

## **CONTESTATIONS AND RESISTANCE IN THE SUGARCANE ECONOMY IN MUMIAS, KENYA**

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### **Contestations and resistance in the sugarcane economy in Mumias, Kenya**

*The study is an examination of how agricultural intensification as a development paradigm gets entangled in farming processes of its adaptation and utilisation. Through qualitative research, it analyses the relationship around agricultural inputs and science for production of sugarcane, between farmers and Mumias Sugar Company Limited (Mumias Sugar) in western Kenya. The article demonstrates the potency of farmers' resistance to aspects of intensification that stifle their control over the processes of sugarcane production and erode social and economic benefits they derive from sugarcane production. Strengthening the capacities of African farmers to adapt paradigms in ways that place their agroeconomies and benefits in their hands is thus emphasised.*

Keywords: intensification, sugarcane production, agoroelationships, farmer resistance

### **Contestações e resistências na economia da cana-de-açúcar em Mumias, Quênia**

*O presente estudo avalia a forma como a intensificação agrícola como paradigma de desenvolvimento está estreitamente ligada aos processos agrícolas da sua adaptação e utilização. Através de investigação qualitativa, analisa a relação entre os agricultores e a Mumias Sugar Company Limited (Mumias Sugar) em torno dos insumos agrícolas e da ciência para a produção de cana-de-açúcar no oeste do Quênia. O artigo demonstra a força da resistência dos agricultores a aspetos da intensificação que restringem o seu controlo sobre os processos de produção de cana-de-açúcar e corroem os benefícios sociais e económicos que eles obtêm da produção de cana-de-açúcar. O reforço das capacidades dos agricultores africanos para adaptar paradigmas de forma a colocar as suas agroeconomias e benefícios nas suas mãos é assim enfatizado.*

Palavras-chave: intensificação, produção de cana-de-açúcar, agoroelacões, resistência dos agricultores

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The central thesis of this contribution is that development paradigms that emerge outside of specific locales are not bad in themselves. What is crucial, however, is rather how these paradigms get adapted and complement life conditions and innovations in every locale. Drawing from empirical field data obtained in a qualitative study of the sugarcane economy in Mumias, Kenya, this study discusses the ways that the relationship around agricultural inputs, science, and infrastructure between sugarcane farmers and the Mumias Sugar Company Limited (Mumias Sugar) manifests, and farmers' responses to such relationship. It addresses the question of whether and how legitimate and sustainable agricultural intensification is in the context of Mumias. A focus on agriculture in addressing this question is justified and relevant. The focus rests on the point that agriculture is pivotal to African development, and agricultural structural transformation is a sure way to reduce poverty, meet growing food demand, and foster prosperity on the continent (Barrett et al., 2017; Reardon et al., 1999; Yumkella et al., 2011).

The goal of this work is to contribute to efforts to invoke, develop, and sustain the capacities of Africans to harness natural resources in ways that place African economies and benefits in the hands of Africans. Within the principles of sustainability, that is, balancing environmental, economic, social, and political contexts of farmers and Mumias Sugar (Jenkins, 2010; Narh, 2018; White, 2013), the contribution of this work to agricultural intensification and rural transformation is that an adaptive, integrative, and complementary system of agricultural intensification can better serve the interests of farmers and other stakeholders when the discourse transcends technical questions to agricultural intensification, beyond the market and the positivists focus on efficiency and productivity, to also address social, political, and environmental ramifications of intensification. To this end, the objective of the paper is to demonstrate through analysing farmers' resistance that farmers political power when properly organised can transform agricultural intensification for equitable benefits to farmers.

## **Eminence of agricultural intensification in Africa**

Sustainable agricultural intensification has evolved quite rapidly as the paradigm for agricultural development to stimulate transformative changes in Africa. One of the main sources of wealth and livelihood in Africa is commercial farming and related agricultural processing (Yumkella et al., 2011). Thus, supposedly declines in food production while food imports rise in Africa served the foundation impetus to direct intense policy on agricultural intensification and introduction of

modern agricultural infrastructure in Africa (Biswas & Biswas, 1986). Sustainable agricultural intensification is defined in the literature mainly as a process to achieve food security through increased and focused harnessing of agricultural lands to increase their productivity while controlling negative outcomes on environmental resources and avoiding expansion of land for agriculture (Garnett & Godfray, 2012; Godfray et al., 2010). Lal (2019) writes that the core strategy of sustainable agricultural intensification is to increase yield per unit of land, by enhancing the application of industrial inputs and technologies that can improve eco-efficiencies, reduce waste in land use, restore soil health, and save land for nature conservation. In Reardon et al. (1999) agricultural intensification is aimed at enhancing food production through adequate use of inorganic fertiliser and capital such as soil and water conservation technologies. The concern over food supply to meet growing demands, which is claimed to be a persistent problem in Africa (Biswas & Biswas, 1986) has firmly established the drive for agricultural intensification as a transformative paradigm for Africa. Indeed, observations around Africa are that agricultural intensification has facilitated the introduction of capital inputs, including extensive use of fertilisers by farmers.

In recent times, concerns over poor agronomic practices and environmental degradation in intensification has led to the supposedly integration of environmental indicators in what is now referred to as sustainable agricultural intensification (Loos et al., 2014). However, evidence abounds that environmental sustainability remains to be achieved in agricultural intensification (Cook et al., 2015; Loos et al., 2014). The reason is primarily because the economic profit interest still holds dominant for key influencers such as agribusinesses. The continued dominance of economic growth as the goal for the transformation of economies has persisted to the current decade. Predictably, with the market-driven and economic growth interests as the *sine qua non* for prosperity in Africa, any initiatives to incorporate environmental considerations into agricultural systems is likely to fail (Kothari et al., 2015, cited in Busck & Schmidt, 2020).

Smith et al. (2017) write that efficiency and productivity goals are the central pillars of agricultural intensification in Africa. Sarr et al. (2021) also affirm that increased yield through concerted efforts to improve efficiency and productivity of land is the most important consideration for agricultural intensification in most of Africa. Thus, there is high faith in agricultural intensification as inevitable in Africa to solve the challenge of rising land and food deficits (Evans, 2003). Among the key indicators of intensification are yield and productivity (Smith et al., 2017). Farming systems such as sugarcane production in Mumias have pursued these goals with extensive application of external inputs and the

management of farm cultural practices and markets. The view is that land use intensification benefits development in general through enhancing the capacities of small-holder farmers, who constitute the backbone of the economies of most African countries (Holden, 2018). Towards this end of raising food production efficiency, research and other efforts into the development and application of inorganic fertilisers and similar farm technologies such as irrigation facilities have been stepped-up in Africa (Evans, 2003).

Against this backdrop of deep faith in efficiency and productivity of agricultural intensification, momentum has been built for capital-intensive agriculture to replace what some believe are inefficient agronomic practices of traditional forms of agriculture. The claim is that the traditional form of agriculture erodes gains that could be maximized from farming (Jaynea et al., 2019). Thus, farmers' social, environmental, and political contexts in farming are relegated in favour of efficiency and productivity goals that come with importation of industrial inputs and technologies. Similarly, it is argued that as populations grow and environment gets worked up more and more, traditional, low capital-intensive modes of agriculture are not sustainable, and cannot meet the growing demands for food. Such arguments have been the key driver for the introduction of capital intensification agriculture (Reardon et al., 1999). The principal idea held therefore is that capital-intensive agriculture holds the key to preventing the revert to traditional, unsustainable, extensive forms of agriculture that lead to environmental degradation and poor yields.

Reardon et al. (1999) claim that environmental resource protection and economic wellbeing of farmers are key goals of sustainable agricultural intensification. They did not mince words to say that in practice, satisfaction of these goals requires "capital-led intensification" based on substantial use of non-labour variable inputs that enhance land and labour productivity (Reardon et al., 1999, p. 376). These framings of sustainable agricultural intensification therefore adopt less of local, traditional modes of agriculture (Lang & Barling, 2012). However, recognition exists of the crucial relevance of traditional forms of agriculture with its contexts that meet the sustainability needs of farmers (Mather, 1996). Indeed, Africa can learn from the acknowledgment in, for instance, South Africa, that traditional modes of agriculture can be redefined to provide similar productivity gains as would be obtained with sustainable capital-intensive agriculture, but with minimal environmental consequences (Mather, 1999). Nonetheless, the author of this current paper insists that there is nothing against agricultural intensification with application of capital inputs. The issue is rather that agricultural intensification based on the efficiency and productivity ideals in pursuing the high

yield and food availability objectives has failed to take cognisance of how intensification is affecting the social, environmental, and political interests of farmers in intensification. Traditional farming systems such as practiced by small-holder farmers in many parts of Africa, that are outside the direct management of intensification systems, can blend well with externally developed intensification systems to produce hybrids that hold more promise than either indigenous or intensification systems alone (Clay, 2018).

Concern about the ecological footprints of intensification has been widespread. Thus, ecological sustainability has emerged to redefine intensification within sustainability principles. This has raised emphasis on the importance of ecological integrity in agriculture (Vanlauwe et al., 2014). This recognition is welcoming, expecting that the integration of sustainability into agricultural intensification can contribute to emphasizing the relevance of farmers' own social and political interests to enable an adaptive intensification paradigm. Yet, this recognition clearly does not emphasize the relevance of the social and political contexts of farmers, and the implications that will result when such contexts are ignored. Indeed, the absence of such integration of farmers' contexts in agricultural intensification and land development has created injustices against local farmers who are exploited for the benefits of other stakeholders such as agribusinesses (Kerr, 2013).

## **Ideology of agricultural intensification in Kenya**

In Kenya and East Africa as a whole, agricultural intensification carries the goals of producing high farm yield and reduce pressure on available land. In the tea and sugarcane production systems for instance, the discourse on intensification has been around food security and high productivity to address land extensification and degradation problems (Narh, 2019; Yami & Asten, 2017). In Kenya, agriculture, particularly intensive cash crop farming such as intensive production of sugarcane contributes about 22 percent to gross domestic income (World Bank, 2019). The focused soil and social engineering processes in intensification have dominated agriculture in Kenya like elsewhere in Africa. Marenya and Barret (2009, cited in Holden, 2018) found in western Kenya that poor organic contents of soils hinder efficiency of fertiliser use towards intensification. Kenya's environmental policy also acknowledges environmental degradation to achieve efficiency and productive land use but blames it on human activities such as unsustainable land use practices, poor soil and water management practices, deforestation, overgrazing, and pollution (RoK, 2013). Besides this, poverty

is seen as one of the major causes of environmental degradation since the poor are said to have no alternatives (RoK, 2013).

Intensification has been running in Kenya on land reforms, which is based on the discourse that low yield and degradation in agriculture have been caused by inefficiencies in the traditional farming system (Kijima & Tabetandob, 2020; World Bank, 1975). However, the introduction of intensification to achieve efficiency and productivity goals has had some negative consequences for the social, economic, and political interests of sugarcane farmers. In western Kenya, farmers bear most of the costs of the large capital inputs applied in the sugarcane farms (Narh, 2019; Waswa et al., 2012). This is to the extent that farmers reported being most often in debt from huge capital input outlay. In this regard, intensification in its current mode rather erodes the innovative capacities of farmers and their profits. Small-scale farmers can be as productive as medium and even large-scale farmers if given the needed support. In the Kenyan Rift Valley, Debonne et al. (2021) found that small-scale farmers as much as medium scale farmers show no dominant differences in terms of efficiency and productivity of their farms. They therefore conclude that it is far-fetched for agricultural development to be premised on the idea that larger farms, and in the sense of intensified cropping systems will produce more efficiency and productivity and thus better results from land.

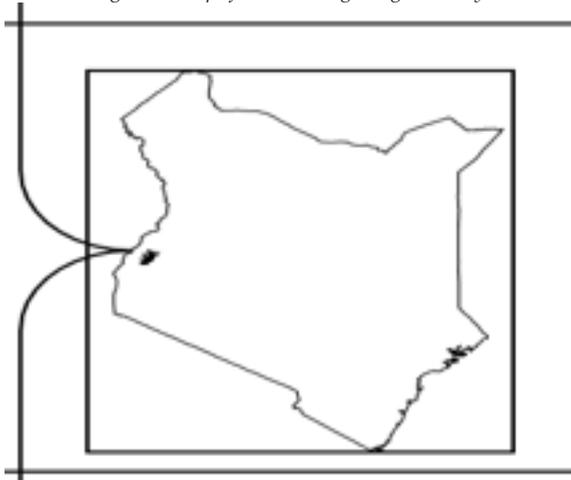
Evidence from Kenya does not also support the contention of intensification that land extensification can be reduced by intensification. In fact, there is no more available land in most agricultural communities in Kenya such that the intensification practice has been the major cause of the widespread soil degradation and growing weaknesses of the social and political power of farmers over their lands. Evidence from field research in Kenya suggests that due to availability of technologies such as fertilisers, weedicides, tractors, relatively abundance of water, and a ready market due to the growing competition among cane processing firms, intensification is rather consuming land as most farmers find it less demanding in terms of labour and time to bring more land into cultivation.

## Methods

Research that generated the field data for this contribution started with an observation while on a family visit in Mumias in western Kenya in April 2017. In this observation, sugarcane farmers were lamenting on several challenges they faced in their relationship with Mumias Sugar Company. A thorough field research was thus planned to conduct in-depth interviews among sugarcane farmers and

officials of Mumias Sugar. Mumias, together with nearby villages, is a collection of farming communities located in the rainier western part of Kenya (Figure 1). It is about 450 kilometres northwest of the capital Nairobi. Its economy is mainly rural with sugarcane, maize, and vegetable production constituting the main agricultural activities. Currently though, its reputation as a major sugarcane farming economy has diminished significantly due to the collapse of Mumias Sugar Company since late 2018. Nonetheless, reports are that the Kenyan government is in the process for a revival of this giant industry.

Figure 1: Map of Mumias sugar region, Kenya



Adapted from Netondo et al., 2010

For four months from October 2018 through to January 2019,<sup>1</sup> with the generous support of two female field assistants, interviews were conducted in five cane farming sub-zones in and around Mumias. These sub-zones were Mumias Main area, Mumias West area, Ekeru area, Matungu area, and East Wanga area. In June 2019, follow-up interviews were completed to augment the data. In-depth interviews were conducted with both contract and ordinary farmers and officials of Mumias Sugar. These interview participants were identified purposively, zeroing in on twenty-six farmers and three Mumias Sugar Company officials whose responsibilities cover cane farm development and recycling of sugarcane processing residues. Interviews were analysed with the aid of Atlas.ti, a qualitative data analysis software. The analysis was conducted by coding various segments of transcribed interview data and hyperlinking related codes to form

<sup>1</sup> The author's research in Mumias is ongoing though, with various themes of the sugarcane industry and natural resource conservation explored at each point of the extended research phase.

quotations or network views. Particularly, the network views enabled drawing out of themes from the individual and linked quotations.

Besides being chosen as a research site from the coincidence of the family visit in 2018, Mumias and surrounding communities also make a qualified case to present here in this contribution because Mumias Sugar Company that buys cane from the farmers in these communities had been the largest sugarcane processing plant in Kenya, and thus poses significant influence on the economy in and around Mumias. The firm is a state-owned plant that buys sugarcane from farmers in the Mumias catchment and processes it into sugar for local consumption and export to neighbouring Uganda, Tanzania, and overseas. Farmland is owned by mainly indigenous families, and most farmers hold title deeds over their lands. Some farmers hold land with usufruct titles or as leases from other community people.

## **Mumias: manifestations of outcomes of agricultural intensification**

### **Input supply**

In this section, field data is presented to demonstrate the domination of farmers by Mumias Sugar Company through agricultural intensification. In Mumias, capital-intensive agriculture has tied sugarcane farmers tightly with Mumias Sugar Company. The result is that there is entrenched erosion of the confidence of farmers in their own abilities to develop sustainable modes of farming cane. The major process for this decapacitative relationship is the supply of inputs and “scientific” ideas of farming from Mumias Sugar Company to cane farmers. Especially for contract farmers,<sup>2</sup> Mumias Sugar Company in pursuit of its profit, supplies farmers with all the capital inputs and ideas they need to develop their cane farms. The process is called cane development, within the Mumias Sugar Company. These inputs include inorganic fertilisers, soil testing, land ploughing, cane harvesting and transportation from the farm, and agronomic advice:

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<sup>2</sup> Contract farmers enter into agreements with Mumias Sugar Company for the development of cane farms. The cane then must be supplied to the company on harvest. Usually, the contract is for three harvests of cane, spanning about six years.

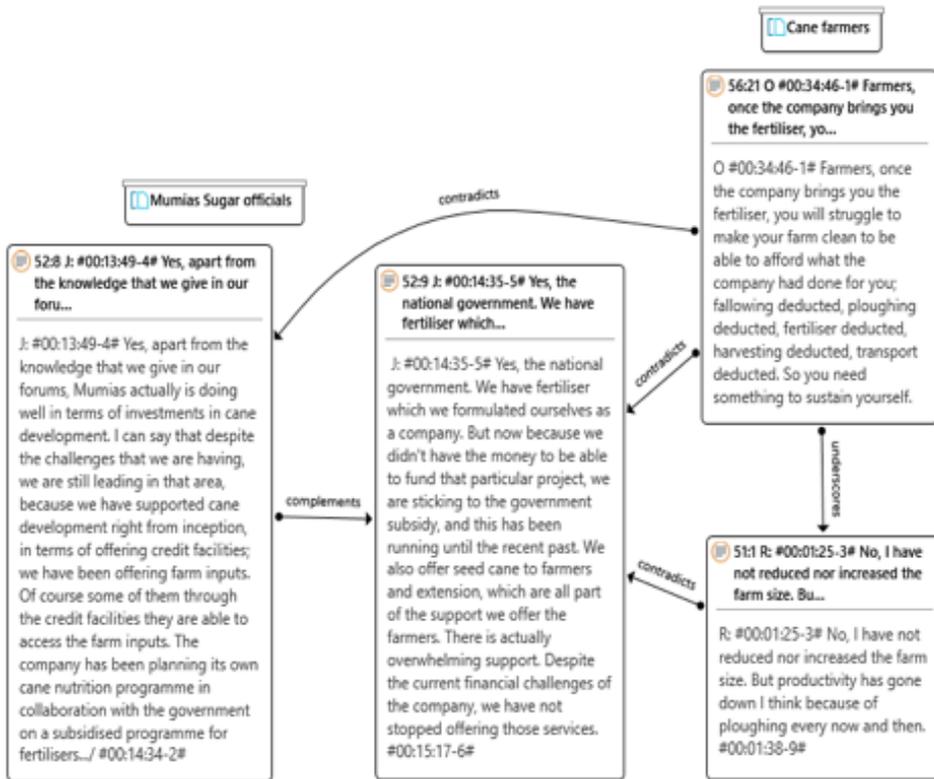
181:4KD: D: #00:01:42-0# You start by ploughing the farms. In the beginning the company wou..... (1146:1992) - D 181: Mumias farmer\_Ekero\_June 2019<sup>3</sup>

KD: D: #00:01:42-0# You start by ploughing the farms. In the beginning the company would send tractors to come and plough the land. Afterwards the company would also do the harrowing. Afterwards they would supply one with seeds depending on the size of the farm. They would later supply the farmer with fertiliser called DAD. When the cane is grown up to the height of one's knee the company supplies another fertiliser called Urea as well as DAD. The sugarcane would then be harvested after 14 to 18 months. The company would equally send labourers for the cutting/harvesting. Afterwards they would transport the cane to the company and later the farmer would be told to go and sign a statement. This statement indicates that sugarcane has been delivered. It is also done to ascertain that the tonnage at the company is the same as the one done on the farm at harvest.

The price of each of these inputs supplied by Mumias Sugar Company is determined by the Company. Farmers over the years have been deeply incorporated into the capital-intensive mode of farming. Thus, they find these inputs necessary to maintain the productivity of their lands and their livelihoods. These inputs are supplied to the farmers in each season of cane farming. For the company, input supply is a tremendous support they provide farmers, yet, for farmers, this supposedly help from the Company rather keeps them in constant obligation to the Company. In a farmer's words, "you [...] struggle to make your farm clean to be able to afford what the company had done for you" (Figure 2):

<sup>3</sup> At the beginning of each quotation used in this report is an Atlas.ti quotation ID for any particular quotation used. The ID consists of the document number and a number indicating the chronological order when the quotation was created. For example, 181:4 KD: D: #00:01:42-0# You start by ploughing the farms. In the beginning the company wou..... (1146:1992) - D 181: Mumias farmer\_Ekero\_June 2019, can be interpreted as follows: '181:4' means the quotation used is the fourth quotation from Document 181 uploaded to the Atlas.ti software for this contribution; 'D: #00:01:42-0#' is a time stamp generated from the transcription that indicates position of the sentence in the audio tape; 'You start by ploughing the farms. In the beginning the company wou.....' is the beginning few words of the quotation; (1146:1992) means the quotation starts from the 1146th character of the page and ends with the 1992nd character of the same page; D 81: Mumias farmer\_Ekero\_June 2019, is the name the author gave to the code, the sub-zone where the interview was conducted, and the date the interview was conducted.

Figure 2: Contradictions between Mumias Sugar Company and cane farmers on input supply



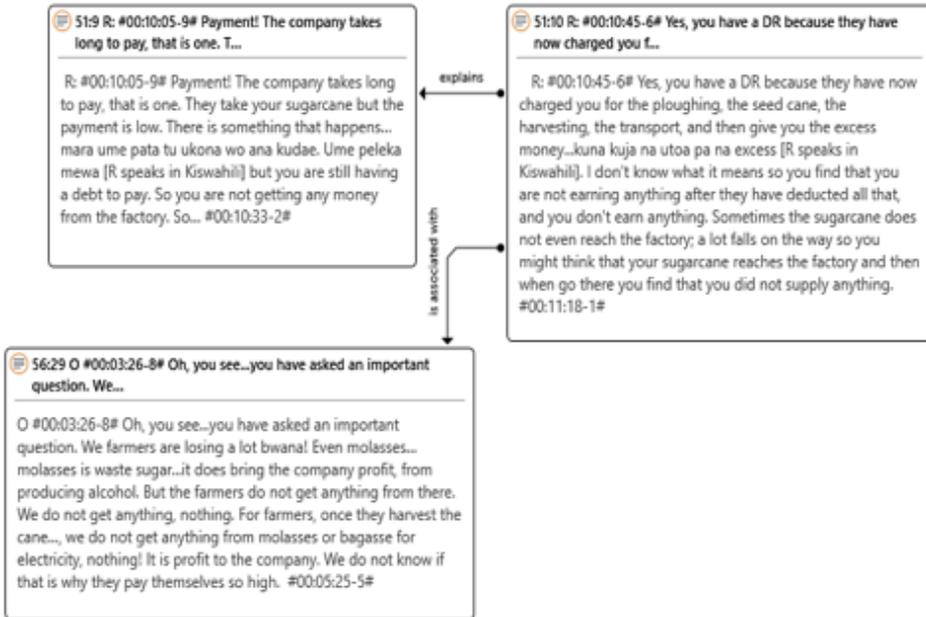
### Farmer persistent debts

In Figure 2, capital intensity characterises sugarcane farming in Mumias. The result is that farmers get saddled with debt from the supply of these capital inputs, as their financial accounts with Mumias Sugar are usually debited to settle the cost of inputs, otherwise popularly referred in Mumias as DR (Debit Recovery) (Figure 3):

In Figure 3, as respondent 'R' said (i.e., top right quote), sometimes farmers' canes do not reach the factory, but Mumias Sugar does not take responsibility for this even though it does the harvesting and transportation of the cane from farm to factory. The situation is one of extraction from the land and human resources of the farmers without comparable benefits to farmers. Moreover, all the farmers interviewed claim that Mumias Sugar delays in payment for cane harvests, which means farmers often resort to loans to meet daily sustenance:

52:27 O #00:44:47-3# Yes, I can plant once Mumias Sugar Company pays earlier..... (22474:22822) - D 56: Mumias farmer\_Main town\_2018\_checked

Figure 3: Farmer persistent debt



O #00:44:47-3# Yes, I can plant; once Mumias Sugar Company pays earlier, I will plant. Mumias Sugar Company is our factory bwana! We are in hunger here through the thieves in the Mumias Sugar Company, they should go away and let new Management come. Also, the payment for Management should be down, so the farmers will get the money! #00:45:19-8#

56:11 O #00:15:04-5# Yes! the fourth harvest is the farmer's own. Then, a co..... (7946:8471) - D 56: Mumias farmer\_Main town\_2018

O #00:15:04-5# Yes! the fourth harvest is the farmer's own. Then, a competition comes with the other machine... from... we call it West Kenya. It passes right at the mouth of Mumias Sugar Company here, at the mouth of Mumias company to Busia. So now the farmers are free. So, a competition arose here. West Kenya Sugar company pays after five days; every Friday – cash!! So, every farmer in Busia district where Mumias Sugar Company used to get a lot of gains, are now concentrated on West Kenya, where they pay early. #00:16:10-3#

130:14 O #00:23:18-2# Yes, very well! So Mumias Sugar Company, all the sugarc..... (12184:12733) - D 56: Mumias farmer\_Ekero\_nov2018

O #00:23:18-2# Yes, very well! So Mumias Sugar Company, all the sugarcane within Mumias section, all the trailers pass through with sugarcane at the mouth of Mumias Sugar Company to West Kenya, which is a long distance from here! How can this be... it is shameful! It shows it is shameful! Mumias Sugar Company is

shameful; it tells the Mumias Sugar Company “shame to you!”. Early payment for farmers! For Mumias Sugar Company to start running again it must come under the other companies for a while, or the current Management should be out.  
#00:24:47-8#

The financial pressure on farmers means that some are compelled to harvest the cane for sale before they fully mature. But this only gets to worsen their financial difficulties because certainly such young cane will weight lower tonnage and attract lower revenue for farmers:

51:8 R: #00:09:38-0# Very many things have changed. Very many farmers uproot.....  
(11894:12225) - D 51: Mumias farmer\_Matungu\_feb2018

R: #00:09:38-0# Very many things have changed. Very many farmers uproot the sugarcane... ni ni [R speaks in Kiswahili] ... Also, very young sugarcane is harvested and sold these days, underage sugarcane... there is no supervision... there is a lot of things that have changed by the way. There is nothing that is going on now.  
#00:10:00-3#

## Farmer resistance

Farmers are not passive or indifferent to accumulation of their debt or difficult conditions in their relationship with the Mumias Sugar Company. Their various reactions suggest a form of resistance to the challenges they face. Ironically, farmers have not established any functional cooperative organisation to mobilise their numbers into resistance or negotiations with Mumias Sugar Company over their grievances. Rather, each farmer takes individual actions as they deem fit, to confront the firm. The main reactions of resistance include refusal to sell cane to the company even though the company may have supplied the farmers with farm inputs, harvesting cane before they fully mature to sell off to a competitor firm, and refusal to even plant cane at all:

53:8 D: #00:10:25-9# Because you get a farmer, he contracted the field to t.....  
(7167:7413) - D 53: Mumias farmer\_Matungu\_feb2018

D: #00:10:25-9# Because you get a farmer, he contracted the field to the company, and he was given seed cane and fertiliser, but he is selling cane to somebody else but not to Mumias itself that gave him the seed cane and fertiliser. #00:10:53-1#

56:8 O #00:12:50-5# So, we farmers calculated... there is another machine (pr.....  
(6443:6722) - D 56: Mumias farmer\_Main town\_nov2018

O #00:12:50-5# So, we farmers calculated... there is another machine (processing firm), we call it West Kenya. And then this and Mumias Sugar Company... they started competition. So Mumias Sugar Company was before now harvesting a much heavy harvest in the whole of Busia district. #00:13:28-0#

53:14 D: #00:15:10-6# The conflicts are there. One conflict is that I was gi..... (11254:11553) - D 53: Mumias farmer\_Matungu\_feb2018

D: #00:15:10-6# The conflicts are there. One conflict is that I was given inputs by the company and yet I am not giving the company the cane; that is already a conflict. Two, the company has harvested my cane and not giving me my payment. So those are two major conflicts that we have. #00:15:44-9#

56:26 In this season we are now, you cannot send your cane to Mumias Sugar c..... (20785:21140) - D 56: Mumias farmer\_Main town\_nov2018

In this season we are now, you cannot send your cane to Mumias Sugar Company... you can take it anywhere you can get early payment. I told you West Kenya company in Busia will come and buy cane here and they will pass through, at the mouth of the Mumias Sugar Company to West Kenya... this factory here, cane passes here, how won't it be shameful! #00:42:09-7#

56:9 O #00:14:04-8# So the farmers, after completing this harvest with Mumi..... (7189:7374) - D 56: Mumias farmer\_Main town\_nov2018

O #00:14:04-8# So the farmers, after completing this harvest with Mumias Sugar Company, they will not... no longer... after three harvests, they say no to Mumias Sugar Company. #00:14:31-0#

These strategies to divert sugarcane from Mumias Sugar Company have constrained adequate supply of cane to the company. They have contributed significantly to the current folding of the Company. Indeed, farmers are not happy that their own factory, Mumias Sugar Company, is unable to meet their needs. Yet, at this heightened level of frustrations, they do not care much anymore about "our own factory" but seek to make the most from their lands and labour. The collapse of Mumias Sugar Company means loss of jobs for many people in the community. But farmers say they cannot solely maintain jobs for other people out of their lands and labour when the Company persistently fails to meet its part of the cane relationship.

### **Mixed consequences of resistance**

Two main consequences of the farmer resistance activities show up in Mumias. First, Mumias cane farmers claim they are reaping some benefits from refusing to grow cane for Mumias Sugar Company. Sugarcane has become quite less abun-

dant as many farmers are now receding to plant other crops such as maize and cassava for sale on local markets though they acknowledge that compared to sugarcane marketing, the maize and cassava markets are volatile and not readily available. Due to reduced cane availability, competition among sugarcane processing firms for cane has become keener now than before, for instance between Mumias Sugar, West Kenya, and Kibos. Increasing competition between these processing firms has created wider leverage for farmers to decide where to sell:

181:8 KD: No, I would not like that. I prefer to sell to any company at all. S.....  
(5317:5696) - D 181: Mumias farmer\_East Wanga\_june2019

KD: No, I would not like that. I prefer to sell to any company at all. Since we picked lessons from just supplying to one company e.g. Mumias Sugar, it helps. In the beginning it was good, but it got to a point they started taking advantage of the farmer seeing that they were a monopoly. They would take long to make payments. Thus, it is now good for one to be free to sell their cane anywhere they like.

183:11 DS: That is because when you decide to take your cane to just one part.....  
(4770:5096) - D 183: Mumias farmer\_interviewer2\_MR

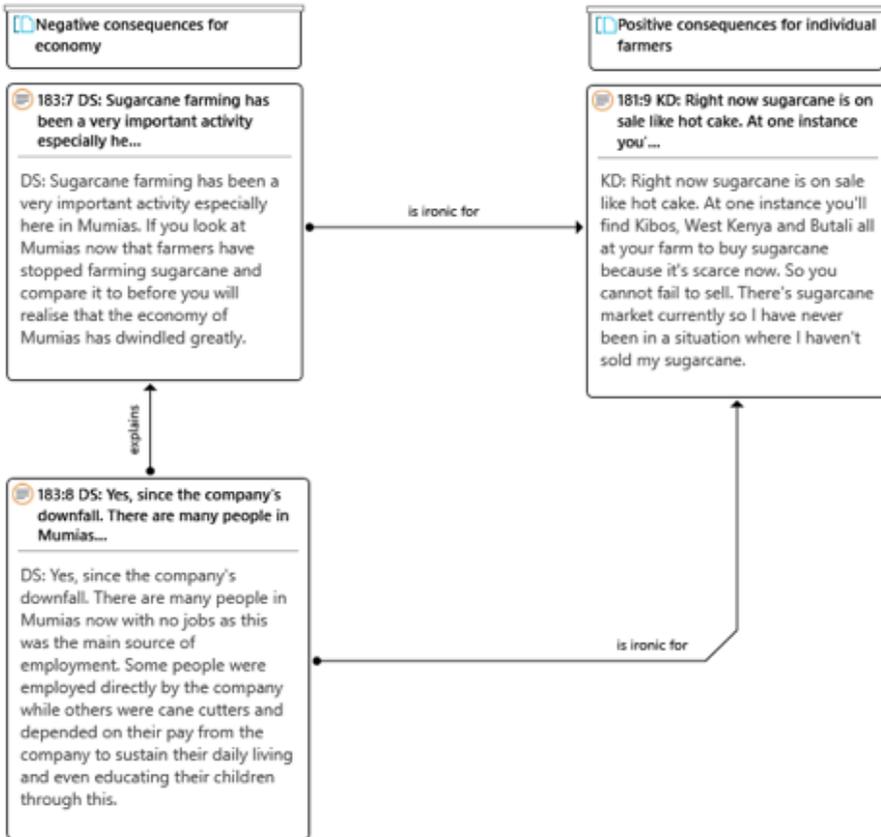
DS: That is because when you decide to take your cane to just one company you may realize that sometimes their deals may not be 100% suitable to you. For example, payment per tonnage. Other companies may have better deals. Thus, you can opt for the better paying company.

181:6 KD: Long ago when Mumias Sugar still existed one was forced to sell to.....  
(4456:4823) - D 181: Mumias farmer\_East Wanga\_June2019

KD: Long ago when Mumias Sugar still existed one was forced to sell to them because that was the only cane company at the time. The pay was good though and the company was doing very well. In recent times we sell the cane to other companies as well. Currently I sell my sugarcane anywhere I feel like for example I have sold to Butali and to West Kenya. I am yet to sell to Kibos.

Second, Mumias Sugar Company, as of October 2019 has not been operational at all. In November 2019, this researcher visited the factory and saw only critical staff such as security and fire officers at post. Many people who work directly at the factory have lost their jobs, and the Mumias economy is feeling the consequences (Figure 4). A former senior management staff of Mumias Sugar Company that this author interacted with in October 2019 disclosed that the folding of Mumias Sugar, even if temporarily as some optimist factory workers claim, has been due to the resistance and refusal of farmers to supply cane to the factory in view of farmers' mounting debt and eroding of their political power over their lands:

Figure 4: Positive and negative consequences of cane competition in Mumias economy



Yet, Figure 4 above also indicates that individually, cane farmers have been reaping some benefits from the competition that has arising among cane processing firms. Farmers’ resistance has paid off for them, but also at the expense of loss of jobs and development in the wider economy.

### Control over agricultural capital

The field data presented above have demonstrated that sugarcane farmers are not passive actors to be manipulated all the time for interests that are not compatible with theirs. Sugarcane farming in Mumias and its associated relationships between farmers and Mumias Sugar Company typify the political struggles associated with capital-intensive agriculture for increased productivity but which has escaped policy makers and academics. In Mumias, capital-intensive agriculture has placed lands, agronomic practices, and farm inputs in the control of the processing firm. Guided by the profit motive, this control exploits farmers’

dependence on cane farming as livelihoods. Such control affirms the dominance of the agricultural intensification goals of efficiency and high yield in most parts of Africa that have rather plagued farmers with debts (Reardon et al., 1999; Sarr et al., 2021; Smith et al., 2017). In this respect, this paper disagrees with studies on the sugarcane industry in Kenya that suggest that farmers can improve their economic and social situations mainly through the empathy of the sugarcane processing firms; that to change the situation of farmers, solutions should be firm-centred (Olanipekun et al., 2019; Owino et al., 2018; Waswa et al., 2012). A Malawi case study (Spencer et al., 2018) shows that farmers can resist illegitimate approaches to agricultural development that do not lead to their wellbeing. The common meaning of agricultural intensification as application of inorganic fertiliser for increased land productivity (Holden, 2018; Jaynea et al., 2019; Reardon et al., 1999) is at variance with farmers' experiences with fertiliser inputs in Mumias.

To this end, capital-intensive agriculture should not be only about efficiency and productivity of inputs and land. Equally important is the extent of local farmers' control over the formulation, supply, application, and governance of agricultural capital inputs to enable the attainment of economic, social, political, and environmental needs of farmers. In the section on ideology of agricultural intensification above, recognition is made of the potential of local farmers to contribute to the positive outcomes of agricultural intensification (Clay, 2018; Kolawole, 2013; Mather, 1999). The lack of integration of farm communities not as objects but as equal leaders in intensification and land use developments, as evidence from Mumias demonstrates, has resulted to injustices against local farmers who are exploited for the benefits of other stakeholders (Bezzner Kerr, 2013).

Finding solutions to the challenges of farmers in the sugarcane industry can be advised from a socioeconomic, political, and conservation approach, rather than only economic. In agreement with Loos (2014) however, sustainable agricultural intensification should take the principles of sustainability seriously to enable positive outcomes not only for the environment but also for the economic, social, and political conditions of those that intensification affect most. There is evidence that in both developing and industrialised countries, with the right policies and incentives for farmers, agricultural intensification can accrue not only economic but also social and natural capital dividends for all stakeholders (Pretty & Bharucha, 2014).

The Mumias case shows that the focus on land productivity to meet growing demands for food as the defining principle for sustainable agricultural intensification can lead to power imbalances and inequitable consequences for actors in a particular agricultural system. Indeed, Loos (2014, p. 358) warns that in the

interest of sustainability, meeting the increasing demand for food (which sustainable intensification seeks to address) disproportionately represents the wants of those with the financial resources to influence food markets, but greatly underrepresents the needs of those who are the most food insecure. In Zimbabwe contract farming has resulted in shifting power from farmers to firms and the state in terms of security of farmers' income and other details of contract, which negatively affect the political and economic power of farmers to develop their livelihoods (Mazwi et al., 2019)

In Mather's (1996) and Adenle et al.'s (2019) analyses, the adoption of traditional modes of farming holds prospects for conservation and at the same time can reduce dependence of farmers on high capital-intensive infrastructure. In agreement with these analyses, traditional modes of agriculture can provide farmers with opportunity to take hold of their livelihoods and resources. Zhang et al. (2015) have already shown how agricultural capital intensification fails to produce environmental and economic returns when farmers' agronomic experiences and participation in policy formulation are not considered. In the pursuit of agricultural intensification in countries like Ghana and Mozambique, the influence of the global agribusiness paradigm and capital accumulation integrates smallholder farmers into capital accumulation that stifles rural development (Amanor & Chichava, 2016). In this way, expertise of African farmers in sustainably harnessing resources for the sustainability of their livelihoods are being depressed and replaced by capital intensive production processes that place these resources out of reach of farmers' control. The negative conservation and wellbeing outcomes for African farmers from capital-intensive agriculture and agribusinesses have eroded any gains made from transforming agriculture. To attain the sustainability principles in the implementation of sustainable intensive agriculture, the pursuit of equity in benefits from resources is imperative, which is only possible when control and power over resources are equitably distributed. In other words, an overly enthusiastic focus on meeting food needs at the expense of the other interests of farmers can be counterproductive to transformation for all, and unnecessarily increase incentives for ecological degradation (Loos et al., 2014; Phelps et al., 2013).

## **Adaptability and legitimacy of paradigms**

The contention of this contribution through evidence from Mumias is reiterated; that any transformative paradigm can be adapted to sustainably serve the needs of any group of people. Two related points explain this contention. First, sustainable agricultural intensification inasmuch as is a paradigm for agricultur-

al modernisation in Africa certainly can be appropriate to contribute to resolving Africa's agricultural deficits (Pretty & Bharucha, 2014). The evidence from Mumias agrees with Loos et al. (2014) and Patel (2014) that governance and institutional arrangements in agricultural intensification are key to prevent the capture of the concept by some actors against others. Contributing to these authors, this paper however asserts, through evidence presented on Mumias, that once capital-intensive agriculture has been introduced for agricultural transformation, it is imperative to adapt it to the social, political, and environmental contexts in which farming households and communities lead their daily lives. Adaptation in this context can be achieved by designing agriculture as an infrastructure that integrates farming with natural environmental and social needs of farmers. Calls have been made to emphasise infrastructure as an essential framework for conservation of natural resources (Chester et al., 2019; Helmrich & Chester, 2020; Reid & de Sousa, 2005). Of course, conservation of natural resources should sustain resources for farming within the control of farmers. Once natural resources are sustained within the control of farmers, economic, social, and political needs of farmers will be met.

By designing agriculture as infrastructure, farming will adapt and integrate agricultural inputs in such a way that the services that inputs provide are consistently available for recipients over a long time without the process necessarily degrading the natural environment nor leading to increased costs to farmers or firms. Infrastructure denotes the physical and non-physical set-ups within which all the needs of and benefits to participants (for example, farmers, firms, the state, input providers, etc.) are identified, coordinated, and planned for to be provided sustainably together within one approach (Buhr, 2003; Chester et al., 2019; Silva & Wheeler, 2017). To this sense, farming strategies and practices, agricultural inputs application, crop processing, and marketing should all be integrated within one framework of conservation of agricultural land, water, soils etcetera, as well as strengthening social and political assets of all participants including farmers.

For instance, in Mumias farmers can work in a cooperative to collect their after-harvest crop residues together into a huge compost making technology. The technology can be supported by skills and expertise from the Mumias Sugar Company and agricultural research centres. Energy to operate such a composting technology can be met with electricity from the bagasse and molasses at the Mumias Sugar Company. The result of this composting technology can provide fertiliser to farmlands, maintain a strong cooperative and social relations among farmers and between farmers, Mumias Sugar Company, and agricultural research agencies. Moreover, once farmers are involved in production of fertiliser

at reduced costs, they meet their economic needs, and have stronger political control over their lands to make decisions that benefit them.

Second, whereas the first point in explaining the contention of this work is about Africans being responsive to adapt paradigms to fit their own contexts, in the same vein Africans should be mindful of how paradigms force themselves into various socioeconomic systems in Africa. The framing of sustainable agricultural intensification conveys a dominant notion that the concept is largely an African solution to its food, nutrition, and larger development problems. Such framing is misleading and must be rejected. The framing in this way creates the impression that efficiency and productivity goals can solve problems that Africans have created. A good weight of Africa's problems in various sectors, including transporting principles of efficiency and productivity in agriculture out of contexts of farming communities, have extracontinental origin, including the marauding rampage of foreign agribusinesses, firms, governments, and development agencies with deep interests in African resources and labour. To this end, the direct association of sustainable agricultural intensification as African solution to African problems (Biswas & Biswas, 1986) is unacceptable. The term "African solution to African problems" that is quoted in academia, media, policy and other platforms is often a disguise that craftily steers dominant economic and political interests towards a disruptive exploitation of natural resources in Africa (Bond, 2006; Campbell, 2011). Thus, the term is framed and implemented to coerce African cooperation and collaboration with these extractive and exploitative interests.

As Mumias demonstrates, the expressing and implementation of sustainable agricultural intensification as African solution only serves to legitimize the extractive and politically and environmentally degradative processes and outcomes of profit-motivated interests in Africa. Mumias' cane farmers lose control over their farms to Mumias Sugar Company in for instance contract farming arrangements for three consecutive harvests of cane, about five years minimum. The contract arrangements enable uninterrupted supply and application of capital agricultural inputs to farmers that can consistently produce good cane for Mumias Sugar Company – inorganic fertilisers, extensive ploughing, and control of cane marketing channels among others. Agricultural intensification disguised as African solution to African problems places natural resources effectively in the hands of profit-making interests like Mumias Sugar Company, without taking much responsibility for conservation of the farmlands and sustainability of farmers' incomes and social relations.

Resistance by community people against neoliberal-grounded transformation discourse such as sugarcane production in Mumias is a crucial process that can evolve into promising strategies of reactions from below against growth-driven development paths (Busck & Schmidt, 2020). Such resistance, as Mumias has demonstrated, opposes the market-driven obsession with efficiency and productivity that relegates social and political contexts of farmers. Resistance by farmers, if well organised, could challenge the international agricultural system to be fair to all stakeholders. Resistance in Mumias has shown the potential of farmers' purposeful action on the prospects and fate of agricultural intensification and agribusinesses. Yet, since farmers' resistance is crucial, their acting in groups rather than individuals will serve to build a stronger force to effect desired changes. Individual efforts as seen in Mumias only go to serve individual ends of taking advantage of competition among sugarcane buying firms to sell cane readily, without effecting any substantive changes to the core of agricultural intensification paradigm. Thus, Yami and Asten (2017) admonish that farmer should be supported for group formation towards protecting their lands against the imposition of foreign agricultural cultures that only go to feed interests beyond farming communities.

## Conclusion

In this paper, the object is not to reject transformative paradigms such as sustainable intensive agriculture that do not emerge from home contexts (local contexts if you prefer). The contention in this current paper follows on from Jordan et al. (2015) that resistance by farmers is not about placing the entire agricultural system in the hands of farmers alone or to strive towards only the interests of farmers. Rather, as Jordan et al. (2015) note, agricultural intensification on a sustainable basis requires a middle way strategy to negotiate the trade-offs between economic, social, environmental, and political interests of key stakeholders such as farmers, agribusinesses, and the state. What the contention of this paper is about is that Africans certainly possess ability to control their livelihoods and economies. One of the ways this can happen and be maintained is for Africans, everywhere across the globe irrespective of geopolitical and social histories, to gather our abilities from dormancy into designing and adapting systems as infrastructure, whether agriculture, mining, education, or urbanisation. In this way, forced adoption of any paradigms will be rejected. To this end, it is proposed in this paper that a conservation infrastructural design of agriculture as a way for adapting sustainable agricultural intensification to meet needs of farmers in Africa is imperative.

The proposal of this paper is also that rejecting forced adoption of paradigms must be holistic, planned, and coordinated by cooperatives of people involved, for example farmers. Mumias farmers though resist their exploitative relationship with Mumias Sugar Company, are deeply fixed in the same extractive relationship with other firms because they operate individually. Their resistance is directed at Mumias Sugar Company and not the exploitative system holistically, where firms control agronomic practices to extract profit from farmers' lands without developing the farming system for sustainability of benefits to farmers. Farmers are less resistant of other processing firms just because they pay a bit more and relatively on time. But the use of fertilisers and ploughing that dissipate soils and lands, and the overly concentration on sugarcane without diversity in the economy pose dangers for Mumias natural resources and economy. Regrettably, farmers' resistance in Mumias is selective, diffused, and scrappy. Resistance of the farmers must be a cooperative effort to be holistic and reach deep to dismantle the control of firms over agricultural inputs. By all means, this is not to say that sustainable agricultural intensification is not desired for Africa.

In the contention of this paper, contributions to agricultural intensification discourse should transcend the common argument that once an intensification paradigm does not emerge from within the ideas of community people, they are inimical to the wellbeing of these target people. The often expressed thought that paradigms that evolve from outside of Africa are not good for Africa is not critical enough. Certainly, there should be a free flow of paradigms across the globe. However, it is essential that community people, for example farmers, cooperate and collaborate to consistently evaluate and resist aspects of paradigms that do not fit their wellbeing. Individual uncoordinated efforts will not effect much change. Cooperatives and collaborative structures can better develop approaches to support farming systems that benefit farmers. An example of such an approach that has been described in this paper is agriculture as infrastructure. Governments, academics, civil society groups, and even well-meaning agribusinesses have roles to play to encourage communities to form cooperatives and collaborative structures to resist any detrimental paradigms. In the future research of this author, focus will be placed on factors that inspire farmers to cooperate and collaborate for the sustainability of their livelihoods.

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