

Factor Affecting Irrigation Agriculture in Ethiopia

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Abstract

This study reviewed to identify factor affecting irrigation agriculture in Ethiopia. Although Ethiopia has abundant land for irrigation, only a fraction of its potential land is being utilized due to different factors like environmental, social and climate-related, economic and political, the land issue and rural land laws. Related with irrigation agriculture and rural land issue the government of Ethiopia has no visible document. So, as a recommendation since ,the land policy of Ethiopia was, the result of a centralized, top-down approach rather than being developed through consultations with all concerned parties and it impedes the development of irrigation agriculture in the country, it needs to be resolved quickly in order to develop irrigation agriculture based on the irrigation potential of the country.

Keywords: Ethiopia • Irrigation • Irrigation development • Agriculture and Irrigation

Introduction

Background

In Africa, rain feed agriculture forms the backbone of most of the continent's economies and providing about 60% of all employment. However, since, the agriculture practice is depending on rainfall the uncertainty of the availability of water resources will affect this agricultural production and challenge socio-economic systems, and threaten environmental sustainability by increasing use of non-recyclable resources to feed the growing population. The effect of this climate change (lack of water availability) will be significant particularly in east African counters where Ethiopia is located [1].

Ethiopia is one of the east African countries whose economy is largely dependent on agriculture [2] and also agriculture is conceded as mainstay of Ethiopian economy [3]. However, a large portion of lands in Ethiopia is arid or semi-arid, inhabited by poor and vulnerable communities wholly dependent on rainfall. In addition, poor land management coupled with increasing climate extremes (lack of water availability) is affecting the livelihoods of these communities. Therefore understand the impact of climate change on water resources to implement appropriate climate change adaptation and mitigation strategies is important.

Expansion of small-scale irrigation is one of the mitigation strategies which taken under consideration for the above problems where dry season stream flow is reliable [4]. It is known that, irrigation is a very old practice, dating back to the earliest civilizations of humankind in Ethiopia. It also, served as one of the key drivers behind growth in agricultural productivity, increasing household income and alleviation of rural poverty, thereby highlighting the various ways that irrigation can impact poverty [5]. In Ethiopian, to meet food requirements by 2020, the Food and Agriculture Organization for United

Nations also, estimated that food production from irrigated areas will need to increase from 35% in 1995 to 45% in 2020.

In Ethiopia, irrigation development is a priority for agricultural transformation, but poor practices of irrigation management discourage efforts to improve livelihoods, and expose people and the environment to risks. In addition to this in Ethiopia irrigation projects have been failing mainly because of insufficient participation by beneficiaries and insecurity of land tenure ,socioeconomic, cultural, religious and gender-related issues pose a problem to full and equal participation by beneficiaries. Due to this irrigation agriculture is not developed as expected in the country. From the cultivated agricultural land of Ethiopia currently only 12 million ha is occurred under cultivation.

In Ethiopia, there is no consistent and reliable inventory and well-studied document regards to land policy and its impact on irrigations agriculture. This shows that there are a little study details about Ethiopian government land policy and its impact on irrigation agriculture. So, knowledge on Ethiopian land policy and its impact on irrigation agriculture are important in such a way that the people (the land owner)and the government (the policy developer) become aware how irrigation is developed in Ethiopia based on the potential irrigable land of the country with the same line of land policy of the country.

Objective

The overall objective of this review paper was to assess factors which affect irrigation agriculture in Ethiopia in order to give attention for development of irrigation in the country.

Methodology

The review was investigated based on intensive reading of published and unpublished materials like books, articles, land policy document of Ethiopia and other scholarly materials that related with the objective of this review paper.

Review of Related Literature

This part was discussed some concepts and definitions which applied in irrigation agriculture development in Ethiopia, factors which limits irrigation agriculture in Ethiopia, land policy of Ethiopia and relate concepts for the objective of this review paper.

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Received 18 August 2020; Accepted 18 February 2021; Published 25 February 2021

Irrigation development in Ethiopia

Irrigation development is seen as one of the means to reduce poverty and promote economic growth. In Ethiopia irrigation was practiced for thousands of years in the Nile Valley. In line with this, the country also has a long history of traditional irrigation systems by diverting small rivers. Still, simple river diversion is the dominant irrigation system in Ethiopia. According to Gebremedh in and Peden [6], the country's irrigation potential ranges from 1.0 to 3.5 million hectares but the recent studies indicate that the irrigation potential of the country is higher. According to Tilahun and Paulos as cited by Awulachew [7], estimates of the irrigation potential of Ethiopia may be as large as 4.3 million hectares.

Traditional irrigation schemes cover more than 138,000 hectares whereas modern small-scale irrigation covers about 48,000 hectares. The total current irrigation covers only about 6% of the estimated potential irrigable land area. However, [8] reported about 10- 12% of the total irrigable potentials are currently occurred under production using traditional and modern irrigation schemes.

Factor affecting irrigation development in Ethiopia

In Ethiopia the government, the donors and the non-governmental organizations are investing to the development of irrigation systems from small to large scale irrigation schemes. As a result, irrigation is developing rapidly. However, it does not develop as expected and its contribution to the national economy is insignificant when compared to rain-fed agriculture.

The successes of irrigation development generally depend on the cooperation of larger range of government institutions and individuals, such as, for instance, the departments of irrigation, extension and rural works, banks and planning bodies. Unsurprisingly, development issues are interrelated and water resource developments by nature have interrelation with many factors. Consequently, irrigation developments are also determined by many factors for their success. As stated by the performance of irrigation schemes depends on: cropping pattern, market accessibility, maintenance and spare parts, social and political, and land tenure policies and also some major factors like environmental, social, economic and political are negatively affect irrigation development in Ethiopia.

Environmental factor

Salinity and Sodicy/alkalinity are the major problems that resulted in the valley due to irrigation practices in the enterprise. In some places high salinity and sodality/alkalinity levels coupled with poor drainage of the soils are at present resulting in quite a large area of productive lands being abandoned from cultivation.

In Ethiopia the environmental impact, that is usually associated with the establishment of the enterprise, is the introduction and invasion of a thorny shrub by the name of *Prosopis juliflora* in the Middle Awash Valley. The plant/weed covers most of the area near the enterprise, which was once barren land during dry seasons and possibly used for grazing purposes during wet seasons. Even if it has some benefits in reducing wind erosion and increasing the organic matter content of the soil, it created problems both to the enterprise and the surrounding inhabitants as it affects the canal network of the farms and cannot be used as animal feed. Water borne diseases are also an environmental impact which resulting from irrigation projects are examples of diseconomies/ external costs imposed by the project to the society. In support of this [9], indicates that water related diseases and treats to flood plain ecosystem are other high environmental costs. Water withdrawn for irrigation impacts the naturally occurring environmental services provided by free-flowing rivers as do changes in flow regimes caused by associated dams. Habitat and resident flora and fauna are destroyed, and the flooding of biomass may result in net releases of carbon dioxide (CO₂) and methane (CH₄). This may have impacts on global climate and localized air pollution problems.

Social and climate-related factor

Increases in standing water associated with irrigation, especially when

systems are poorly managed, can serve as a breeding-ground for disease vectors including *Anopheles* mosquitoes, contributing to increases in malaria and other disease. Similarly, dams constructed for irrigation slow water flow and may increase the prevalence of malaria or sleeping sickness. Irrigation with untreated wastewater can increase exposure of both producers and consumers to pathogens resulting in schistosomiasis, diarrhea or other ailments [10]. Irrigation with chemically contaminated water, either natural as in arsenic or human induced has clear health implications. The availability of irrigation can encourage use of other agricultural inputs including fertilizer and pesticides, increasing exposure of both farmers and consumers.

Economic and political factor

Irrigation influenced changes in agricultural productivity have been shown to impact overall growth through multiplier effects and can free human and financial capital for industry and services stabilize rural populations and impact foreign exchange earnings and budgets via export taxes.

Irrigation may also influence overall governance structures. While governance change may typically be a by-product of irrigation, it can also be an explicit objective. Similarly, electricity reform to support overall economic growth is complicated by the political economy of power subsidies and groundwater.

The Land Issue in Ethiopia

Rural land is both an economic and a political/social question in the present-day Ethiopia. The insertion of the issue of land in the Ethiopian constitution in the early 1990s, however, may indicate that rural land has increasingly become a political affair. By inserting the land policy in the constitution, the current government has effectively eliminated the possibility of flexible application of policy. Even worse, it has eliminated all meaningful debates about efficient utilization of land. However, there are growing criticisms of the existing land policy. The United Nations Economic Commission for Africa's (UNECA) 2002 economic report on Africa, for instance, stated that land tenure, along with the issue of governance, were "the most pressing areas requiring institutional reforms in Ethiopia." The report suggests that "Land policy has not yielded the expected results. Moreover, it has been heavily criticized for not being participatory. The policy was the result of a centralized, top-down approach rather than being developed through consultations with all concerned parties (farmers, civil society, businesses). The report suggests that, though the land issue is politically difficult, it needs to be resolved quickly since it impedes the development of several key sectors like irrigation agriculture".

Rural land laws

Access to rural land: The federal government enacted a rural land administration and use law (Proc. 87/1997) that replaced the 1975 (Proc. 31/1975) rural land law. Proclamation 87/1997 again itself repealed and replaced by the current RLAUP (Proc. 456/2005). This proclamation follows the constitutional principle that creates free access to rural land. It declares that peasant farmers and pastoralists engaged in agriculture for a living shall be given rural land free of charge. A person, above the age of 18 years may claim land for agricultural activities, and women who want to engage in agriculture shall also have the right to get and use land.

The conditions attached to this right are, firstly, the person must want to engage in agricultural activities. Secondly, the person must reside in the area where the agricultural land is located. Although this principle is not clearly seen in the federal rural land administration and use law, regional rural land administration and use laws have clearly envisaged it. Thus, residency and profession are two important conditions to get rural land in Ethiopia. The reason seems that since there is shortage of agricultural land in rural areas, because of population pressure, it is not advisable to give land to those who live elsewhere (absentee owners) and those who earn income from other professions.

Nature and duration of land rights: Concerning the nature of land rights provided to the farmers of rural land administration and use law uphold the constitutional principle that denies private ownership to land. Rather this law provides farmers with right termed as possession right. Rural land administration and use proclamation 130/2007 defines possession as right of any peasant or pastoralist or semi pastoralist shall have to use rural land for agricultural purpose and natural resources development, lease out and bequeath to members of his family and includes the right to acquire property produced on his land there on by his labor or capital and to sale, exchange and bequeath the same. The general understanding today is that peasant farmers will have all rights of an owner except sale and mortgage. They can use the land for agricultural production, have full ownership to the produce collected there from, have right to rent fellow farmers, lease to investors, and inherit and donate to family members.

Peasants shall have such rights for life time and beyond, since they can donate and inherit to others. It has been declared that rural land use right of peasant farmers, semi pastoralists and pastoralists have no time limit. In a way, this gives tenure security to the holder of the land as the right of using the land and the investments made there on will not be threatened by time limitation. It must be noted that the longer the duration of rights of using land is the better in terms of ensuring tenure security.

Conclusion

This part of the review paper was described some points which summarized from different points of the background and literature of this review paper and recommended some points which related with the objective of the review paper in order to fill the gap for future irrigation agriculture practice in Ethiopia.

In Africa, rain feed agriculture forms the backbone of most of the continent's economies and providing about 60% of all employment. However, the uncertainty of the availability of water resources will affect this agricultural production, challenge socio-economic systems, and threaten environmental sustainability by increasing use of non-recyclable resources to feed the growing population.

Ethiopia is one of the east African countries whose economy is largely dependent on agriculture and also agriculture is conceded as mainstay of its economy. However, a large portion of lands in Ethiopia is arid or semi-arid inhabited by poor and vulnerable communities wholly dependent on rainfall. For this expansion of small-scale irrigation is one of the mitigation strategies under consideration where dry season stream flow is reliable. It is known that, irrigation is a very old practice, dating back to the earliest civilizations of humankind in Ethiopia.

In Ethiopia, irrigation development is a priority for agricultural transformation, but poor practices of irrigation management discourage efforts to improve livelihoods, and expose people and the environment to risks. Due to this from the cultivated agricultural land of Ethiopia currently only 12 million ha is occurred under cultivation. In addition to this there are many different factors which limit the development of irrigation agriculture in Ethiopia.

Factors like environmental factor, social and climate-related factor, economic and political factor, the land issue factor and rural land laws factor are the most dominate factors in Ethiopia which limit irrigation development. Related with irrigation agriculture and rural land issue the government of Ethiopia has no visible, measurable and tangible document. It creates ambiguity between rural land owner and irrigation developer sectors. So, this condition limits the development of irrigation agriculture in a large manner.

Recommendation

- The land policy of Ethiopia was the result of a centralized, top-down approach rather than being developed through consultations with all concerned parties and it impedes the development of irrigation agriculture in the country. So, it needs to be resolved quickly in order to develop irrigation agriculture based on the irrigation potential of the country and irrigation demand of the population in the country.
- In addition to land policy of Ethiopia, factor like, environmental factor, social and climate-related factor, economic and political factor also affect irrigation development in Ethiopia. So, in the country irrigation project should be developing based on integrated and grass root approach in order to minimize these factors and to increase the acceptance of the project by the users.

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How to cite this article: Kasye Shitu and Melaku Almw. Factor Affecting Irrigation Agriculture in Ethiopia. *Irrigat Drainage Sys Eng* 10 (2021): 251.