

MIRACLE OR MIRAGE?

MANUFACTURING HUNGER AND POVERTY IN ETHIOPIA

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The Oakland Institute

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Executive Summary

In 2016, food crisis in Ethiopia once again topped the international headlines, with 18 million people reportedly requiring food assistance for survival.¹ The food crisis has been widely attributed to climatic events resulting from El Niño, and presented as an exogenous incident in Ethiopia's acclaimed economic miracle and double-digit growth rate.²

This narrative is convenient for the Ethiopian government. For many years, the regime has used the argument of its economic success to counter the critics of its development strategy and repressive rule. It has labeled organizations such as the Oakland Institute³ as being 'anti-development' after they exposed the devastating impact of its policies on the livelihoods and basic human rights of millions, including many indigenous communities across the country.⁴

The climatic explanation is also critical for the international backers of the regime. Ethiopia received on average \$3.5 billion annually from donors in recent years, which makes it one of the largest recipients of international development assistance.⁵ Its largest donors, the United States, the United Kingdom, and the World Bank, have been closely involved in the design of its development strategy and play a key role within a number of aid mechanisms established to deliver it. Their indefectible support to the regime has not been affected by the prevalent repression of political opposition and independent media, and widespread human rights abuses over various religious and ethnic groups.⁶

The 2016 crisis is a harsh reminder that despite the trumpeted economical miracle, Ethiopia has not moved beyond its tragic history of chronic hunger and famine. Every year since 2005, 8 to 18 million Ethiopians have relied on food assistance for their survival. The country still ranks 173rd out of 186 countries in the latest United Nations' Human Development Report.⁷

Over the past decade, the government has designed policies and plans supposed to address chronic food insecurity and to usher in development. The five-year Ethiopia Growth and Transformation Plan (GTP), launched in 2010, had the objective of eradicating poverty and dependence on food aid in the short run and lead to the 'renaissance of Ethiopia.'⁸

In order to achieve these ambitions, the GTP included efforts to increase the productivity of smallholder farmers⁹ – and at the same time included programs to accelerate agricultural industrialization through large-scale farming operations. By 2011, the government of Ethiopia had demarcated 3.6 million

hectares of land for large-scale agricultural investments.¹⁰ It put in place the Commune Development Program (CDP), also known as "villagization" program, to resettle 1.5 million people in lowland areas which were targeted for large-scale agricultural plantations, including South Omo, Gambella, Somali, Benishangul-Gumuz and Afar.¹¹ As evidenced by the Oakland Institute and others,¹² the CDP has resulted in forced evictions of local communities, mostly pastoralists and agro-pastoralists, and the seizure of land and water resources on which millions of Ethiopians rely for their livelihoods. More evictions can be expected in the future given that beyond the initial 3.6 million hectares earmarked for large-scale agriculture, the government has announced a total of 11.55 million hectares being available to agricultural investors.¹³

Sugar production is a key sector prioritized by the Ethiopian government. In 2015, the government announced its plan to make Ethiopia one of the world's ten largest sugar producers and exporters by 2023.¹⁴ Under the GTP, the government has pursued the construction of several sugar factories and sugarcane plantations, accompanied by construction of multiple dams for irrigation and generating electricity for agro-processing industries.

These are not the first large-scale agriculture and irrigation schemes that have been established in Ethiopia. In the mid-1950s, the imperial regime created sugar and cotton plantations in the Awash Valley in the Afar Region.¹⁵ Along with plantations came the building of several hydroelectric dams and irrigation schemes along the Awash River.¹⁶ These projects established on the lush banks of the river, negatively affected local pastoralists and offer valuable lessons, which are being ignored by the Ethiopian government in its quest for development.

Deprived of access to the Awash banks on which they depended for dry-season cattle grazing, the Afar pastoralists were forced to move increasingly long distances in search of pasture and water.¹⁷ The modification of water flow and seasonal flooding patterns downstream of dams and irrigation schemes further shrank pasturelands, while water contamination by the sugar processing plants and plantations threatened the wellbeing of humans and animals. Studies have shown that shrinking land and water resources and the push for the sedentarization of pastoralists in Afar lead to increased land degradation (resulting from cattle concentration in small grazing areas), food insecurity, and the in-



tensification of inter-ethnic conflicts.¹⁸ Even today, recurring weather variations and food crisis take a high toll on Afar pastoralists, who are deprived of their traditional strategies to cope with drought, such as access to dry season pasture, mobility and herd management.¹⁹

The Afar Region, thus, provides a valuable example of the negative impacts of large-scale plantations on people, livestock, and the environment. Separate research conducted on plantations in Afar has brought to light additional evidence that seriously challenges the development narrative of the government. This research shows with solid quantitative data that pastoral cattle production is far more profitable than large-scale cotton and sugar plantations.²⁰ Contrary to the destructive effects of monocrops on soil and water resources, pastoralism has no detrimental impact on the environment and instead provides a range of ecological benefits, including soil fertilization with manure.

These lessons have been largely ignored by the Ethiopian government, which instead seeks inspiration from emerging economies like Brazil. However, the Brazilian experience raises more red flags over Ethiopia's sugar development plans. Sugarcane expansion in Brazil has resulted in increased land concentration, displaced indigenous communities, dangerous and harsh working conditions, destruction of sensitive ecosystems, increased rural-to-urban migration, and has mostly benefited large landowners and agribusinesses at the expense of farm laborers and smallholder farmers.²¹

Another alarming aspect of Ethiopia's development plans comes from the large reliance on dams for irrigation needs. Five of the nine sugar factories currently running or under construction in Ethiopia rely on dams for sugarcane irrigation.²² Scientists and NGOs have warned for many years that dams create major threats for people's livelihoods and the environment. Environmental consequences of large dams range from destruction of ecosystems and biodiversity

to erosion and pollution.²³ Social consequences include population displacements and livelihoods destruction, as exemplified by the Koka Dam built to irrigate sugarcane plantations in Afar in 1960. The Koka Dam drastically impacted river flow and changed flooding patterns and the grazing land areas crucial for the survival of pastoralists in the Awash Valley.²⁴

In addition to the Awash Basin, the government has recently targeted the Lower Omo Valley, a UNESCO World Heritage Site, to develop one of the largest ever state-led agriculture schemes in the country: the Omo-Kuraz Sugar Development project. The project relies on irrigation schemes to be established from the recently completed Gibe III Dam and includes the construction of four to five sugar factories accompanied by 100,000 to 175,000 hectares of sugarcane plantations.²⁵ It is expected that Gibe III and irrigation schemes will affect 200,000 Ethiopian pastoralists and agro-pastoralists who rely on flood-recession agriculture and grazing lands bordering the Omo River.²⁶ The project is expected to affect another 300,000 people in Kenya whose livelihoods depend on Lake Turkana, which receives 90 percent of its water from the Omo River.²⁷

Large-scale agriculture and agro-processing plans constitute an increasingly large amount of the Ethiopian government's budget. Between 2010 and 2020, sugar expansion plans will cost an estimated \$11.2 billion.²⁸ Meanwhile, in March 2016, Ethiopia's Prime Minister called for more foreign aid to fight the ongoing food crisis and stigmatized the international community for its slow response to the emergency situation.²⁹ The government emphasized its own \$380 million contribution to respond to the food crisis,³⁰ but this is far from the amount of money spent in grandiose agro-industrialization schemes.

The Ethiopian government's development strategy takes away key coping strategies from its own people, destroys natural resources, and impacts the livelihoods of millions.



Introduction

Ethiopia has decades-long history of chronic hunger and famine,³¹ and remains one of the most food insecure countries in the world. In 2015-2016, the country had to call for international assistance to provide emergency food relief to some 10.2 million people,³² in addition to about 8 million people receiving food or cash assistance through the donor-funded Productive Safety Net Program (PSNP),³³ and other forms of relief aid in various sectors.³⁴

Drought and the effects of El Niño have been put forward as the main causes of the 2016 food crisis, which has been portrayed as an exceptional situation. However, the conditions were already primed for crisis before being exacerbated by extreme weather.

The prevailing food insecurity in Ethiopia is not inconsistent with the concerns previously raised by the Oakland Institute and other organizations, questioning the development policy pursued by the Ethiopian government in recent years.³⁵

The food crisis came as dissonant news in the often positive discourse surrounding Ethiopia – a country praised for its miraculous economic growth³⁶ and its successful approach to agricultural productivity³⁷ and investment.³⁸ Ethiopia is hailed as one of the top performing African economies – its economic growth averaged 10.8 percent per year between 2004 and 2014 against a regional average of 5 percent.³⁹ Despite this outstanding performance, the country remains one of the world's largest recipients of aid, receiving on average \$3.5 billion of official development assistance every year between 2008 and 2014.⁴⁰

A key area of concern has been and remains that current development plans rely largely on large-scale agricultural investments, in particular for export crops such as sugar or cotton, and large dams, for both electricity and irrigation. These schemes involve forced evictions of local

communities and the seizure of land and water resources on which millions of Ethiopians rely for their livelihoods.⁴¹ The government's plans for expanding large-scale agriculture and agro-processing industries primarily target areas populated by pastoral and agro-pastoral communities in Ethiopia's five lowland regions: Afar, Somali, Benishangul-Gumuz, Gambella, and Southern Nations Nationalities and People's Region (SNNPR).⁴² Much of the land demarcated for new agriculture programs is communal pastoral land. In order to make it available for large-scale agriculture, the government of Ethiopia has embarked on a program to forcibly relocate 1.5 million people.⁴³

The government has justified its policy by citing the need to increase agricultural production and productivity to enable economic growth.⁴⁴ However, it has failed to demonstrate how large-scale industrial agriculture schemes will address chronic food insecurity and the vulnerability to climatic shocks – whether at the local level, where the investments are taking place, or nationally. The latest food crisis calls for an urgent and objective reassessment of the relevance of the strategy implemented.

Such a review can benefit from the large body of independent research documenting the impact of dams and plantations in Ethiopia and other countries. Based on this research, this report analyses some of the key features of Ethiopia's development strategy, namely the expansion of plantations in pastoral and agro-pastoral regions of the country, the national priority given to sugar production and processing, and the increase of large dams for irrigation and electricity. This report provides important learning, which should be the basis for the Ethiopian government's development strategy and influence donor governments' financing of development programs in the country.





Women gather to receive World Food Programme relief food distribution in the Somali Region of Ethiopia © WFP/Michael Tewelde

Hunger Persists in Ethiopia

Food crisis in Ethiopia topped the media headlines in 2015-2016. In December 2015, the Ethiopian government called for international aid to provide emergency food assistance to 10.2 million people.⁴⁵ This was in addition to the ongoing government-led PSNP, financed by international donors, which will assist 7.9 million food-insecure people in 2016.⁴⁶ Adding these two figures, over 18 million people were in need of food assistance in Ethiopia in mid-2016.

Certainly El Niño⁴⁷ weather conditions have caused drought and reduced harvests, but alone do not account for the food crisis.⁴⁸ The worst affected zones include pastoral areas of the Afar and Somali regions and lowland agricultural zones of East and West Hararge.⁴⁹ Crop production dropped by 50-90 percent in some areas,⁵⁰ and drought-induced cattle deaths in 2015 reached 200,000.⁵¹ According to the United Nations, up to 450,000 livestock deaths are expected in 2016,⁵² as heavy rains resulting from El Niño's counter weather pattern also affect Ethiopia and cause destructive flash floods.⁵³

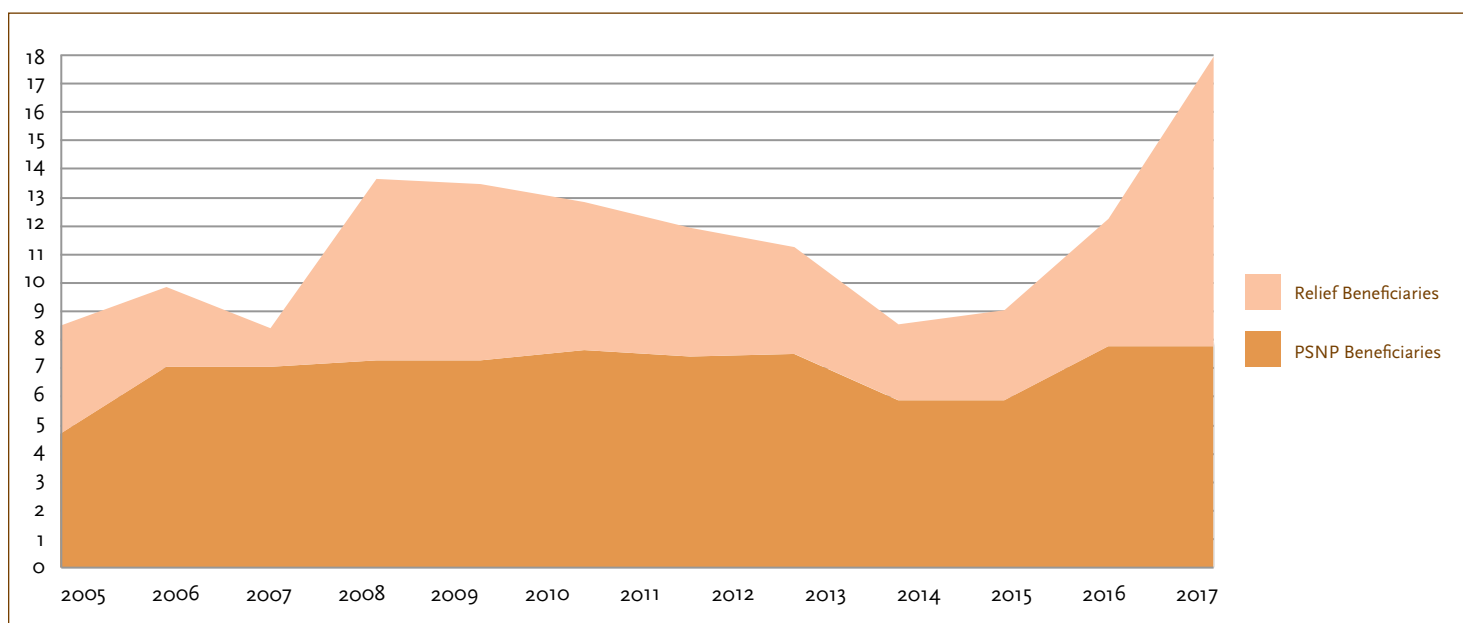
Yet before El Niño's impact on worsening food insecurity, over the past decade, every year, between 8 and 14 million Ethiopians have relied on food assistance for their survival (see Figure 1).⁵⁴

Established in 2005, the PSNP is a major channel for this aid. It is the largest social safety net program in Africa,⁵⁵ with an estimated cost of over \$5.8 billion for 2005-2020.⁵⁶ The PSNP is a joint effort by the government and international donors to address chronic food insecurity with a development-oriented aid approach.⁵⁷ The program beneficiaries receive food aid or cash transfers, generally as payments for their participation in labor intensive public work projects. It was conceived with the expectation that PSNP beneficiaries would "graduate" out of chronic food insecurity after receiving support for a certain amount of time.⁵⁸ However, in practice, only a small number of beneficiaries actually graduate out of the program, which questions the relevance of the safety net as a development instrument. Rather than lifting beneficiaries out of poverty, the PSNP's main achievement is to provide aid at a cheaper cost and in a timelier manner than emergency relief operations.⁵⁹

In the agricultural sector, the Ethiopian government has put in place strategies to increase farmers' productivity in order to meet the food needs of the country.⁶¹ The focus has been on the adoption of chemical fertilizer and commercial seeds, the use of which more than doubled in Ethiopia between 2004 and 2014.⁶² In the past decade, the total area cultivated expanded by nearly 30 percent from 10.1 million



Figure 1: PSNP and Relief Beneficiaries Receiving Food & Cash 2005-2016 (millions)⁶⁰

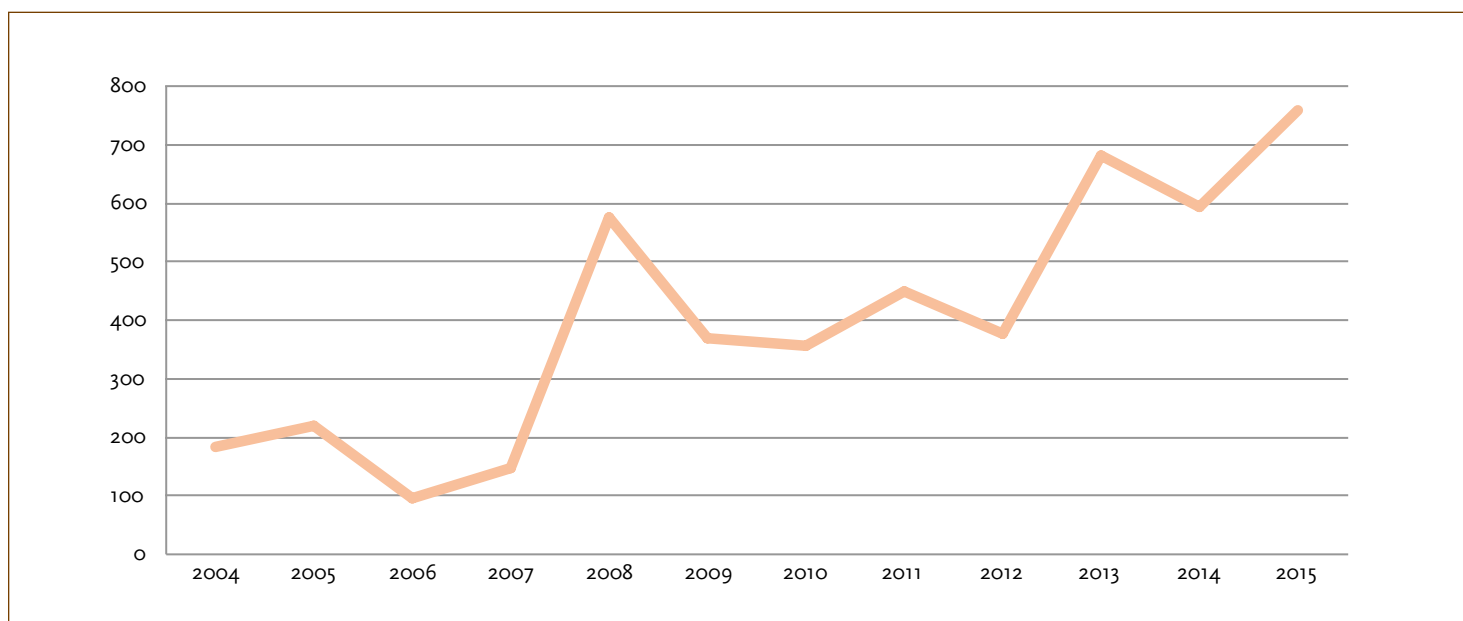


to 12.9 million hectares, while the number of farmers rose by an average of 3.8 percent per year during this period. These combined factors increased Ethiopia’s agricultural output by an average of 9.4 percent per year between 2004 and 2014, while yield growth averaged 7 percent.⁶³

However, this reported growth has failed to reduce chronic food insecurity or to prevent the recent food crisis. In 2015,

Ethiopia’s spending for cereal imports hit a record high of \$767 million.⁶⁴ Wheat forms the majority of these imports, with \$413 million spent on importing 1.3 million metric tons in 2015.⁶⁵ The country is expected to import a record of 2.5 million metric tons of wheat in 2016.⁶⁶ Since 2004, the country’s trade deficit in cereals has increased by 315 percent (see Figure 2).⁶⁷

Figure 2: Ethiopia’s Cereal Trade Deficit, 2004-2015 (in million US dollars)⁶⁸



‘Modernizing’ Agriculture for Growth and Transformation

In 2010, the government of Ethiopia released the first Growth and Transformation Plan (GTP I), a five-year strategy driving the country’s agenda for development. The GTP I, and its successor, GTP II, aim to turn Ethiopia into a middle income country by 2020-2025 through a rapid transformation of the agrarian economy into an industry and service-led one.⁶⁹ The agricultural sector is to form the basis of the country’s industrialization.

One key element of the consecutive GTPs, besides increasing smallholder productivity, is the promotion of investments in medium and large-scale commercial farms to increase production and supply of raw material for

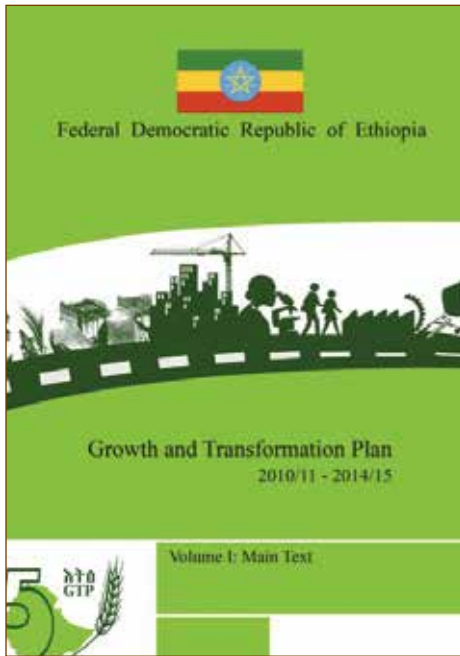
growing agro-processing industries.⁷⁰ The first GTP planned to attract private investors with the establishment of a land administration and lease system, and the provision of infrastructure and services to make targeted areas suitable for investment. It guaranteed, “every effort will be made to ensure private investors receive efficient services from the government.”⁷¹

Consequently, by 2011, 3.6 million hectares of land – an area larger than Belgium – had been earmarked for investments.⁷² Despite generally poor results of the large-scale agricultural projects that were allocated land,⁷³ the government advertised in 2015, 11.5 million hectares of

Table 1: Ethiopian Sugar Factories and Associated Plantations and Irrigation Schemes⁸²

Factory	Location	Associated Plantations	Associated Irrigation Scheme
Running Factories			
Metehara	Oromyia	10,100 ha	Irrigation canals from the Awash River ⁸³
Finchaa	Oromiya	Current expansion plans will bring size of plantation from 18,750 to 21,000 ha	Diversion weir from the Finchaa River ⁸⁴
Tendaho (two-phased construction. The first phase was completed and the factory started production in 2014)	Afar	50,000 ha (25,000 ha cultivated by the factory, and another 25,000 ha by outgrowers)	Tendaho Dam on the Awash River
Kessem	Afar	20,000 ha	Kessem Kebena Dam on the Kessem River (Awash basin)
Arjo Dedessa	Oromiya	20,000 ha	Arjo Dedessa Dam on the Dedessa River
Factories under Construction			
Wonji Shoa (2 factories built in the 1960s are in process of being replaced)	Oromiya	Expansion plan started in 2010 to increase existing plantations from 7,000 to 16,000 ha	Groundwater ⁸⁵
Omo-Kuraz Sugar Development Project (4-5 factories under construction)	SNNPR	100,000 - 175,000 ha ⁸⁶	Gibe III Dam on the Omo River
Belles (3 factories under construction)	Amhara	50,000 ha ⁸⁷	Diversion weir from the Beles River
Wolkaiyt	Tigray	25,000 ha ⁸⁸	May Day Dam on the Zarema River ⁸⁹





Ethiopia's first Growth and Transformation Plan (2010-2015) © Federal Republic of Ethiopia

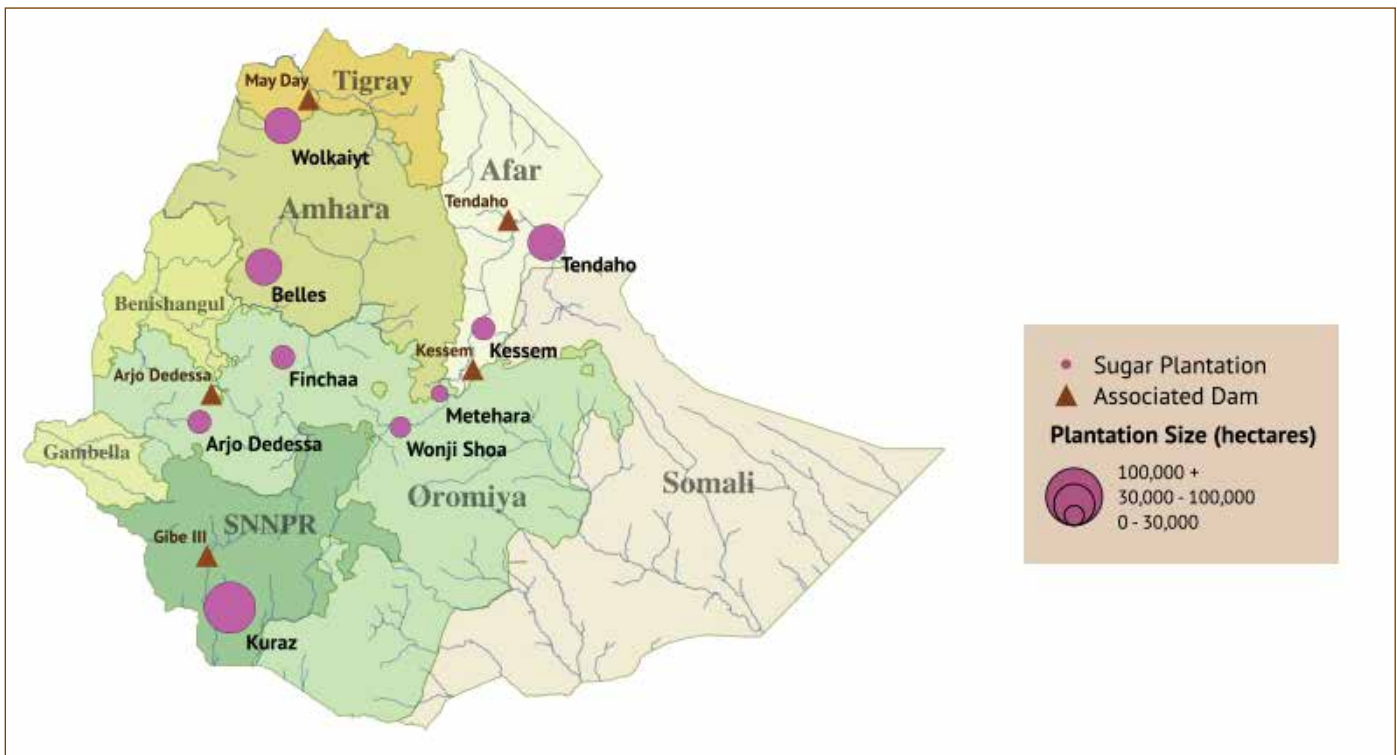
arable land available to investors, emphasizing its “strong commitment [...] to avail the country’s fertile land for investment.”⁷⁴ The GTP II (2015-2020) continues to encourage large-scale commercial farming, especially for export and agro-industry development.⁷⁵ Ethiopia looks to countries such as Brazil, India, Thailand and China, models of fast economic growth, for inspiration.⁷⁶

The development of the sugar sector is a key component of the GTPs, with the goal to make Ethiopia one of the world’s ten largest sugar producers and exporters by 2023.⁷⁷ To accomplish this goal, the GTP I projected to increase the level of sugar production from 0.31 tons in 2009-2010 to over 2.25 million tons by 2015 – a growth of over 614 percent. A state monopoly company, the Sugar Corporation, was created in 2010 with the mandate to renovate and expand several existing sugar factories (notably in Wonji Shoa, Metehara, and Finchaa) and to build 10 additional factories throughout the country.⁷⁸ The size and number of accompanying sugarcane plantations is expected to exceed 300,000 hectares in the coming years (see Table 1 on previous page).

The government of Ethiopia seeks to enhance South-South cooperation in agriculture and hopes to benefit from Brazil’s expertise and investments in the sugar sector to promote biofuel production.⁷⁹ In addition, Chinese banks have played a key role in financing of the Sugar Corporation’s expansion plans, having committed no less than \$1.63 billion for the Omo-Kuraz Sugar Development Project in the Lower Omo.⁸⁰ The sector is also supported with loans from India, Israel, and Poland.⁸¹

Dams play a key part in Ethiopia’s agricultural modernization plans, as they are combined with irrigation projects to provide water for large-scale plantations and generate electricity that is vital for agro-processing industries. Details on current and planned dam constructions are provided in a separate section below.

Figure 3: Sugar Plantations and Associated Dams in Ethiopia⁹⁰





Kwegu fishing in the Omo River in 2012, before the expansion of sugar and irrigation schemes © Will Hurd / Oakland Institute

A High Toll on Indigenous People and Agro-pastoralists

According to the first GTP, large-scale agriculture operations are supposed to take place in areas “not occupied or utilized by people.”⁹¹ However, research by the Oakland Institute and other organizations has shown that, far from being constrained to vacant lands, the expansion of large-scale agriculture is leading to the displacement of millions of indigenous people, mostly agro-pastoralists and pastoralists.⁹² A key element of this plan is the relocation of 1.5 million people from zones targeted for industrial plantations under the government’s “villagization” program, primarily implemented in agro-pastoralist areas of Gambella, Benishangul-Gumuz, Somali, South Omo, and Afar.⁹³

The government has repeatedly claimed that the goal of villagization is to improve access to basic services for local communities and that the process was voluntary.⁹⁴ However, numerous reports based on extensive field research document that the program has been enforced through violence and pressure on local communities to vacate the lands.⁹⁵

One key area targeted for large-scale agriculture, especially sugarcane, is the Lower Omo Valley, with the Omo-Kuraz Sugar Development Project launched in 2011. The project, one of the largest agricultural development schemes ever initiated by the Ethiopian government, relies on irrigation schemes to be established from the recently completed Gibe III Dam. It includes the construction of four to five sugar factories accompanied by 100,000 to 175,000 hectares of sugarcane plantations.⁹⁶

The impact of Gibe III and associated plantations on the flow of the Omo River, notably the modification of natural flooding patterns, will affect as many as 200,000 agro-pastoralists who depend on flood-recession agriculture and grazing lands bordering the Omo River.⁹⁷ The project is expected to affect another 300,000 people in Kenya whose livelihoods depend on Lake Turkana, which receives 90 percent of its water from the Omo River resources.⁹⁸

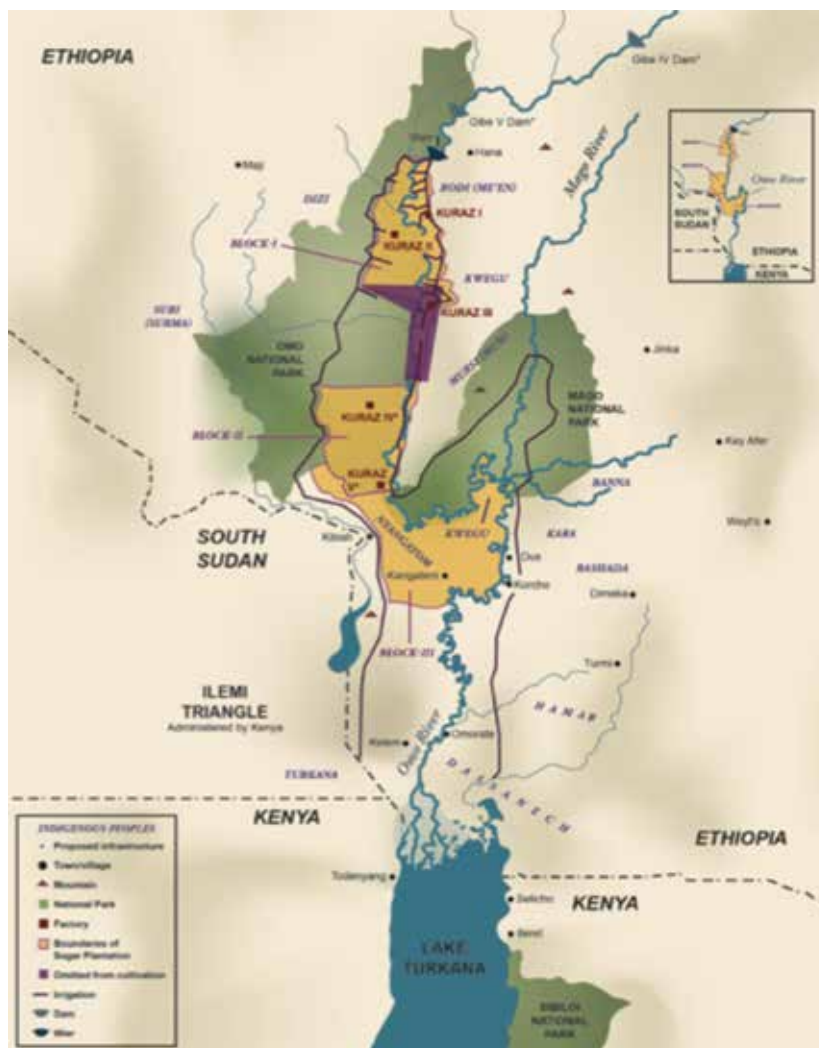


The government claims that its plans will bring development and improve the livelihoods of the local people.¹⁰⁰ Yet, there is ample evidence from Ethiopia and other countries pointing to the high toll that expansion of plantations and dams takes on indigenous people and the environment.



Omo-Kuraz sugar factory © Ethiopian Sugar Corporation

Figure 4: The Omo-Kuraz Sugar Development Project



Source: Omo-Turkana Basin Research Network/B. Kamski⁹⁹

Lessons from the Past: Devastating Impact of Plantations in the Afar Region

The Afar Region, a lowland area in the North East of Ethiopia, was the first region to see the establishment of large-scale plantations in the mid-1950s.¹⁰¹ In this relatively arid part of the country, the schemes relied on significant supply of irrigation water from the Awash River. Sugar and cotton plantations were expanded by successive governments in the following decades through the construction of new dams on the Awash River.¹⁰²

Over the past five decades, over 400,000 hectares of land in the Afar Region were seized by the government for various purposes, including plantations, national parks, wild life

conservation areas, and hunting lands.¹⁰³ This figure does not account for the loss of pasture land due to the decrease in flooded land downstream of the irrigation schemes. It is estimated that the 1960s expansion of plantations and the establishment of the Awash National Park reduced pastoral grazing areas by 60 percent.¹⁰⁴ The construction of hydroelectric dams on the Awash River reduced further the water flow downstream and affected the flooding patterns.¹⁰⁵ Whereas certain parts of the Afar region are semi-desert, the land taken away for plantations is located along the river in the lush Awash Valley,¹⁰⁶ and constitutes the most fertile area and the most vital to local livelihoods.





Shepherd boy, with his sick cow in Ab'Ala, Afar Region
© WFP/Wagdi Othman

The Afar has a population of over 1.7 million people, 90 percent of whom are pastoralists.¹⁰⁷ Their livelihoods rely largely on herding mixed stocks of camels, cattle, sheep and goats, and many depended on the land in the Awash Valley for pasture.¹⁰⁸ Pastoralists are mobile to adapt to the environment and maximize available resources. During the rainy season, they use the sparse grazing land further away from the valley, but during the dry season they depend on the more condensed grazing land near the banks of the Awash River. These riverbanks are lush from the water that flows from the highlands.¹⁰⁹

Large-scale plantations have had dramatic negative impacts on the Afar pastoralists. The loss of grazing land¹¹⁰ has been a key factor in growing food insecurity,¹¹¹ and increased vulnerability to droughts with the loss of vital dry season pasture.¹¹² Even if the area covered by agricultural plantations is relatively limited, the loss of lands that are crucial to ensure cattle survival in the dry season jeopardized the sustainability of pastoralism in the entire region. Loss of

land has also been a key factor in overgrazing of the sparse grazing land further away from the valley,¹¹³ with both short and long-term impact on the Afar people's ability to feed their livestock.¹¹⁴

The increased vulnerability to drought was made evident during the 1972-1973 famine,¹¹⁵ when as many as 200,000 people (roughly 25-30 percent of the Afar population) died as a result of food insecurity.¹¹⁶ As with the current crisis, this disaster was only partly due to limited rainfall, as the lack of access to grazing land resulted in the inability of pastoralists to cope with drought.¹¹⁷

The increase in food insecurity and vulnerability among Afar pastoralists has increased the need for relief aid to the region. In 2016, as it occurred many times before, Afar was again a major recipient of emergency relief for people (food aid) and animals (emergency forage, destocking, etc.).¹¹⁸

Beyond this direct impact on food security and capacity of resilience, the loss of pasture and land degradation has dramatically aggravated the pre-existing conflicts between different ethnic groups in the region.¹¹⁹ Afar pastoralists have been forced to compete for resources and grazing land with neighboring pastoral groups such as the Issa-Somalis and Oromos [Karrayyu].¹²⁰ Such conflicts have cost many lives along with large numbers of animals lost through cattle raiding, and further shrank the availability of pasture for security reasons.¹²¹

The establishment of plantations in Afar has also impacted the environment including the clearing of forests, the spreading of invasive species,¹²² as well as land and soil degradation, causing sodicity, salinity,¹²³ and alkalization.¹²⁴ By the early 1990s, salinity and sodicity in parts of the Awash Valley had reached such high levels that 3,000 hectares of cotton plantations were abandoned.¹²⁵ On other cotton plantations, yields decreased from 30 tons to 20 tons per hectare.¹²⁶

In addition to the impact on the land, the use of chemical pesticides, insecticides and herbicides in cotton and sugar production, combined with the accompanying industrial waste from the factories have significantly polluted and degraded the Awash River.¹²⁷ In a region where pastoralists and their livestock depend on the river for drinking water, this pollution has gravely endangered both people and animal health.¹²⁸



Dams: Electricity, Irrigation, and Man-made Disasters

The construction of dams is a centerpiece of Ethiopia's development strategy. Several major projects have been undertaken in the past decade, including the Gibe III Dam completed in 2015 in Lower Omo.¹²⁹ By 2017, Ethiopia will complete the construction of Africa's largest hydroelectric dam, the Grand Ethiopia Renaissance Dam on the Blue Nile River, which is expected to produce 6,000 megawatts of electricity for both export and domestic use.¹³⁰ Other mega-dam projects such as Gibe IV and Koysha planned for construction on the Omo River, secured financing in spring 2016.¹³¹ These should help Ethiopia reach its goal to produce 12,000 megawatts of electricity by 2020 – an increase of over 80 percent from the amount generated in 2015.¹³² In addition, over a hundred smaller dams are planned under the GTP II (2015-2020) to provide electricity for small-scale industries and support irrigation schemes.¹³³

Scientists and NGOs have, however, warned for many years that these plans pose major threats to the livelihoods of millions of Ethiopians.

Environmental consequences of large dams range from wholesale destruction of ecosystems and biodiversity to erosion, diversion and pollution. Because dams reduce rivers' flow and hold back sediments, they provoke important physical transformation of watersheds. Riverbeds and riverbanks erode in downstream areas where the river seeks recapturing necessary sediment and gravel.¹³⁴ Dams often block fish migration, while the depletion of river gravel and sediment affect fish and other fauna's habitat. The modification of water flow and seasonal flooding patterns also affects riverside vegetation, including vital dry season pasture land in critical grazing areas. In addition, the deepening of riverbeds can affect groundwater tables, which in turn impacts vegetation, well levels, and agriculture along the river.¹³⁵ Upstream, ecosystems are affected by the forming of vast reservoirs with different temperature, oxygen level and chemical composition compared to flowing water.¹³⁶ Smaller dams are often considered more environmentally friendly, but recent studies suggest that their cumulative impacts may be worse per megawatt of electricity generated than that of large dams.¹³⁷

Meanwhile, it has been shown in many places around the world that cost-effective alternatives to dams can provide electricity and irrigation that truly benefit communities.

Decentralized systems include micro-hydro schemes, water harvesting techniques, and rooftop solar panels, among others.¹³⁸ Larger alternatives such as wind power production, larger solar installations, biomass electricity generation, geothermal plants, and more, have also shown successful results.¹³⁹

In Ethiopia, warnings over the government's plans come from the research conducted on previous dams such as the Koka Dam, built in 1960 on the upper Awash River.¹⁴⁰ The Koka Dam drastically reduced river flow and thus changed flooding patterns and the grazing land areas of the Awash Valley.¹⁴¹ Prior to the building of the dam, peak water flow was 700 m³/second. It decreased to 300 m³/second after the construction of the dam, while minimum water flow that was 200 m³/second decreased to 30 m³/second.¹⁴² The significant decrease in water flow following the construction of the Koka Dam and the numerous irrigation schemes upstream shrank the proportion of land flooded in downstream areas, reducing the amount of grazing land and negatively impacting pastoralists.¹⁴³

More recently, experts have expressed serious concerns over the projected impact of the Gibe III Dam and associated sugar irrigation schemes, both in Ethiopia and in Kenya. The Omo Valley and Lake Turkana, two UNESCO World Heritage Sites, could be affected by a reduction by as much as 70 percent of the Omo River's water flow.¹⁴⁴ Straddling the border between Ethiopia and Kenya, Lake Turkana could



Omo River in 2012, before the completion of the Gibe III Dam
© Will Hurd / Oakland Institute





Fishermen at Lake Turkana, 2012 © Will Hurd / Oakland Institute



undergo a drop in level between 16-22 meters (the average depth of the lake is 31 meters) due to the dam construction and water diversion for commercial agriculture.¹⁴⁵ It is expected that Gibe III will affect a total of 500,000 indigenous Kenyans and Ethiopians dependent on the downstream water flow for their livelihoods based on herding, fishing, and flood-recession agriculture.¹⁴⁶

Large dams were once viewed as potent symbols of development, bringing electrification, water management, employment, and other benefits to countries. Yet, as the research has mounted in recent years, mega dams have come under heavy scrutiny from scientists, NGOs and communities impacted or displaced by dams, triggering serious concern over current and planned investments in Ethiopia.



Sugarcane Expansion: Bitter Lessons from Brazil

Another red flag comes from Brazil, ironically the source of inspiration for much of Ethiopia's plans for the expansion of the sugar industry. Over the past half-century, sugarcane production for conversion to ethanol have been key elements of the Brazilian government's development strategy. As a result, the area of cultivated sugarcane in Brazil has increased from 1.4 million hectares in 1960 to over 10 million hectares today.¹⁴⁷ Proponents of this model of development have declared that this will help the country in terms of land use efficiency,¹⁴⁸ economics and development,¹⁴⁹ food and energy security,¹⁵⁰ and the environment.¹⁵¹ But experience on the ground reveals a different reality.

First, sugarcane expansion has had a massive and devastating toll on indigenous peoples. A poignant example is the plight of the Guarani. For centuries, the Guarani lived off the land in Brazil, but today they have lost nearly 95 percent of their traditional territories to industrial scale sugarcane and soy plantations.¹⁵² Their ongoing fight to reclaim these lands has been met with arson, violence, intimidation, and the murder of their leaders. Having lost their traditional livelihoods, many have been forced to work on sugarcane plantations facing horrific work conditions while others have fled to reservations where they are reliant on food aid from the government and face malnutrition.¹⁵³ In 2016, it was reported that nearly 1,000 mostly young Guarani had taken their own lives in the last ten years, causing one indigenous leader to describe the situation as a "slow genocide" of his people.¹⁵⁴

Sugarcane expansion has also exacerbated land concentration in Brazil. In the early 2000s, a mere three percent of Brazil's population owned two thirds of its farmland while 25 million people were landless.¹⁵⁵ Around the same time, large foreign-owned companies – including agribusiness giants like Bunge and Archer Daniels Midland – began buying sugar mills and plantations in the country.¹⁵⁶ The growth of large agribusinesses for sugar and other crops has led to larger estates, even fewer landowners, and decreased rural employment.¹⁵⁷ Ultimately, this has created a situation where benefits from sugarcane expansion have been real-

ized by large-scale farmers and agribusinesses, with small farmers largely missing out.¹⁵⁸

While many rural laborers have found employment in the sugarcane industry, jobs in the sector are typically seasonal, and have been notorious for being low wage with slave-like labor conditions, child labor, and innumerable health and human rights issues.¹⁵⁹ More recently, technological advancements such as mechanized harvesting have reduced rural employment in the industry, with estimates that up to 200,000 manual harvesting jobs may be lost.¹⁶⁰

Finally, environmental issues relating to sugarcane expansion abound. One issue is land use change and the encroachment of sugarcane onto sensitive ecosystems including large swaths of rainforest. Land use change can be direct (sugarcane itself expanding into ecologically sensitive regions)¹⁶¹ or indirect (sugarcane expansion displacing other crops, such as soy, causing the agricultural frontier to expand into sensitive ecosystems like the Cerrado).¹⁶² While there is legislation to ensure the protection of sensitive biomes in the context of agricultural expansion, experts note that lack of enforcement "is a widespread problem."¹⁶³ Other environmental issues caused by extensive sugarcane cultivation include: soil erosion and compaction, the high use of pesticides, loss of biodiversity especially around riparian zones, and over fertilization, amongst others.¹⁶⁴ In some cases, these issues – for instance, the overuse of aerial pesticides – have negatively affected nearby vegetable farmers, further impacting rural livelihoods and food security.¹⁶⁵

Strides have been taken in recent years to address some of the concerns plaguing the sugarcane industry in Brazil.¹⁶⁶ However, these improvements do not change the fact that sugarcane expansion has increased land concentration, devastated indigenous communities, had negative impacts on sensitive ecosystems, increased rural-to-urban migration, and has mostly benefited large landowners and agribusinesses at the expense of laborers and smallholder farmers. These bitter lessons cannot be ignored as Brazil is falsely promoted as a positive model of rural development worldwide.





Zahara Mohammed, 12, moves her family's livestock in Afar © UNICEF/Ose

Overlooking Reality: High Cost and Low Benefit of Plantation Agriculture Compared to Pastoralism

An important 2013 study by the International Institute for Environment and Development¹⁶⁷ compared the productivity per hectare of industrial agriculture of sugarcane and seed cotton against pastoral production in Afar.

Looking at the output of a heard of animals (milk, meat, and other animal products)¹⁶⁸ on one hectare of land, the researchers found that agro-pastoralists net return was \$542 per hectare for low stocking rates¹⁶⁹ and \$1,084 per hectare for high stocking rates. When compared to both the first production form of cotton (seed cotton) and sugar (sugarcane), they found that pastoral output production was equal or higher. The state-owned cotton plantation MAADE's seed cotton production had an annual net loss of \$120 per hectare between 1980 and 1990. When the MAADE plantation was converted into smaller privately owned cotton plantations, the annual average profit rose to \$135 per hectare between 2004 and 2009. This is still substantially lower than the livestock low stocking rate production output. When examining the more processed lint cotton, research shows higher returns per hectare in good years, but in bad years the financial losses were significantly magnified.

Sugarcane production rates were slightly more profitable than the seed cotton. The analysis of the production of the Metahara Sugar Factory and Wonji-Shoa Sugar Estate from

2001 to 2009 showed that sugarcane production rates were as profitable as livestock production rates for two out of eight years and less profitable for the other six years. The net annual average return over the period was \$488, which is less than the annual net livestock output for low stocking rates.

The comparison in Table 2 demonstrates that large-scale agriculture is far less profitable than pastoralism, whereas, as revealed earlier, it has many devastating effects on the land, the water and the environment in Afar.

The economic contribution of pastoralism has often been overlooked and underestimated in development policies¹⁷¹ notably because of the lack of documentation of pastoral activity and of its classification under the informal sector.¹⁷² Several experts have claimed that official estimates of the share of livestock in Ethiopia's GDP (10-20 percent according to the years and estimates)¹⁷³ are underrated.¹⁷⁴ This underestimation limits the amount of investment and support to the sector portrayed as less profitable.¹⁷⁵ With much of the cross-border and within border trading of livestock, milk, meat, skin and hides going undocumented, it has been argued that actual informal trade of pastoral products may be about 10 times higher than documented, formal trade.¹⁷⁶



Table 2: Economic Comparison of Plantation Agriculture and Pastoralism in Afar (Net return per hectare)¹⁷⁰

Livestock – low stocking rates (2009)	Livestock – high stocking rates (2009)	Seed Cotton – MAADE state plantation (average 1980-1990)	Seed Cotton – private plantation (average 2004-2009)	Sugarcane (average 2001-2009)
\$542	\$1,084	\$120	\$135	\$488

Despite a growing body of evidence that highlights the economic and environmental importance of pastoralism, few governments are ready to tolerate mobile livestock production and many pursue explicit or inadvertent policies of settlement. Yet the policy of sedentarization, particularly in the drylands, has been shown time and again to result in increased environmental degradation, reduced economic potential and eroded social and cultural systems. Rainfall in the drylands is low and unpredictable, both in terms of when it comes and where it lands, so the only practicable management system is an opportunistic one: to go where the resources are, when they are available. Most dryland ecosystems are ecologically grazing-dependent, and a reduction of mobility of graziers or exclusion of such graziers can result in a significant drop in biological diversity and reduced ecosystem health and stability.

Mobile pastoralism has considerable economic value and latent potential in rangelands environments, and is central to the livelihoods and well-being of millions of the world’s poor, but the state of knowledge regarding this sector of the economy is inadequate. This knowledge gap creates weaknesses in understanding what constitutes value in such systems. The policies that emanate from such misunderstanding continue to devalue mobile pastoralism, often at significant cost to national economies and to the natural environment.

Adapted from Davies, Jonathan and Richard Hatfield. “The economics of mobile pastoralism: a global summary.” Nomadic Peoples 11.1 (2007)¹⁷⁷



Cattle grazing in Mursiland © Will Hurd / Oakland Institute

This demonstration that Afar pastoralism is a profitable and productive form of livelihood doesn’t even take into account indirect benefits of pastoralism, such as providing transportation, food and nutrition, and environmental services to grazing land.¹⁷⁸ The pastoral lifestyle maximizes the scarce resources in the dryland areas, and has been found to be the most sustainable livelihood in the arid lowlands of Ethiopia.¹⁷⁹ Pastoralism has no environmental costs but rather helps increase biodiversity, fertilize the land with livestock manure, and protects it from degradation and desertification.¹⁸⁰

This is important given soil erosion and degradation is a major problem for Ethiopia today.¹⁸¹ According to the United Nations Food and Agriculture Organization (FAO), Ethiopia loses approximately one billion tons of topsoil annually, is faced with a high rate of nutrient loss in the soil, and 30,000 hectares are lost to water erosion each year.¹⁸² The twofold effect of losing pastoral environmental benefits while adding industrial plantations intensifies land degradation and reduces the usability of some of the country’s most valuable land and resources.





Trucks transporting industrial turbines for development projects © Oakland Institute

Repeating Past Mistakes

Driving a massive expansion of sugarcane plantations in the country, the Ethiopian government is willfully ignoring the available evidence about the negative impacts and lack of economic benefit. Yet, as seen in Afar, the transformation of pastoral and farm land into sugar or cotton plantations created hunger and conflict, while it failed to contribute to local or national food supply.

In the Lower Omo Valley, the Omo-Kuraz Sugar Development project, although far from having attained its final configuration with five sugar factories and plantations on over 100,000 hectares, has already physically and socially transformed the area. Echoing the Afar scenario, resource deprivation and tribes' displacement is generating conflict and food insecurity.¹⁸³ Confrontations have occurred between the Bodi and Konso in the area where the Kuraz I and II factories are being constructed.¹⁸⁴ Clashes have also been reported in Mursiland, where increased road traffic due to

the project has led to human and animal collisions with vehicles, engendering retaliation against truck drivers and road blockages.¹⁸⁵ The region is also expecting an influx of a large number of plantation workers (up to 500,000 people, mainly from the Ethiopian Highlands), another potential catalyzer for ethnic and social conflict.¹⁸⁶

In Afar, where the expansion of commercial sugar projects has continued in recent years through the construction of the Tendaho and Kessem sugar factories,¹⁸⁷ the drought is heightening tensions. In January 2016, the federal police arrested and imprisoned 70 drought stricken shepherds who tried to take their cattle to drink in the Awash River reservoir.¹⁸⁸ This followed the decision of the manager of the Tendaho factory to stop water release from the irrigation dam, which resulted in dramatic reduction of water levels and a threat to local pastoralists and lives of their cattle.¹⁸⁹





Sickly livestock gather in the drought stricken area of Ab'Ala in Afar
© WFP/Wagdi Othman

While indigenous people are paying a high price for the development of commercial agriculture, there is no evidence that the sugar projects will generate good economic returns. The Omo-Kuraz Sugar Development Project has been ill-planned (after five years of construction, the project's feasibility studies are still due), whereas the remoteness of the region and delays in construction are casting serious doubts about its profitability.¹⁹⁰ The impact on environment and people will increase with the beginning of the sugar cultivation, which will affect water supply and quality through fertilizer and pesticide pollution.¹⁹¹ A 2016 study by the Omo-Turkana Basin Research Network also questioned the viability of the Omo-Kuraz plans, pointing at difficult drainage conditions and irregular levels of soil alkalinity and carbon content.¹⁹² This mirrors the situation

in Afar, where plantations have been abandoned due to soil degradation.

Ethiopia's colossal agro-industrialization plans cost billions of dollars. Since 2010, the Sugar Corporation has received \$3 billion to carry out expansion plans,¹⁹³ and needs another \$8.2 billion to complete all projects by 2020.¹⁹⁴ The dam plans are no less expensive: Gibe III cost Ethiopia \$1.8 billion,¹⁹⁵ and more projects are planned to help expand irrigation, such as Gibe IV, which will require \$1.7 billion in financing.¹⁹⁶ Outside agriculture, the government's plans for dams and energy generation could cost up to \$25 billion between 2015 and 2020, half of which would be financed from Ethiopia's own coffers.¹⁹⁷

Meanwhile, the humanitarian requirements to fight Ethiopia's food crisis were reevaluated at \$1.5 billion in May 2016.¹⁹⁸ In March 2016, the Prime Minister complained about the slow response of the international community to the ongoing food crisis and called for more aid.¹⁹⁹ The government emphasized its own \$380 million contribution to fight the crisis,²⁰⁰ but this is far from the amount of money spent in grandiose industrialization projects.²⁰¹

The research compiled in this report, including lessons learnt from Afar, Brazil and elsewhere, raises serious questions about the choices made by the government and its donors. It warns that "development" projects, supported by billions of dollars of public money from Ethiopia and its donors, is likely to destroy the livelihoods of millions, cause displacement, lead to increased food insecurity and dependence on food aid, with adverse impacts on natural resources and the environment.²⁰²

Conclusion

The contrast between Ethiopia's economic boom and continued poverty and food insecurity of its population can be partly elucidated by the Afar example. In this region, the development of large-scale plantations and associated loss of land has exacerbated the marginalization of pastoralist and agro-pastoralist groups. Increased food insecurity, vulnerability to droughts, environmental degradation, violations of land rights, and surge of conflicts should be enough to discourage future irrigation and plantations schemes. The economic comparison makes it even clearer that pastoralism is a valuable lifestyle and makes a compelling argument for

the re-evaluation of current plans for resettlement schemes and large-scale agriculture.

Prevailing disregard of the negative impacts of the past development strategies, however, bounds the Ethiopian government to replicate failed plantation and irrigation schemes and doom itself to repeat mistakes on a much larger scale throughout Ethiopia. The costs are likely to increase with worsening climate change and trends of land degradation. Moving forward, the Ethiopian government would do better to reconsider its plans for development that will actually benefit all of Ethiopians, including the pastoralists.



Endnotes

- 1 This figure accounts for 7.9 million food insecure people covered by the Productive Safety Net Program (PSNP) and 10.2 million people in need of emergency food assistance in 2015 – 2016. See: Government of Ethiopia and Humanitarian Partners. 2016 *Ethiopia Humanitarian Requirements Document*. Joint Government and Humanitarian Partners' Document, December 2015. http://www.unicef.org/ethiopia/ECO_Ethiopia_HRD_2016.pdf (accessed June 27, 2016); USAID. "Food Assistance Fact Sheet – Ethiopia." *Our Work*. <https://www.usaid.gov/ethiopia/food-assistance> (accessed May 27, 2016).
- 2 World Bank. "Ethiopia" *Countries*. <http://www.worldbank.org/en/country/ethiopia/overview>
- 3 See for instance: Ministry of Foreign Affairs. *A Week in the Horn*. [Weekly Press Release], March 9, 2012. <http://mfa.gov.et/> (accessed April 9, 2013).
- 4 Horne, Felix. *Understanding Land Investment Deals in Africa: Ethiopia*. Oakland Institute, 2011. <http://www.oaklandinstitute.org/understanding-land-investment-deals-africa-ethiopia> (accessed June 27, 2016); Flores, Luis. *Development Aid to Ethiopia: Overlooking Violence, Marginalization, and Political Repression*. Oakland Institute, 2013. <http://www.oaklandinstitute.org/development-aid-ethiopia> (accessed June 27, 2016); Oakland Institute. *Omo: Local Tribes under Threat. A Field Report from the Omo Valley, Ethiopia*. Oakland Institute, 2013. <http://www.oaklandinstitute.org/omo-local-tribes-under-threat> (accessed June 27, 2016).
- 5 OECD stats. <http://stats.oecd.org/> (accessed June 27, 2016).
- 6 Flores, Luis. *Development Aid to Ethiopia: Overlooking Violence, Marginalization, and Political Repression*. *Op. Cit.*
- 7 UNDP. "National Human Development Report 2015 Ethiopia." *Human Development Reports*. <http://hdr.undp.org/en/countries/profiles/ETH> (accessed June 28, 2016).
- 8 Ministry of Finance and Economic Development. *Growth and Transformation Plan (GTP) 2010/11-2014/15*. The Federal Democratic Republic of Ethiopia, 2010. <http://planipolis.iiep.unesco.org/upload/Ethiopia/EthiopiaGTP.pdf> (accessed June 27, 2016).
- 9 Smallholder farmers produce 96 percent of Ethiopia's agricultural output, World Bank. *Second Agricultural Growth Project – Federal Democratic Republic of Ethiopia*. Agriculture Global Practice, March 2015. http://www.wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2015/03/10/000442464_20150310100025/Rendered/PDF/PAD10520PADoP100Box385443BooOUO9o.pdf (accessed August 8, 2016).
- 10 Horne, Felix. *Understanding Land Investment Deals in Africa: Ethiopia*. *Op. Cit.*
- 11 Flores, Luis. *Development Aid to Ethiopia: Overlooking Violence, Marginalization, and Political Repression*. *Op. Cit.*; Fraser, Elizabeth. *Moral Bankruptcy: World Bank reinvents Tainted Aid Program for Ethiopia*. Oakland Institute, 2016. <http://www.oaklandinstitute.org/moral-bankruptcy-world-bank-reinvents-tainted-aid-program-for-ethiopia> (accessed June 27, 2016).
- 12 Horne, Felix. *Understanding Land Investment Deals in Africa: Ethiopia*. *Op. Cit.*; Flores, Luis. *Development Aid to Ethiopia: Overlooking Violence, Marginalization, and Political Repression*. *Op. Cit.*
- 13 Ethiopian Investment Commission. *Ethiopia, A Preferred Location for Foreign Direct Investment in Africa: An Investment Guide to Ethiopia*, 2015. Ethiopian Investment Commission, 2015. http://www.ethiopianembassy.org/PDF/Ethiopia_Investment_Guide_2015.pdf (accessed January 4, 2016), p. 30.
- 14 Global Agricultural Information Network (GAIN). *Ethiopia Aims to Become One of the World's Top 10 Sugar Producers*. USDA Foreign Agricultural Service, 2015. <http://www.fas.usda.gov/data/ethiopia-ethiopia-aims-become-one-world-s-top-10-sugar-producers> (accessed June 27, 2016).
- 15 Behnke, R. and C. Kerven. *Counting the Costs: Replacing Pastoralism with Irrigated Agriculture in the Awash Valley, North-Eastern Ethiopia*. International Institute for Environment and Development, 2013. <http://pubs.iied.org/pdfs/10035IIED.pdf> (accessed June 27, 2016).
- 16 Little, P.D., Behnke, R.; McPeak, J. and G. Gebru. *Retrospective Assessment of Pastoral Policies in Ethiopia, 1991–2008. Report Number 1: Pastoral Economic Growth and Development Policy Assessment, Ethiopia*. Department for International Development, 2010. <http://www.future-agricultures.org/search-documents/future-of-pastoralism/other-resources-1/1131-retrospective-assessment-of-pastoral-policies-in-ethiopia-1991-2008/file> (accessed June 27, 2016).
- 17 Elias, E. and F. Abdi. *Putting Pastoralists on the Policy Agenda: Land Alienation in Southern Ethiopia*. IIED, 2010. <http://pubs.iied.org/pdfs/14599IIED.pdf> (accessed June 29, 2016).
- 18 Hundie, Bekele. "Conflicts Between Afar Pastoralists and their Neighbors: Triggers and Motivations." *International Journal of Conflict and Violence* 4.1 (2010): 134-148; Rettberg, Simone. "Contested Narratives of Pastoral Vulnerability and Risk in Ethiopia's Afar Region." *Pastoralism* 1.2 (2010): 248-273.
- 19 Overseas Development Institute. *Getting it Right: Understanding Livelihoods to Reduce the Vulnerability of Pastoral Communities*. Humanitarian Policy Group, 2009. <http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/4307.pdf> (accessed June 27, 2016).
- 20 Behnke, R. and C. Kerven. *Counting the Costs: Replacing Pastoralism with Irrigated Agriculture in the Awash Valley, North-Eastern Ethiopia*. *Op. Cit.*
- 21 De Andrade, R.M.T. and A. Miccolis. *Policies and Institutional and Legal Frameworks in the Expansion of Brazilian Biofuels*. Working Paper 71, CIFOR, 2011. <http://www.cifor.org/library/3509/policies-and-institutional-and-legal-frameworks-in-the-expansion-of-brazilian-biofuels/?pub=3509> (accessed June 9, 2016); Vidal, John. "Brazil's Guarani Indians Killing Themselves over Loss of Ancestral Land." *The Guardian*, May 18 2016. <http://www.theguardian.com/environment/2016/may/18/brazils-guarani-indians-killing-themselves-over-loss-of-ancestral-land> (accessed July 8, 2016); Martinelli, Luiz, A. and Solange Filoso, "Expansion of Sugarcane Ethanol Production in Brazil: Environmental and Social Challenges." *Ecological Applications*, 18.4 (2008): 885-898; Filoso, Solange *et al.*, "Reassessing the Environmental Impacts of Sugarcane Ethanol Production in Brazil to Help Meet Sustainability Goals." *Renewable and Sustainable Energy Reviews*, 52 (2015): 1847-1856.
- 22 Sugar Corporation. <http://www.etsugar.gov.et/> (accessed July 8, 2016).
- 23 World Commission on Dams. *Dams and Development. A New Framework for Decision-Making*. United Nations Environment Programme, 2000. http://www.unep.org/dams/WCD/report/WCD_DAMS%20report.pdf (accessed June 28, 2016); International Rivers. "Environmental Impacts of Dams." *The Basics*. <https://www.internationalrivers.org/environmental-impacts-of-dams> (accessed June 28, 2016).
- 24 Gebre-Mariam, Ayele. "The Alienation of Land Rights Among the Afar in Ethiopia." *Nomadic Peoples*: 34/35. (1994): 137-146.
- 25 Sugar Corporation. "Omo-Kuraz Sugar Development Project." *Projects*. <http://www.etsugar.gov.et/index.php/en/projects/kuraz-sugar-development-project> (accessed June 27, 2016); Kamski, Benedikt. *The Kuraz Sugar Development Project*. Omo-Turkana Basin Research Network, Briefing Note 1, 2016. http://www.arnold-bergstraesser.de/sites/default/files/field/pub-download/ksdp_briefing_note_omo_turkana_basin_research_network_1.pdf (accessed June 27, 2016).
- 26 Oakland Institute. *Omo: Local Tribes Under Threat. A Field Report From the Omo Valley, Ethiopia*. *Op. cit.*
- 27 Fong, Catherine. *A Cascade of Development on the Omo River. Downstream Effects of the Gibe III Filling and Associated Commercial Irrigation Projects*. International Rivers, 2014. https://www.internationalrivers.org/files/attached-files/cascade_of_impacts_ir.pdf (accessed June 27, 2016).
- 28 Davidson, William. "Ethiopia May Ship Sugar in 2016 as India-Backed Plant Ready." *Bloomberg*, November 12, 2015. <http://www.bloomberg.com/news/articles/2015-11-13/ethiopia-may-ship-sugar-in-2016-as-india-backed-plant-completed> (accessed June 27, 2016).
- 29 "Ethiopia Calls for International Help as Drought Bites." *Aljazeera*, March 17, 2016. <http://www.aljazeera.com/news/2016/03/ethiopia-calls-international-drought-bites-160317142601295.html> (accessed June 28, 2016).
- 30 *Ibid.*
- 31 Flores, Luis. *Development Aid to Ethiopia: Overlooking Violence, Marginalization, and Political Repression*. *Op. Cit.*
- 32 Government of Ethiopia and Humanitarian Partners. 2016 *Ethiopia*



- Humanitarian Requirements Document. *Op. Cit.*
- 33 USAID. "Food Assistance Fact Sheet – Ethiopia." *Our Work*. <https://www.usaid.gov/ethiopia/food-assistance> (accessed May 27, 2016).
- 34 Government of Ethiopia and Humanitarian Partners. 2016 *Ethiopia Humanitarian Requirements Document. Op. Cit.*
- 35 Horne, Felix. *Understanding Land Investment Deals in Africa: Ethiopia. Op. Cit.*; Flores, Luis. *Development Aid to Ethiopia: Overlooking Violence, Marginalization, and Political Repression. Op. Cit.*; Hathaway, Terry. *What Cost Ethiopia's Dam Boom? A Look Inside the Expansion of Ethiopia's Energy Sector*. International Rivers, 2008. <https://www.internationalrivers.org/files/attached-files/ethioreport06febo8.pdf> (accessed June 27, 2016); Horne, Felix. 'Waiting Here for Death.' *Displacements and 'Villagization' in Ethiopia's Gambella Region*. Human Rights Watch, 2012. https://www.hrw.org/sites/default/files/reports/ethiopia0112webwcover_o.pdf (accessed June 27, 2016).
- 36 International Monetary Fund. *The Federal Democratic Republic of Ethiopia*. IMF Country Report No. 15/300, September 2015. <http://www.imf.org/external/pubs/ft/scr/2015/cr15300.pdf> (accessed June 2, 2016); Moller, Lars Christian et al. *Ethiopia's Great Run. The Growth Acceleration and How to Pace It*. World Bank Group, 2016. http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2016/02/16/090224b084187906/3_0/Rendered/PDF/Ethiopiaosogreonandohowotopaceoit.pdf (accessed June 27, 2016).
- 37 *Ibid.*
- 38 Blumenstein R., Gates, B. and M. Gates. "Bill Gates: GMOs Will End Starvation in Africa." [Video] *Wall Street Journal*, January 22, 2016. <http://www.wsj.com/video/bill-gates-gmos-will-end-starvation-in-africa/3085A8D1-BB58-4CAA-9394-E567033434A4.html> (accessed July 6, 2016).
- 39 World Bank. "Ethiopia." *Countries*. <http://www.worldbank.org/en/country/ethiopia/overview> (accessed July 6, 2016).
- 40 OECD stats. *Op. Cit.*
- 41 Horne, Felix. *Understanding Land Investment Deals in Africa: Ethiopia. Op. Cit.*; Flores, Luis. *Development Aid to Ethiopia: Overlooking Violence, Marginalization, and Political Repression. Op. Cit.*
- 42 *Ibid.*; Fraser, Elizabeth. *Moral Bankruptcy: World Bank Reinvents Tainted Aid Program for Ethiopia. Op. Cit.*
- 43 *Ibid.*
- 44 Ministry of Finance and Economic Development. *Growth and Transformation Plan (GTP) 2010/11-2014/15. Op. Cit.*
- 45 Government of Ethiopia and Humanitarian Partners. 2016 *Ethiopia Humanitarian Requirements Document. Op. Cit.*
- 46 USAID. "Food Assistance Fact Sheet – Ethiopia." *Op. Cit.*
- 47 El Niño-Southern Oscillation (ENSO) is a complex weather pattern associated with temperature variations in the Central and East-Central Equatorial Pacific. El Niño and La Niña are the opposite phases of the phenomenon, sometimes referred to as the cold phase (La Niña) and warm phase (El Niño). See: National Oceanic and Atmospheric Administration (NOAA). "What are El Niño and La Niña?" *Ocean Facts*. <http://oceanservice.noaa.gov/facts/ninonina.html> (accessed May 27, 2016).
- 48 McFerron, W., Almeida, I. and W. Davison. "Food Crisis Looming in Ethiopia after Worst Drought in 50 Years." *Bloomberg*, January 6, 2016. <http://www.bloomberg.com/news/articles/2016-01-07/food-crisis-looming-in-ethiopia-after-worst-drought-in-50-years> (accessed June 21, 2016).
- 49 USAID. "Food Assistance Fact Sheet – Ethiopia." *Op. Cit.*
- 50 FAO. *Ethiopia Situation Report*. February 2016. http://www.fao.org/fileadmin/user_upload/emergencies/docs/FAO%20Ethiopia_EI%20Nino%20Situation%20Report_February%202016.pdf (accessed June 21, 2016).
- 51 McFerron, W., Almeida, I. and W. Davison. "Food Crisis Looming in Ethiopia after Worst Drought in 50 Years." *Op. Cit.*
- 52 *Ibid.*
- 53 Maasho, Aaron. "Flash Floods Displace Nearly 120,000 in Ethiopia." *Reuters*, May 11, 2016. <http://www.reuters.com/article/us-ethiopia-drought-floods-idUSKCN0Y22DH> (accessed May 27, 2016).
- 54 Dagnachew Siyoum, A., Hilhorst, D. and G. Van Uffelen. "Food Aid and Dependency Syndrome in Ethiopia: Local Perceptions." *The Journal of Humanitarian Assistance*, November 27, 2012. http://sites.tufts.edu/jha/archives/1754#_edn16 (accessed June 21, 2016).
- 55 UK Parliament. "International Development Committee. Written Evidence Submitted by Development Initiatives (DI)." *Publication and Records*. <http://www.publications.parliament.uk/pa/cm201213/cmselect/cmintdev/657/657vw16.htm> (accessed June 21, 2016).
- 56 The \$5.8 billion estimate aggregates project costs and additional financing to the PSNP 1 (2004-2006), PSNP 2 (2007-2010), PSNP 3 (2010-2015), and PSNP 4 (2015-2020). See: World Bank. "Projects- Ethiopia." *Project & Programs*. http://www.worldbank.org/projects/search?lang=en&searchTerm=&countrycode_exact=ET (accessed May 27, 2016).
- 57 World Bank. "Productive Safety Net Project for Ethiopia." *Projects & Operations*. <http://www.worldbank.org/projects/P087707/productive-safety-nets-project-apl-1?lang=en> (accessed June 21, 2016).
- 58 Graduation is defined as follows: "A household has graduated when, in the absence of receiving PSNP transfers, it can meet its food needs for all 12 months and is able to withstand modest shocks." 500,000 beneficiaries are said to have graduated from the PSNP. See: Hoddinott, John. "Operationalising Graduation in Ethiopia's Productive Safety Net Programme." *IFPRI Presentation*, May 7, 2014. <https://www.ids.ac.uk/files/dmfile/5.1.Hoddinott2014-OperationalisinggraduationinEthiopiaPSNPPptv228-apr-14.pdf> (accessed June 21, 2016).
- 59 UK Parliament. "International Development Committee. Written Evidence Submitted by Development Initiatives (DI)." *Op. Cit.*
- 60 Data for this chart has been retrieved from multiple sources including humanitarian appeal documents available at <http://reliefweb.int/country/eth> and documents from the World Food Programme, World Bank, and various media outlets.
- 61 Ministry of Finance and Economic Development. *Growth and Transformation Plan (GTP) 2010/11-2014/15. Op. Cit.*; Ministry of Agriculture and Rural Development. *Ethiopia's Agricultural Sector Policy and Investment Framework (PIF)*, 2010-2020. The Federal Democratic Republic of Ethiopia, 2010. [http://gafspfund.org/sites/gafspfund.org/files/Documents/Ethiopia_5_of_6_CAADP_Post_compact_Investment_Plan_\(PIF\)_o.pdf](http://gafspfund.org/sites/gafspfund.org/files/Documents/Ethiopia_5_of_6_CAADP_Post_compact_Investment_Plan_(PIF)_o.pdf) (accessed June 27, 2016).
- 62 Moller, Lars Christian et al. *Ethiopia's Great Run. The Growth Acceleration and How to Pace It. Op. Cit.*
- 63 *Ibid.*
- 64 United Nations. *UN Comtrade Database*. <http://comtrade.un.org/data/> (accessed June 29, 2016).
- 65 *Ibid.*
- 66 Global Agricultural Information Network (GAIN). *Drought Pushes Ethiopia's Wheat Imports to a Record 2.5 MMT*. 2016. USDA Foreign Agricultural Service. http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Drought%20Pushes%20Ethiopia%E2%80%99s%20Wheat%20Imports%20to%20a%20Record%202.5%20MMT%20Addis%20Ababa_Ethiopia_1-21-2016.pdf (accessed June 29, 2016).
- 67 United Nations. *UN Comtrade Database. Op. Cit.*
- 68 *Ibid.*
- 69 Ministry of Finance and Economic Development. *Growth and Transformation Plan (GTP) 2010/11-2014/15. Op. Cit.*; National Planning Commission. *The Second Growth and Transformation Plan (GTP) 2015/2016 – 2019/2020 (Draft)*. The Federal Democratic Republic of Ethiopia, 2015. <https://www.africaintelligence.com/c/dc/LOI/1415/GTP-II.pdf> (accessed June 27, 2016).
- 70 Agricultural Transformation Agency. "Industrial Park and Agriculture Transformation." [Video], 2016. <https://www.youtube.com/watch?v=8i3O3C8Tgg&feature=youtu.be> (accessed July 6, 2016); Ministry of Finance and Economic Development. *Growth and Transformation Plan (GTP) 2010/11-2014/15. Op. Cit.*
- 71 *Ibid.*
- 72 A spokesperson for Ethiopia's Agricultural Investment Support Directorate indicated that 1.2 million ha were available in Oromia, 1.4 million ha in Benishangul, 1.2 million ha in Gambella, and 0.3 million ha in SNNPR. See: Horne, Felix. *Understanding Land Investment Deals in Africa: Ethiopia. Op. Cit.*
- 73 According to a 2014 report, only 11 percent of the land transferred to investors has actually been developed and commercial farm productivity has been lower than smallholders' since the beginning of the GTP. Subsequently,



- the Government of Ethiopia announced in 2016 the suspension of its farm lease program until further review of the scheme. See: Ministry of Finance and Economic Development. *Growth and Transformation Plan, Annual Progress Report F.Y. 2012/2013*. The Federal Democratic Republic of Ethiopia, 2014; Maasho, Aaron. "Ethiopia Body Suspends Farm Lease Programme after Poor Results." *Reuters Africa*, March 25, 2016. <http://af.reuters.com/article/topNews/idAFKCN0WR10P?pageNumber=2&virtualBrandChannel=o&sp=true> (June 27, 2016).
- 74 Ethiopia Trade and Investment Agency. "Investing in Ethiopia: a Guide for New Investors." 2015. http://www.ethiombassy.org.uk/trade_and_investment/General%20report-final.pdf (accessed June 27, 2016).
- 75 Abiye, Yonas. "GTP II Wheels Rolling." *The Reporter*, December 26, 2015. <http://web.archive.org/web/20160101145330/http://www.thereporterethiopia.com/content/gtp-ii-wheels-rolling> (accessed June 27, 2016); Ethiopian Agricultural Transformation Agency. "GTP II Transformation Agenda." *Transformation Agenda*. <http://www.ata.gov.et/ta/gtp-ii-overview/> (accessed June 27, 2016).
- 76 Alemu, Dawit. "Rising Donors: Can China and Brazil help Ethiopia Achieve its Development Ambitions?" *GREAT Insights*, April 2014. <http://ecdpm.org/great-insights/emerging-economies-and-africa/rising-donors-can-china-brazil-help-ethiopia-achieve-development-ambitions/#fn> (accessed June 27, 2016).
- 77 USDA Foreign Agricultural Service. *Ethiopia Aims to Become One of the World's Top 10 Sugar Producers*. Op. Cit.
- 78 "Ethiopia: Boosting Sugar Industry." *Welkessa*. March 4, 2016. <http://www.welkessa.com/ethiopia-boosting-sugar-industry/> (accessed June 27, 2016); "Ethiopia's Grand Renaissance: Sugar's Sweet Success." *Foreign Affairs*, May-June 2012. http://www.ethiombassy.org.uk/trade_and_investment/EthiopiaReprintFA.pdf (accessed June 27, 2016).
- 79 Alemu, Dawit. "Rising Donors: Can China and Brazil help Ethiopia Achieve its Development Ambitions?" Op. Cit.
- 80 Davidson, William. "Ethiopia China-Backed Sugar-Export Push Hits Cash, Design Snags." *Bloomberg*, June 13, 2016. <http://www.bloomberg.com/news/articles/2016-06-13/ethiopian-china-backed-sugar-export-push-hits-cash-design-snags> (accessed June 27, 2016).
- 81 Davidson, William. "Ethiopia May Ship Sugar in 2016 as India-Backed Plant Ready." Op. Cit.; Netafim. "Bank Hapoalim Leads Financing Deal for the Ethiopian Sugar Corp. as Part of Netafim's \$200M Innovative Irrigation Project." *News*. <https://www.netafim.com/news-item/225392> (accessed June 27, 2016); Kassa, Lucy. "Parliament Approves \$50m Polish Loan for Sugar Sector." *Addis Fortune*, July 6, 2015. <http://addisfortune.net/articles/parliament-approves-50m-polish-loan-for-sugar-sector/> (accessed June 27, 2016).
- 82 Unless otherwise indicated, all information comes from the Ethiopia Sugar Corporation website: Sugar Corporation. <http://www.etsugar.gov.et/> (accessed July 8, 2016).
- 83 Bishaw, D and Y. Kedir. "Determining Sediment Load of Awash River Entering into Metehara Sugarcane Irrigation Scheme in Ethiopia." *Journal of Environment and Earth Science* 5.13 (2015): 110-117.
- 84 Girma, M. M. and S. B. Awulachew. *Irrigation Practices in Ethiopia: Characteristics of Selected Irrigation Schemes*. International Water Management Institute, 2007. http://www.iwmi.cgiar.org/Publications/Working_Papers/working/WOR124.pdf (accessed June 27, 2016).
- 85 About 90% of the plantation fields have groundwater table above the critical depth of 1.5 m below the soil surface. The tables are waterlogged as a result of their shallow depth. See: Dinka, M. O., Loiskandl, W. and J. M. Ndambuki. "Status of Groundwater Table Depth Under Long-Term Irrigation in Wonji Plain: Concerns for Sustainability of Wonji-Shoa Sugar Estate, Upper Awash Valley, Ethiopia." *Sustainable Agriculture Research* 3.3 (2014): 16-27.
- 86 According to the Sugar Corporation, the Omo-Kuraz Project will have 100,000 hectares of associated plantations. Other recent studies indicate plans for expansion to 175,000 hectares. See: Sugar Corporation. "Omo-Kuraz Sugar Development Project." *Projects*. Op. Cit.; Kamski, Benedikt. *The Kuraz Sugar Development Project*. Op. Cit.
- 87 Some reports indicate that at least 4,280 households were resettled during the preparation of the land for the project. See Abraham, D. "Ethiopia's Mushrooming Sugar Factories - A Bird's Eye View." *Aigaforum*, April 19, 2016. <http://aigaforum.com/article2016/sugar-factories-041916.htm> (accessed June 27, 2016).
- 88 Ethiopian Investment Agency. *Investment Opportunity Profile for Sugar Cane Plantation and Processing In Ethiopia*. 2012. <http://ethemb.se/wp-content/uploads/2013/07/Sugar-Cane-Plantation-and-Processing-in-Ethiopia.pdf> (accessed June 27, 2016).
- 89 Berhane, Fetsum. "Ethiopian Sugar Corporation's 'May Day Dam.'" *Horn Affairs*, May 21, 2014. <http://hornaffairs.com/en/2014/05/21/ethiopian-sugar-corporations-may-day-dam/> (accessed June 27, 2016).
- 90 The map was prepared using *QGIS Geographic Information System*. Open Source Geospatial Foundation, 2009. <http://qgis.osgeo.org>. Data Layers for Map: Map Library. "Ethiopian administrative area boundary outlines." *Ethiopia*. <http://www.mapmakerdata.co.uk.s3-website-eu-west-1.amazonaws.com/library/stacks/Africa/Ethiopia/index.htm>; Global Agricultural Information Network (GAIN). *Ethiopia Aims to Become One of the World's Top 10 Sugar Producers*. Op. Cit.; RCMRD Geoportal. "Ethiopia Main Rivers." *Layers*. http://servirportal.rcmr.org/layers/servir%3Aethiopia_river_main (all accessed July 6, 2016).
- 91 Ministry of Finance and Economic Development. *Growth and Transformation Plan (GTP) 2010/11-2014/15*. Op. Cit.; Ministry of Finance and Economic Development. *Growth and Transformation Plan, Annual Progress Report F.Y. 2012/2013*. Op. Cit.
- 92 Liu, W., Sinha, G. A. and R. Stern. *Unheard Voices: The Human Rights Impact of Land Investments on Indigenous Communities in Gambella*. Oakland Institute <http://www.oaklandinstitute.org/unheard-voices-human-rights-impact-land-investments-indigenous-communities-gambella> (accessed June 27, 2016); Horne, Felix. *Understanding Land Investment Deals in Africa: Ethiopia*. Op. Cit.; Horne, F. *Waiting Here for Death: Forced Displacement and 'Villagization' in Ethiopia's Gambella Region*. Op. Cit.
- 93 Flores, Luis. *Development Aid to Ethiopia: Overlooking Violence, Marginalization, and Political Repression*. Op. Cit.; Fraser, Elizabeth. *Moral Bankruptcy: World Bank Reinvents Tainted Aid Program for Ethiopia*. Op. Cit.
- 94 *Ibid.*
- 95 *Ibid.*
- 96 Sugar Corporation. "Omo-Kuraz Sugar Development Project." *Projects*. <http://www.etsugar.gov.et/index.php/en/projects/kuraz-sugar-development-project> (accessed June 27, 2016); Kamski, Benedikt. *The Kuraz Sugar Development Project*. Op. Cit.
- 97 *Omo: Local Tribes under Threat. A Field Report from the Omo Valley, Ethiopia*. Op. Cit.
- 98 Fong, Catherine. *A Cascade of Development on the Omo River. Downstream Effects of the Gibe III Filling and Associated Commercial Irrigation Projects*. International Rivers, 2014. https://www.internationalrivers.org/files/attached-files/cascade_of_impacts_ir.pdf (accessed June 27, 2016).
- 99 This map is based on pictures, maps, and information provided by the Sugar Corporation, but the plantation's scale and setup may change as the project's development unfolds. See: Kamski, Benedikt. *The Kuraz Sugar Development Project*. Op. Cit.
- 100 Sugar Corporation. "Reaping the Fruits of Sugar." *News*. <http://www.etsugar.gov.et/index.php/en/news/articles/55-reaping-the-fruits-of-sugar> (accessed June 27, 2016).
- 101 Behnke, R. and C. Kerven. *Counting the Costs: Replacing Pastoralism with Irrigated Agriculture in the Awash Valley, North-Eastern Ethiopia*. Op. Cit.
- 102 Bondestam, Lars. "People and Capitalism in the North-Eastern Lowlands of Ethiopia." *The Journal of Modern African Studies* 12.03 (1974): 423-439.
- 103 Lautze, S., Aklilu, Y., Raven-Roberts, A., Young, H., Kebede, G. and J. Leaning. *Risk and Vulnerability in Ethiopia: Learning From the Past, Responding to the Present, Preparing for the Future*. Feinstein International Famine Center, 2003. <http://fic.tufts.edu/publication-item/risk-and-vulnerability-in-ethiopia/> (accessed June 28, 2016); Hundie, Bekele. "Conflicts Between Afar Pastoralists and their Neighbors: Triggers and Motivations." Op. Cit.
- 104 Elias, E. and F. Abdi. *Putting Pastoralists on the Policy Agenda: Land Alienation in Southern Ethiopia*. Op. Cit.
- 105 Behnke, R. and C. Kerven. *Counting the Costs: Replacing Pastoralism with Irrigated Agriculture in the Awash Valley, North-Eastern Ethiopia*. Op. Cit.
- 106 Gebre-Mariam, Ayele. "The Alienation of Land Rights Among the Afar in Ethiopia." Op. Cit.
- 107 Author projection based on 2007 census. See: Population Census



- Commission. *The 2007 Population and Housing Census of Ethiopia: Statistical Report for Afar Region*. The Federal Democratic Republic of Ethiopia, 2008. http://www.csa.gov.et/images/documents/pdf_files/regional/Afar.pdf (accessed June 28, 2016); Ethiopian Government Portal. "The Afar National Regional State." *Regional States*. <http://www.ethiopia.gov.et/stateafar> (accessed July 28, 2016).
- 108 Behnke, R. and C. Kerven. *Counting the Costs: Replacing Pastoralism with Irrigated Agriculture in the Awash Valley, North-Eastern Ethiopia*. *Op. Cit.*
- 109 *Ibid.*
- 110 Rettberg, Simone. "Contested Narratives of Pastoral Vulnerability and Risk in Ethiopia's Afar Region." *Op. Cit.*
- 111 Little, P.D., R. Behnke, J. McPeak, and G. Gebru. *Retrospective Assessment of Pastoral Policies in Ethiopia, 1991–2008*. *Op. Cit.*
- 112 Behnke, R. and C. Kerven. *Counting the Costs: Replacing Pastoralism with Irrigated Agriculture in the Awash Valley, North-Eastern Ethiopia*. *Op. Cit.*; Rettberg, Simone. "Contested Narratives of Pastoral Vulnerability and Risk in Ethiopia's Afar Region." *Op. Cit.*
- 113 Gebre-Mariam, Ayele. "The Alienation of Land Rights Among the Afar in Ethiopia." *Op. Cit.*
- 114 *Ibid.*
- 115 The 1972/1973 famine is often referred to as the "Wollo Famine." Wollo is an historical Ethiopian province, which was divided in 1995 between the Afar, Tigray, and Amhara regions. See: Viewchange.org. "About Wollo Province." *Topics*. <http://www.viewchange.org/topics/wollo-province> (accessed June 24, 2016).
- 116 Little, P.D., R. Behnke, J. McPeak, and G. Gebru. *Retrospective Assessment of Pastoral Policies in Ethiopia, 1991–2008*. *Op. Cit.*; Bondestam, Lars. "People and Capitalism in the North-Eastern Lowlands of Ethiopia." *Op. Cit.*
- 117 *Ibid.*; Behnke, R. and C. Kerven. *Counting the Costs: Replacing Pastoralism with Irrigated Agriculture in the Awash Valley, North-Eastern Ethiopia*. *Op. Cit.*
- 118 Government of Ethiopia and Humanitarian Partners. *2016 Ethiopia Humanitarian Requirements Document*. *Op. Cit.*; Little, P.D., R. Behnke, J. McPeak, and G. Gebru. *Retrospective Assessment of Pastoral Policies in Ethiopia, 1991–2008*. *Op. Cit.*; Bondestam, Lars. "People and Capitalism in the North-Eastern Lowlands of Ethiopia." *Op. Cit.*
- 119 *Ibid.*
- 120 Hundie, Bekele. "Conflicts Between Afar Pastoralists and their Neighbors: Triggers and Motivations." *Op. Cit.*; Pantuliano, S. and M. Wekesa. *Improving Drought Response in Pastoral Regions of Ethiopia: Somali and Afar Regions and Borena Zone in Oromiya Region*. Humanitarian Policy Group, Overseas Development Institute, 2008. <http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/2043.pdf> (accessed June 28, 2016); Gebre-Mariam, Ayele. "The Alienation of Land Rights Among the Afar in Ethiopia." *Op. Cit.*; Hundie, Bekele. "Conflicts Between Afar Pastoralists and their Neighbors: Triggers and Motivations." *Op. Cit.*
- 121 *Ibid.*; Pantuliano, S. and M. Wekesa. *Improving Drought Response in Pastoral Regions of Ethiopia: Somali and Afar Regions and Borena Zone in Oromiya Region*. *Op. Cit.*; Gebre-Mariam, Ayele. "The Alienation of Land Rights Among the Afar in Ethiopia." *Op. Cit.*; Hundie, Bekele. "Conflicts Between Afar Pastoralists and their Neighbors: Triggers and Motivations." *Op. Cit.*
- 122 Admasu, Dubale. *Invasive Plants and Food Security: The Case of Prosopis Juliflora in the Afar Region of Ethiopia*. International Union for Conservation of Nature, 2008. http://cmsdata.iucn.org/downloads/invasive_plants_and_food_security_final.pdf (accessed June 28, 2016).
- 123 Gebre-Mariam, Ayele. "The Alienation of Land Rights Among the Afar in Ethiopia." *Op. Cit.*
- 124 Behnke, R. and C. Kerven. *Counting the Costs: Replacing Pastoralism with Irrigated Agriculture in the Awash Valley, North-Eastern Ethiopia*. *Op. Cit.*
- 125 Gebre-Mariam, Ayele. "The Alienation of Land Rights Among the Afar in Ethiopia." *Op. Cit.*
- 126 *Ibid.*
- 127 *Ibid.*; Bondestam, Lars. "People and Capitalism in the North-Eastern Lowlands of Ethiopia." *Op. Cit.*
- 128 The Afar Human Rights Organisation (AHRO). "Half Million Afar Pastoralists Risk Displacement and Environmental Disaster in the Awash Valley of Ethiopia." *Sudan Tribune*, July 4, 2007. <http://www.sudantribune.com/spip.php?article22705> (accessed June 28, 2016); Gebre-Mariam, Ayele. "The Alienation of Land Rights Among the Afar in Ethiopia." *Op. Cit.*; Bondestam, Lars. "People and Capitalism in the North-Eastern Lowlands of Ethiopia." *Op. Cit.*
- 129 Davison, William. "Ethiopia's Largest Hydro Plant to Produce Power This Year." *Bloomberg*, March 18, 2015. <http://www.bloomberg.com/news/articles/2015-03-18/ethiopia-s-largest-hydro-plant-to-produce-electricity-this-year> (accessed June 27, 2016).
- 130 Veselinovic, Milena. "Ethiopia's \$5bn Project that Could Turn it into Africa's Water Powerhouse." *CNN*, October 20, 2015. <http://www.cnn.com/2015/03/06/africa/grand-renaissance-dam-ethiopia/> (accessed June 27, 2016).
- 131 "Gibe IV Secures Finance." *The Reporter*, March 12, 2016. <http://www.welkessa.com/gibe-4-secures-finance/> (accessed June 27, 2016); "Ethiopia Secures Financing for Koysha Hydro Dam." *Esi Africa*, April 5, 2016. <http://www.esi-africa.com/news/ethiopia-secures-financing-for-koysha-hydro-dam/> (accessed June 27, 2016).
- 132 "Gibe IV Secures Finance." *The Reporter*, *Op. Cit.*; "Ethiopia Secures Financing for Koysha Hydro Dam." *Esi Africa*, *Op. Cit.*; International Finance Corporation. "Ethiopia's Full Steam Push for an Energy Breakthrough." *News*. http://www.ifc.org/wps/wcm/connect/news_ext_content/ifc_external_corporate_site/news+and+events/news/za_ifc_geothermal_ethiopia_fiani (accessed July 6, 2016); Maasho, Aaron. "Ethiopia Eyes Extra 12,000 MW in Power Projects by 2020." *Reuters*, June 8, 2015. <http://www.reuters.com/article/ethiopia-power-idUSL5N0YUoSl20150608> (accessed June 28, 2016).
- 133 Sites for dam construction have already been identified in Gambella, Oromia, Southern Nations, Nationalities and Peoples, Amhara and Benishangul-Gumuz states. See: "Ethiopia Envisions Building 105 Small Dams in GTP-II Period." *EBC*, January 11, 2016. <http://www.ebc.et/web/ennews/-/ethiopia-envisions-building-105-small-dams-in-gtp-ii-period> (accessed June 27, 2016).
- 134 Asmal, Kader et al. *Dams and Development. A New Framework for Decision-Making*. *Op. Cit.*; Pottinger, Lori. "Environmental Impacts of Large Dams: African Examples." *International Rivers*, October 1, 1996. <https://www.internationalrivers.org/resources/environmental-impacts-of-large-dams-african-examples-2029> (accessed June 28, 2016).
- 135 *Ibid.*
- 136 International Rivers. "Environmental Impacts of Dams." *Op. Cit.*
- 137 Kibler, K. M. and D. D. Tullos. "Cumulative Biophysical Impact of Small and Large Hydropower Development, Nu River, China." *Water Resources Research* 49.6 (2013): 3104–3118.; Fenci, J. S., Mather, M. E., Costigan, K. H. and M. D. Daniels. "How Big of an Effect Do Small Dams Have? Using Geomorphological Footprints to Quantify Spatial Impact of Low-Head Dams and Identify Patterns of Across-Dam Variation." *PLoS One* 10.11 (2015): 1 – 22.
- 138 Score Sarawak. *Alternatives*. http://scoresarawak.org/_/alternatives/ (accessed July 6, 2016); International Rivers. "Alternatives to Large Dams in India: Easy and Cheap Options." *Resources*. <https://www.internationalrivers.org/resources/alternatives-to-large-dams-in-india-easy-and-cheap-options-3677> (accessed July 7, 2016).
- 139 *Ibid.*; Koberle, Alex. *An Alternative Power Development Plan for Guatemala*. International Rivers and El Observador, 2012. http://www.internationalrivers.org/files/attached-files/energia_ingles_072412.pdf (accessed July 7, 2016).
- 140 Little, P.D., R. Behnke, J. McPeak, and G. Gebru. *Retrospective Assessment of Pastoral Policies in Ethiopia, 1991–2008*. *Op. Cit.*
- 141 Gebre-Mariam, Ayele. "The Alienation of Land Rights Among the Afar in Ethiopia." *Op. Cit.*; Behnke, R. and C. Kerven. *Counting the Costs: Replacing Pastoralism with Irrigated Agriculture in the Awash Valley, North-Eastern Ethiopia*. *Op. Cit.*
- 142 Gebre-Mariam, Ayele. "The Alienation of Land Rights Among the Afar in Ethiopia." *Op. Cit.*
- 143 *Ibid.*; Rettberg, Simone. "Contested Narratives of Pastoral Vulnerability and Risk in Ethiopia's Afar Region." *Op. Cit.*
- 144 Fong, Catherine. *A Cascade of Development on the Omo River. Downstream Effects of the Gibe III Filling and Associated Commercial Irrigation Projects*. *Op. Cit.*
- 145 International Rivers. "Omo River, Lake Turkana at Risk from Dams and Plantations." *Resources*. <https://www.internationalrivers.org/resources/omo>



- river-lake-turkana-at-risk-from-dams-and-plantations-8199 (accessed June 28, 2016).
- 146 International Rivers. *Ethiopia's Gibe II Dam Sowing Hunger and Conflict*. Factsheet, 2011. <https://www.internationalrivers.org/files/attached-files/gibe3factsheet2011.pdf> (accessed June 28, 2016).
 - 147 Martinelli, Luiz, A. and Solange Filoso, "Expansion of Sugarcane Ethanol Production in Brazil: Environmental and Social Challenges." *Op. Cit.*; Filoso, Solange et al., "Reassessing the Environmental Impacts of Sugarcane Ethanol Production in Brazil to Help Meet Sustainability Goals." *Op. Cit.*
 - 148 Cotula, L., Dyer, N., and S. Vermeulen. *Fueling Exclusion? The Biofuels Boom and Poor People's Access to Land*. IIED & FAO, 2008. <http://pubs.iied.org/pdfs/12551IIED.pdf> (accessed June 28, 2016).
 - 149 Some of the economic and development arguments include: the potential to increase rural incomes and foreign investment, boost the national economy, provide long-term poverty reduction, improve the trade balance, development stronger export markets, and enable economic diversification. See: Cotula L., Dyer, N., and S. Vermeulen. *Fueling Exclusion? The Biofuels Boom and Poor People's Access to Land*. *Op. Cit.*; Peskett, L., Slater, R., Stevens, C., and A. Dufey, *Biofuels, Agriculture, and Poverty Reduction*. Overseas Development Institute, March 2007, <https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/3441.pdf> (accessed June 9, 2016); Schneider, Lynn. *A Sweeter Alternative for Whom? Sugarcane Ethanol Production and Rural Livelihoods in Northeast Brazil*. American University, 2010. https://www.american.edu/sis/gep/upload/LynnSchneider_SRP_Final_1.pdf (accessed June 9, 2016).
 - 150 Food security arguments include increasing farmers' incomes and yields and providing higher incomes to rural laborers, while energy security arguments include protecting countries' from a reliance on oil. See: Cotula, L. Dyer, N., and S. Vermeulen. *Fueling Exclusion? The Biofuels Boom and Poor People's Access to Land*. *Op. Cit.*; Peskett, L., Slater, R., Stevens, C., and A. Dufey. *Biofuels, Agriculture, and Poverty Reduction*. *Op. Cit.*; Schneider, Lynn. *A Sweeter Alternative for Whom? Sugarcane Ethanol Production and Rural Livelihoods in Northeast Brazil*. *Op. Cit.*
 - 151 Environmental arguments tend to focus on the need for renewable energy sources and a reduction in greenhouse gas emissions to address climate change. See: Peskett, L., Slater, R., Stevens, C., and A. Dufey. *Biofuels, Agriculture, and Poverty Reduction*. *Op. Cit.*
 - 152 Vidal, John. "Brazil's Guarani Indians Killing Themselves over Loss of Ancestral Land." *Op. Cit.*; Survival International. "The Guarani." *Tribes*. <http://www.survivalinternational.org/tribes/guarani> (accessed June 9, 2016).
 - 153 Baccaert, A., Navarro, C., and N. Muñoz. "The Dark Side of Green." [video] *FIAN*, 2012. <http://www.fian.org/library/multimedia/dark-side-of-green/> (accessed June 9, 2016).
 - 154 Vidal, John. "Brazil's Guarani Indians Killing Themselves over Loss of Ancestral Land." *Op. Cit.*
 - 155 Mark, Jason. "Brazil's MST: Taking Bank the Land." *Multinational Monitor*, February 2001. <https://www.globalpolicy.org/component/content/article/219/46651.html> (accessed June 9, 2016).
 - 156 De Andrade, R.M.T. and A. Miccolis. *Policies and Institutional and Legal Frameworks in the Expansion of Brazilian Biofuels*. *Op. Cit.*
 - 157 Frayssinet, Fabiana. "Brazil: Agribusiness Driving Land Concentration." *Inter Press Service*, October 5, 2009. <http://www.ipsnews.net/2009/10/brazil-agribusiness-driving-land-concentration/> (accessed June 9, 2016).
 - 158 Peskett, L., Slater, R., Stevens, C., and A. Dufey, *Biofuels, Agriculture, and Poverty Reduction*. *Op. Cit.*
 - 159 De Andrade, R.M.T., and A. Miccolis. *Policies and Institutional and Legal Frameworks in the Expansion of Brazilian Biofuels*. *Op. Cit.*
 - 160 Kaup, Felix. *The Sugarcane Complex in Brazil: The Role of Innovation in a Dynamic Sector on Its Path Toward Sustainability*. Switzerland: Springer International Publishing, 2015.
 - 161 Filoso, Solange et al. "Reassessing the Environmental Impacts of Sugarcane Ethanol Production in Brazil to Help Meet Sustainability Goals." *Op. Cit.*
 - 162 De Andrade, R.M.T., and A. Miccolis. *Policies and Institutional and Legal Frameworks in the Expansion of Brazilian Biofuels*. *Op. Cit.*
 - 163 Peskett, L., Slater, R., Stevens, C., and A. Dufey, *Biofuels, Agriculture, and Poverty Reduction*. *Op. Cit.*
 - 164 Martinelli, Luiz, A. and Solange Filoso, "Expansion of Sugarcane Ethanol Production in Brazil: Environmental and Social Challenges." *Op. Cit.*; Filoso, Solange et al. "Reassessing the Environmental Impacts of Sugarcane Ethanol Production in Brazil to Help Meet Sustainability Goals." *Op. Cit.*
 - 165 Field research conducted by the Oakland Institute researchers in São Paulo state, November 2015.
 - 166 These include, but are not limited to: agro-ecological zoning for sugarcane expansion, better labor conditions for workers, phasing out the practice of sugarcane burning, a reduction in fertilizer use, and the emergence of voluntary certification schemes like BonSucro.
 - 167 Unless otherwise indicated, the data in this section is from Behnke, R. and C. Kerven. *Counting the Costs: Replacing Pastoralism with Irrigated Agriculture in the Awash Valley, North-Eastern Ethiopia*. *Op. Cit.*
 - 168 Livestock outputs include milk and meat consumed within pastoral group as well as livestock products that were sold.
 - 169 Estimates on the forage production of the flood plains in the Awash Valley range within the scientific literature, so Behnke and Kerven use low and high level stocking rates based on the amount of consumable dry matter per hectare per year. Low-level stocking rates are based on 3 tons of consumable dry matter and high-level stocking rates are based on 6 tons of consumable dry matter. See: Behnke, R. and C. Kerven. *Counting the Costs: Replacing Pastoralism with Irrigated Agriculture in the Awash Valley, North-Eastern Ethiopia*. *Op. Cit.*
 - 170 *Ibid.*
 - 171 Little, P.D., R. Behnke, J. McPeak, and G. Gebru. *Retrospective Assessment of Pastoral Policies in Ethiopia, 1991–2008*. *Op. Cit.*
 - 172 Davies, Jonathan, and Richard Hatfield. "The economics of mobile pastoralism: a global summary." *Op. Cit.*
 - 173 *Ibid.*; Aklilu, Y. *An Audit of the Livestock Marketing Status in Kenya, Ethiopia and Sudan*. Community-Based Animal Health and Participatory Epidemiology (CAPE) Unit, Organization of African Unity/Interafrican Bureau for Animal Resources (AU-IBAR), 2003. <ftp://ftp.cgiar.org/ilri/ICT/Theme%203/Aklilu%20Marketing%20vol%2011.pdf> (accessed June 28, 2016).
 - 174 Little, P.D., R. Behnke, J. McPeak, and G. Gebru. *Retrospective Assessment of Pastoral Policies in Ethiopia, 1991–2008*. *Op. Cit.*
 - 175 Davies, Jonathan, and Richard Hatfield. "The Economics of Mobile Pastoralism: A Global Summary." *Nomadic Peoples* 11.1 (2007): 91-116.
 - 176 Little, P.D., R. Behnke, J. McPeak, and G. Gebru. *Retrospective Assessment of Pastoral Policies in Ethiopia, 1991–2008*. *Op. Cit.*
 - 177 Davies, Jonathan and Richard Hatfield. "The Economics of Mobile Pastoralism: A Global Summary." *Op. Cit.*
 - 178 Davies, Jonathan and Richard Hatfield. "The Economics of Mobile Pastoralism: A Global Summary." *Op. Cit.*
 - 179 Curtis Kline. "Pastoralism and the Discrimination of Sustainable Livelihoods." *Intercontinental Cry Magazine*, November 25, 2013. <http://intercontinentalcry.org/pastoralism-and-the-discrimination-of-sustainable-livelihoods-21183/> (accessed June 28, 2016).
 - 180 Davies, Jonathan, and Richard Hatfield. "The Economics of Mobile Pastoralism: A Global Summary." *Op. Cit.*
 - 181 Berry, Leonard. *Ethiopia: Extent and Impact of Land Degradation. A Pilot Study in Seven Countries*. Food and Agriculture Organization, 2010. http://www.fao.org/nr/lada/index.php?option=com_docman&task=doc_details&gid=477&Itemid=165&lang=en (accessed July 7, 2016).
 - 182 Berry, Leonard. *Ethiopia - Extent and Impact of Land Degradation*. Food and Agriculture Organization of the United Nations, *Op. Cit.*
 - 183 Oakland Institute. *Understanding Land Investment Deals in Africa. Half a Million Lives Threatened by Land Development for Sugar Plantations in Ethiopia's Lower Ormo Valley*. Land Deal Brief, 2011. <http://www.oaklandinstitute.org/land-deal-brief-ethiopia-lower-ormo> (accessed June 28, 2016); Human Rights Watch. "Ethiopia: Land, Water Grabs Devastate Communities." *News*. <https://www.hrw.org/news/2014/02/18/ethiopia-land-water-grabs-devastate-communities> (accessed June 28, 2016).
 - 184 Kamski, Benedikt. *The Kuraz Sugar Development Project*. *Op. Cit.*
 - 185 *Ibid.*



- 186 Undisclosed Authors. *South Omo Zone, Ethiopia – Final Report*. DAG Informal Field Visit Report, 2014. <http://assets.survivalinternational.org/documents/1451/dag-southomo-report-aug2014.pdf> (accessed June 28, 2016).
- 187 Sugar Corporation. "Reaping the Fruits of Sugar." *Op. Cit.*
- 188 "Afar Region Ablaze Due to Drought." *Africa Intelligence*, February 5, 2016. <http://www.africaintelligence.com/ION/politics-power/2016/02/05/afar-region-ablaze-due-to-drought,108128888-GRA> (accessed June 28, 2016).
- 189 *Ibid.*
- 190 Kamski, Benedikt. *The Kuraz Sugar Development Project*. *Op. Cit.*; Davidson, William. "Ethiopia China-Backed Sugar-Export Push Hits Cash, Design Snags." *Op. Cit.*
- 191 Kamski, Benedikt. *The Kuraz Sugar Development Project*. *Op. Cit.*
- 192 *Ibid.*
- 193 Davidson, William. "Ethiopia May Ship Sugar in 2016 as India-Backed Plant Ready." *Op. Cit.*
- 194 *Ibid.*
- 195 Maasho, Aaron. "Ethiopia Dam Project Could Start Power Generation by June." *Reuters*, January 1, 2015. <http://www.reuters.com/article/idUSL6NoUGo8620150101> (accessed June 28, 2016).
- 196 "Gibe IV Secures Finance." *The Reporter*, *Op. Cit.*
- 197 Maasho, Aaron. "Ethiopia Eyes Extra 12,000 MW in Power Projects by 2020." *Op. Cit.*
- 198 "Humanitarian Requirements for Ethiopia is up from US\$1.4 Billion to US\$1.5 Billion." *Kaliti Press*, May 21, 2016. <http://kalitipress.com/news/exclusive/item/586-humanitarian-requirements-for-ethiopia-is-up-from-us-1-4-billion-to-us-1-5-billion-following-re-prioritization-of-needs> (accessed June 28, 2016).
- 199 "Ethiopia Calls for International Help as Drought Bites." *Op. Cit.*
- 200 *Ibid.*
- 201 Maasho, Aaron. "Ethiopia Readies Record \$11 Billion Budget for Fiscal Year from July." *Reuters*, June 9, 2016. <http://af.reuters.com/article/ethiopiaNews/idAFL1NoYV1HB20150609> (accessed June 29, 2016).
- 202 Fujita, M., Roth, E. A., Nathan, M. A. and E. Fratkin. "Sedentism, Seasonality, and Economic Status: A Multivariate Analysis of Maternal Dietary and Health Statuses Between Pastoral and Agricultural Ariaal and Rendille Communities in Northern Kenya." *American Journal of Physical Anthropology* 123:3 (2004): 277-291; Overseas Development Institute. *Social Protection in Pastoral Areas*. *Op. Cit.*



