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BIOFUELS as a NECESSARY EVIL?

REPORT FROM A MINOR FIELD STUDY IN KIPO,
TANZANIA
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Abstract

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This paper gives an introduction to the pro and cons towards biofuel in the current international debate. The thesis is empirically based on fieldwork in Tanzania and presents a specific biofuel investment from the Swedish company SEKAB (Swedish Ethanol Chemistry AB). The location of fieldwork was in the Rufiji District where SEKAB plans to invest. The study's focus is on the present quality of life of the villagers in Kipo and their knowledge of and attitude towards the investment. The study also discusses the possible consequences from the investment with specific focus on livelihood and ecological conditions.

With the analytical framework of political ecology and ecologically unequal exchange, the discussion focuses on the social and environmental consequences, power relationship with natural resources and the impact of global policies on local communities.

In conclusion two sides to this biofuel investment in Tanzania are presented. The potentials of financial capital which could be used in development projects in the village will be very favorable. On the other side there are substantial ecological consequences which will affect biodiversity, soil and water quality as well as the possible social effect the village could go through in this "transition".

Keywords: Political ecology, Biofuels, Tanzania, Human Ecology

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1. Introduction

“What way is the right way towards development?” The discussion is diversified and intense. The topic surrounding biofuels have taken a broader level and the different researchers and participants of this university seminar all have important standpoints. The place is the University of Dar es Salaam, and the topic “Biofuels- for whose benefit? At what cost?” has attracted many interested in this newcomer investment possibility that has risen in Tanzania.

The different lectures air the aspects of technology, economy and politics and were very educating but the following discussion is what really triggered my interest: “...it (bio-fuels) is a necessary evil”, “one can not stop development” and “it’s the same forces today as “the Scramble for Africa”. These arguments illustrate the torn feeling towards this popular and modern investment that at least Tanzania’s government, voiced by President Kikwete, has welcomed.

The timing of a Swedish investment in Tanzania regarding biofuels coincided well with my preparations for a field study that was initially planned to focus on rural development as well as resource management. With the help of Swedish researchers concerned with the rapid process and the issue of a Swedish company, SEKAB (Swedish Ethanol Chemistry AB), being the investors of a large-scale sugarcane plantation, my attention was brought to this subject.

Kipo, the village of my study, lies on the northern flood plain of the region called Rufiji, also the name of the large river passing the area (see Figure 1). Walking along the main dirt road through the village I observed the poor condition of the road, the chatting women collecting water, the small dirt roads to the distant *shambas* (gardens), repairing of housings, the children laughing and playing, the joy and status of having a radio, the few but important products in the local *duka* (shop) etc. My interest lies in the current livelihood situation of these Kipo-inhabitants whose lives will very much be affected by the possible large-scale investment in their near neighbourhood (see Figure 2.). What would it mean for them to have this investment implemented and, if so, what would this walk be like in five years?



Figure 1. River Rufiji



Figure 2. Author in the field

Purpose & Object of Research

The purpose of this study is to investigate possible consequences of the investment of SEKAB in biofuel production in Rufiji, a district in Tanzania, with specific focus on livelihood and ecological conditions. The general object of research is to get a glimpse of the possible effects that biofuel-investment can have on a local community in a developing country.

In this report I will discuss the following four issues:

1. How is the investment of SEKAB implemented?
2. How can the economic activity, household power structure and access to social services and infrastructure, that is, the livelihood situation of the villagers of Kipo, be characterized?
3. How is the information from SEKAB perceived by villagers in Kipo?
4. What are the possible local and national consequences, environmental and social, of the investment?

Regarding environmental consequences I aim to focus on waterways and biodiversity. As my research objective is focused on this specific investment, the discussion on biofuel investments is restricted to only this area and country. Also the livelihood situation is that of my informants in Kipo and I do not claim it to be the general situation of the Rufiji district, nor in Tanzania.

I have not been able to cover all the aspects in the biofuel-debate and have consciously chosen not to dwell on the debate of food vs. fuel, as a lot has been published on this topic. Neither have I chosen to cover the still ongoing debate on the actual statistics of greenhouse gas-

saving that can be achieved by increasing biofuel investments. There is research with diverse statements of the benefits regarding emissions from biofuel compared to fossil fuel also followed by a critique regarding other negative effects on nature. Although this debate is not discussed in this study, the reader should certainly be informed that it exists (e.g., see Fargione et al. 2008).

Definition

Biofuel is what you can extract from biomass and can apply to solid, liquid, or gaseous fuel. The type I will refer to in this thesis is in the liquid form, namely ethanol. Ethanol can be made from energy crops like sugar (sugarcane, sugar beet) or grain (corn) by the methods of fermentation and distillation (Miller 2007:405-406). Sugarcane is an efficient converter of biomass from water which makes it a high-yield energy crop. However, it still needs about 1500-2000mm/ha/year and ranks among a group of crops noted for their significant water consumption (WWF 2005:12).

General outline

Chapter 2 presents the highly debatable themes regarding biofuels in a more global context. It brings up what is “fuelling” biofuels as well as the replied critique. The chapter also includes a presentation of the development challenges faced in Tanzania today. Chapter 3 begins with an introduction to SEKAB’s investment with its goal and process as well as the company’s sustainability vision. A subsequent section gives a general introduction regarding the west northern floodplain of Rufiji in terms of natural and human capital. Chapter 3 also contains an interview with anthropologist Jean-Luc Paul who shares his viewpoint on the situation in Kipo. Chapter 4 presents the voices of Kipo who share their present struggles and hopes for the future. Chapter 5 includes a discussion on the possible small- and large-scale consequences of this specific investment for the village Kipo, followed by a discussion on the power relationships between stakeholders as well as the validity of the trade-offs regarding biofuels. Concluding thoughts are presented in Chapter 6.

Analytical framework

The scope of this thesis is political ecology, a diverse field of critical research with practitioners from the fields of human ecology, anthropology, development studies, environmental history, geography etc. who all make a query on the relationships between

economics, politics and nature (Robbins 2004:5). Although political ecology can have a range of definitions, a general statement is that there is no such thing as an apolitical view about ecological relations. The common premise is the belief “that environmental change and ecological conditions are the product of political process” (Robbins 2004:11). Bryant and Bailey (1997) talk about the field of Third World political ecology as research based on the idea of “politicised environment.” The vital point of politicised environment is that in order to understand environmental problems there is a need to recognise the political and economic contexts within which they are created (Ibid.:28).

Rather than a single body of theory, political ecology is something people do. It surrounds common questions that underlie different cases (Robbins 2004:xviii). The material political ecology relies on is the research-based empirical finds, and the aim is to explain the linkages of change in social/environmental systems, focusing on power relationships (Ibid.:12). The forms of access and control over resources are in need of analysis regarding their implications for sustainable livelihoods and environmental health (Ibid.:6-7).

In *Third World Political Ecology* Bryant and Bailey find three fundamental assumptions that political ecologists should share:

First, they accept the idea that costs and benefits associated with environmental change are for the most part distributed unequally. [...] Second, political ecologists assume that an unequal distribution of environmental costs and benefits reinforces or reduces existing social and economic inequalities. [...] Finally, political ecologists argue that the differentiated social and economic impact of environmental change also has political implications in terms of the altered power of actors in relations to other actors (Bryant and Bailey 1997:28-29).

There are two ways in researching political ecology; there are the hatchet and the seed. The strength of the hatchet is to investigate and discover possible flaws within the dominant approaches to the environment which can result in different undesirable impacts. The reason why it is dominant is the fact that it means favour in business and/or strengthening state or international authorities. The goal is to reveal undesirable impacts, the hidden costs and point out the possible “loser”, especially from the view point of vulnerable marginal groups (Robbins 2004:11-12). The object of “the seed” is to assert alternative ways of management and development. The goal of the efforts to collect data of different “traditional” practices and

techniques is to preserve them enabling a more sustainable way of living (Ibid.:13). In other words, the ambition is to be progressive. As Robbins (2004:12) expresses it: “political ecology...attempts to do two things at once, critically explaining what is wrong with dominant account of environmental change, while at the same time exploring alternatives, adaptations, and creative human action in the face of mismanagement and exploitation.”

Ecologically unequal exchange

A relevant concept for this paper, with its focus on the extraction of natural resources, large-scale investment and local livelihood, is ecologically unequal exchange. This concept is built on the unequal exchange already marked out in development theories expressed as undervaluation of labour and health and of deteriorations of the terms of trade expressed in prices (Martinez-Alier 2002:214). Unequal exchange was of central concern in the dependency school pioneered by Andre Gunder Frank in the 1960's and 70's (e.g., Frank 1967), who pointed out that development and underdevelopment are two sides of the same coin. In order to gain the outcomes related to development (economic growth, improved human capital, etc.) it would be at the expense of another place and other people - the developing countries. This is expressed by the dependency school as the contradiction of the capitalist system of development (Frank 1967:3, Potter 2008:110). The reason for the conditions of these countries was not bad luck or climatic conditions, etc., but rather a reflection of their place in the global capitalist system (Hornborg 2001:37). The extractive economies were called “satellites” and the accumulative economies “metropolis”.

In the development theory of Immanuel Wallerstein, World-system theory, the regions he refers to are areas which can be centres (cores) or peripheries. He claims that the modern world is a capitalist world-economy which rewards accumulated capital. In the process it tends to expand the gaps, economic and social, among its varying areas, or as he expresses it, “the steady polarization of classes and regions over time” (Wallerstein 1984:28, 1974:350). Another characteristic feature is the political conditioning of price levels. Products can have a more or less profitable position in the world system, and when an exchange of products is made an unequal exchange occurs because of the transfer of accumulated capital from the periphery to the centre (Wallerstein 2005:54). Hornborg (2001) describes the undermining position the periphery tends to be in when looking on the elasticity of demand as well as the market prices in raw material contra industrial products from the centre (Hornborg 2001:37).

He also stresses that even if exchange was entered freely into, it can “generate a systematic deterioration of one party’s resources, independence and development potential” (Hornborg 2001:38).

The concept of ecologically unequal exchange must, as Martinez-Alier (2002:214) expresses it, be expanded “to include unaccounted, thus uncompensated, local externalities, and the different production times exchanged when extracted products that can only be replaced in the long run (if at all) are traded for products or services which can be produced quickly.” The periphery/extractive economies are often too poor and powerless, and this affects their ability to defend their interests in environment and health issues, for example, to incorporate negative local externalities in export prices, diversify exports and to slow down the rate of resource exploitation (Ibid.:215). The lack of economic and social power to defend the environment does however not mean a lack of environmental awareness (Ibid.:217).

Methods & Material

The methods applied in this study are qualitative and are connected to interactive processes limited by a specific situation, in contrast to the focus on variables and context independency in quantitative method. The values in qualitative method are present and explicit, and they are thus of importance in this thesis. The amount of subjects and the thematic study are also fundamental to this research style (Mikkelsen 1995:142).

In my fieldwork I used semi-structured interviews. The character of an interview guide approach was appropriate for the purpose of my study. The strengths are having an outlined form of topics and issues that are to be covered and at the same time as being flexible during the course of the interview (Mikkelsen 1995:171). As the livelihood situation was the topic in all the interviews there was still the flexibility to be able to elaborate and to go in-depth in any given answer. Fägerborg (1999:55) explains the advantages of using interviews: “Through interviews the reality can be described and personalized by people sharing their lives and experiences, their thoughts and know-how, by those communicating their versions and interpretations of events” (my translation). As will be shown in the Chapter 4, I followed the advice of using quotations, because quotations “capture participants’ views of their experiences in their own words” (Mikkelsen 1995:155).

The questions for my field study were constructed with the help of my field supervisor, Dr. Mung'ong'o, as he had previously made field surveys (although using quantitative methods) surrounding SEKAB's pilot sugarcane plantations in Bagamoyo. In order to get a fairly general perception of the livelihood situation of the local people I chose to focus on their economic activity, household power structure, access to social services and infrastructure. Additional efforts to investigate their current awareness surrounding the SEKAB investment and their attitudes towards it were brought up in the second half of the interview. Every interview ended by giving the respondent an opportunity to ask questions. I first made a pilot interview to check if the questions were abundant or insufficient as well as the flow and length of the interview and made alterations accordingly.

The materials I have worked with are interviews from the field trip as well as the visit to the office of SEKAB Bioenergy Tz Ltd. I also present material based on an interview with an anthropologist living in the village and my observations at a seminar surrounding the biofuel investments in Tanzania at the University of Dar es Salaam.

Mikkelsen (1995:178) presents a list of qualification criteria for the interviewer. It consists of several guidelines which I tried to follow; examples are to be clear, open, knowledgeable and structuring. In the introduction of myself and my assistant there was a clear statement of the purpose of not only the interview but also the reason for coming to Tanzania and Kipo in particular. In interviewing I used both a voice recorder and took notes. Because of the duration between the question posed and its translation into Swahili, and between the response and translation into English, I had time to take longer and more precise notes.

I conducted a semi-structured interview with Jean-Luc Paul, an anthropologist who was conducting research in Kipo at the time of my visit. We met at the vicinity of the University of Dar es Salaam a month after my return for an interview regarding his viewpoint of Kipo and the investment of SEKAB. He had then lived in Kipo for 1 year and 4 months. Jean-Luc Paul had worked in Tanzania previously, in the years 1984-87 and 1995. Before that he had studied agronomy and worked with agricultural development in the Sokoine University, Tanzania, and his current position is lecturer at Université des Antilles et de la Guyane. I also conducted semi-structured interviews in Swedish with two employees of SEKAB Bioenergy Tanzania, Lena and Pär Oscarsson.

I conducted literature studies on written references with the object of introducing the main issues in the biofuel debate as well as providing a general understanding of Tanzania's development status in order to understand the context of the reality of a developing country.

I wished to obtain more general information regarding the area of my field study, and thanks to the work of the local organization REMP (Rufiji Environmental Management Project) I accessed reports containing a lot of data from this region, especially with a socio-economic profiling. Their goal is "to promote the long-term conservation through 'wise use' of the lower Rufiji forests, woodlands and wetlands, such that biodiversity is conserved, critical ecological functions are maintained, renewable natural resources are used sustainably and the livelihoods of the area's inhabitants are secured and enhanced" (REMP 4, 2001:vi).

Apart from using relevant literature, I have had use of official reports, briefing notes/paper as well as accessing relevant information at SEKAB's web site with particular interest in the company's projects in East Africa and their press releases.

Issues of fieldwork

I was very fortunate to have the support of a well respected institute, IRA (Institute of Resource Assessment) from the University of Dar es Salaam. As the institute worked closely with different field based research projects all around Tanzania they are experienced and have authority. To go and visit and interview people in a village is a formal matter which first of all needs to be approved by the district officer, and an introduction letter from the director of IRA, Dr Yanda, facilitated my tasks considerably.

In my fieldwork in Kipo, Rufiji, I aimed to gain a base-line "snapshot" of the village's capabilities and means of living. My informants are rural farmers in a village of approximately 2.500 inhabitants, and they are divided into three hamlets. I was fortunate to be escorted by each hamlet chairman to ease an introduction towards the informants. I was also fortunate to have a previous contact made in the village in the form of anthropologist Jean-Luc Paul. He introduced me to the village chairman, and this facilitated the cooperation and preparations of my stay.

There were different factors that lead to the number of informants that I was able to interview in Kipo. Naturally, the actual time limit for staying in the field meant limiting the number. Also, in assessing the work load from the interviews as well as the need to have an assistant to

introduce us to the households limited our informants. I feel that the number of 31 interviews was quite sufficient for this kind of study, and in retrospect I would have settled for less and used that time for more informal encounters and for exploring the village. More time would have enabled me to see more of the day-to-day cycles and interactions so that my perception of the routines of the village could have become expanded.

In helping me to find and be introduced to the households, each hamlet's chairman took us around the village (See Figure 3). I requested to talk to men and women, young and old, in order to get a good sample of the village. Unfortunately this request was not fulfilled as much as I would have hoped. The official head of each household is an older man, so their representation received a major attention in my field study. I managed to interview 31 inhabitants of Kipo of which 22 was male and 9 female. The age of the informants varied somewhat but the majority were elderly men. Middle-aged/elderly men (from 30 and up): 14, Middle-aged women: 7, Young (up to 30) men: 8, Young women (up to 30): 2. All of my informants were subsistence farmers with extra economic activities, for example fishing, carpet-making, carpeting, or bicycle repair. Two of my informants were members of the Village Land Committee but unfortunately I did not manage to interview the Village chairman or his deputy.

In learning that the village would have a Village meeting during our stay my assistant and I had the intention to do a focus-group discussion. However, due to the unfortunate loss of the child of the village deputy chairman, the meeting was cancelled and postponed indefinitely.



Figure 3. Hamlet chairman, a young schoolgirl, field assistant Stephen and Village deputy chairman.

The need of an interpreter was obvious. In search of one I got in touch with a Masters Student, Stephen Shadrack (see Figure 3). As he had previous experience in fieldwork in Rufiji, I had good use of him as a field assistant. The formal language in universities in Tanzania is English but the practiced language is Kiswahili. Prior to our field visit I perceived the communication between us as adequate but felt that in the field the challenge of switching between two languages became quite tangible. The use of an inexperienced translator compromised the quality of the response in the interviews, which was unfortunate but in this case unavoidable. Although the language was a barrier, the social competence and ability to make a good and relaxed impression on the informants was impressive and facilitated our present work and also possible future ones.

Reflections on the role as a researcher

Fägerborg (1999:60) brings up the different meanings that an interview can have for the interviewer and the respondent. The goal and purpose I had for retrieving the responses had a professional character. The meaning for the respondents to enter an interview was surely different for every respondent. The enthusiasm to answer the questions varied from somewhat indifferent to very eager. I felt that the anticipation of “getting something out of the interview” was very present in several of the interviews. When giving the informants an opportunity to pose questions to me, the notion of “what will this interview bring to me?” was frequent. It was perhaps not the issue of getting something material from me or a payment of any kind, but rather the curiosity and hope that my report would materialize into something beneficial for the village. In these situations I repeated and stressed the purpose of my study and the humble outcome it would really mean: a bachelor thesis for my very own benefit. For me this resulted in several ethical questions with a feeling of inadequacy, pressure and a will to do more.

Fägerborg (1999:60) writes about the interview as a social situation and highlights the importance of both the difference and the comparable between interviewer and informant. Factors like age, gender, social background, nationality, etc. may have varying relevance to how the interview is being acted out. In *Tolkning och Reflektion*, the topic of source criticism brings up the risk of information being distorted when getting your information directly from a narrative source since the source is a subjective medium. The fact that there is within the informant a degree of conscious and unconscious interest to distort the information she/he

presents during the interviews, is brought up in the tendency criticism (Alvesson & Sköldberg 1994:124-125).

The issue of me being an “Mzungo”, a Caucasian, was very present during my field stay. The small children would shout or sing Mzungo every time I past by and really called attention to me standing out. The complexity of being the one that stands out from the majority, and not to mention what prior experience my informant may have had with white people in general, or white women in particular, would naturally influence how they perceived me and my goals. The colour of my skin could give possible association with power, wealth and opportunity. My own anticipation of what I would experience during my field study also contributed in constructing the social situation.

In my attempt to experience the very periphery of the periphery, the daily struggles, immense tolerance and remarkable management, I have at the same time experienced a striking nature and a new level of self-awareness. My fieldwork experience gave much more than the material for this paper: it improved my worldview and awoke a curiosity for more “reality-based” knowledge.

2. Background

Why Biofuels, why now?

The scientific evidence is now overwhelming: climate change is a serious global threat, and it demands an urgent global response. (Stern review 2006:vi.)

In an era of increasing global warming and the severe global consequences that might follow, governments across the globe have been forced to take swift action against the major contributors of green house gases (GHG). With the Stern report urging them (especially economies in the North) to make changes, because of the undisputable financial deficits that otherwise will be unavoidable, methods of making a change are being implemented. One of the urgent changes has been addressed towards the replacement of oil, especially in the fuel-industry and a hope towards a “sustainable” alternative has been put on *biofuels*.

Individual governments and regional collaborations have ambitiously been incorporating policies towards an increase of biofuel accessibility within their borders. Attention has swiftly turned towards developing countries in a search to realize the goals in implementing more biofuel. This is due to the vast “unused” land in the Global South which is scarce in the crowded European Union, and the obvious advantages to growing large-scale plantations in temperate climates. This chance to attract investors makes many governments in developing countries very eager to not miss out on these opportunities.

The review of the Stern report summarizes that the overall costs and risks of climate change means at least losing 5% of global GDP each year but could rise up to 20% (Stern review 2006:vi). In a policy brief bringing up possibilities regarding Biofuels for Transport (OECD 2007), the question “why and how are governments promoting biofuels?” is discussed. The search to develop a substitute source of energy widens as the more urgent need to reduce GHG emissions grows clear. Comparing emission from fossil fuel, bioenergy is seen by many as a “clean” form of energy. In bringing investments to the developing countries, the joined goal in enabling biofuels investments for its reduced GHG qualities as well as the potential driver for economic growth is intensely argued. Developing countries can benefit from these

investments by reducing dependency on imported fossil energy and expected higher crop revenue. All of this could aid the countries in poverty reduction and national revenue collection (OECD 2007:3). The policy brief stresses, however, that there is no “one size fits all” solution in the making of policy measures (Ibid.:6)

In an IEA (International Energy Agency) report it is stressed that improving energy security and curbing GHG emissions is of great importance. The policies underlying the increased production and use of biofuels over the next decade are being formulated by countries all over the world, including many IEA countries like the US, Canada and several European countries (IEA 2004:3, 11). The report mentions a study about the near-term potential for economically competitive ethanol production through 2020. The estimation is that a low-cost ethanol production could displace about 10% of gasoline and 3% of diesel fuel worldwide. However, to reach the low-cost levels, it is conditioned that the ethanol would need to be produced in developing countries. Since the transport fuel consumption is higher in developed countries, the major demand for biofuel would originate from them (Ibid.:18, 67).

An example of the ambitious promotion for using renewable fuel sources is the proposal from EU. Their policies towards a reduction of GHG emission are, for instance, an increase of biofuel in European cars. The Commission states: “a 10% binding minimum target for biofuels in transport to be achieved by each Member State, as well as binding national targets by 2020 in line with the overall EU target of 20%” (Commission 2008:2).

Critique and call for regulation

Oxfam (2007:5) discusses the targets of renewable fuels. As the title “Bio-fuelling Poverty” reveals, the worry is that pressure of meeting the augmented demands of EU will result in negative impacts for the poor. The concern regarding a food crisis related to the strong demand of biofuels is brought up in another Oxfam paper, “Another Inconvenient Truth“. The demand from the developed countries causes a spiralling production affecting the food security. If a crop can be used in biofuel production as well as in food production, and the fuel value for that crop will rise above the value for food, this could create food inflation (Oxfam 2008:19).

In an article, “How Green Are Biofuels?” Scharlemann and Laurance (2008) bring up the narrow-mindedness regarding GHG emissions when evaluating different biofuels. In an environmental perspective the efficiency of biofuels is questionable based on the possible destruction of native ecosystems in the initial phase of production. If forests are removed to make way for sugarcane plantations causing an increase of GHG emissions, the mentioned benefits of biofuels is sharply reduced. They emphasize that, when evaluating different biofuels, there is a great need to consider other environmental costs other than just GHG emission (Ibid.:43).

A World Bank Policy Working Paper also notes the other environmental costs that may occur in the preparatory work of accessing biofuel, for example soil erosion, eutrophication (an increase in chemical nutrients in an ecosystem), and loss of biodiversity. The paper also brings up the concerns of the dependence of fossil fuels in the production of biofuels. The different inputs in large-scale cultivation include fertilizers, pesticides, irrigation and use of machinery. In addition, the industrial processing of the crop relies on an energy derived from fossil fuel (World Bank 2007:24).

WWF has also become engaged in the prospects of biofuel investments and has in a report requested the need for regulation and responsibility. The report takes up different recommendations that companies involved with biofuel-plantations should follow up on, as well as a firm call towards certifications. The responsibilities that underlie a company in a developing country are big. The need for a strategy which incorporates existing knowledge and learned experiences as well as a clear communication with all stakeholders is great. The responsibility to conduct an Environmental Impact Assessment (EIA) has to be taken by every large-scale investor. This assessment reports on the possible effects the investments would have on the natural environment and the social structures of the affected area. WWF also recommends the companies to join a credible certification system and to contribute in the improvements of these (WWF 2008:1,3,6).

... and where? Case of Tanzania

Development challenges

In an ambitious survey from all around Tanzania (see Figure 4), Household Budget Surveys (HBS) confirms that income poverty is high and that the country suffers from large gaps

between different social groups, especially between urban and rural populations (HBS 2000/01:2). The proportions of the poor have fallen to some extent since last HBS 1991/92; however, due to population growth, the absolute numbers have risen (Ibid.:3). Rural areas suffer from the highest poverty levels as 39% of the population (in absolute numbers ~11.4 million) lives below the basic needs poverty line (HBS measure the poverty line as the minimum spending per person needed to provide 2.200 calories a day for one month) (Ibid.:18-19).

Regarding education, in rural areas 30% of the population has no formal education, in particular rural women. The enrolment in secondary school (secondary school: Forms I-IV, 14 to 17-year-olds) is much lower than in primary (primary school: Standards I-VII, 7 to 13-year-olds.). The distance to primary school is generally not longer than two kilometres, but to secondary school it can be up to 20 kilometres or in rural areas even more. The survey also reports that the level of poverty is strongly linked to the level of education of the head of the household. The statistics show that 51% are poor if the head is uneducated, but only up to 12% when the head is educated above primary levels (HBS 2000/01:7-9, 20).

The Tanzanian government established, in 2005, a five-year National Strategy for Growth and Reduction of Poverty (NSGRP). The NSGRP focuses on three clusters of factors: (a) growth and reduction of poverty, (b) improvement of quality of life and social well-being, and (c) good governance and accountability in the public sector (African Economic Outlook 2005/06:477). The government has, in addition to the NSGRP, also created the “Tanzania Mini-Tiger Plan 2020”. The mini-tiger plan is inspired by the growth experiences of South East Asian countries, and its aim is to reach a constructive climate for both domestic and foreign investment through a revised regulatory framework and a supportive legal framework (African Economic Outlook 2005/06:488).

A country report on the potential and implications for Liquid Biofuels for Transportation in Tanzania has been made by the German Technical Cooperation (GTZ) as a part of the World Watch Institute’s *Biofuels for Transport: Global Potential and Implications for Sustainable Agriculture and Energy in the 21st Century*. The report states some of the benefits that may follow future biofuels programs, for example agricultural/rural development in the form of creation of new jobs and income opportunities. The possibilities of foreign exchange savings on account of the reduction of oil imports as well as an improved energy security; the creation

of new industries and a reduction of GHG emissions are some suggested assets that may act as a main driver for Tanzania (GTZ 2005:3).

The report suggests the establishment of a high-level Biofuels Task Force with the aim to provide advice and recommendations to the Government for the elaboration of biofuels policies and regulations. However, the report also emphasizes the recommendation to quickly proceed with the promotion and introduction of biofuels and suggests a learning-by-doing process. The government is advised not to wait for results and policy advice from the Task Force (GTZ 2005:5).



Figure 4. Map of Tanzania, River Rufiji marked out (own map).

3. Investment and area description

Investment of SEKAB

SEKAB is one of Europe's leading companies in the ethanol business with their main office placed in Örnköldsvik, Sweden. They produce and distribute bioethanol and according to their website see their mission to "prepare the groundwork for and actively promote future sustainable transport with the help of a long-term sustainable fuel" (SEKAB's home-page).

In their press release SEKAB's CEO, Per Carstedt, states their ambitions in East Africa: "We are working to help Tanzania and Mozambique within 20 years become free of their dependence on oil, significantly increase their production of electric power and at the same time export several billion litres of ethanol from the factories we are planning" (SEKAB 080312). He continues to paint the picture of the millions of hectares of unused land available for the establishment of sugarcane plantations which will not stand in competition with food production nor pose a threat to the biodiversity. He sees the opportunity for the countries as almost revolutionary and strongly believes that their investment can strengthen these weak economies. He sees the expansion of the infrastructure and employment opportunities as large contributors to a better living standard in the rural areas as well as enabling "access to energy for other small-scale industrial development, cooking, refrigeration and freezing capacity and lighting" (SEKAB 080312).

At SEKAB BioEnergy Tanzania Ltd office in Dar es Salaam I met Lena Oscarsson, who was at the time responsible for social issues and health policy regarding employees of SEKAB. She explained the SEKAB plans in Rufiji to me in general. Their company, jointly owned by SEKAB and CFC (Community Finance Company of Tanzania), started up a year ago and has the ambition of producing ethanol in a sustainable way. Their goal is to establish 10-15 factories in Rufiji area during a 20 years period. She stated that they want to be a responsible employer, and as an example of this is the company's policy to give free health care for each of its employees including the employee's spouse and three children.

SEKAB wishes to primarily take on already degraded areas, for example land not used for agriculture or where the forest has already been cut down. As a pilot project the company has

already started a seedcane plantation close to a planned sugarcane plantation in Razaba ranch near Bagamoyo, one hour north of Dar es Salaam. Initially the plans for Razaba are to plant 6.000 ha which will mainly serve as a learning process in a small area before launching the large scale productions in Rufiji with primarily around 200.000 ha.

According to the company profile the investment is a kind of role-model project with the ambition that “the platform could establish Tanzania as a leader in the Biofuel sector in East Africa.” SEKAB also aims to ensure local community participation in the form of an outgrower’s programme, a community farming scheme. An outgrower is a farmer who sells the crop to public or private enterprises for export or processing in return for various price guaranties, inputs and services. The production of the outgrowers will be supplemental to the production from the commercial estates under the management of SEKAB. The demand of ethanol in the domestic market will be met as well as exporting and distributing the excess to European and Nordic markets (Company Profile 2007).

I also met Pär Oscarsson, who is the land/agriculture manager in the company and who has been working closely with the villages around Rufiji during the year. In working for a profitable biofuel project, large-scale plantations are the only alternative- he uses the phrase “big is beautiful”. Due to the insufficient condition of the infrastructure, the costs would be too large if choosing not to invest in an intensive large-scale cultivation. He gives an explanation of the process the company has to go through to enable this investment. It started in November 2006 when SEKAB (of Sweden) and CFC signed a Memorandum of Understanding with the government of Tanzania to initiate large-scale sugarcane plantations of a 500.000 ha area during a 20 year period. Then the Rufiji District Council, placed in Utete, has to be informed of the company’s purpose and approve the visits to the different villages. When arriving to a village, contact must be made with the Village Government, a group which is elected by the villagers. The company then has to state their purpose and request for the land. The village council will then call for a full village assembly meeting, with at least one week’s notice, where presentation and open discussion is made possible. The village chairman, the village executive officer, and a central government employee always have to be present during the meetings. If the majority of the village is in agreement with the proposal the company may initiate a mapping project, and in collaboration with the Village Land Committee start to discuss a specific land area. When a proposal is ready, another village

assembly meeting is called where two thirds of the total registered adult villagers have to vote “yes” for it to be approved.

The District Land Committee controls the procedure and makes sure the validity is reasonable. At times a representative joins the meeting to make sure there are no cases of corruption. If the District Land Committee has no objections the proposal will be sent to the Ministry of Land where a full survey is made regarding the land borders, cooperation between villages and settling the value of the land. The assessed value of the land will be presented to the villages as compensation in form of money. Pär Oscarsson suggests the use of an interest bearing account with a maturity during 10 years for a more long-term solution and to prevent corruption. If the Ministry of Land agrees, SEKAB will be offered a “Letter of Offer” and the agreement has to be published in the Government Gazette for three months to be legally binding. If no one makes any claims the investment is secured and a tenancy agreement is made for the period of 99 years.

Pär Oscarsson emphasizes that SEKAB has no intention to accept the responsibility of social services for the Rufiji community and that those sectors still lies under village, district and governmental management. Regarding organizing the farmers, he recommends it but feels that the initiative and responsibility lies within the civil society. The contract opportunities in the outgrowers program are still under construction with the ambition to provide a good contract standard. Although, he states that there are difficulties for inexperienced cultivators to start working under a contract. He emphasizes that there will be plenty of discussions between farmers, District and NGO’s before all the details are finalised. Flexibility with the contract is necessary and as the skill and knowledge improve, both for SEKAB and the outgrowers, parts of the contract will have to be revised. Pär Oscarsson also emphasizes that the capability to provide assistance and advice in the sugarcane cultivation can be provided initially but that there needs to be a balance between how much financial resources can be invested into this assistance and the price that will be paid out to the cultivator for his work. He believes that there may be a question of public–private partnership with the already existing local agriculture support network in the districts. The already exiting counselling would stay on with food crops and SEKAB would take on the part regarding growing sugarcane.

An information document from SEKAB regarding plans in Rufiji describes that for each ethanol factory an area of 15-20.000 ha of land is required and that each factory is designed to process about 2 million tonnes of sugarcane. The production from the outgrowers will further add to this capacity. For every factory and plantation the labour requirements will be about 2.000 workers. The investment will improve both the access to the market, increasing income from sugarcane production, and better infrastructure for the villages in Rufiji. They also emphasize the chance for Tanzania to generate a huge income from production of fuel and electricity from renewable sources and also for the District Council to develop towns and villages with schools, clinics and other supporting services. However SEKAB also wants to point out the different challenges that remain for the area. These difficulties are for example, the, initially, relative low production capacity of the outgrowers and the major changes on village level which could affect the future social stability and security (SEKAB leaflet).

The company's sustainability vision

- We will work for providing assurance of human rights and needs within SEKAB's line of business.
- We will contribute to reducing fossil fuel and fossil chemical utilization, and strive for energy- and cost efficient processes.
- We will contribute to the reduction of fossil GHG emissions, and to as great extent as possible to avoid non degradable substances in our line of business/process.
- We will use raw materials that originate from functioning ecosystems and safeguard the environment where we operate. (SEKAB's home-page.)

The "Ecology and sustainability expert" employed at SEKAB BioEnergy Tanzania Ltd, Kirsten Rottcher; explains the "green" ambition with the investment. At the same time as focus lies with the company and the outgrowers to experience economic success, the ambitions is a low carbon footprint and a general low environmental impact. The methods to make it happen are a zero-burning policy (when burning, the field is set on fire, burning away dry dead leaves but leaving the water-rich stalks and roots unharmed) and the use of green harvesting and natural pest and weed control. The ambition is also to preserve ecosystems and biodiversity with wildlife corridors, islands and waterways protection (SEKAB's home-page). In order to allow wildlife to co-exist most of the plantations will be fenced.

SEKAB has in 2007, in cooperation with Brazilian ethanol producers, initiated a certification called “Verified Sustainable Ethanol”. Their purpose with this initiative is to be able to provide sustainable biofuel for the consumers in Sweden. As Anders Fredriksson, Deputy CEO of SEKAB Biofuels & Chemicals says, "We think it is entirely justifiable that consumers and decision-makers are demanding guarantees that the ethanol we supply is environmentally, climatically, socially and ethically quality-assured and that it generates lower fossil carbon-dioxide emissions than those of petrol and diesel" (Hållbar Etanol's home-page).

The criteria for the certification are:

- At least 85 % reduction in fossil carbon dioxide compared with petrol, from a well-to-wheel perspective (Well-to-wheel is the specific Lifecycle assessment of efficiency of fuels esp. in the transport sector)
- At least 30 % mechanisation of the harvest now, plus a planned increase in the degree of mechanisation to 100 %
- Zero tolerance for felling of rain forest
- Zero tolerance for child labour
- Rights and safety measures for all employees in accordance with UN guidelines
- Ecological consideration in accordance with UNICA's (Brazilian Sugarcane Industry Association) environmental initiative
 - Protection of forests close to water areas
 - Protection of water resources
 - Program for reuse of water in industrial processes and for conservation of water quality
 - Implementation plan for soil conservation
 - Plan for reduction of environmental impacts from production
 - Continuous monitoring that the criteria are being met

(Hållbar Etanol's home-page).

When querying if these criteria are only implemented in Brazil I turned to Annika Carstedt Parmlid at Communications, who states that “The same criteria are to be implemented on the ethanol production in Tanzania and Mozambique rigorously”.

Rufiji

The Rufiji District, a vast and green area in the southeast of Tanzania, is named after the largest river in the country, even in all East Africa, The Rufiji River (see Figure 5). The river has its origin in three major tributaries, the Great Ruaha, the Kilombero and the Luwegu, and drains 20% of mainland Tanzania (Havnevik 1993:77).

The important resources in the district include arable and fertile land, fishing potential, tourist attractions and labour availability. The arable land in the Rufiji district is estimated to be 1.067,000 ha out of which only 62.000 ha (6%) are cultivated. The potential for increasing agricultural production is therefore large. The district has a large percent (60%) of its land under Forest reserve and Selous Game Reserve. Selous Game reserve is the largest in Africa and offers an extensive sanctuary for both flora and fauna. The Reserve is also important in its role as a tourist attraction (Mbiha et al. 2001:9-10).

In a report regarding the flora of the district one of the conclusions was that all forests in the lower Rufiji River Basin have suffered considerably from human interference. Felling of trees for timber production, the effects from burning and the intrusion for agricultural production has all taken a toll on the forests (Mwasumbi et al. 2000:11). The reports on fauna of the region also stress the importance of coastal forests. On a daily or seasonal base the forest provides shelter, food and a breeding place for numerous species. There exist a number of vertebrate species which are forest dependent and, thus, unable to survive outside the forest (Howell et al. 2000:1). Some new species have been discovered in the past ten years. Also the coastal forests in Tanzania rank especially high as hotspots for endemism of plants. (Ibid.:2). The report states that there is “a need to manage and conserve the remaining small coastal forest patches as part of Tanzania’s overall biodiversity conservation strategy [...] especially the case for those species which are endemic for Tanzania’s coastal forest, i.e., are found nowhere else in the world” (Ibid.:2).

The cultivation in the northern flood plain is dominated by the flood plain agriculture which is characterized by two cultivation periods. The flood period (*masika*) and the flood recession period (*mlau*) overlap each other. Another feature in flood plain agriculture is the domination of clay soils which have a high moisture retention capacity. (Mbiha et al. 2001:8, Havnevik 1993:94-95)

The energy need the majority (93%) of the households in the district depends on is fuelwood like firewood, charcoal and coconut husks. Women are usually given the responsibility of firewood collection. The district is a main source of charcoal and fuelwood for the urban centre (Hogan et al. 2000:40, Mbiha et al 2001:42).

The district's major ethnic group is called Wandengereko. The trade links between the East African coast and the Persian Gulf countries has had influence in the creation of the coastal Swahili culture and an essential part of that is Islam (Mbiha et al. 2001:6-7). The level of education of the population of Rufiji is known to be lower than most other parts in Tanzania with problems of absent teachers as well as pupils. The remote floodplain areas are not attractive for teachers, and children have difficulties travelling to schools far away from their parents' fields (Hogan et al. 2000:42). One report even stresses that "there is a need for educational campaigns and sensitization whenever a new development is proposed." (Mbiha et al. 2001:51).

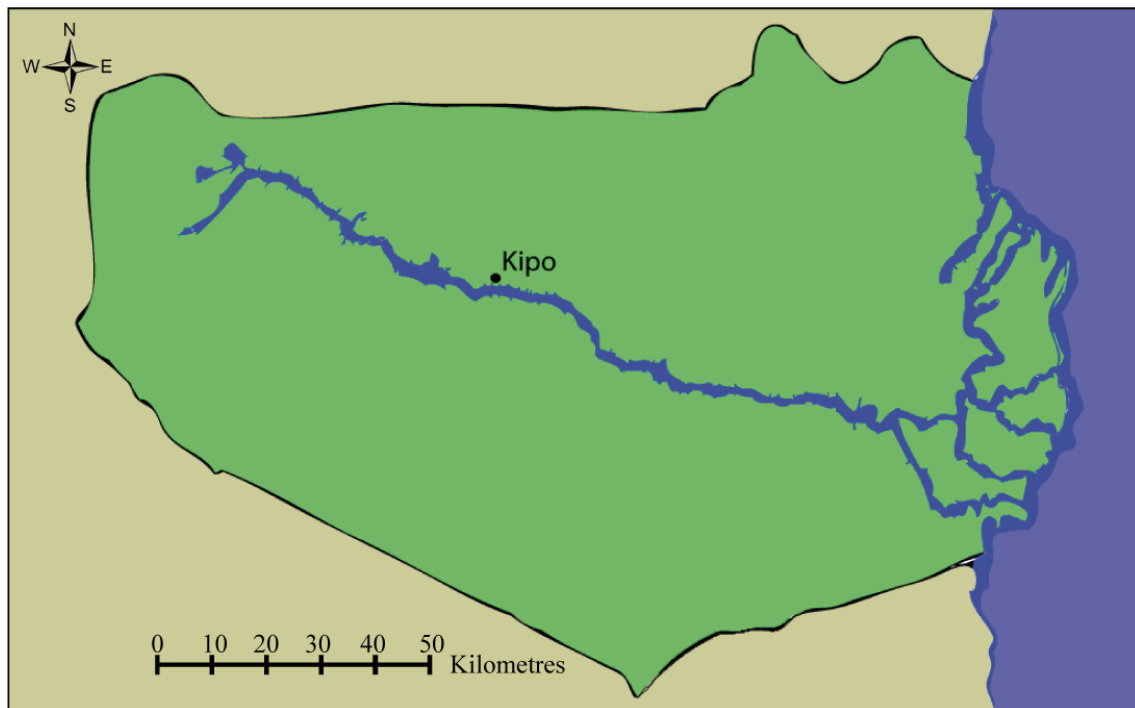


Figure 5. Map of Rufiji District and River, Kipo marked out (own map).

The voice of the anthropologist

In my interview with the anthropologist who was living in Kipo, Jean-Luc Paul, I wished to hear his version of the livelihoods in Kipo and of his opinion regarding the biofuel investment. The access to a secure market and better education is, according to him, the biggest obstacle towards a better livelihood in Kipo. When I asked about the management of the village he answered that formally it is very democratic with the usage of village assemblies, but functionally not at all. There are hierarchies other than the formal ones, for example lineage, family, men and women, old and young.

Jean-Luc is concerned of the different levels of communications between the villagers and the company. He feels that the villagers are discussing questions they do not ask themselves; it is a topic which comes from outside. Since they have no “proper” education to answer these questions they are unaware of the mechanism at work and are judging and giving opinions from wrong basis. He believes that everybody will approve of the investment since they will get rent paid every year resulting in an income for the village. He expresses his concern: “They don’t know of biofuel; the consequences of plant factory installed, strangers coming, or even how to manage tractors. There will be big social impacts that they can’t perceive. Even if the discussion is brought up in a general village assembly it is not, in that sense, democratic“.

What does he think the employment opportunities will mean for the village? His firm belief is that it will shape a proletariat. The villagers have no education and will accept a very low wage level. People are going to want work anyway because of the lack of money. Regarding the outgrower’s plan he knows that sugarcane is not suitable without irrigation, and the lack of assistance with this as well as farming implements will result in a low productivity for the outgrowers.

Regarding the best use of the financial compensation the village would access, Jean-Luc agrees with the village council’s plans in giving priority to housing of the teachers and a dispensary. The inadequate numbers of teachers (three teachers for seven classes) can be helped if they can offer better housing. Also making the water pumps work again would mean a lot for the women in the village. He states, though, that concerning the responsibility of the social services it should lie in the hands of the government, national and regional.

4. Field study in Kipo

“The only positive is the harvest.” The main economic activity in Kipo is subsistence farming. The area of cultivation varies depending of the amount of workers in the household who can tend to it, but it generally lands on 2-4 acres (= 0,8- 1,6 hectares) per household. The farming equipment is limited to just hand hoes. This means hard labour which restricts the cultivating area. The main food crops are maize and rice and these are particularly produced for household food supply. There are other crops like simsim (a sort of spinach), cassava, cotton and cashew nuts which are also produced for income which supports the financial requirements of the household. The most frequent second economic activity is fishing from the Rufiji River and Lake Zumbi. In dry seasons the fishing in the lake is always uncertain. Fishing is normally carried out by men although during rainfall fish catch is scarce so more fishermen are tuned to cultivation activities. Other activities are plaiting carpets (see Figure 5), bicycle repairing, carpentry, building houses, tending to a food vending (mostly women) and petty trading (mostly men, see Figure 6). In a household it is common that the wife takes the biggest work load in the shamba but there are also good cooperation between husband, wife and the eldest children. It is also mainly the women or the children who are involved in household’s activities like collecting water and cooking.



Figure 6. Young girl plaiting carpets



Figure 7. Young man attending the *duka* (shop)

Villagers sometimes tend to diversify farms in Kipo. There are cultivation areas on the upper side (on the village side) as well as the other side of the river. During low rainfall the other

side normally supports the household's food requirement while during higher rainfall the upper side becomes the major source of food requirement as the other side is flooded.

Most retrieve their land from their ancestors or found a free area in moving to the village and began working the land. Many told me of the different reasons for relocating into the village. Recurrent flooding of Rufiji River, lion attacks (as the village is close to Selous game reserve) were reported, but the major reason was the political factor. During the ujamaa-politics (villagization) in 1968-1973 there were (national) relocations of villagers to form ujamaa villages where the government provided social services hence making people move from for example the other side of Rufiji River. One emphasis of the ujamaa-politics was on collective farming practices and the cultivated land had to be big enough to take account of modern farming methods. (Havnevik 1993:201)

When establishing the division in decision-making, the official head of the household is the *baba* (father/husband). There are, however, households where the collaboration between the spouses in decisions concerning the household and agriculture are functioning well. The small day-to-day decisions about the chores are usually under the wife's supervision. An elderly man stated that in his household he is the most knowledgeable one and the only one capable of taking decisions, and another man said that "*some lead, some needs to be pushed*". A young man explains that he is the chairman and that his wife is the secretary. A middle-aged woman explains that big or small, she and her husband always make the decisions together. Baba is the official or formal head of the household in most cases, but there are also several mixes of negotiation and division of responsibilities in the village's households.

"Hunger is still a problem." When I ask what is positive and negative about their work situation many have trouble finding anything positive other than the harvest they can collect. The dependency of managing a shamba is doubtless and the wish to have more economic activities is strong: "*if there were other work available, I would prefer it*". Many wish to have more knowledge and formal education enabling them to access more work opportunities.

The work in shamba is hard and tiresome when restricted to working with hand hoe alone. Poor production is due to unreliable rainfall and wild animals like rats, monkeys and wild pigs that eat the harvest as well as poor price to cash crops. A man says that he is planning for some change in his shamba because of the effects from climate change: "*Now the rain-season*

is short and dry season long. There's a need to transform crops, abolish crops with long harvest time".

A man confesses, that in the long run there are some improvements that when comparing his situation with that of his parents. A woman says that it is too early to predict how 2008 will turn out but that the last few years were difficult years when the prices of goods and services went up.

"Too far to get help." The most common health issues in the village are headache and stomach-ache (symptoms of malaria and diarrhoea/cholera). The most common source of drinking water is from Rufiji River which runs thousand of miles passing other settlements which could have polluted the water and making it unsafe. Few households tend to boil the river water in trying to avoid bacterial diseases. The distance which the villagers have to travel to access health care, coupled by the seasonality of the road, is for the majority a real problem. The perception of the level of health services in the neighbouring facilities is varied; some have full confidence and some find the service flawed but emphasizes that there are no alternatives. A man expresses his concern for the emergency cases especially the pregnant women and children under five years. The long way to help has cost lives.

It was, however, mentioned that a health centre is under construction and will hopefully be ready in the end of next year (2009), but there were also doubts about the extent to which health services and human resources (doctors, nurses and chemist) will be made available. The financial access to medical care isn't a problem; *"free of cost"*. There was, however, talk of an insurance fee being installed where memberships was mandatory at a cost of 5000 Tanzanian shilling/household/year (1 SEK~184 TSH jan.-08). Attitudes towards this varied from *"we are not able to pay"* to *"it is a fair price for the service"*. These opinions are naturally linked to the financial capital that each household are able to maintain. One man considered that price too high based on the economic status of the village and claimed that only 42% of the households in Kipo have the means to pay.

"There aren't enough teachers." Several informants tell me how their children love to go to school (See Figure 8). The inhabitants of Kipo have an elementary school, but unfortunately the shortage of teachers is a problem (three teachers for seven classes and in total approx. 300 pupils). A problem they have is providing housing to teachers, so therefore they cannot attract

them to work in the countryside. Unfortunately, the issue of a higher education; secondary school, is a whole other matter. There is no secondary school in Kipo at the moment, but it is under construction, although the funds for the project are delayed. This secondary school under construction is meant to serve an entire ward. Under the current system there are several complaints about the distance the students have to make to reach the neighbouring secondary schools and most of those who have been selected to join the secondary school have dropped out due to distance and the cost involved. Only a very few of the best students get selected to continue further (eight out of twenty). The price that involves secondary school is for many a too big expense. A man says: *“primary is free but secondary is difficult to pay; tuition and school clothes.”* Another says: *“the government should reduce the price otherwise the expenses are too high to let your child go to school”*.

A father tells me that he inspects the results and homework of his children to inspire them to do well. A man expresses his concern of the lack of teachers which restricts the students from doing well in exams. He says: *“I will fight for it for I know the value of education”*. Another man tells of situations where the parents asks their child to deliberately do bad on the examinations that help select the children for secondary school. That way they do not have to face the large expense and avoid the possible embarrassment of having to deny their child higher education. The level of education has great influence in giving a person great authority. A woman shares her opinion regarding her lack of education *“I am not trusted to have an opinion because I didn’t finish school. My voice is therefore not important. I was just waiting to get married... The most important for my children are to get a good level of education”*.



Figure 8. Children of Kipo.

“No conflicts here, we are all equal.” When I ask if there exist any conflicts in the village many have trouble finding any causes. The first answer is *“hamna shida”* (no problem) which is a frequently used phrase in Tanzania. Although when contemplating it there were different answers:

“Hunger is most likely to cause strife. Jealousy. There are no problems when rain fed is enough”.

“Boundaries of shamba can cause minor conflict. The village land committee takes care of this. There is no problem with land access”.

“The lack of education and enough income may cause jealousy”.

Most think of Kipo as a peaceful village without land issues. There is enough land for everyone, is a common answer. Issues concerning farm boundaries in case of expansion exists but is not frequent and the ones in charge of mediating, Village Land Committee, was created 2006. One man tells me that there are no conflicts in Kipo, although some tribalism exists. A fisherman tells me of a conflict between young and old fishermen because of different use of fishing techniques. There is still fish to go around today but the risk of over-fishing exists in the future.

“Blessed with much water.” The area is blessed with Lake Zumbi where clean water and good fishing is available (See Figure 9). At the shores of the lake are several “smoking huts” where the catch of the day is smoked and packed to be sold either in the local area or to be transported to Dar es Salaam for the markets. The river Rufiji contains a lot of sediments from upstream water which affects the water’s quality. Despite this, women and children collect water in these areas, running the risk of being attacked by the crocodiles and hippopotamus that live in those waterways (every year there is at least one crocodile attack). The river is trafficked daily with canoes that traverse the river bringing the villagers to their shamba on the other side of the river.



Figure 9. Fisherman in Lake Zumbi

“God cuts of the road.” When discussing the status of the main road that goes through Kipo the discontent is strong and widespread. It is the weather which predicts the conditions, and during rainy seasons the communications is really bad. The road is said to be passable during nine months but for three months it is, as a man expressed it, *“as if God cuts off the road”*. The condition also dictates the possibilities of economic activity. The access the villagers have to sell and receive goods depends entirely if the road is passable. A man expresses his discontent of the governments transport project and feels that the political promises were not delivered. If it was maintained many believe that it would mean an improved tourism and easy and safe transport of products.

When I ask my informants what they would prioritise as in most need of attention in the village, the majority emphasizes the access to health care.

“Everybody has to attend the meetings.” Kipo has village meetings minimum three times a year, and each hamlet has a meeting once a month. The meeting’s agenda is posted along the main road a week before the meeting. On special occasions an extra meeting can be called, for example if investors ask for it. The meetings are mandatory for everyone over 18 years. My question about who represents the household at meetings usually receives the answer that the baba is the formal representative of the family. However, who attends the meetings depends on who is free - *“one has to work”*. If possible, both will attend the meetings. When the answer was that baba would go I asked if he would share the information with his wife of

which most answered yes. At the meetings the discussions may surround village development, social services or national politics in general.

”The village needs the investment very much.” I wished to get a sense of the level of information that had reached the villagers surrounding the investment from SEKAB and the answers I got were very diverse. Several had previously heard through the radio that President Kikwete had welcomed investors to the district of Rufiji to grow sugarcane and advised the villages to agree with the investor’s propositions.

Most of the informants had heard of the company SEKAB, a few claimed they had never heard of the name although they had heard of the sugarcane investment. The most frequent answer was that SEKAB had come to access land to grow sugarcane. They *“move from village to village in Rufiji district”* and wish to *“cultivate sugarcane to get petrol”*. A man who was a member of the Village Land Committee said that SEKAB had plans of sugarcane production, to improve living standard and reduce poverty. They wished to make contributions to the social services, but they were not specific about work opportunity. Another man claims that *“they are just interested in the land, and only the land.”*

An informant explains SEKAB’s presence there: *“they want to establish sugarcane plantation but has not permission from district, therefore has to ask villages for opinions”*. There were those who had doubts about current promises imbedded in SEKAB project as there had been such promises made previously by another investor which was not implemented in the end.

One informant explains that SEKAB’s ambition is to start collaborations with villages and investigate if they are ready and willing to implement sugarcane production. They need some area to cultivate and also outgrowers’ area for the villagers to cultivate on. They will help the villagers to acquire farming equipments because the current capacities are too low – villagers are supposed to participate in the clearing of the land which SEKAB later will take to the plantations. Products grown are to be sold to SEKAB who will act as the market. There will be credit assistance for those who want to cultivate with the chance to pay back later.

There are diverse statements surrounding an actual agreement between SEKAB and the village. Some claim that nothing has been decided yet and that they are in negotiation. Others say it is a done deal, where the villagers have already approved the proposal. A man speaks of the meeting where they approved the proposal and describes that there were no official votes

but only to shout out “yes” or “no”. His reply to why he said “yes” was: “*I have to do the same job as my neighbour is doing*”. Some claim that promises of employment opportunities were made and also that they will provide education on how to grow sugarcane efficiently. Also, the assistance in improving school, road, health services and housing are expected from some villagers.

The uninhabited forest area north of the village is wild and not cultivated. This area is the one in question for the sugarcane plantation and as a man puts it “*they will pay compensation accordingly*”. There is therefore not an issue to relocate any villagers, although no one seems to know how large the proposed area really is.

“*Let them come tomorrow!*” There was definitely a positive attitude among the majority of informants surrounding the investment. There were high hopes and wishes that the investment would be implemented as soon as possible. An elder man says that he wishes to see them before he dies. The positive attitudes are exemplified with: *We’re happy to have land, bush land, to provide to them. It will provide and produce a lot which will mean a lot for the coming generations*”. Another woman has the opinion that: “*It seems to help in a near future*”.

The knowledge of growing sugarcane is varied and many say that they depend on getting education and better farming implements with the investment. A man says he chooses not to grow sugarcane but still thinks that the project will be prosperous for the village. Another man states that he only wishes to cultivate it if improvements for the village are guaranteed.

When I ask a man if he thinks the investment is good for Kipo he says: “*I don’t have enough education to evaluate. One day is too little to get a feeling*”. Another agreed that it is not easy to know of the positive or negative effects although he still hopes the investment will be implemented. If it will, there are possible positive outcomes such as access to credit and social services and also ability to change their housing conditions. There are those who do not wish to grow sugarcane in their own shamba but hope to cultivate it on the outgrower’s area. The majority of the informants say that they have no knowledge of the market price for sugarcane.

The expectations are different; more income sources, employment, extension services, factory, etc. The belief is that SEKAB will need many workers in the beginning of their

project, in clearing the land for the plantations, *“people are still necessary, machines will not do everything”*. There are also hopes to be able to be factory workers.

A man states that he feels positive about the project and that he expects assistance from the government to help and evaluate the project. The respect for the government was brought up by many informants: *“Obeying our government is all we can do”*, and *“The government knows of the risks”*.

When asking the villagers of their opinions regarding irrigation, the attitudes were very diverse. Many said that they were blessed with much water and that if the plantations needed it there were no problems. A few voices were, however, very clear about that water from Lake Zumbi must not be used for irrigation: *“If they take water from Zumbi they will kill it. Better from river where there’s not so much fishing”*. Other suggestions were, for example: *“take from lake first then from river to fill the lake”*. A man states that *“Nine villages put faith in Lake Zumbi for water and fish. Maybe it’s ok to take from the lake during rainy seasons”*.

5. Discussion

Life in Kipo

After listening to what the informants say about their economic activity, it becomes clear that it is in restraints. The shambas which support them does it with minimal adequacy and the notion of hunger is present in the village. The production is constrained by worsened climate conditions and plagued by vermin. A restriction frequently brought up was the hand hoe, the time-consuming heavy work load. They do the best they can by using mixed crops and diversifying farm areas to maximize their production, both for direct household consumption and for the market. The will to acquire another skill, more education, and more work opportunities is very strong. The villagers work either on inherited land or have acquired it as they came to the village, and according to them there is no lack of access to land. The second economic activity, fishing, is what can help to generate an income. Since river Rufiji contains a lot of sediments Lake Zumbi is the natural place to fish. The Zumbi Lake is presently the source of cash income for the villagers, and if that source will be compromised, so will their economic security. As one informer informed me, several villages depend on Lake Zumbi for water and fish.

As the husband/father is the formal head of the household, he is the spokesperson whose opinions are heard and listened to. The women in the area are not fully incorporated into the society; a fact very tangible even in my field work. This means that the voice of half of the population of the village is not being listened to enough, a fact which certainly needs to be taken into account in any discussion about the development potential of the region.

The problems Kipo is experiencing with their social services are also related to development problems. Not having adequate access to health care was the no 1 issue according to most of my informants. My own experience of this fact was very tangible when during my stay the loss of a child on the way to a distantly situated health dispensary put the village in mourning. The construction of their own local health centre is scheduled to be complete shortly, reassuring the wellbeing of the villagers. Access to school was also problematic, and the lack of teachers compromised the quality of the education. Higher education was not accessible by

many and bearing in mind that the educational level and poverty level is interconnected, this problem is in need of much attention.

Regarding the infrastructure of the village, the quality of the road also needs attention. The opportunities to more economic activity are relying on better transport, meaning a better contact with markets, and therefore a more secure income would be possible for those who trade in fish, cassava, cashew, carpets etc. The village is, as mentioned, blessed with much water although it comes with a price. The dangers of collecting water are significant for the children and women of the village. Enabling the water pumps to function again would certainly be beneficial when levitating the work load for women and children as well as eliminating the risks of water collection

Their hope for the future consists of being able to better provide for their families. The access to financial capital will enable them to provide the very basic of needs, better schooling and health care, not only as a goal, but from a development viewpoint, as the means to an end.

What may come?

The large area of 200.000 ha of monoculture of a crop which is in need of substantial irrigation gives a pretty good perspective of the immense ecological changes in process. The very meaning of monoculture is an absence of a mixture of species with the main concern to nurture just one species. The dangers of cultivating sugarcane are, for example, the contribution to soil degradation, impacting both on soil quantity and quality (WWF 2005:5). The company has, indeed, a challenging concept of producing ethanol sustainably, but the extent of their effort to minimize negative environmental impact by the use of the best available agriculture practices and technologies only goes so far. Their ambition to use green harvesting and minimal burning is strong, as is the more general goal to follow the Verified Sustainable Ethanol initiative. The initiative's different criteria will surely be a guideline, but the fact remains that bush-land will need to be cut and irrigation will need to be taken from the lake or the river as a necessity for the plantations. There is, as mentioned before, a great need to treat the coastal forests with caution so that the biodiversity will suffer regarding the numerous species which are depending upon it. The waterways are also threatened, and the irrigation schemes may affect its ecological stability negatively with long-term consequences. In WWF report on "Sugar and the environment" they bring up impacts of field, farm and landscape level. Soil erosion is, as mentioned, a major concern and so is the runoff of polluted

effluents into the waterways. The report also mentions how the discharging effluents from processing sugarcane and its by-products can result in the suffocation of freshwater biodiversity (WWF 2005:8-10). The land clearance for sugarcane cultivation can mean habitat destruction which not only results in the direct loss of species and habitats, but also a range of wider impacts on ecosystem function (Ibid.:11). The report also discusses the impacts of pre-harvest cane burning and use of chemicals but since SEKAB's ambition is a zero-burning policy as well as natural weed and pest control, those negative impacts will hopefully be avoided.

Socially- employment and gender issues

The conditions for the villagers' employment opportunities are not necessarily positive. The villagers of Kipo are used to cultivate a very small area with limited equipment. Nearly all of the informants stress the large need to access farming implements as well as further education regarding growing sugarcane. According to SEKAB, no promises have been made to give further assistance regarding equipment and education, meaning that the outgrowers program will only provide the opportunity for villagers to grow sugarcane on a specific area which is mapped out by SEKAB and sell the crop to the company.

SEKAB made an ambitious promise of work opportunities with the biofuel investment. It is probable that the investment initially has a large labour need for example in preparing the fields and planting seeds. These required manual jobs are likely to decrease over time (FAO 2008:13). SEKAB's goal of extended mechanization means that machines will do most of the work and the ones using them will probably not be the inexperienced small-scale farmer. The stability of the employment opportunities is therefore not sustainable.

In a report from FAO the issues of gender and equity are discussed in regards to biofuels production. The aim of the paper is to explore the potential gender-differentiated risks associated with the large-scale production of biofuels in a developing country. It states the different risks with regard to the diverse access and control women and men have of the land and other productive assets, their level of participation in decision-making and socioeconomic activities, employment opportunities and conditions, and their food security (FAO 2008:4).

Regarding employment opportunities it is likely that those who will be employed are the young, strong and healthy men of the village, even though the women are the ones who

usually take the biggest workload in the household's shamba. There is a risk that the jobs will be distributed unequally, especially leaving it unfavourable for women. On the question if there existed any conflicts in the village, a woman answered: *"There are no conflicts here, we are all equal"* - which might be the case in the present being. The revenues from the contract to outgrowers will most likely be in the hands of men and this income access can create more financial inequalities in the village as well as power inequalities. Biofuels production may in fact exacerbate the pre-existing gender-based, socio-economic inequalities (Ibid.:19).

Power relationships –company and local society

In the process of acquiring the land, SEKAB has to have continuous contact with and approvals by the village, both the village government as well as in full village assemblies. Regarding this process Jean-Luc brought up the issue of the democracy/equality. He stresses their lack of adequate education which presents a disadvantage in these discussions. The biofuel-issue which is being brought up is not theirs, but comes from outside. The subsequent opinions and judgments from the villagers therefore come from the wrong basis. One informant expresses precisely this problem: *"I don't have enough education to evaluate. One day is too little to get a feeling"*. The stories regarding if the village had reached a settled agreement with SEKAB or not differed which could be seen as an example showing the low level of understanding and therefore critique of the process. It is also possible that the people didn't have access to the information regarding an agreement. The general attitude in Kipo is lacking in criticism which can be seen as an education issue which in turn is a development concern. The power of the environment lies theoretically in the hands of the villagers *but* goes hand in hand with the low ability to identify an unsustainable and unequal exchange. The form of access and control in this scenario unfortunately seems to be unequal.

I agree with what the REMP report says regarding the need for educational campaigns whenever a new development is proposed and that the responsibility for this lies with the government. Informants trust that the government knows what is best for them and that it is aware of the risks. Regarding the process of land access and the transparency, controlling and regulating authorities exist. The state may in this case intervene to promote the investment with the interest of growth and reduction of poverty at heart even though the activities are environmental destructive (Bryant & Bailey, 1997:3). When reviewing the development challenges current in Tanzania the issue of passing down investments while struggling with

poverty reduction is not an easy call. In the perspective of a developing country the widespread and multifaceted goal of sustainable development can result in a dilemma for example with short-term goals conflicting with long-term goals. In that sense, the notion of development opportunities in biofuels projects seen “as a necessary evil” is understandable. Today there is an absence of clear policies and regulations for biofuels production and use in Tanzania, forcing the creation of such regulations to be ambitious, rigorous and not to mention quick.

Trade-offs globally and locally

The risk of ecologically unequal exchange is apparent when looking at the environmental trade-offs to globally reduce GHG emissions vs. to locally inflict negative environmental impact like local pollution and loss of natural habitats. When advocating biofuels as an environmentally friendly choice emphasis lies on climate change to the disadvantage of other environmental problems. Seeing as the demand for biofuel and existence of sufficient transportation infrastructure is for the moment very low in Tanzania, the biofuels will mainly go to export to the developed countries, helping them to reach their domestic environmental goals. Looking at the possible negative ecological consequences, Tanzania will be left with the costly externalities. To characterize the overall environmental impact of biofuels is complex and challenging and an evaluation of the development opportunities linked with it makes this task very complicated. The tense discussion of the Biofuel seminar illustrates the uncertainty of this controversial topic making it hard to take sides.

I would also like to mention the interesting work of the founders of “Ecological footprint”, Mathis Wackernagel & William Rees. The purpose of this concept is to have a tool to see how much land/water area is needed for nature to be able to support the flows of energy and matter to and from a defined economy (Wackernagel & Rees 1996:3). To enable a measure of the load imposed by a given population on nature helps in understanding the ecological constraints of our economy and will make our sustainability efforts more effective. It would be an interesting research object to, with this tool, see the environmental load that this biofuel production would mean for the ethanol-driving Swedes.

6. Conclusion

My own opinion regarding the biofuel topic were scattered when I had returned from my fieldwork. Through my interviews I had listened to these villagers' daily struggle, limitations of assets and hopes for the future and sensed that their wishes for a change, any change, were strong. The global discussion surrounding the fight against climate change often takes a standpoint for the wellbeing of the already challenged in the society, in this case the typical poor small-scale subsistence farmer. The social group that already today has difficulties to obtain their livelihood is the most vulnerable towards climate change. This alarming and approaching threat is being fought against with "the weapon" of bio-fuels disregarding the possibility that in the process you take part in exceeding the pressure on ecological and social carrying capacity in the local production area.

Not all biofuels are created equal and I believe in the need to see every biofuel investment separately, on a case by case-basis. What is preferable, in my opinion, is a small-scale, locally organised and managed biofuel project where the involvement of the local knowledge and respect the carrying capacity of the environment and the society is present. The advantage would be the opportunity to improve development from within and not in a dependency situation. It is interesting to see how the policies of the international authorities indirectly dictate the local environment in the periphery when those policies on how to achieve ecological sustainability are made in countries whose lifestyle cannot be generally adopted by the world at large. My opinion is still scattered since I cannot ignore the immediate local and national gains as well as the detrimental environmental effects, and that the impact of biofuels on welfare will unavoidably be heterogeneous, creating winners and losers. The changes that could happen to the small society regarding structure, security, equality as well as the ecology are likely to become a heavy burden as well as a relief.

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- **Requirements for sustainable ethanol**
- **Questions and Answers**

Appendices

A. Abbreviations

AEO	African Economic Outlook
EIA	Environmental Impact Assessment
GDP	Gross Domestic Product
GHG	Green House Gas
HBS	Household Budget Survey
IEA	International Energy Agency
IRA	Institute of Resource Assessment
NSGRP	National Strategy for Growth and Reduction of Poverty
OECD	Organization for Economic Cooperation and Development
REMP	Rufiji Environmental Management Project
SEKAB	Swedish Ethanol Chemistry AB
WWF	Worldwide Fund for nature

B. Interview guide

– *Livelihood: people's capabilities and means of living (resources as well as claims and access).*

Households in Kipo village

1. General questions

1.1 Personal:

- Age: wife? Husband?
- If children how many and at what age?
- Personal background: comes from family of farmers? Other rural background?
-Where were you born? Why have you come to live in Kipo?

1.2 Definition of economic activities

- Describe your main economic activities
- self definition as mainly farmer?
- seasonal work?

1.3 If mainly farmer:

- Size of the farm?
- Main production? What crops?
- labour capacities? How many are there working on your main farm?

1.4 Farm history:

- How did you acquire the land? Given from relatives/government/ village council?
- For how long have you been running/working on the farm?
- Have there been changes of main production during this period?
-from to... ? Why?

1.6 Other economic activities

- Possibilities of outside work

- How are the possibilities of finding work outside the farm (men/women?) in your location?
- Are the possibilities for outside work changing?

2. Integration/exclusion in workings and decisions of the farming activities

2.1 Decision-making

- Who is considered the head of the farming activities?
- Who takes the decisions important for the running of the farm (e.g. on purchases of farm implements, investments in changes in production etc.)
- Who takes the day to day agricultural decisions (are there separate domains of husband/wife where they each make the daily decisions?)

3. Accessibility to social services

3.1 Health

- How would you describe the level of access to medical care?
- Distance? Financial cap.? Level of service efficiency?

3.2 Education

- How would you describe the level of access to schools? Primary and secondary.
- Distance? Financial cap.? Level of service efficiency?

3.3 Security

- How would you rate the security status?
- What would be the causes for strife/violence?

3.4 Logistics

- How would you rate your accessibility to drinking water?
- How would you assess the condition of roads?

Of these services, which one do you think needs most attention (improvement)?

4. *Integration/exclusion in the process of interrelationship with outside world*

4.1 Participation and contacts with rural organisations/extension services/financial institutions:

- Who represents the farm formally e.g. in contacts with external institutions?
- Who has access to important agricultural information by attending meetings?
-only one from the household or all?
- How often do you spend taking part of outside engagements directly involved with agriculture?

4.2 Own evaluation

- How do you find your work situation? Mainly positive/negative?
- How do you look at the future for your economic (farming) activity?
- Are you planning any changes in production? If yes, why?

4.3 Have you any experience with outside projects?

- If yes, how did they affect you? Pos/neg.

4.4 Are you aware of the proposed project from SEKAB?

- If yes, what information have you received?
- What are your attitudes towards it?
- Would you like to grow sugar cane for the upcoming project?
- What assistance would you like to get from the company?
Ex. Extension services, land clearing and cultivation, supply of inputs