Agro-fuels in Africa: Tiptoeing in the Minefield of Hunger

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Abstract

The global political economy of agro-fuels emerging since 2007 appears set to intensify hunger among the countries and rural peoples of Africa. One of the key concerns about agro-fuels is the massive land grabbing, which invariably has implication on food production. Attempts are made to present the use of tropical countries as agro-fuels farmlands as something being done in the best interests of the people. Although the impacts of agro-fuels vary by region, analysis suggests that already-vulnerable people and communities bear a disproportionate share of the costs of agro-fuels development, particularly for crops already embedded in industrial production systems, which are equally staple foods. The point to note is that the production of agro-fuels is not aimed at local consumption, but for export. It is such that African staple food crops such as oil palm, cassava, corn, groundnuts, sorghum, sweet potatoes, etc., are being used to produce bio-ethanol. Already, most staples across the continent are under severe attack and assault by agro-fuels giants and their biotech partners. The central argument of this paper is that the emerging agro-fuels reinforce the precarious food security problem. The process and structures of agro-fuels increase pressures on the tropical forests and further wrest control of resources from subsistence farmers and rural peoples. Based on historical evidences, this paper analyses the consequences of proliferating agro-fuels in the face of existing hunger crisis in Africa. This

will be done by drawing both on recent studies on agro-fuels expansion and on the political economy literature on agrarian transition in Africa.

INTRODUCTION

The use of plants as fuels has a long history. For example, wood and crop residues have been used as fuels for centuries and are still used in many countries (Magdoff 2008, 34–5). During the Japanese occupation of Southeast Asia in the 1940s, coconut, castor and Jatropha curcas oils were used for lamp oil (Jhamtani and Dano, 2007). In recent time, the global expansion of agro-fuels has elicited rapid expansion of literature and debate from varying institutional and disciplinary perspectives. While the proponents of agro-fuels express its potential, those opposed to it are raising serious concerns about its impact on food security and environments (FAO 2008; Oxfam, 2008). The arguments and debates in the emerging literature focus mainly on land gabbing and sustainable food production and its impact on food security for the growing populations. Global demand for both fuels and food is stimulating new forms of competition between the former and the latter.

The conditions for rapid expansion of agro-fuels as an alternative energy source seemed to be available in the global south. For example, suitable agro-fuels crops such as oil palm, cassava, sugarcane, maize, jatropha, etc are found in the countries of Africa. Similarly, millions of hectares of 'unused' land are said to be available in many countries of Africa for ago-fuels production. It is projected that up to one-fifth of the world's agricultural land would be planted in agro-fuels by 2050. Presently, only about 14 million hectares of global arable land are devoted to agro-fuels and it is expected to increase as the project gathers momentum across the globe. (Liversage, 2010). According to the proponents of agro-fuels, the projects promised employment and incomes for millions of rural workers, whether as smallholder farmers on contract, waged workers on large plantations, or workers in the upstream and downstream agro-industries. The expanding agro-fuels and helping to stymie global warming.

In considering the possibilities of benign arrangements linking rural populations and agro-fuels capitalism, the basic question is whether efforts to promote food security are realizable against the background of the projects (O'Laughlin 2008, 949)? To answer this question, it is necessary to analyse how and why governments of African countries are becoming pro agro-fuels. Smallholder agriculture has been going through a major crisis in the last three

decades, and governments have been failing to provide the necessary groundswell to save the situation. The major share of global poverty is still based in rural areas of Africa and it appears the situation may not change in the near future. Whether it is the impact of neo-liberalism on smallholder farmers, stagnant agricultural productivity or the increasing shift of 'de-agrarianising' peasant households to non-farm activities in Africa, the indications of this crisis are manifold (Rao 2009, 1279–80). The reactions of African governments to this crisis have been at best palliative and non-existent in most cases. Governments of African states have been withdrawing more and more from their roles of supporting peasant farmers and rural development generally. Subsidies have sharply declined, while public investments in agriculture have not kept up with the needs of food security.

The claim that bio-fuels have the potential to revive peasant agriculture and stimulate rural development, which has been made time and again in recent academic writings, should be examined against this backdrop of persistent food crisis (Diouf 2007, Peskett et al. 2007, Clancy 2008). Given the persistent neglect of agricultural and rural development imperatives, it is not surprising to note the attitudes of governments in offering foreign capital long-term access to large tracts of land and large scale investments in agro-fuels production. Some have argued that the production conditions for agro fuels and agro-fuels yields of tropical crops per hectare of land are much higher than those of temperate crops (Clancy 2008). While it is true that most African economies have ample supply of labour to be absorbed in the face of increased demand, land even in regions where it is often taken as a non-scarce resource, the situation is volatile, with land-related conflicts often erupting in response to the growing demand for agricultural and grazing land from large scale producers (Cotula et al. 2008).

Although the linkages between agro-fuels expansion and agrarian revival in Africa are tenuous at best, it is not difficult to see why many governments have jumped on the bandwagon of agro-fuels in the hope that they will resolve the agrarian questions. From this point of view, however, it is not agro-fuels as such, but any large scale foreign investment that governments find attractive, and this is indeed what is happening.

It can be argued with some justification, that agro-fuels are another means by which environmental costs of energy consumption of developed countries are passed to poor countries such as Africa. Invariably, the current politics on agro-fuel is an attempt to solve the environmental problem of the developed world by creating same in the third world countries. It is simply passing the energy burden of the rich counties to the poor counties such as Africa. The fuel needs of the developed countries with their consumerism and rising energy demands are therefore to be met by further underdeveloping the poor countries of the south (Jagdeesh Rao, 2008). Agro-fuels production, at least in its present form, is accelerating food insecurity and slowing down rural development, particularly in Africa. Even when expanded to cover all available land on the globe it would make only a small contribution to global energy needs at current levels of consumption.

If the agro-fuels boom engenders all these problems and does not contribute significantly to the solution of African problems, why is it happening in the continent? To understand this paradox requires that we consider both the global and domestic forces behind the rush to agro-fuels. Agro-fuels expansion currently is not driven by environmental concerns in Africa or the needs of local populations, but by the governments of developed countries to find a 'quick fix' to their energy and environmental problems. Governments of underdeveloped countries have therefore been padded to adopt agro-fuels projects as new ways to revive rural and agrarian development. While much has been written on the expansion of agro-fuels in Latin America and Asia, less analysis of its underlying political-economic dynamics in Africa has been undertaken (GRAIN 2008; Monsalve et al. 2008; Oxfam 2008; Cotula et al. 2009; von Braun and Meinzen-Dick 2009). This paper therefore lays out some of the emerging themes, which define the politics of agro-fuels.

TOWARDS UNDERSTANDING AGROFUELS

Agro-fuels also known as bio-fuels are non-petroleum-based liquid fuels, derived largely from plants and plant oils. Agro-fuels are divided into three categories, namely, 'first-generation', 'second-generation' and 'third-generation' (Dauvergne and Neville, 2010:635). 'First-generation' agro-fuels are produced from food crops, some of which are palm oil, corn, rapeseed, and sugarcane. In contrast, the sources of 'second-generation' fuels are non-food crops, like switch grass and Jatropha curcas, or the residual inedible parts of food crops, such as the husks and stems of corn. 'Third-generation' agro-fuels are in full-scale production, second- and third-generation ones are yet to be commercially viable to penetrate the global market. Based on the categories of sources, or 'feedstocks', from which agro-fuels are derived, they have differing impacts on food crops, carbon emissions, and the environment. Sources use of agro-fuels

depends on geographical diversity largely based on existing agricultural production in those regions. Corn-based agro-fuels are dominant in the United States, while sugarcane is used in Brazil, and rapeseed in the European Union (EU). Oil palm is the energy source in Indonesia and Malaysia (McCarthy 2010).

Agro-fuels as an alternative energy source surged in the late 1990s, especially in the United States of America and Europe. It should however be noted that agro-fuels research and development had begun in the twentieth century, especially in Brazil. Brazil became a global leader in the search for alternative energy by investing considerably in agro-fuels, particularly through the Brazilian Alcohol Program in the 1970s (Moreira, Nogueira and Parente, 2005). The concerns in the developed world in the 1990s over declining oil reserves and climate change gave fillip to the potential of agro-fuels as alternative energy source that could contribute to clean environment. Proponents of agro-fuels cut across industrial and environmental groups, with agricultural interests and many climate change activists expressing support.

Those that supported agro-fuels in the early 2000s were mainly EU officials, national and municipal government representatives of the developed world, Friends of the Earth, and Greenpeace. Similarly, multinational companies such as Archer Daniels Midland, ADM, Bunge and Cargill supported the agro-fuels project because of the possibility of new and vast markets (Accenture 2008; Kurdusiewicz and Wandesforde-Smith 2008). Agro-fuels represent a new profitability frontier for agribusiness and energy sectors fraught with declining productivity and/or rising costs (Magdoff 2008; McMichael 2009; Houtart 2010; McMichael 2010). Many governments of the developed countries are said to be keen on the potential of agro-fuels as alternative source of energy in order to mitigate the challenges of climate change. Agro-fuels are thus presented as a route to reducing energy-use patterns in ways that can ameliorate environmental concerns. This is reflected in diverse policy debates in Europe and the United States (Franco et al. 2010; Hollander 2010; Gillon 2010) and has dominated debates on agrofuels globally. Agro-fuels project is also designed to reduce dependence on foreign oil, particularly the Middle East (Dauvergne and Neville, 2010:638). The recent expansion of industrial agro-fuels is therefore a response to an assumed 'energy crisis', due to the cost of capital inputs (production, processing, transport) in an age of peaking oil prices.

It was on these bases that the Bush administration in 2007 set the targets of 35 billion gallons of corn ethanol by 2017 with huge subsidies to agribusiness giants, namely, ADM,

Bunge, and Cargill. Similarly, the European Union targeted 10 per cent agro-fuels mix in transport fuels by 2020. Following this example, the UK's Gallagher (2008) Report estimated, via land use, that 500 million more hectares of land, (one-third more than currently under cultivation), would be required to meet global demand for agro-fuels in 2020. The implication of this can be found in the estimates that suggest Northern fuel demands could only be met with the conversion of 70 per cent of European farmland to fuel crops (Holt-Gime´nez 2007). At present Brazil plans to replace 10 percent of the world's fossil fuels by 2025 with sugar ethanol, Malaysia and Indonesia are expanding oil palm plantations to supply 20 percent of EU biodiesel needs; India plans 14m hectares of land for Jatropha plantations (Holt-Gime´nez 2007, Vidal 2007: 3; Altieri 2009).

Given the challenges of agro-fuels targets and the enabling Kyoto protocols, foreign capital are investing massively in agro-fuels production in the global South. It is these combined processes that are creating an emergent agro-fuels complex in Africa. Some estimates show that European firms have acquired about five million hectares of land for agro-fuels development across the global South. Presently, European, American and Asian firms are angling for 400m hectares of land in Africa for agro-fuels (Dauvergne and Neville, 2010:639). With this, availability of land for rural livelihoods and food production will be undermined under agro-fuels regime in Africa.

Agro-fuels project is capable of accelerating deforestation as exemplified in Indonesian where 80 per cent of the rainforest (covering 77 percent of Indonesia in the mid-1960s) has already disappeared (Gouverneur, 2009:5), largely due to massive expansion of palm oil for agro-fuels. In this light, dispossessed indigenous peoples in the Amazon refer to agro-fuels plantations as the 'devil's orchards', which accelerate displacement of food crops with fuel crops (Holt-Gime'nez 2007). Meanwhile, Ethanol superpower, Brazil leads the way, 'helped in this strategy by its leading firms, through the initiatives of its national development bank and its leadership position in tropical agriculture research and extension' (Wilkinson 2009:103; Wilkinson and Herrera 2010).

A new oil, food, and biotech industrial alliances are beginning to emerge and, investing in Southern land through new private-public partnerships. One such new alliance is demonstrated between Cargill and Monsanto, incorporated as Renessen, which uses genetically modified maize, soy and rapeseed to produce agro-fuels. Similarly, in Indonesian, the palm oil trade is dominated by a combination of Cargill (the world's largest private company), an ADM-Kuck-Wilmar alliance (the world's largest agro-fuels manufacturer), and Synergy Drive, and the Malaysian government firm 'soon to become the world's biggest palm oil conglomerate' (Greenpeace, 2007:3). Also, there is the 'ethanol alliance' (US, Brazil, the Central American corridor, together with multinational companies); Brazil's ethanol alliances with India, China, Mozambique and South Africa; and the Southern Cone transgenic soy complex (Argentina, and Paraguay, with Bunge, and Dreyfus).

Oil giant, Royal Dutch Shell is also exploring a joint venture with Brazil's bio-ethanol producer, Cosan. This move would stimulate growth for Shell's investments, and for Cosan, the alliance would double ethanol production, and consolidate Brazil's position as 'the world's alternative energy superpower with the potential to ship huge quantities of fuel to the US and Europe' (Mathiason, 2010:43). The emerging agro-fuels regime thus reproduces a 'global ecology' (Sachs 1993), whereby planetary resources are managed through market paradigm to the environment, (McMichael 2010). The consequences are increasing North/South synergy, converting crops to fuel as export at the expense of encouraging local agro-fuel developments for local 'energy sovereignty (Rosset 2009; Fernandes et al. 2010). The 'energy transition', through agro-fuels represents short-term responses to energy consumption, in the name of arresting climate change. By constructing the agro-fuels project, alternative food-energy pathways are excluded and more sustainable and equitable food security systems are ignored.

AGRO-FUELS IN AFRICA

The economy of Africa is sustained by low-input and low output small-scale rain-fed agriculture. Increases in African agriculture production depend mainly on extensive use of land and not the amount of technological inputs. Because of this dependence, rain-fed agriculture is especially vulnerable to climate variations, making many African countries susceptible to the changing drought patterns that lead to food insecurity. Governments at all levels in African have started creating favorable investment environments for foreign agro-fuels firms. They are developing international partnerships with countries, such as Brazil, China and India, and with the European Union (EU), to establish agro-fuels projects in Africa. The establishment of agro-fuels in Africa, unfortunately, will further undermine the continent's food security.

Although agro-fuels production is new to Africa, many foreign firms are interested in investing in the continent, because of the perceived availability of 'idle' land. Industrialized nations, especially those constrained by land available for development (e.g., European countries and Japan), are already targeting Africa for the cultivation of agro-fuels. The EU, Israel, Brazil, India, and China have expressed serious interest in the development of the agro-fuels industry in Africa, through direct private investments.

Several companies from Germany, Israel, India, and the United States have acquired large tracts of land and signed investment agreements with some African countries for the purpose of agro-fuels projects. According to the Ethiopian Investment Agency, more than 30 companies and state-owned sugar factories currently are registered to produce agro-fuels and five have already become operational (Wolde-Georgis and Glantz, 2010). Brazil, the leading agrofuels giant has planned to establish a "Biofuel towns" in Africa in order to spread the agro-fuels revolution in the continent. Already Brazil has links with Mozambique, Senegal, Nigeria, Angola, and the African Union for this purpose (Wolde-Georgis and Glantz, 2010).

It appears that there is strong believe among many African leaders that agro-fuels will make the continent strategically important because of its abundant land and favorable climate for agro-fuels. Because of its tropical climate, Africa can grow crops that have higher fuel contents than those cultivated in temperate zones for agro-fuels production (UNCTAD, 2008). A number of African countries came together in 2006 to form the Pan-African Non-Petroleum Producers Association (PANPP)—the so-called "Green OPEC". This was meant to provide the platform to exchange information, knowledge, and cooperate on the development of agro-fuels in Africa. Some African countries (15 of the 25) participating in the African agro-fuels conference in Dakar signed the Green OPEC treaty, which was also endorsed by the African Union ((Wolde-Georgis and Glantz, 2010). The African Union (AU) endorsed agro-fuels project believing that it will develop as one of the most dynamic and rapidly changing energy sub-sectors in the world (AU, 2007). Moreover, it has called for the development of an enabling policy and regulatory frameworks and guidelines to develop agro-fuels in Africa.

The AU's strong interest in agro-fuels development is not to promote economic growth alone, but also to serve as part of the effort to eradicate poverty in the continent. It has also supported agro-fuels in order to encourage individual African countries to design their national agro-fuels strategies based on their natural endowments, land tenures, and socioeconomic needs. All these were contemplated without weighing the consequence of agro-fuels on African food crisis. Today, many African nations are creating national forums to promote agro-fuels development. Tax holidays and other incentives such as free lands are given to investors to establish hundreds of thousands of hectares of agro-fuels farms.

LARGE SCALE LAND DEALS

There appears to be widespread concern about land acquisition and human rights due to agro-fuels project expansion in some African countries. Most lands allocated for agro-fuels are veritable sources of the livelihoods of poor and vulnerable rural groups (Cotula *et al.* 2008:22–23). In Ghana, a Norwegian agro-fuels company took advantage of northern Ghana's traditional system of communal land ownership to acquire 38,000 ha of land for the establishment of Jatropha plantation (Nyari 2008). The company in collusion with some government officials got the large tract of land from a local chief with insignificant compensation. Lands are usually acquired with the temporary support of local communities through the promise of jobs and income that may not come. As forests were cleared, local people lost their income from forest products, especially staple food crops. The local elites who opposed acquisition of large scale land were made to appear anti-development by the government. Hence, national and district authorities were co-opted into supporting the project.

The onslaught of agro-fuels has put land in African under severe threat, which ultimately affects not only food production, but also the incomes from crops on such land. Threat posed by agro-fuels on land resources has elicited concerns among the rural people. For example, such concern was demonstrated by a woman in Ghana thus:

Look at all the shear nut trees you have cut down already and consider the fact that the nuts I collect in a year give me cloth for the year and also a little capital. I can invest my petty income in the form of a ram, and sometimes in a good year I can buy a cow. Now you have destroyed the trees and you are promising me something you do not want to commit yourself to. Where then do you want me to go? What do you want me to do (Nyari 2008, 6)?

We may compare this with the similar experience of some peasant farmers in Itobe area of Kogi State of Nigeria where 450 ha of their land was appropriated by the government for Chinese agro-fuels refinery in 2010. Typically, indigenous cultivators with customary tenure were

compelled to surrender their customary holdings without compensation, because they were made to believe that the agro-fuels refinery will bring development to them. The implication is that the people from Itobe no longer have suitable land which they can use for mixed-farming as their land have been converted for agro-fuels project.

The idea of taking away 450 ha sustainably cultivatable land from local cultivators with the explanation that its conversion to agro-fuels represents progress for the community is a remarkable construction to justify the process of expropriation. Expropriation of land for agrofuels as in the cases cited here presupposes that it will be difficult to get arable land necessary for African food security problem. This situation is therefore capable of worsening African food crisis that has already reached precarious condition.

Schemes (or scams) of this type are often planned on a massive scale and without regards to the welfare of the people. The British firm, Sun Agro-fuels acquired large tracts of land for agro-fuels production in Ethiopia, Tanzania and Madagascar without the consent of the indigenous owners. For example, in Tanzania, the villagers were not aware of any decision to hand their lands over to Sun Agro-fuels. In fact, Sun Agro-fuels cleared and marked off the land without even consulting the village elders, a situation not too different from colonial exploitation (Bassey 2009:2). It was also noted by Bassey (2009:3) that Korean Daewoo negotiated a US\$6 billion, 99-year lease on one million ha of land in Madagascar for the production of corn and palm oil, for agro-fuels. The tragedy of such land deals is that it is a direct attack on African staple foods with the consequence of exacerbating the hunger situation in Africa.

FOOD VS FUEL

Most African nations as a result of food crisis have embarked on dependent food policy by importing food to compliment local production. Being a food-deficit continent, the use of food crops, especially staples for agro-fuels is inimical to the survival of the people. Now that food crops are being converted into fuels, there is a link between the price of food and the price of petroleum. As petroleum fuels get more expensive, agro-fuels become more profitable, but at the risk of severe hunger. In the past, food and energy economies have different historical conjuncture, but the expansion of agro-fuels has created a synergy between them. The implication is that as the price of oil rises, the price of crops rises too. This could mean more hunger for more people as the competition between food and fuel harms African people who are already "in a world of hurt." In an attempt to demonstrate the global impact of agro-fuels production, FAO (2008) report warned that "drastic" agro-fuels expansion would reduce calorie consumption by more than 8% in sub-Saharan Africa thereby exacerbating the hunger situation.

As growing quantities of corn and other grains are being diverted for use as agro-fuels, there are many signs of concern. The conversion of food crops to agro-fuels production was a significant factor to global food prices rocketing by 83% since 2007, and causing violent conflicts in some African countries (Tenenbaum, 2008:254). In fact, food riots have erupted in recent times in Guinea, Mauritania, Morocco, and Senegal (The New York Times, 2008). In December 2007, the United Nations Food and Agriculture Organization (UN FAO) calculated that world food prices rose 40% in 12 months prior, and the price hikes affected all major agrofuels crops such as sugarcane, corn, palm oil, and soybeans, which are African staples. This scenario points to the fact that there is a very serious risk that fewer people will be able to get food to feed in Africa.

No one is blaming African food crisis on agro-fuels expansion alone, but the demand for agro-fuels as in Madagascar, South Africa, Mozambique, Kenya, etc is overwhelming the precarious food supply system. Moreover, the demand for agro-fuels affects even non feedstock crops, such as rice and wheat, as foreign capital invest on fuel crops instead of food crops. As food becomes scarce, countries like Vietnam, Russia, Argentina, and Kazakhstan, have imposed limits on food exports, a situation that is not helping African food import policy meant to compliment domestic production against the background of food shortage in Africa. Some African countries that demonstrate fluid food sufficiency have imposed ban on food export. For example, "Egypt has banned rice exports to keep food at home (The New York Times, 2008).

Meanwhile, agro-fuels production is booming around the world, particularly in Brazil, the United States, Europe and Asia. However, producers are beginning to take advantage of the many crops grown elsewhere that can be converted into fuel, which also serve as staple foods. For example, cassava and palm oil that are extensively produced for consumption in Nigeria are already targets for agro-fuels projects. The implication of using these staples for agro-fuels is that the people would have to look for alternative to their staples, which may compel them to further depend on food importations from other continents that are limiting their food exports. In Malaysia and Indonesia, where agro-fuels has been firmly established, biodiesel refineries have created a palm oil shortage. The 19 January 2008 New York Times reported that the price of

palm oil for cooking has risen by 70%, and street vendors in Malaysia are having difficulty finding cooking oil. This situation is likely to be replicated in Nigeria where palm oil is a staple dietary whenever agro-fuels is fully unleashed on the country.

China who has an active agro-fuels program has begun importing cassava as a feedstock from Nigeria for her agro-fuels project. Ironically, this is already putting pressure on the price of this dietary staple in Nigeria. In Tanzania, GRAIN (2007) reported that thousands of rice and maize farmers are being evicted from their lands in order for large companies to plant sugarcane and jatropha trees, which are suitable for agro-fuels in Tanzania. Similarly, industrial groups from Malaysia and South Africa have already acquired between 300,000 and 400,000 hectares of land in the Benin Republic for production of palm oil for agro-fuels production. Benin's growing population needs more food to sustain them, but it is clear that the production of agro-fuels will seriously undermine food security in Benin.

CONCLUSION

This paper has argued that 'agro-fuels' represent the movement towards more crisis of food security in Africa insofar as they become allocator of agricultural resources. While crops are locked in an embrace with fuel, the resort to agro-fuels is an artificial solution. Agro-fuels displace food and food producers thereby revealing the falsity of corporate agriculture's claim to 'feed the world'. While an emergent food/fuel complex offers possibilities for profitable investments for foreign capital, it offers death to Africans via hunger. It represents the bankruptcy of a development paradigm and that of African leaders that have started accepting the logic of agro-fuels.

Land was communally owned in many African countries thereby making it easier for African governments to transfer land away from its users. Large-Scale acquisition of land for agro-fuels is already causing domestic displacements and food shortages, especially in rural areas. African policy makers have not yet made a convincing argument that agro-fuels will not contribute to food insecurity in the continent. African leaders are either pretending or ignorant about the impacts of large-scale Agro-fuels production on food production, especially in relation to the transfer of land from its traditional uses.

Indeed, the policy of African governments to shift attention from solving food insecurity in order to produce agro-fuels is an opportunity cost. Arguably, if African leaders were to give food production the attention they are giving to agro-fuels development, the continent might become food secure. Biofuels shift land use, water use, and human and capital resources away from food production. There is urgent need for a secure land tenure system in Africa in a way that farmers do not become landless peasants as a result of agro-fuels development. Unfortunately, this already has happened in some parts of Africa (Sunday Times, 2007).

The shift in the use of corn from human consumption to agro-fuels consumption in the United States and the subsequent agro-inflation at a global level are lessons to be learned on the impact of agro-fuels on food security (Wolde-Georgis and Glantz, 2010). For example, the planned production of ethanol from cassava in some African countries would definitely lead to local food shortages. It was for fear of this outcome, that the South African government banned corn as a feedstock for ethanol (Nieuwoudt, 2007)

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