, 45.4%, 39.3% and 30.4%in1995/96, 1999/2000, 2004/05 and respectively. In the same way the poverty gap index indicates that about 13.4% in 1995/96, 12.2% in 1999/2000, 8.5% in 2004/05 and 8% in 2010/11 people falls short of the poverty line or far from the poverty line. Additionally, the rural area poverty severity index stood at 0.053, 0.046 and 0.027 in1995/96, 1999/2000 and 2004/05 respectively. Calculated poverty severity index also shows that the number of people called as the poorest of the poor reduced from 5.3% in 1995 to 3.5% in 2010/11.

Table 3.3.2 Trends of poverty across rural areas

level	Poverty indices over time				% Change of poverty indices over time		
	1995	1999/00	2004/05	2010/11	1999/00-1995	2004/05-1999/00	2010/11-2004/05
Head count index	0.475	0.454	0.393	0.304	-4.42	-13.44	-22.64
Poverty gap index	0.134	0.122	0.085	0.08	-8.95	-30.3	-5.88
Poverty severity index	0.053	0.046	0.027	0.032	-13.21	-41.30	18.52

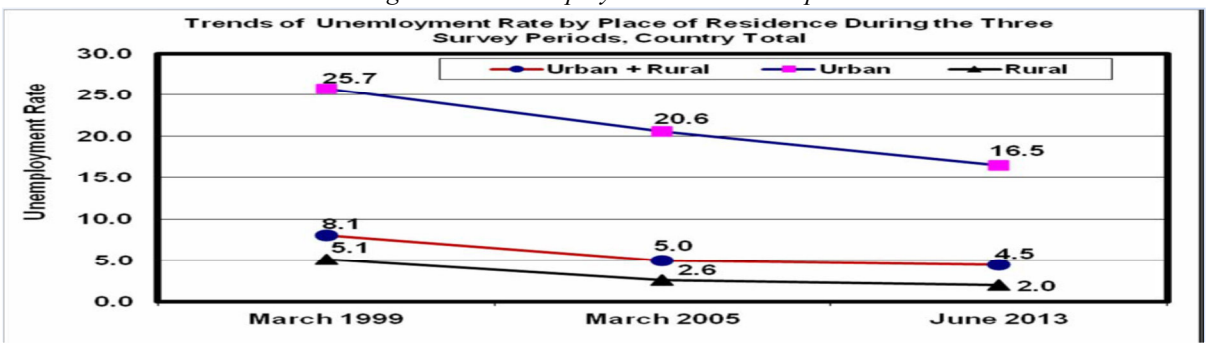
Source: HICE survey of 1995/96, 1999/00, 2004/05 and 2010/11

The difference in the indices between 1995/96 and 1999/2000 shows a slight decline, while the head count, poverty gap, and poverty severity indices in 2004/05 for rural areas is lower by 13%, 31%, and 41%, respectively than the levels in 1999/2000. The analysis indicates that there was a decline in the proportion of rural people who are below the poverty line and the average gap of the poor from the poverty line and improvement in the distribution of income among the rural poor. The decline in poverty gap and severity could be attributed to high rate (11 % average yield increment per year for temporary crops while rural population growth rate was around 4.47 % per year). This shows that despite significant portion of rural people is taken out of poverty every year; it is still predominantly a rural phenomenon.

3.3.3. Rural Unemployment Trend

Figure 3.3.3 shows that the general national level unemployment in Ethiopia is declining from time to time. The overall national level unemployment rate declined from what it was 8.1 % in 1999 to 4.5% in 2013. The rate of rural unemployment on both sex (male and female) was 5.1 % in 1999, 2.6 % 2005 and 2% in 2013. However, national labor force survey results indicates, indicates declining trend, unemployment is predominantly problem of urban areas than rural areas. Unemployment rate in urban ears was 25.5 % in 1999, 20.6 % 2005 and 16.5 % in 2013.

Figure 3.3.3 Unemployment rate in Ethiopia



Source: *CSA, statistical report (2014)*

The agricultural sector is greatly influencing economic performance in Ethiopia which contributes about 85 % of the total employment in Ethiopia. Of course, about 25 per cent of rural households earn some income from non-farm enterprises, but less than 3% of these who rely exclusively on income from such enterprises (MoARD, 2010). That means in other words, agriculture is the main and principal sources of employment in rural areas. Rural unemployment rate also fail from 5.2 % in 2005 to 2.00 in 2013 with an average rate of 3.2 % growth

3.3.4. The Impacts of Social Variables on land Sustainability

Social variables are critical factors in determining land resources sustainability. Among others significant impacts on land arises from population growth and poverty. More specifically, the concentration of the rural poor on marginal land leads to resource over-exploitation and land degradation. Rapid rural population growth can lead to unsustainable living conditions and increased pressure on the environment, especially in ecologically-sensitive areas (Menberu, 2014).

As it is clearly presented in *table 3.4.1*, the total numbers of agricultural household who were deriving their daily livelihood from agriculture in 2004 was estimated to be 53,605,695. According to CSA, agricultural

survey data, that number has significantly changed into 87,741,584 in the year 2016. In just thirteen years time rural population who depends on agriculture increased by 34,135,889 (61%) people. Correspondingly, the total cultivated land was changed by 4,897,903(51%) hectare for the same period. It is apparent from table Table4.3.1 that that agricultural land is growing slowly (3.52% per a year) as compared with population growth (4.37 %) and finally show stagnation or even some decline from 2010 to 2016.

Table3.4.1: Projected Rural Population of Ethiopia from 2004 to 2016

Year	Population	% Change in population	Cultivated Land/ ha	% Change in cultivated land	Grazing land/ha	Average holding/ household
2004	53605695		9,654,159		877,428	1.16
2005	56167995	4.78	10,887,953	12.78	844,626	1.20
2006	60962398	8.54	11,292,572	3.72	829005	1.24
2007	60598930	-0.60	11,787,775	4.39	987,415	1.25
2008	69516621	14.72	12,382,434	5.04	1,529,603	1.18
2009	67325924	-3.15	12,493,989	0.90	1,383,839	1.16
2010	66859820	-0.69	12,953,636	3.68	1,396,048	1.23
2011	76791488	14.85	13,358,881	3.13	1,708,624	1.18
2012	78456375	2.17	13,690,119	2.48	2,017,601	1.22
2013	76897825	-1.99	13939459	1.82	1,924,694	1.17
2014	78716365	2.36	14143660	1.46	1,943,214	1.17
2015	78582329	-0.17	14347861	1.44	577,000	1.14
2016	87741584	11.66	14552062	1.42	1,886,030	1.06
Mean		4.37		3.5		1.18
Range (% change)	**34135889 (61%)**		**4897903 (51%)**		**1008602(114%)**	

Source: compiled from CSA agricultural survey data, 2004 to 2016

From the above discussions it is possible to suggest that significant number of rural population growth led to increasing demand for cultivated and grazing lands since 2004.

4. Conclusion

This research has set intents at the outset to review impacts of agricultural practices on land, social sustainability as well as to describe the effects of social variables on land resource. Regarding the first objectives, the study has made known that agriculture in Ethiopia is expanding by converting natural lands into cultivation and by using agricultural chemicals intensively. For example, 4.8 million hectare new land was brought in into crop land between 1995 and 2016. Similarly, fertilizer and pesticides were applied to 3.7 and 2.61million hectare new land respectively in the same period. This shows that more natural lands and ecosystem are being converted into agricultural lands with increasing use of chemicals. No doubt that this puts land and marine ecosystem as well as human health at risk which eventually have effects on sustainable livening standards by risking food and environmental safety.

Regarding the second objective, the study shows that poverty and unemployment are declining in rural areas. The downward poverty trend is attributable to high production rate. For example, temporary crop yield was growing on average by 11 % per year while rural population growth rate was around 4.47 % per year. In other words, while population is increasing at a higher rate, crop production is also increasing to satisfy the demands of ever increasing population. Such a growth is achieved as a result of large proportion of the rural population is engaged in agriculture. Furthermore, unemployment is reducing in rural areas would mean the work force in agricultural sector is swelling from time to time. Such agricultural production growth and employment is the result of greater proportion of the rural population is engaged in agriculture at the expense of natural environment. That indicates the burden that the natural environment is bearing to be sources of livelihood to rural people. As rural employment is increasing it will have tremendous impact on land resources if there is no alternative source income available to rural community other than agriculture.

Regarding the third objective rural population growth (34 million people or 6.14 million households were included to rural population since 2004) led to increasing demand for food which eventually led to increasing demand to cultivated and grazing lands . Even the slow growth rate of agricultural lands in Ethiopia justifies that the land to be cultivated has already reached its limit in the highlands, still overexploitation of land resources is apparent due to high population pressure. In other hand, even if the agricultural land growth rate is lower, still there is agricultural land expansion. This would mean that agricultural practices are degrading the

lands as the expansion is expected to be made to areas which are not suitable for agriculture.

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Appendix 1

Table 3.2.2 trends of land use system per hectare

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
All land use	12,060,789	13,607,745	14,243,412	14,744,544	15,686,940	15,334,737	15,855,904	16,955,697	17,508,079	17580156	17928785	17,728,525	18104024
Temporary crop	8,910,333	10,150,937	10,524,990	10,964,655	11,343,121	11,587,470	11,917,078	12,241,268	12,557,637	12797277	12884607	13010000	13007323
Permanent crop	679,091	737,017	767,582	823,121	1,039,314	906,518	1,036,558	1,117,613	1,132,483	1142182	1259053	1320000	1513678
Grazing land	877,428	844,626	997,038	987,415	1,529,603	1,383,839	1,396,048	1,708,624	2,017,601	1924694	1943214	577000	1886030
Fallow land area	1,075,742	1,368,751	1,398,214	1,444,087	1,165,337	635,433	635,212	615,139	617,599	623635	714221	1759000	590271
Forest Area	109,049	106,905	142434.12	159,372	187,394	169,675	186,243	231,965	256,941	256515	264350	239000	285,344
All land use	12,060,789	13,607,745	14,243,412	14,744,544	15,686,940	15,334,737	15,855,904	16,955,697	17,508,079	17580156	17928785	17,728,525	18104024

Source: compiled from CSA, 2004-2016

Table 3.2.2 Annual agricultural land, farm inputs and outputs growth rate

Variables	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average
All crop land growth rate	12.8	3.72	4.39	5.04	0.9	3.68	3.13	2.48	1.82	1.46	1.44	1.42	3.52
Permanent crop yield growth rate	12.9	250.1	-15.1	-15.4	11.04	-20.2	52.32	-5.12	1.66	-41.3	311	181	60.24
Temporary crop yield growth rate	13	8.71	10.15	8.43	4.47	7.98	12.23	5.86	13.7	8.79	10.18	35	11.54
Fertilizer usage growth rate	12.90	34.76	3.00	11.39	-6.70	0.54	23.00	19.96	9.62	10.12	14.09	-0.03	11.05
Pesticide usage growth rate	46.9	20.99	9.5	8.4	-0.03	-20.8	50.28	1.2	22.08	1.01	14.21	7.19	13.41
Grazing land growth rate	-3.74	9.79	6.48	54.91	-9.53	0.88	22.39	18.1	-4.6	0.96	-70.3	227	21.02
Fallow land growth rate	27.2	2.15	3.28	-19.3	-45.5	-0.03	-3.16	0.4	0.98	14.5	146.3	-66.4	5.04
Forest land growth rate	-1.97	33.23	11.89	17.58	-9.46	9.76	24.55	10.8	-0.17	3.05	-9.59	19.4	9.09

Source: compiled from CSA agricultural survey data, 2004 to 201

3.4.1 The trends of the effects of agriculture on social variables

Year	Crop Production /quintal			Rural Population	Rural Poverty	Rural Unemployment
	Permanent	Temporary	Total			
1995	420000	88,909,960	89,329,960	47,418,679	47.50	2.9
2000	2,460,000	106,159,800	108,619,800	54, 280, 927	45.40	5.2
2005	6,705,713	139,540,184	146,245,897	60,962,398	39.30	2.6
2011	22,757,907	229,396,953	252,154,860	76,791,488	30.40	2.0
2013	21,951,565	276,110,169	298,061,734	76,897,825	30.40	2.0
Range	21,531,565	187,200,209	208,731,774	29,479,146	17.10	3.2
Average Rate	60.24%	11.54%	35.50%	4.37%		

Source: compiled from CSA agricultural survey data, 1995 to 2013