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Large Scale Agricultural Investment and Natural Resources Linkage in Ethiopia: Harmony or Enemy? Systematic Review

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Abstract
In Ethiopia, agriculture plays a lions' share in leading the economic growth of the country. The crippling nature of small-scale farming system pushed the government to commence large-scale farming system so as to ensure food security and promote agricultural commodity export. Therefore, the country hosted domestic and foreign investors who engage in large-scale agricultural investment. Following this, this paper aimed to review the provisional change occurred to natural resources viz water, forest and land due to the expansion of large-scale agricultural investment. The result of the review revealed that large scale agricultural investment has been affecting directly natural resources and in the long run, being scared to cause physically irreversible alterations in the natural resources in the near future. Therefore, it is highly recommended to rehabilitate the existing natural resources and confront future devastation of natural resources in the country.
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1. General Overview

Ethiopia is one of the underdeveloped countries in the world. To alleviate poverty and improve the livelihood and well-being of the societies, the country decided to renovate its strategies and ensure economic growth. Having a high percentage of labour aged population and dependency of 70% of the country's population living in rural areas on agriculture, assured the agriculture as a leading sector. In the middle of 1990, the country developed Agricultural Development led industrialization (ADLI) strategy that promotes the whole economic growth, via structural change, by encouraging supply and demand (Daniel, 2014). The ever-increasing population of Ethiopia accompanied with the increasing food demand at a high rate highly warned the households' food insecurity and attracted the concern for inducing high domestic food production capacity in Ethiopia. On the other hand, export of agricultural commodities is considered as the engine that accelerates the country's economic growth and solves the difficulty of foreign exchange earnings. These interrogated directions shift from smallholder to large scale farming where it was evidently mentioned on the 2006 Plan for Accelerated and Sustained Development to End Poverty (PASDEP) (Mo FED 2006). On the other hand, the country introduced liberalization of the economy, development of private investment and inclusive economic growth through taking steps toward assuring liberalization and deregulation of the economy by shifting it from a centrally arranged socialist economy to a market-oriented economy (Bogale and Yared, 2020). Since that time, Ethiopia began opening the door for both private domestic and foreign investors with the objective of enhancing and promoting investment and increasing the share of the private sector in order to assure rapid economic development of the country. FDRE (Federal Democratic Republic of Ethiopia) Investment Council of Ministers Regulation No. 36/1998 were brought into effect with the intentions of incentivizing and lubricating investment by opening several alternative investment areas to the private sector and offering supplemental investment incentives. Foreign investors are entitled to invest in the realm of investment defined in the schedule attached to FDRE Investment Incentives and Investment Areas Reserved for Domestic Investor by the Council of Ministers Regulation. Investment incentives determined by FDRE Investment Incentives and Investment Areas Reserved for Domestic Investors were Remittance of funds, guarantees against expropriation, exemption from income tax and exemption from the payment of customs duty (Bogale and Kefyalew, 2020).

Ethiopia exerted many efforts for the expansion of well-established Investment as a whole and incredibly Foreign Direct Investment (FDI) to accrue the benefits; ensuring rapid development of infrastructures, generating employment opportunities along newly launched or diversified projects; filling skill gaps of local labour force, providing practice-oriented training, upgrading regional management skill and fetching new technology and know-how (FDRE, 2016).

Among the investment areas that the government allowed foreign investors to invest in, the agricultural sector has been considered as the prominent and leading sector. Ethiopia's natural endowments of natural resources viz sufficient rainfall and fertile land have enhanced its attractiveness for large-scale investments in

agricultural land. The government has welcomed such investments in the past decades, providing large parcels of land at lowest lease rates. One report estimates that, by January 2011, the government had transferred 3,619,000 hectares of land to investors. (Vhugen and Darryl, 2012) Reports from early 2010 suggested that the government planned to make available some 3 million hectares of land to investors in the next 3 years. This amounts to about 4 percent of all arable land in Ethiopia and about 20 percent of the total land area currently under cultivation.

The Ethiopian government advocates large-scale agricultural investment as a strategy to ensure food security at the nationwide stage, using foreign exchange earnings produced by farm yields; improve production of cereals in the country and increase revenue from jobs created on farms (Keeley *et al*, 2014).

On the other hand, generally established goals by both developed and economically rapid developing countries to enhance large-scale biofuel and food yields, attain highly secured energy levels and ever-increasing sensitivity of climate issues and its impacts attracted foreign investors to invest in large scale agricultural investment in overseas countries. The intention toward compensating the fall in equity and bond values that occurred due to the worldwide financial crisis with the expected benefits from agricultural products further intensified the competition of foreign direct investment (FDI) in agricultural land (Görgen *et al.,* 2009; Gerlach and Liu, 2010). Following the Kyoto protocol of 37 industrialized countries and EU commitments to diminish greenhouse gas and carbon dioxide(co_2), the need for maximizing utilization of plant-based fuels as a substitution of fossil fuels, availability of guaranteed markets for biofuel products were considered as the drivers toward the large-scale land agricultural investments (Cotula *et al.*, 2009).

The global increasing of the population growth sharply(FAO/OECD, 2011),continuously growing pattern of urbanization (Cotula *et al.*, 2009), shifting of diet habit, demand for welfare and healthy diet (Toulmin *et al.*,2011), the continued warning of food insecurity for food-import dependent countries due to their consistent dependency on the imported food (Deininger and Byerlee, 2011) and the change in climate conditions like drought that led to the fall down of agricultural products(FAO, 2011) further strengthen the need of many countries to safeguard their future food security through expanding their large-scale agricultural investment.

The above-mentioned multiple drivers that pushed foreign investors to invest abroad easily supported an early mentioned Ethiopian government need to expand private investment sectors and consequently resulted in the coverage of vast large-scale land of the countries by foreign, joint and domestic investors. Commission and Investment bureaus were founded at regional level. Issues related to facilitation of acquisition of land, handling trade registration, providing investment licenses, issuing work permits to overseas employees and other investment related services were designed to be performed by the centre of one-stock investment service.

Regarding the sectors of investment, Ethiopia followed a negative list style where few lists of the sectors or sub-sectors like huge electric power were closed (prohibited) or restricted under the investment proclamation. Consequently, numerous lists of sub sectors that come under four main sectors (agriculture, manufacturing, trade and service) have been acknowledged by local and regional investment bureau to attract foreign and local private investors. These sectors include cotton, textile, ceramics, paper and paper products, chemical products, mining, electronic products, food crops, bakery, beverage crops, Sugar, floriculture, horticulture, livestock, fishery, forestry and agricultural Services, manufacturing, tannery and leather good, glass, metallurgy, chemicals and chemical products, drugs and pharmaceuticals, plastic products, building materials, electrical and electronic products, machinery and equipment, tourism, etc(Alemu, 2017.).

For agricultural sector alone, in 2015, Ethiopian Investment Agency (EIA) publicized that greater than 11.50 million hectares of land possess the capacity for farming in Ethiopia and ready made for agriculture ventures who fit the country's requirements (Teklemariam *et al.*, 2016). It is worth noting that getting permission over the land of investment authorize the investor to take control over or claim ownership right to the land and its naturally endowed resources and facilities (including forests, water, and biodiversity and ecosystem) (Fairhead *et al.*, 2012, Dell 'Angelo *et al*., 2017a). Such claims inaugurate the beginning of competitions over naturally scarce resources like water, eradication of forests and land use change to commence utilization of the land owing to environmental devastation via logging, habitat destruction, and soil tillage and result in disappearance of biodiversity and soil fertility, greenhouse gas emissions, and soil erosion (Runyan and D'Odorico, 2016).

Most of the time, the environmental aspect of the large-scale agricultural investment was left unnoticed. Whilst accelerating the growth and expansion of the investment that boost up the economic advantages from the utilization of naturally limited natural resources is awfully remarkable, considering the corresponding environmental and other related costs that stemmed from manipulating uneconomic usage of natural resources is also highly indispensable. Otherwise, the costs to be incurred for resilience and recovery of the damaged environment may surpass an early gained economic welfare.

In Ethiopia most of the investors were engaged in agriculture like floriculture, the extraction of natural resources, production of food crops, while few were involved in the manufacturing. However, the accompanying effects of natural resources deterioration caused by large scale agricultural investment in Ethiopia were rarely given due attention by the scholars. Therefore, this review attempts to fill the gap of an existing literature and

explore the undergoing situations that the natural resources specifically water, forest and land are experiencing since an expansion of large-scale agricultural investment in Ethiopia.

2. Water and large-scale land investment

In the past decade Ethiopia has been listed among the countries highly engaged in the large-scale agricultural investment. The country applied large scale investment as a tool for better improvement of rural livelihood.

Few scholars have argued that among the major factors that push foreign investors to invest abroad, shortage of natural resources of the investor's country were the prominent one (Woodhouse, 2012, and Kreft and Jetz, 2007). Results from studies revealed the existence of positive linkage between natural resource abundance and large-scale agricultural investment. Substantial percentages of capital are directed to countries holding valuable petroleum and mineral resources, for instance, Nigeria (UNCTAD, 2008).

The association has been recorded at the overall level in the condition of multinational panel data studies (Asiedu, 2006, 2013; Ezeoha and Cattaneo, 2012) and single national case studies viz the case of Ghana (Acheampong and Osei, 2014). Oppositely, other scholars argue that availability of natural resources and large-scale foreign investments on natural resources have negative correlation. They support their arguments by saying that availability of ample natural resources in a given country creates an intensified competition of foreign investors in resource extraction ventures which in turn led to ignoring investment in the rest of development sectors and so that net large scale foreign investment of the country diminished.

Apart from this, rapid increase of natural resource export may result in the decline of the value of national currency and thereby demolish export-based large-scale investment (Ndikumana, and Sarr, 2019). The result released from data on Netherland multinational companies confirmed this forecast (Poelhekke and van der Ploeg, 2013.). On the other hand, it has been commonly understood that economic sound of the investment in large scale agricultural investment is unconditionally depends on availability of water (Breu *et al.*, 2016). Therefore, the motives toward selecting investment in agricultural land itself were based on the corresponding abundancy and easily accessibility of water at the host country (Mehta *et al.*, 2012 and Breu *et al.*, 2009).

Availability of water particularly both green and blue water mainly determines participation in agricultural and non-agricultural exploitation of land (e.g., mining) (Allouche, 2011). Rush for the large-scale agricultural investment indirectly implies applying for the right to secure green water, since green water is considered as an integral part of the soil. Many scholars involved in the arguments concerning the ongoing agricultural investment [Breu *et al.*, 2016, Allouche, 2011, Mann and Smaller, 2010, Peluso and Lund, 2011) have claimed that availability of land is not the major concern of investors, rather ensuring the right of priority access to water.

In the case of access and use rights in blue water, experience shows that they either come for free or are included in the investment contracts, which are rarely disclosed to the public. It is widely assumed that investment contracts do not reflect the full value of water (Breu *et al.*, 2016). Whilst Ethiopia has currently a substantial endowment of water, the country's improvements toward achieving efficient and economic utilization of water resources were still at its infant stage. It is worth noting that, it has been discovered that depending on the standard that less than 25% of water from rivers is drawn out for human usage, in the near future, the country will encounter problems of economic water scarcity, undeniably, unexploited water resources are still tremendous (World Bank, 2006; Awulachew *et al*., 2010). As it is mentioned earlier in addition to their intensive use of water resources, large scale agricultural investors claim priority access to land and sufficient access to water sources for irrigation, compared to the native investors and residences (ETIA, 2013).

On the contrary, since the source of food and livelihood of indigenous and local societies are greatly tied to natural resources, they acquire easy access to these natural resources viz water without any rivalry (Degife and Mauser, 2017). These result in dispute among investors and local farmers owing to the emerging risk of water security in the area. Based on its target to be achieved, Water security is designed to preserve the 'risk of scarcity', 'risk of lacking quality', 'risk of surpluses, and the 'risk of crippling the recovery of freshwater systems'. Considering the linkage between large scale agricultural investment and water, there exist intensive conflicts of interest among three key players namely: investors, the government and endogenous local communities (Embaye, 2020). Investors diversify the mechanisms that enable them to easily access water these are through the process of reallocating and redefining water rights (Sosa and Zwarteveen, 2012) redirecting of rivers and rearrangements of waterscapes (e.g., Matthews, 2012) and virtual appropriation of freshwater through agricultural production (Breu *et al*., 2016; Rulli *et al*., 2013).

Large scale agricultural investment substantially increases depletion of blue water resources since investments mostly necessitate the installation of irrigation systems and closeness to water sources and an increase in the lease rate due to the availability of irrigation (Rahmatora, 2011). This implies that almost all leases are opted for irrigable land or lease rents are predominantly higher for investments where irrigation is plausibly, or some irrigation infrastructure already exists (Bossio *et al.*, 2012). For instance, in the Benishangul regional state where most of the investors engaged in large scale agricultural investment, significant appropriation of water has been experienced.

Furthermore, the actions undertaken by large scale agricultural investments in the region (e.g. Karuturi agricultural project) like the building of a water blockage system and the construction of dams to divert the Baro River's natural flow causing the river to overflow which negatively affect the environment and nearby communities (Persson, 2016). Additionally, such appropriation of water may also exacerbate the availability of freshwater resources for ecosystem functioning. Similar activity occurred in the Gambella region where large scale agricultural investors engaged in extracting agricultural water from the nearby river. For instance, Saudi Star that has hired 10,000 ha in Gambella region for the purpose of rice production for export. This investor financed huge capital to develop a huge intensive irrigation canal that enabled to divert water from Alwero River that currently underpins the sustainability of several valuable ecosystems.

Saudi Star used water from the dam constructed on the Alwero River, which has the capacity of storing 74 million cubic metres of water. Such extraction of water from Alwero River resulted in shrinking the river flow which, in turn disturbed the river's aquatic ecosystems (Bossio *et al.*, 2012). Besides these, those investors participating in floriculture have been degrading water quality and damaging underground water parts and biodiversity through releasing extreme pesticides. Just like crop production, the flower industries are also known by its excess extraction of water from the lake for through building irrigation canal. Due to the underdeveloped waste purification technologies of leather production companies, the industries undertake like soaking, fleshing and washing by using water in order to get rid of dirt, flesh, salt and other foreign matters. This result in the releasing of salt, pesticides, flesh, hair, suspended solids, sulphate, ammonia, base, chloride for tanning process (chrome tanning), BOD (Biological Oxygen Demand), COD (Chemical Oxygen Demand), salt, acid, chromium, etc. in to the surrounding water bodies. As results of this Akaki, Awash, Modjo, etc. rivers of the country are being contaminated (Abebe, 2011).

The prominent lake mentioned as an example is the Naivasha lake which is the sole freshwater ecosystem in the Eastern Rift Valley. Fisher and the nearby local communities living on the coastal region of Lake Naivasha in Kenya have recently been suffering from dropping water levels of the Lake for the past several years. In addition to these, fish stocks are diminishing and the lake is being polluted by chemicals. The flower industry around the lake, held accountable and condemned for such unfriendly environmental consequences. Approximately around thirty huge flower farms, typically producing cut flowers for the European markets, are established around the lake (Kassa, 2017). This indicate that less attention has been given to the other side of the coin of large-scale agricultural investment which result in not only affecting the scarce natural resources and living habitats but also disturbing over whole ecosystems.

3. Forest and large-scale land investment

Globally, tremendous areas of the forests have been lost and the problem continues unabated. According to the Food and Agriculture Organization of the United Nations (FAO), around 13 million hectares (ha) of forest were cleared to other uses or disappeared through natural causes annually between 2000 and 2010 compared to 16 million ha per annum in the 1990s (FAO, 2010). Researchers from different parts of the world studied the drivers behind the rapid increase of deforestation especially in Africa in the past decades. Conigliani *et al*. (2018) said that few years ago, world have experienced an increasing interest in land-based investments to secure food, feed, fuel, and fibre, pushed by the instability in product prices, economic growth of emerging economies, policy drivers of biofuel demand, and investor strategies to confront the global economic crisis.

Conigliani *et al*. (2018) found three fundamental factors that investors require to choose host countries in Africa. These are: availability of huge percentage of well-suited land under traditional right system and devoted to cultivated land, grassland, and forest land, and with tolerable limitations on soil fertility; cheap land price; and improved institutional environment from the aspect of respecting the law, but loosen institutional environment and regulatory policies that better facilitate doing business.

From these afore-mentioned factors, the agro-potential of land (specifically its fecundity) and the percentage of apposite land devoted to forest land are the leading attractive factors, while the part of land allocated to grassland and woodland is less. In terms of respecting the law but having worse institutional environment and regulatory policies, for instance, in Ethiopia, the agricultural land lease agreements are one of the tools to implement policies, policy-based proclamations, directives and procedures that are intended to encourage agricultural growth in Ethiopia.

The lease agreement therefore, expected to make due stress on the environmental consequences of large-scale agricultural investment and provide a clear statement of responsibilities and duties of both investors and Government so as to secure ecological benefits like soil preservation, water quality, air quality, sustaining and conserving biodiversity and wildlife habitat. However, this land lease agreement format is very worse as it fails in capturing the substantial and apparent environmental problems owing to large-scale agricultural investment. For instance, it ignores critical clauses such as environmental liability, conservation plans, conditions of arrangements for compensation, maintenance and repairing the land, monitoring and reporting format and frequency, non-point source pollution (Persson, 2016).

For example, Saudi Star Agricultural Development Plc leased 10,000 ha of agricultural land found in Agnuwak Zone, Abobo Woreda (Persson, 2016). The leased land was initially forest and part of it was appealed from the Gambella National Park. The evidence from the Environmental and Social Impact Assessment report reveals that the owner cleared 6,000 ha of forest land in January 2011(Persson, 2016). According to report of Conigliani *et al*. (2018), Ethiopia is the second most suitable country in Africa next to congo in terms of area acquired for huge land investments for its ease of doing business given its naturally endowed natural resources and fertile land.

Therefore, now a days due to coverage of vast large-scale land of the countries by investors, it is quite experienced to see the areas covered by forests before being destroyed and converted to production area, forests are cleared for producing charcoal and expansion and development of infrastructure. Deforestation has eradicated numerous of the country's biodiversity into extinction. The rate of deforestation undertaken in Ethiopia is estimated to be 141,000 hectares per year. According to the estimation of the country's environmental protection policy, deforestation rates of the country could reach as high as 200,000 hectares per annum (Srinivasan, 2014)).

All of these studies confirmed a continuous diminishing of forest coverage in Ethiopia. On the other hand, Ethiopia has exhibited a robust voluntary commitment in the context of the Bonn Challenge. It demands to implement Forest Landscape Restoration (FLR) on 15 million ha. (Pistorius *et al*., 2017). In line with this, there are some studies that indicate the increasing trend of forest land areas in Ethiopia. Moges and Bhat (2018) study showed continuous growth of area under forest cover over the study period. The forestland increased from 40 km2 in 1973 to 51 km2 in 1986, 55 km2 in 2001, and 68 km2 in 2016.

The study conducted by Bewket (2002) showed that there was a vital initiative during the Derg regime to conserve the remnant indigenous trees and expand forest land by the means of afforestation in various areas of the country. Furthermore, numerous studies (Nyssen *et al*., 2009; Gebrehiwot *et al*., 2014; Sewnet, 2015) also reported that there has been a continuous growth of forest cover in highlands of Ethiopia due to eucalyptus plantations and regeneration of some natural forests. However, it is worth noticing that the increasing of forest land coverage is not due to the expansion of indigenous trees, rather due to the expansion of eucalyptus and decreasing of local original home-grown trees.

4. Land degradation and large-scale agricultural investment

Land is considered as a critical resource for the survival of human being and Land degradation is one of the most acute global problems. Land degradation is the reduction or loss of biological, economic productivity, and ecosystem services of land resources (Hugo, 2006). Globally, $6.3 trillion worth of ecosystem services per annual is lost due to land degradation (Sutton *et al.,* 2016). Approximately, 30% of the global land area and 40% of land in developing countries is degraded, disturbing the life of 3.2 billion people globally (Global Environmental Facility [GEF], 2019; Nkony *et al.,* 2016). About 65% of Africa's agricultural land and one million square kilometres of land in Sub-Saharan Africa are degraded, while 43% is extreme deserts (Ioras *et al.,* 2014).

Ethiopia is among the countries that highly affected by the problem of land degradation where 23% of the land area in the country is degraded and 17.7% harshly degraded (Gebreselassie *et al*., 2016; Sutton *et al.,* 2016). In Ethiopia, since 85% of the population principally rely on agriculture (land) as a means of survival (Alemu *et al*., 2002), studies revealed that land degradation is markedly caused due to land-use changes particularly agricultural activities undertaken by human being (IPPC, 2019). Large scale agricultural investments are emerging as new drivers of land use and land cover change in the developing world both through agricultural intensification and extensification (D'Odorico *et al*., 2017).

Large scale agricultural investments are widely known by causing both direct and indirect land use change and deforestation. In some cases, it has been possible to document that large scale agricultural investments are a "new" apparatus contributing to deforestation and land degradation (Rulli *et al*., 2016). These effects are most apparent where investors put forested land under production, many times causing environmental damage through logging, habitat destruction, and soil tillage and leading to biodiversity losses and soil erosion (Runyan and D'Odorico, 2016). For instance, the study conducted by Dheressa (2013) said that large scale agricultural investments have negative environmental effects as demonstrated by clearing of vegetation cover and depletion of water resources that result in loss of vegetation cover and exposing lands to serious erosion and land degradation that could even be irreversible unless appropriate measures are taken.

In order to prepare the land for large scale agriculture, grasses and trees were cleared and burned down. Dheressa (2013) also mentioned that these extensive slashes and burning process carried out to remove bushes and grasses from the land were highly attributed to land degradation and thereby severely damaged the soil and its nutrients. Similarly, large-scale commercial agricultural lands allotted by Ethiopian government in Gambella region, where investors engaged in clearing the forest and savanna also resulted in huge land degradation in the region (Degife and Mauser, 2017).

5. Conclusion and Recommendations

Agricultural sector has been dominated Ethiopian economy due to its leading contribution to the national GDP and reliance of more than 75% of the total population on agricultural activities. Given the long-time experiences of agricultural practice in the Ethiopia, yet the result is annoying where the sector is unenabled to change the history of a fatal series of starvation in the country for the decades due to food scarcity.

During the past two decades, the country has formulated and implemented several development strategies like Agricultural Development-led Industry (ADLI) to escalate the economic growth of the country and transform agricultural sector from subsistence and poor traditional farming to intensified and commercial farming system. However, such small scale-based development strategies were failed to ensure the growth of agricultural and allied sectors and thereby stimulate the country's economy as a whole. Therefore, few years ago, the country began giving due attention to large scale land farming system and opening the door to both foreign and domestic investors to engage in large scale agricultural investment.

In addition to solving problems like absence of infrastructures, foreign exchange earnings, large scale agricultural investment has several benefits like transfer of better technologies, filling skill gap, innovation, increased productivity, off-farm income, etc to local residents. On the other hand, numerous factors like economic crises, continuous increases in food price, huge demand for food globally and stiffen environmental law enforced foreign investors to compete for large scale agricultural investment. As a result, huge acres of land were transferred to investors. Various researchers have been conducted several studies to analyse the dark side of these large-scale agricultural investment form the environmental aspects.

This paper specifically focused on reviewing the damage inflicted by large-scale agricultural investment on water, forest and land. The result of aforementioned reviewed literature revealed that from the step of land preparation to production stage, uncountable and un anticipated environmentally inimical activities that were observed. On the top of these, the results of many researchers also demonstrated that, a large number of the natural and monetarily esteemed land assets are being deteriorated and contaminated by the latest things of the investment adventures. The pernicious and negative biological effects of the current venture advancements from floriculture, tannery and debris delivering businesses can be referenced as an illustration where natural effect, supportable utilization of land assets and land capacity issues have not been considered considerably (Alemu, 2017). Attached to this, most of the environmental devastation was assumed even beyond the capacity of the government to control.

Large-scale agricultural investment markedly increases depletion of water resources. Many investors participated in extraction of water from rivers (e.g., Alwero) resulted in diminution the river flow which, in turn affected the river's aquatic ecosystems (Bossio *et al.,* 2012). Furthermore, the water quality was highly deteriorated; underground water and smooth system of biodiversity were detrimentally destructed due to extreme pesticides form floriculture. Massive areas formerly covered by forests being destroyed and converted to production area. This brought numerous of the country's biodiversity and indigenous medicinal and other valuable trees, vegetations and shrubs into extinction. As a result, such intensive deforestation and change in land use further exacerbated the land degradation where wide coverage of land was highly degraded and exposed to serious erosion.

Moreover, fertility of the soil and its nutrients were hugely damaged. From this review one can even insight that the cost to incur for the reestablishment, compensation and resilience of these devastated environmental resources or the long-term effect of destroyed environmental resources may lead to cancel or overweight the benefits anticipated for the large-scale agricultural investment. Accordingly, to ensure the benefits from the large-scale agricultural investment with the minimal damage to the natural resources, the following points should be enacted and put into consideration:

The government should strengthen the capacity of environment and investment concerned institution (e.g., EIAA) to learn a lesson from degraded environment and thereby better prepare themselves to confront the future deterioration of natural resources. Prior to transferring the land to investors, the concerned body from the government should thoroughly investigate the overall capability of the investor in resisting the predicted environmental challenges and handling the land appropriately and in a sustainable manner.

Before engaging in the investment activities, investors need to bear in mind the environmental cost of each and every investment activity. Relating to this, there must be restricted mechanism devised and monitored by government officials that obligate the responsibility of absorbing the cost of environmental damage by the concerned body. Otherwise, government and local residents will plausibly be exposed to the problems of tragedy of the commons.

It is highly recommended to design and reformulate the existing land usage and restoration mechanism so as to protect the existing natural resources (land, forest and water) and promote the campaign of rehabilitation. Lastly, it is worth noticing that both government and owner of the investment should give value to indigenous local knowledge in ensuring efficient utilization and sustainability of natural resources

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