Genetically Modified Organisms: a rapid review of the prevalence of GMOs and of relevant laws, policies and conventions in the context of REDD in Tanzania.

By Mark Phillips and Nike Doggart, TFCG

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1) Introduction to Genetically Modified Organisms (GMOs)

This briefing note aims to provide background information on the prevalence of GMOs in Tanzania and the relevant laws and policies that guide their use with a view to informing the policy of the TFCG and MJUMITA REDD project with regard to the use of GMOs. In line with the Climate, Community and Biodiversity Project Standards, the project is committed to not using GMOs to generate GHG emissions reductions or removals. By understanding the prevalence and national policy with regard to GMOs the project can better assess the risk of inadvertently using GMOs to achieve GHG emission reductions.

What are GMOs?

Genetically modified organisms (GMO) are defined as living organisms that possess a novel combination of genetic material obtained through the use of modern biotechnology. These techniques, combine DNA molecules from different sources to create a new set of genes. This DNA is then transferred into an organism, giving it modified or novel genes.

GMOs internationally

Genetically modified organisms have been used for research, agriculture, gene therapy and in the pharmaceutical industry. Within agriculture, crops have been modified for different characteristics including resistance to commercial herbicides such as roundup or to produce pesticidal proteins internally.

Countries such as the USA, China, India and South Africa have millions of hectares under GMO crops including cotton, corn and soybeans. There are also genetically modified strains of rice, sweet potato, oilseed rape, tobacco and cassava that are grown commercially.

GMOs in Tanzania

There are at least four crops for which there are or have been trials or experimentation involving genetically modified crops within Tanzania. According to our research, the Government has not permitted any GM crops to be produced commercially in Tanzania.

- **Maize**

Currently, water efficient maize (WEM) is being tested within Tanzania and is expected to be released for public farming as soon as 2015. The objective of the project is 'To develop and make drought tolerant maize available royalty free to small-scale farmers in Sub-Saharan Africa.'

The project to test WEM in Tanzania began in 2003 by the African Agriculture Technology Foundation (AAFT). AAFT gained support from Tanzania, Kenya, Mozambique, South Africa and Uganda to begin testing the WEM immediately. The project is said to be in full accordance with the Cartagena Protocol and all laws within these 5 African countries and is fully funded through the Bill & Melinda Gates Foundation and the Howard G. Buffet Foundation providing 47 million dollars to help with costs.[i]

Within this project, AATF, the International Maize and Wheat Improvement Centre (CIMMYT) and

Monsanto have signed a legal agreement so that any drought-tolerant maize variety developed through this project will be licensed to AATF, which will identify local seed multipliers to make the seed available to smallholder African farmers at the regular price of maize seed without royalty. Farmers will also have the right to keep their harvested grain for replanting if they so wish.

- **Bananas**

There have been trials of GM virus resistance in bananas at Maruku, HORTI-Tengeru, and Sokoine University of Agriculture (Nang'ayo 2006).

- **Tobacco**

From 2003, Tanzania conducted field trials of GM tobacco near Moshi (Mnyulwa & Mugwagwa 2003).

- **Cotton**

There have been field trials of BT cotton in Tanzania since 2005. Further trials were announced by the Tanzania Cotton Board in 2010.

- **Biotechnology Capacity**

The International Centre for Genetic Engineering and Biotechnology (ICGEB) has approved the establishment by Tanzania of an Agricultural Biotechnology Centre (ABC), which it will fund in conjunction with the Tanzanian government. This centre will be established at the Sokoine University of Agriculture (SUA).[ii] The ENRECA programme has financed the construction of a biosafety training laboratory and glasshouse at the Department of molecular biology and botany at the University of Dar es Salaam. http://www.biosafetrain.dk[iii]

- **GMOs in food aid and imports**

Tanzania has been a port of entry for GM maize provided as food aid for other countries in the region.[iv] It received 4,364 tons of food aid from the US under Public Law 480 (the majority of it likely to contain GMOs), and 93,497 tons from the WFP, whose GM status was not specified.[v],[vi]

Risks and concerns in relation to GMOs

Concerns have been raised about GMOs in relation to:

- **Health**

There is concern that GMOs may be generated that are allergenic causing unexpected health problems in humans.

- **Risks of genetic pollution**

This refers to the risk that modified genes may 'jump' to related wild taxa e.g. from GMO salmon to wild salmon with unintended ecological consequences or may jump to non-GMO strains of the same crop.

- **Toxicity to non-target organisms**

This refers to the risk of adverse effects on non-target organisms such as insects (e.g. butterflies, beetles) not targeted by the specific insect-resistant trait expressed by the GM plant.

- **Insufficient labelling**

There is concern from consumers that not enough is being done to monitor the risks of GMOs and to clearly label all food from GMOs.

- **Generation of virulent new viruses from modified viruses inserted in crops**

There is concern that modified viruses may give rise to virulent new viruses that cause crop failure or disease in humans, animals or plants.

- **Unresolved ethical issues**

Many NGOs oppose the use of GMOs until rigorous policies are implemented regarding long term GMO studies, corporate liability, and sufficient GMO labelling to ensure ethical marketing and sale of products.

- **Dependence of farmers on the purchase of GMO seeds**

There is a concern that farmers who adopt GMO seeds become dependent on external inputs as, in some cases, they can no longer keep seeds back from one harvest to plant for the next harvest. There is concern that this might force poor farmers into debt and deeper poverty.

In general, many people advocate the precautionary principle i.e. that until more long term research has been carried out on GMOs, they should not be used.

2) Policy and legal context of GMOs in Tanzania

The Cartagena Protocol provides an international framework for policy on GMOs. Within Tanzania, most policies and laws relating to natural resources and environment are silent on the issue of GMOs including the Wildlife Act 2009 and the Forest Act 2002. As such the most important piece of legislation on GMOs is the Environmental Management Act 2004.

Cartagena Protocol on Biosafety

The Cartagena Protocol on Biosafety to the Convention on Biological Diversity is:

> 'an international agreement which aims to ensure the safe handling, transport and use of living modified organisms (LMOs) resulting from modern biotechnology that may have adverse effects on biological diversity, taking also into account risks to human health.'

Tanzania is a Party to the Convention on Biological Diversity and has ratified the Cartagena Protocol on Biosafety. The protocol is widely supported in Africa to the extent that some countries have rejected food aid where there have been concerns that the aid included genetically engineered food. South Africa is so far the only country where GM crops are widely cultivated.

The Environmental Management Act 2004

The Environmental Management Act 2004 states that:

> 'any person who develops, handles, uses, imports or exports genetically modified organisms (GMOs) and or their product shall be under general obligation to ensure that such organisms do not harm, cause injury or loss to the environment and human health including socio-economic, cultural and ethical concerns.'

The Act assigns responsibility to the Minister Responsible for Environment for issues relating to the environment including the regulation of genetically modified organisms.

National Biosafety Guidelines 2004

Draft guidelines were issued in 2004 which were non-binding and voluntary. Amongst other things, the guidelines described a permitting system and risk management. The guidelines were criticised because they lacked teeth and because they failed to provide for adequate regulation of commercial releases and imports of GMO food, including food aid, feed and processing. In addition, the precautionary principle in decision-making was not explicitly set out in these guidelines (Mayet 2005).

National Biosafety Framework 2004

The National Biosafety Framework (2004), issued in March 2005, serves as a basic guide to the implementation of the biosafety system in Tanzania.

The NBF has the following objectives:

a) Establish science-based, holistic and integrated, efficient, transparent and participatory administrative and decision making system so that Tanzania can benefit from modern biotechnology while avoiding or minimizing the inherent environmental, health and socio-economic risks; and

b) Ensure that the research, development, handling, transboundary movement, transit, use, release and management of GMOs are undertaken in a manner that prevents or reduces risks to human and animal health, biological diversity and the environment.

The NBF are supposed to be supported by National Biosafety Regulations. In the absence of these regulations, Tanzania established an interim Biosafety regulatory process for permitting small-scale confined field trials of plant and plant products through the Plant Protection Act. That document puts in place a review and approval process for all small-scale confined field trials involving genetically engineered plants. These state that 'no one shall import, transit, carry out the contained use of, or release of, or place in market a GMO or a product thereof without an advanced informed or the explicit written approval of the vice-presidents office.' The process has been prepared in accordance with the Cartagena Protocol.

3) Genetically Modified Organisms and REDD

So, how are GMOs relevant to REDD? REDD involves the implementation of strategies to reduce deforestation and forest degradation. Depending on what kinds of deforestation drivers are at work in a project area, strategies might involve the introduction of fast growing, high yielding crops including GMOs as a way of maintaining or increasing productivity without needing to clear forest to secure more agricultural land. This has raised the concern that in pursuing reductions in greenhouse gases, projects might use GMOs thereby causing other environmental problems.

Within the voluntary carbon market, project proponents can seek external validation from different accreditation schemes such as the Voluntary Carbon Standard which provide a guarantee of the validity of the emission reductions that are being sold. In addition, the Climate, Community and Biodiversity project standards were created to foster the development and marketing of projects that deliver credible and significant climate, community and biodiversity benefits. One of the issues that is covered by the CCB standards is the issue of Genetically Modified Organisms.

Under the Biodiversity section the CCB Project standards state:

B1. Net Positive Biodiversity Impacts

Concept

> Projects may not use GMOs to generate greenhouse gases (GHG) emissions reductions or removals. GMOs raise unresolved ethical, scientific and socio economic issues. For example, some GMO attributes may result in invasive genes or species.

Indicators

Project proponents must guarantee that no GMOs will be used to generate GHG emissions reductions or removals.

Thus for REDD projects that are seeking validation from CCBA, it is critical that they are aware of the prevalence of GMOs and that they can guarantee that GMOs are not being used to address the drivers of deforestation and forest degradation.

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Links

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