THE ECONOMIC POTENTIALS OF LIQUID BIOFUELS PRODUCTION: CHALLENGES AND OPPORTUNITIES FOR SMALLHOLDER FARMERS IN TANZANIA

A discussion paper prepared for Scientific Workshop for "Strategic Production and Marketing of Biodiesel to improve Socio Economic and Environment conditions in Rwanda" held on July 17, 2008 at Novotel Hotel in Kigali, Rwanda

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Introduction

- The global interest on biofuels has increased significantly for the past few decades.
- The major driving forces are;
  - Ever increasing prices of fossil fuels currently (143+ July,2008$);
  - The worries about the oil peak;
  - Increasing impact of fossil fuel on environmental and climatic change;
  - The need to expand agricultural prodn and improve the welfare of rural peasants through agricultural market development and increased income diversification opportunities;
  - Improvement of energy security and reduction of Green House Gases Emissions (GHS).

Introduction

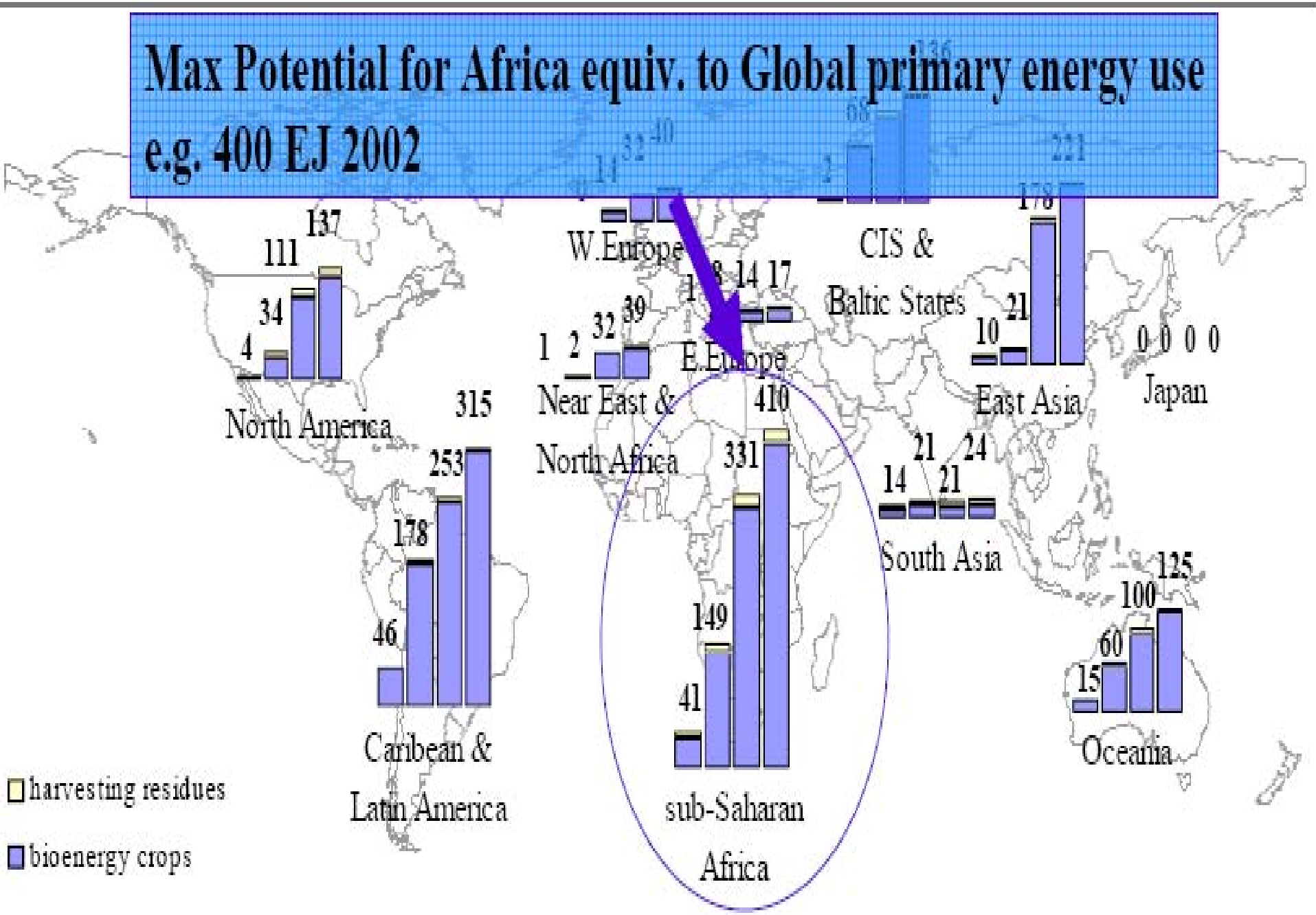
- Despite the driving forces behind biofuel there are many emerging challenges on how to strike a balance for producing biofuel for increased income and energy security without compromising the effort for improving environmental conservation and food security.

- Thus the major objectives of this paper were:
  - To assess the status of liquid biofuel production and processing in Tanzania;
  - To identify multiple effects of biofuel production
  - To identify the opportunities and challenges stemming from emerging biofuel industry for smallholder producers in Tanzania
  - Most of the information required to meet the objectives have been collected through desk review of relevant literatures.

Overview of Global Biofuel Production

- Biofuel is any fuel that is derived from biomass which can be found in many living biological materials.
- Brazil for was the first country to start a major biofuels programme in the 1970's,USA and Malawi followed in the 80's and Europe began its biodiesel program in 90's. Since then many countries including India, China, Thailand, and Egypt have initiated the biofuels programme.
- The production of biofuel has dramatically increased recently especially in USA, Brazil and EU.
- The biodiesel capacity grew from almost nothing in 1990 to 1,800,000 tonnes a year in 2004, mostly in Europe.
- The EU is targeting to use 5.75% of biofuels in motor vehicles by 2010. Malaysia has constructed a palm oil extractor with a capacity of 500,000 tonnes (SADC, 2005).
- Ethanol programme also continue to grow rapidly in many parts of the world with Brazil and USA as the major producers

Max Potential for Africa equiv. to Global primary energy use e.g. 400 EJ 2002



Overview of Biofuel Production in Africa with focus in Tz

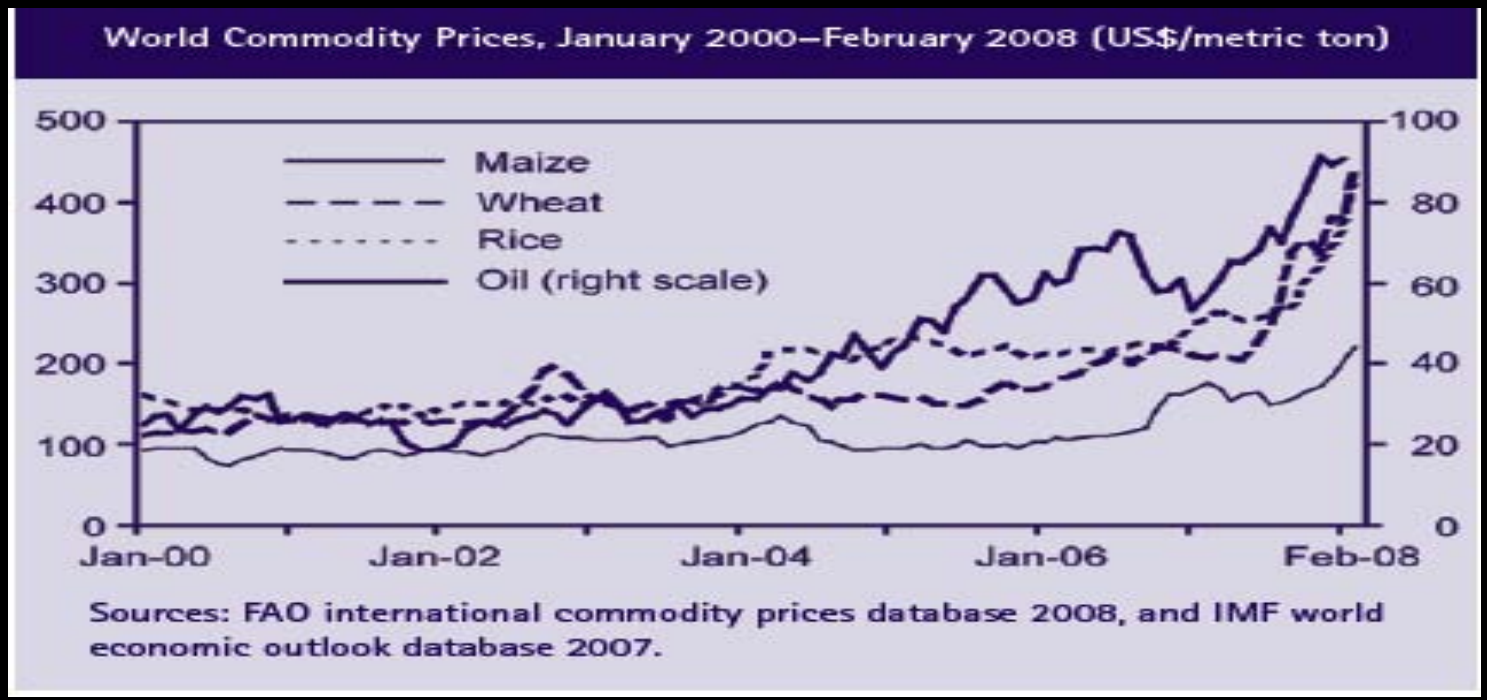
- In Africa the most countries are in pilot phase
- South Africa, Egypt, Malawi, Mali,Swaziland has made some advances
- Despite of its high potential for biofuel prodn Tanzania currently has no any reported commercial scale roduction
- However there are many International and local companies which have showed interest in investing on biofuel production in Tanzania.
- Some of these investors are in advanced stage and some of them are in its initial stage.
- There is also big pilot project under FAO in collaboration with Tanzania government on “Food Security and Bioenergy developments at the country level: The BEFS project and Tanzania”.
- Some investors have started biofuel production at least on the experimental stage eg. Deligent Tanzania limited mainly involved in production of Biodisel from Jatropha,
- KAKUTE involved in production of biodiesel from Jatropha.
- Others are D1 oils – UK , PROKON – A German company investing on Jatropha , US – UK group SEKAB

The role of smallholder farmers in Biofuel production

- The smallholder farmers may play a big role in producing feedstocks
- But recent trend shows that most of potential producers of biofuel in Tanzania are large commercial scale farmers
- Unless the value chain is strategically controlled and monitored, it is likely that leaving everything under market forces it may be dangerous
- The experience from FFV in sub-Saharan Africa especially in Kenya shows that free market may work against the poor
- Also another example is banana production in South America in which the smallholder farmers receive less than 15 %
- The bottom-line is that, it is likely that biofuel poses a huge income diversification potential but ……

Multiple Effect Production and Trade of Biofuel

- Effect on Food security
  - Globally has contributed about 30-40% increase in Price
  - Locally it is difficult to associate it with food prices
  - Only through indirect effect and speculations
  - Increases in Prices may be over estimated



Multiple Effect Production and Trade of Biofuel

- Effect on Environment
  - There has been a controversy on whether the biofuel reduces GHS
  - Beer *et al*, 2007 biodiesel reduces emissions from the transport industry, one of the largest producer of greenhouse gases,
  - Based on Australian scenario biodiesel has the potential of reducing about 80% of the greenhouse gas emissions.
  - However the extent of emission reduction will depend on the feedstock used to produce the biodiesel.
  - Fargione, J. *et al* (2008) and Searchinger, T. *et al* (2008) studies has shown that conversion of tropical ecosystems, including peat swamps in Southeast Asia and rainforests and grasslands in South America, for energy crops result in net emissions.
  - When assessed at a global level, U.S. corn ethanol is a major CO2 source contrast to a CO2 sink as usually claimed by the farm industry.

Multiple Effect Production and Trade of Biofuel

- Effect on Biodiversity
  - Biofuel production especially by using feedstocks like Soya beans and palm oil may lead to serious biodiversity loss due to land clearing and replacement of the previous existing species.
  - There has been increasing concerns over the ongoing Amazon forest clearing in South America due to expansion of Soya beans plantations especially in Brazil.
  - Very little can be done to make palm oil plantations more hospitable for local birds and butterflies.
  - According to Lian (2008) who looked at the number of birds and butterflies in 15 palm oil plantations in East Sabah, Malaysia,
  - He found that palm oil plantations supported between one and 13 butterfly species, and between seven and 14 species of bird.
  - Previous research by other ecologists found at least 85 butterfly and 103 bird species in neighboring undisturbed rain forest.
  - Thus strategic partnership among different stakeholders is very important for sustainable production of biofuel with minimum impact on biodiversity

Opportunities for smallholder farmers

- Opportunities for income generation and diversification by producing and selling biofuel feedstocks.
- Employment opportunities through agro-industrializations
- Improved standard of living and linkages with others sectors in the economy
- Energy supply in rural areas and reduced pollution caused by fire wood;
- Reduced time spent by women and children on basic survival activities (gathering firewood, fetching water, cooking, etc.);
- The development of biofuel as a source of energy, when grown on a large scale, could represent a paradigm shift in agricultural development.

Challenges for smallholder farmers

- Human food is being diverted to fuel production.
- Competition for inputs (e.g. land, water, fertilizers) and other factors that might be diverted from food production.
- Increased demand of Food will lead to increased food prices
- The sheer speed of biofuel expansion may generate new pressures on land tenure arrangements, leading to alienation.
- Poor HHS may either sell or be forced to relocate as the rush to meet increasing demand gathers momentum. Eg . Mukuranga
- Poor contractual arrangement between smallholder farmers and large scale biofuel producers
- Advent of new technologies. As new second-generation technologies are developed, first-generation technologies may become noncompetitive.
- Decrease in price of fossil fuel. There is some risk that the price of fossil fuels could decline, rendering biofuels noncompetitive,.

Conclusion

- Tanzania has a great potential for production of biofuel dues to the availability of arable land, water resources, conducive climatic condition and relatively cheap labour.
- Biofuel sector poses a promising development paradigm shift and enormous income diversification potential especially for rural poor in Sub-Saharan African.
- At the moment biofuel production and processing in Tanzania is in its infant stage
- For smallholder farmers there is promising future for biofuel crops.
- The challenge is how to integrate them in the value chain
- However, it may be too early to provide a firm conclusion as there are no data about how fair will be the distribution of the returns form the industry among economic agents
- Experience from other sectors like FFV SSA and Banana in SA shows that free market is not necessarily fair to small holder farmers
- At least on the short run Biofuel is likely to impact negatively on food security, biodiversity loss and if there is no well sought policies

Recommendation

- In policy terms for biofuel to be pro-poor, the following policy actions are recommended:
  - Government policy to focus on non-staple food as a feedstock like Jatropha and pangomia in mitigating the direct impact of biofuel on food security ;
  - To develop an integrated policy frame work which will ensure fair and equitable participation of smallholder farmers in the biofuel value chain ;
  - Address critical challenges to current agricultural production and agricultural growth;
  - Reduce agricultural support regimes for biofuels in the north to avoid penalizing developing countries who already have restricted access to OECD markets ;
  - Invest in improved land administration systems to deal with conflicting claims emerging under biofuels expansion ;
  - Provide support for small farmers to increase productivity to cope

Thank You for Your Attention

Welcome to Tanzania

Asante Sana Kwa Usikivu Wenu

Karibuni Tanzania