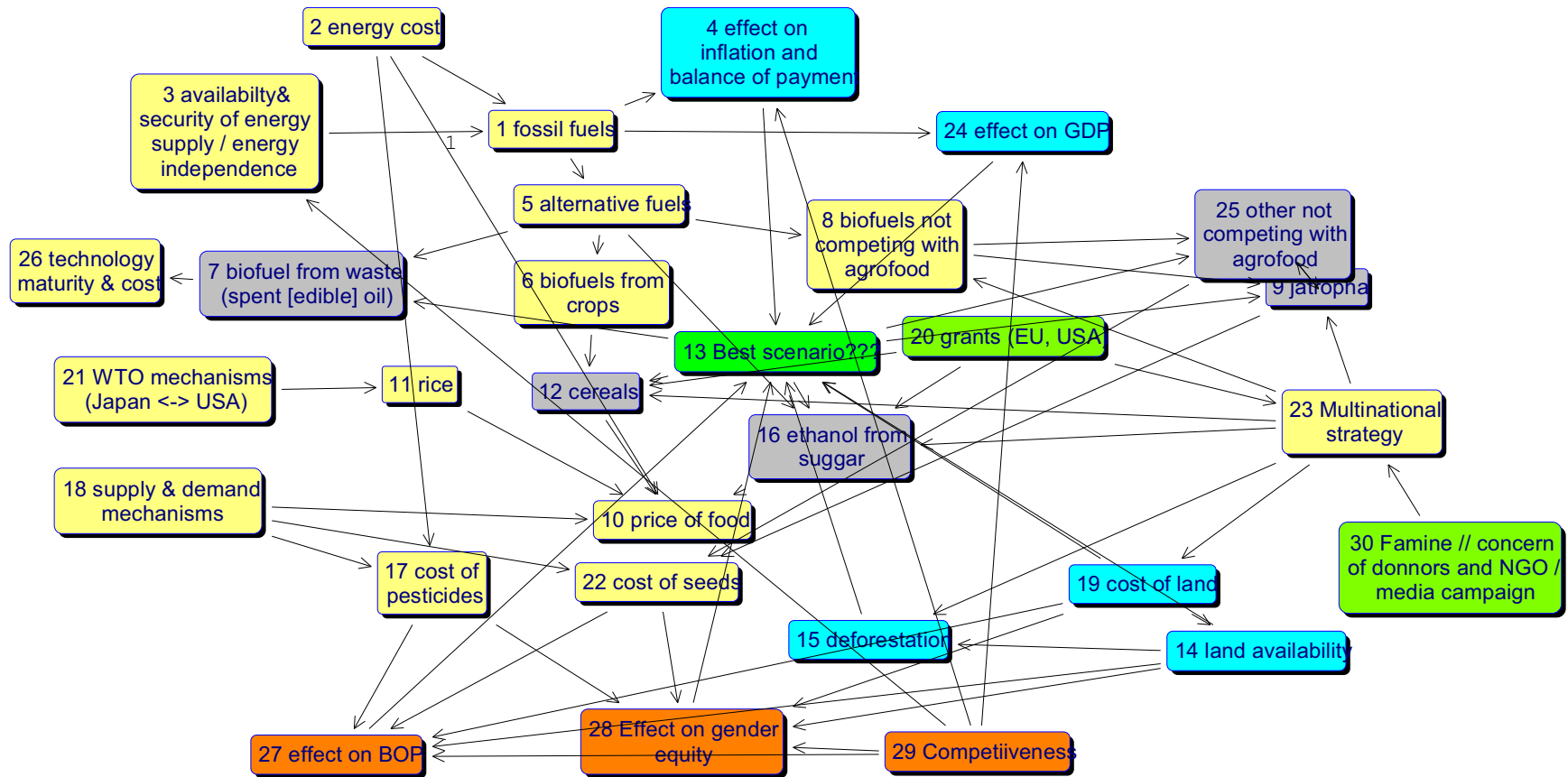


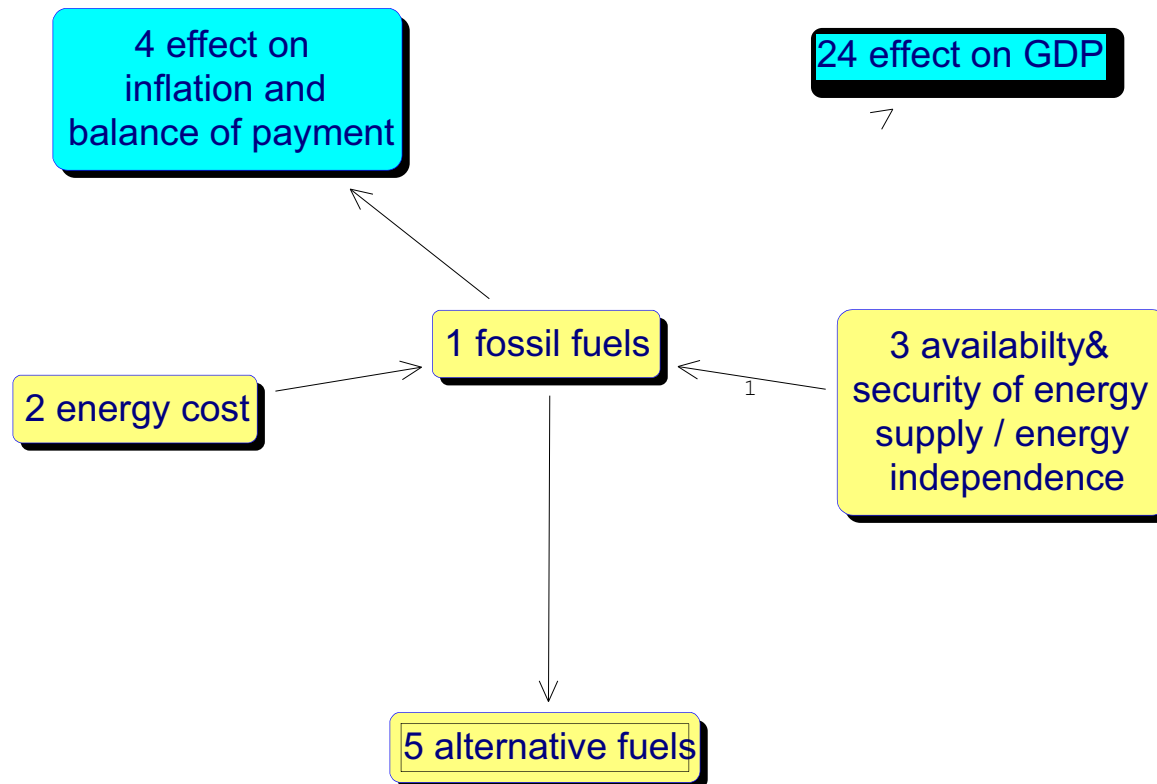
# DEVELOPMENT OF JATROPHA-BASED BIOFUEL

THE VALUE CHAIN APPROACH  
THE CASE OF TANZANIA  
PRELIMINARY RESEARCH AND PRESENTATION  
BY:  
MR. MARTIN A. LYEWE (MBA)

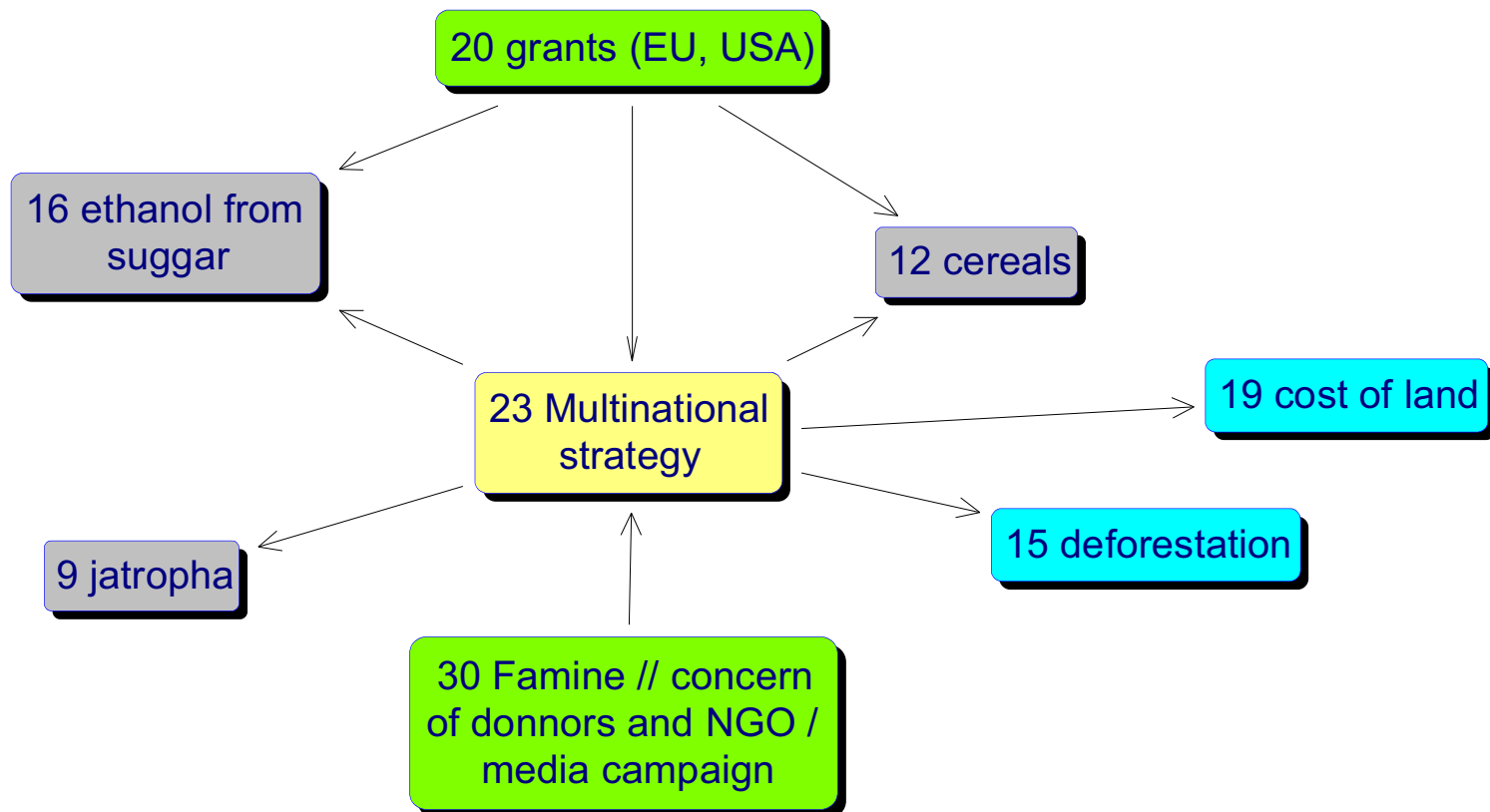
# JATROPHA: CONTEXTUAL ANALYSIS



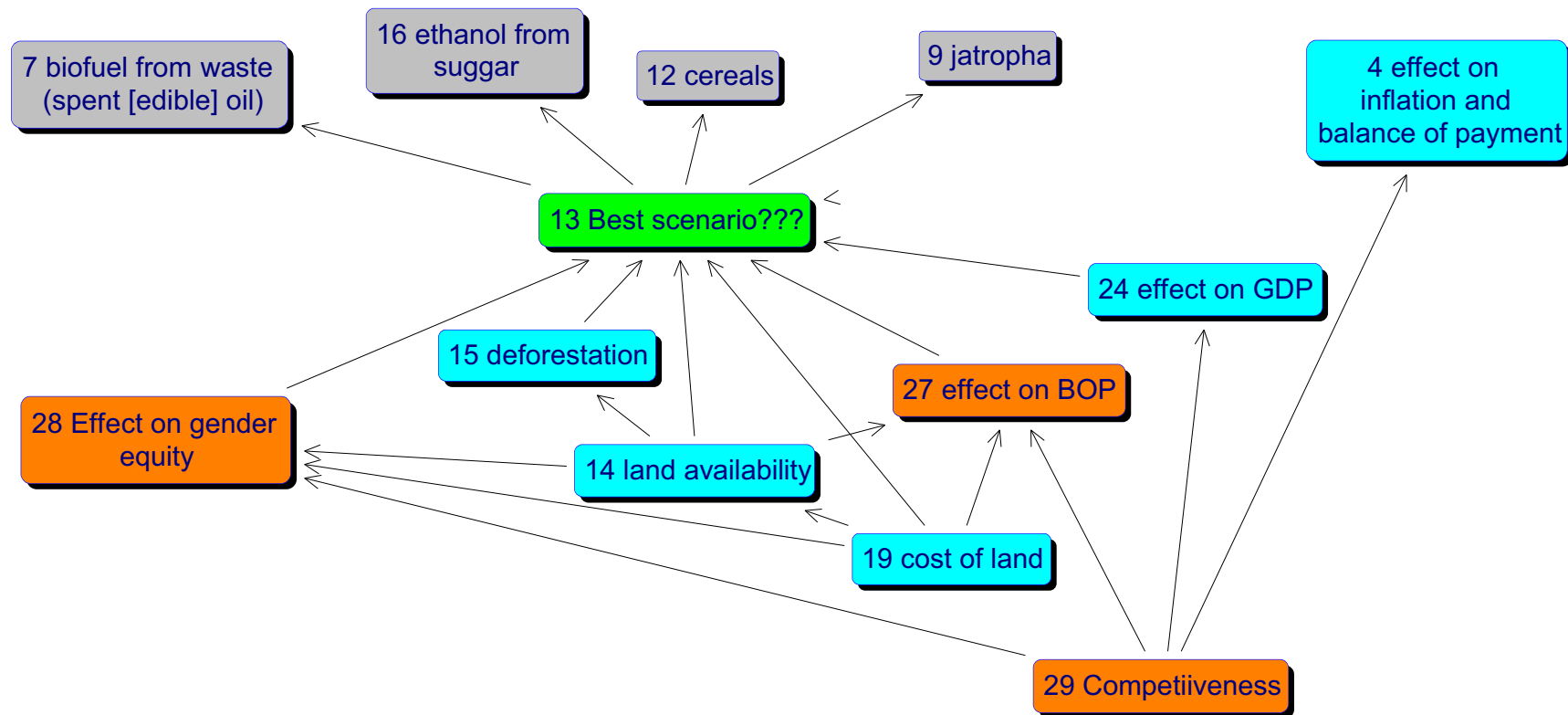
# FOSSIL FUELS: MACRO-ECONOMIC CONCERNS



# JATROPHA: MULTINATIONAL STRATEGIES



# JATROPHA: RESEARCH QUESTION



# WHY JATROPHA

- Jatropha offers the following advantages:
  - it requires low water and fertilizer for cultivation,
  - is not grazed by cattle or sheep,
  - is pest resistant,
  - is easy propagated,
  - has a low gestation period, and has a high seed yield and oil content, and
  - produces high protein manure.
- It will not compete with food except for land use issues.

# The commercialisation of Jatropha in Tanzania

- Currently, there is no commercial biofuels production in Tanzania.
- However, several stakeholders are engaged in the development of biofuels, such as
  - FELISA (palm oil),
  - KAKUTE, Diligent, PROKON and D1 Oils (jatropha oil)
  - 4 main sugar companies (Kilombero Sugar Company, Mtibwa Sugar Estates, Kagera Sugar Limited, Tanganyika Planting Company) in the field of sugarcane-based bioethanol production.

# Mapping of the jatropha-based biofuel value chain in tanzania

- **Functions**

- Research
- Cultivation;
- Transportation
- Production (or processing);
- Transportation;
- Retailing; and
- The usage stage.

# Current and potential Stakeholders (actors)

- producers/collectors,
- collection centres,
- agent/transporters and
- clients for biofuel (SVO or biodiesel)
- Regional fleet owners; and
- Retail fuel traders at local markets.
- Agricultural producers to include smallholder farmers (individual or in farmer groups),
- large farmers operating as contract farmers (outgrowers), and plantation owners.
- Processors (oil pressing and processing, storage, marketing) to include private businesses, and farmer associations or groups.

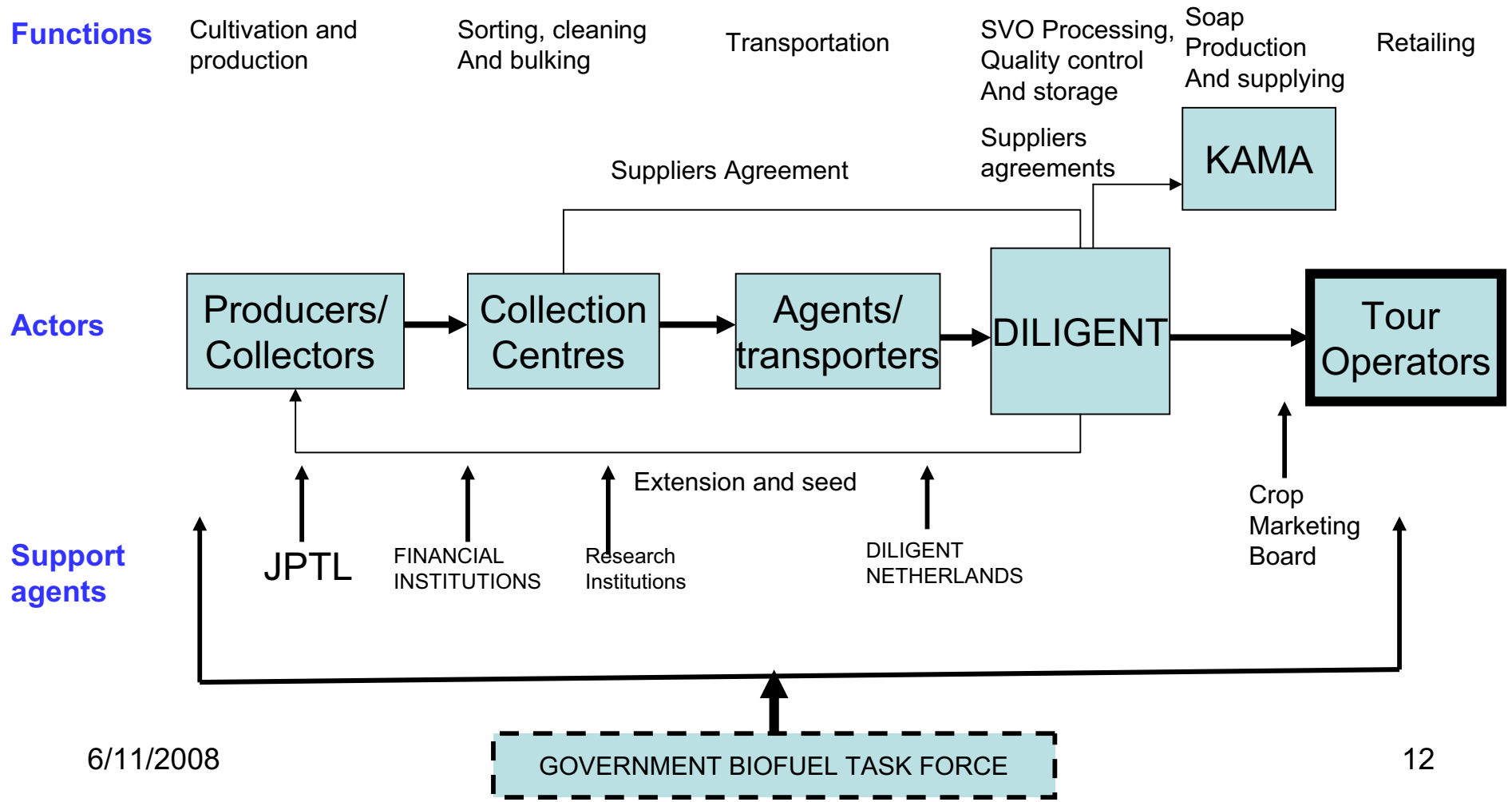
- **Market segments**

- The present value chain is not fully driven by the market focus.
- There is still a lot of production drive.
- Future success however, can only be achieved with developing ability to read the market and respond to it.

- **Governance**

- Diligent (T) Ltd is the firm that is next to the final consumer and going by the assumptions in the value chain analysis, it should take the leading role in this chain.
- The key partners in the chain are lined up but their commitment to each other is still very low.

# Value Chain Identification, Mapping and Relationships



# VIABILITY OF JATROPHA-BASED BIOFUELS IN TANZANIA

- Jatropha-based biofuel development and production is a viable business proposition in Tanzania
- Simplified gross margins range from a low of 12.5% for SVO production for a small holder farmer to a high of 92% for seed collection.

# RISKS AND CONSTRAINTS

Type	Constraints
Technology/Product Development	<ul style="list-style-type: none"> <li>• The technology of processing seeds into oil is very rudimentary and as a result female processors depend on (male) casual labourers and their profits are affected</li> <li>• Standardisation (quality, size, shape, colour) is difficult to achieve due to the cold fusion applied by KAMA and affects its marketing</li> <li>• There are still a lot of unknowns about commercial production of jatropha, since there is very limited experience with large scale production to date, and the crop takes several years to mature</li> <li>• A laboratory setting is required to be able to monitor the quality. This requires staff with adequate skills and education</li> </ul>
Market Access	<ul style="list-style-type: none"> <li>• The (female) soap makers (I suppose it is also true of those in engaged in SVO production) are not supported to market their products outside Mtu Wa Mbu which reduces their returns (lower prices)</li> <li>• The acceptability to use edible oils for fuel is yet unclear</li> </ul>
Organization and Management	<ul style="list-style-type: none"> <li>• The producers of Jatropha are not organised which makes it difficult to reach them and hence, production stagnates</li> </ul>
Regulatory/Policies	<ul style="list-style-type: none"> <li>• The absence of a performing national body to regulate the development and production of biofuels makes it difficult to determine the quality of the SVO currently produced both by the female producers in the villages as well as Diligent (T) Ltd.</li> </ul>
Finance	<ul style="list-style-type: none"> <li>• Unavailability of appropriate (commercial) finance for input supply and investments in appropriate technology for small scale producers/processors, affects efficiency and increases dependency on project funding</li> </ul>
Input Supply  6/11/2008	<ul style="list-style-type: none"> <li>• The input costs of TShs 150/= per seedling is too high for small scale farmers, which may hinder new entrants in the production and hence, the dependency on subsidized input supply.</li> <li>• Seasonal influences in the supply of seeds</li> <li>• Not enough supply of the caustic soda, methanol or ethanol.</li> </ul>
Infrastructure	<ul style="list-style-type: none"> <li>• Lack of communication means and high transport costs causes dysfunctional supply</li> </ul>

# Business models

Business Model	Model Structure
<b>Smallholder farmer in farmer group</b>	<ul style="list-style-type: none"> <li>– Work with existing farmer association or organise farmers in farmer groups (20 groups of &gt;50 farmers each)</li> <li>– Farmer groups invest in local press machine. Filter pressing is done at the investors location</li> <li>– Investor collects pressed oil on monthly basis for market price</li> <li>– Investor invest in production facility</li> </ul>
<b>Outgrowers model/ Contract farming</b>	<ul style="list-style-type: none"> <li>– District council will assist with allocating medium sized farmers, interested to start a new line of business</li> <li>– Contract will be established, whereby seeds and input will be provided and price per kg seeds is determined before hand.</li> <li>– Seeds will be collected by the investor from the farmers location, and filtered and processed in the production facility.</li> </ul>
<b>Company owned farms/ plantations</b>	<ul style="list-style-type: none"> <li>– Allocate piece of land and start clearings procedures</li> <li>– Employ farmers and start seeding</li> <li>– Market the SVO</li> <li>– Volume of seeds sufficient, investment in processing plant</li> </ul>

# Value Chain Development

- **Process**

- More sophisticated technology is required to make the process more efficient.

- **Product**

- An opportunity exist to upgrade this product to producing biodiesel which can be used in combination with fossil diesel or straight for transportation and power generation purposes.

- **Functional**

- Upgrade the cultivation function to large scale plantation farmers of agrifuels.
- Organise small scale farmers (outgrowers) into cooperatives borrowing from the experiences of the “white Revolution’ in India, the cotton growing in Burkina Faso and the soybean experience in India

- **Marketing**

- To remain sustainable, the production of jatropha-based biofuel should (in the short and medium term) be promoted to meet the energy requirements of the local market.
- To remain competitive, in the long run the biofuel could be marketed in the region and beyond using a crop marketing board

# MODEL PREFERENCE

	Sustainability	Competitiveness	Gender	Job creation
<b>Option 1</b> Small holder farmer in farmer groups	*	*	**	***
<b>Option 2</b> Outgrower model/contract farming	*	**	***	**
<b>Option 3</b> Company owned farms, plantations	**	***	*	**
<b>Option 4</b> Option 1 plus option 3	***	***	***	***

KEY: \*\*\* guranteed; \*\* somewhat guranteed; \* no gurantee

# Investment Climate

- Tanzania has ideal geographic and climatic conditions.
- Tanzania has over 88 million hectares much of it is former agricultural land that fell into disuse during nationalization
- Tanzania have significant irrigation sources
- A number of local entrepreneurs and corporate groups have expressed interest in co-investing in biofuel production alongside international investors

# Government and Institutional Support

- The President of Tanzania and his Cabinet have identified biofuel as a priority growth sector.
- The Tanzania Investment Centre maintains a database of suitable growing areas.
- Tanzania's Land Policy gives investors full rights to buy and sell land
- Tanzania offers VAT and import duties on imported inputs and 100% repatriation of profits and capital investments.
- A number of international donor organizations (e.g. the World Bank, USAID, DFID) provide technical and financial assistance to develop the productivity and capacity of outgrower associations and communities in palm oil and jatropha growing areas

- The BEST (Business Environment Strengthening in Tanzania) programme is a coordinated multi-donor project to increase competitiveness across sectors. Under the BEST Cluster Competitiveness Project, donor financing may be made available to support capacity development (such as training, yield-improvement, market research, etc.) of outgrowers in key growth sectors
- With significant funding now earmarked for infrastructure development in Tanzania (by the Millennium Challenge Corporation and other donors), potential also exists to leverage these funding sources to offset infrastructure development costs associated with new production facilities (e.g. road linkages, irrigation, etc.)

Welcome to Tanzania  
**An Investment destination**  
**for**

**JATROPHA-BASED BIOFUELS**

**THANK YOU FOR YOUR ATTENTION**