

# The GM maize onslaught in Mozambique: Undermining biosafety and smallholder farmers



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On 7 April 2015 the African Centre for Biosafety officially changed its name to the African Centre for Biodiversity (ACB). This name change was agreed by consultation within the ACB to reflect the expanded scope of our work over the past few years. All ACB publications prior to this date will remain under our old name of African Centre for Biosafety and should continue to be referenced as such.

We remain committed to dismantling inequalities in the food and agriculture systems in Africa and our belief in people's right to healthy and culturally appropriate food, produced through ecologically sound and sustainable methods, and their right to define their own food and agricultural systems.

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Ação Académica para o Desenvolvimento das Comunidades Rurais – ADECRU<sup>1</sup>, is a social movement with a popular character composed of members and militants inserted in community-based groups. The organisation emerged in 2007 and is recognised for its work in democratic engagement with and productive insertion of citizens and rural communities in solidarity with the struggle for the construction of popular power and a fair and sovereign agenda of development.

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1. The English translation ADECRU is Academic Action for the Development of Rural Communities



## Acronyms and abbreviations

AATF	African Agricultural Technology Foundation
ACB	African Centre for Biodiversity
ADECRU	Acção Académica para o Desenvolvimento das Comunidades Rurais
BAGC	Beira Agriculture Growth Corridor
BMGF	Bill and Melinda Gate Foundation
CIMMYT	International Maize and Wheat Improvement Centre
CSO	civil society organisation
DT	drought tolerant
DTMA	Drought Tolerant Maize for Africa
FOEI	Friends of the Earth International
GM	genetically modified
GMO	genetically modified organism
HOMEF	Home of Mother Earth Foundation
IIAM	Instituto de Investigação Agrária de Moçambique (Institute of Agriculture research of Mozambique )
ISAAA	International Service for the Acquisition of Agri-biotech Applications
NARS	national agricultural research systems
UNAC	União Nacional de Camponeses (National Peasants Union)
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
WEMA	Water Efficient Maize for Africa



## About this paper

The African Centre for Biodiversity (ACB) and Acção Académica para o Desenvolvimento das Comunidades Rurais (ADECURU) conducted this research with the objective of providing information on the uptake of genetically modified organisms (GMOs) in Mozambique in the context of a changing policy environment. In this paper, we provide an analysis of changes made to Mozambique's biosafety legislation in order to allow for field trials of genetically modified maize to take place under the auspices of the Monsanto/Gates Foundation's Water Efficient Maize for Africa (WEMA) project. Our research draws on interviews conducted with key stakeholders during November, December of 2016 and April 2017 in Chókwe district, Manica and Maputo provinces.

## Use of terms

### About the WEMA project

The Water Efficient Maize for Africa (WEMA) is a project whose goals it is to produce drought tolerant (DT) hybrid and genetically modified (GM) varieties of maize seed. Primarily the Bill and Melinda Gates Foundation (BMGF) fund it. WEMA is a public-private partnership involving Monsanto, International Maize and Wheat Improvement Centre (CIMMYT), and the national agricultural research systems (NARS) of five African countries: Kenya, Uganda, Tanzania, Mozambique and South Africa. The WEMA project has a relationship with the African Agriculture Technology Foundation (AATF) whose primary role it is to promote the uptake of GM crops in Africa and negotiate licensing agreements with the private sector. There is also a Drought Tolerant Maize

for Africa (DTMA) project that is primarily funded by the Gates Foundation. The DTMA also involves CIMMYT and the NARS, where ostensibly the conventional drought tolerant maize varieties may be bred for the WEMA project (WEMA AATFAfrica, 2017).

Initially, the goal of the WEMA project was to produce drought tolerant maize varieties for small-scale farmers in sub-Saharan Africa, using both genetic engineering and conventional hybrid breeding.<sup>2</sup> Its website now includes the promotion of Bt maize.<sup>3</sup>

Beginning with a substantive objection to proposed field trials in South Africa in 2007, the ACB has a long track record of resisting Monsanto's GM drought tolerant maize and monitoring the WEMA project. Since 2007, the ACB objected to four more field trial applications concerning the DT maize, the last of which was accompanied by a petition signed by 25 000 concerned citizens. (Acbio, 2016.) In August 2015 the ACB lodged an appeal against the decision to grant commercial release of Monsanto's DT maize (MON87460) in South Africa. The appeal board upheld the decision to commercialise MON87460 and the ACB will now challenge the decision in the High Court, citing procedural irregularities in the decision-making process (Acbio, 2017). The commercial release of MON87460 will impact not only South Africa, but could also sway decision-makers in the four other countries that are hosting the WEMA project, none of which have, to date, granted the release of any GM crops and certainly not any GM food crops.

The ACB has also consistently shared information and knowledge with various publics, including with civil society groups from Kenya, Uganda, South Africa, Mozambique and Tanzania, in light of the fact that the NARS of all five countries are partners in the WEMA project. This was done through several

2. Profiting from the climate crisis, undermining resilience in Africa: Gates and Monsanto's Water Efficient Maize for Africa (WEMA) Project, released in April 2015. Available at: <https://acbio.org.za/gates-and-monsantos-water-efficient-maize-for-africa-wema-project/>.

3. <http://wema.aatf-africa.org/wema-products>



briefings exploring the development of GM DT in the WEMA project over the years<sup>4</sup> as well as through monitoring and sharing information about relevant permit applications and doing joint press work with our allies in other countries.

## GM Drought Tolerant (GM DT)

The GM component of the WEMA project is from Monsanto's GM maize variety MON87460, which contains the bacterial cold-shock gene, *csxB*, derived from the common soil bacterium *Bacillus subtilis*. According to Monsanto's general release application for MON87460 in South Africa, the *csxB* gene 'helps to preserve cellular functions during certain stresses' and 'reduces yield loss, primarily through increasing kernel numbers per year' (Acbio,2015a).

## Bt maize and WEMA project

Initially WEMA's goal was to introduce drought tolerant maize into five African countries; however, Monsanto's Bt technology was included in the project in 2011 (Acbio,2013). Bt is a toxin derived from the soil bacterium, *Bacillus thuringiensis* that is engineered into crops to provide protection against certain pests of the Lepidopteran family (caterpillars), such as maize stem borers (ISAAA,1997). WEMA has gained approval for field trials of Monsanto's Bt event, MON810, in Kenya and Uganda. However, in South Africa, where this 'event' is no longer in use due to the development of insect resistance, WEMA is using another trait called MON89034, and branding this maize 'TELA'.

## GMO, genetic modification, genetic engineering

In this paper, when we refer to a genetically modified organism (GMO), we mean an organism, the genes or genetic material of which has been modified in a way that does

not occur naturally through mating or natural recombination or both. Genetic modification, or genetic engineering, refers to the process of developing a GMO.

## Introduction

Following ratification of the Cartagena Protocol on Biosafety in 2003, Mozambique put in place a biosafety legal framework in 2005, which severely restricted the commercial import of genetically modified organisms (GMOs) for food, feed and processing and import, for the cultivation, of genetically modified (GM) seed. However, this scenario has changed drastically as agriculture and development policies have begun to fall under the influence of regional Green Revolution policies and programmes, such as that of the African Union's Comprehensive African Agriculture Programme (CAADP). Due to, inter alia, Mozambique's membership of the G8 New Alliance for Food Security and Nutrition – now the G7 – international pressures and foreign investment promises have resulted in the Mozambican government promoting policies that strongly favour the use of modern and mechanised agriculture and private sector inputs, such as certified and GM seeds and synthetic fertilisers, towards the industrialisation of Mozambique's agriculture (Acbio, 2015). This vision dominates and underpins the thinking, policies and programmes of government institutions that manage the agriculture sector. For example, the government has undertaken to radically restructure the seed system to promote and protect the interests of private breeders through seed and plant variety protection, laws that together create an exclusive market for certified, improved and commercial varieties of seed, while rendering illegal the centuries-old African farmers' practices of freely using, exchanging and selling seeds/

4. Briefings include: - Profiting from the climate crisis, undermining resilience in Africa: Gates and Monsanto's Water Efficient Maize for Africa (WEMA) Project. 2015. Available at: [https://acbio.org.za/wp-content/uploads/2015/05/WEMA\\_report\\_may2015.pdf](https://acbio.org.za/wp-content/uploads/2015/05/WEMA_report_may2015.pdf).

- Water efficient maize for Africa: Pushing GMO crops onto Africa. 2011. <https://acbio.org.za/wp-content/uploads/2015/02/WEMA-Pushing-GMO-crops.pdf>.

- Africa's Green Revolution drought tolerant maize scam. 2010. <https://acbio.org.za/wp-content/uploads/2015/02/ACB-Africa-Drought-Tolerant-Maize-2010.pdf>.



propagating material (Acbio,n.d.). Further, key policy commitments under Mozambique's G8 Co-operation Framework include crafting policies and regulations designed to expand input markets, reform the land tenure system, promote liberalisation of agricultural trade and increase farmers' access to credit (Acbio,n.d.)

*According to Edgar Jonas of the Beira Agriculture Growth Corridor (BAGC) in Chimoio, Mozambique must use GM technologies to ensure food security and food production, as Mozambique is not an island and cannot afford to be left behind. To that end, peasants must be sensitised.<sup>5</sup>*

The government now strongly supports the promotion of competitive private sector input markets and especially the participation of national and multinational seed companies in the seed sector (ACB,2015). This shift also resulted in the government of Mozambique reviewing the country's biosafety framework (Decree6/2007), and replacing it with new legislation that allows GMO field trials to take place in the country (Decree71/2014, Article 13).

Further, whereas previously imports of GM grain from South Africa were authorised only under emergency situations as food aid, and the grain had to be milled before distribution, revised legislation (Decree 671/200114, Article 13) now allows GM to be imported commercially for food, feed and processing. GM seed may also be imported for the purposes of conducting field trials but not for commercial cultivation. The law however, has retained a certain degree of caution in that it holds the technology provider responsible for any adverse impact that may arise as a result of any field trials and to bear the costs of repairing such damage (Decree 71/2014, Articles 11, 46 and 47). It is expected that huge pressure will be put on the government to revise this law to permit commercial cultivation of GM seed, and to relax these liability and redress provisions.

These changes in the law have prompted field

trials with Monsanto's drought tolerant and Bt maize to be authorised.<sup>6,7</sup> Trials involving both Bt and GM DT maize have been authorised to be tested by the WEMA project, in partnership with the Mozambique Institute for Agricultural Research (IIAM), accountable to the Ministry of Agriculture and Food Security.

Trials of Bt maize started in Chókwè in February 2017 and were near the flowering stage at the time of writing. Chókwè district, around 200km away from the capital, Maputo, is also the area where GM DT trials are due to take place. However, according to Pedro Fato of the WEMA project in Mozambique, quarantined trials involving the GM DT maize have been delayed, first by bureaucratic issues and then by the onset of the rainy season and the presence of many insects in the fields. It is, thus, expected that the trials of GM DT maize will only commence in June/July 2017.<sup>8</sup>

In relation to the Bt maize trials, the Cry1Ab technology has been 'donated' by Monsanto to the WEMA project. This is an old throwaway technology, now discontinued in South Africa, where massive pest resistance is widely reported (Van den Berg, J., *et al.*, 2013). Further, in South Africa, the ACB has lodged an appeal to overturn decisions to allow the commercial growing of Monsanto's DT maize seed (Acbio,2017). The ACB is strongly disputing Monsanto's claims of drought tolerance based on sound science; a single gene (cspB) does not confer efficacious drought tolerance and is yet another risky and novel gene introduced into the staple food of millions of people in the name of corporate profits (Acbio,2012).

The government has deliberately excluded civil society organisations, especially associations of small-scale farmers, from discussions about the introduction of GM trials in Mozambique. Accessing information about these trials was extremely difficult and the authors of this paper had to rely principally on information gained in interviews. In this

5. Interviews with Edgar Jonas, BAGC, Chimoio, 12 November 2016.

6. Interview with Pedro Fato, project manager of WEMA project, Mozambique, 21 April 2017.

7. It is unknown whether these are single event trials or stacked events. A request for access to information by the ACB to the 'non-confidential business information' or non-CBI version of the application was denied.

8. Interview with Pedro Fato, project manager of WEMA project, Mozambique, 19 April 2017.



regard, the Mozambique government has flouted its obligations in terms of Article 23 of the Biosafety Protocol with regard to access to information, public participation and consultation (Secretariat of the Convention on Biological Diversity, 2000).

## The GM push in Africa

The WEMA project's GM thrust in Mozambique is part of a broader GM push in Africa that is fast gaining momentum. Currently South Africa, Sudan and Burkina Faso are the only countries on the continent to have commercialised GM crops. South Africa is the only country growing GM staple food (maize), with Burkina Faso and Sudan having grown (Bt) insect resistant cotton (although Burkina Faso is phasing this out, due to problems with the quality of the fibre produced by the GM seed) (ACB, 2017; Dowd-Urbe & Schnurr, 2016).<sup>9</sup>

On the rest of the continent, under the guise of addressing the challenges posed by climate change, nutrition deficiencies, urbanisation and population growth, various players –including foreign and local agribusiness, and particularly the biotech industry – are redoubling their efforts to introduce GM crops into the rest of the continent and to reshape Africa's agricultural and biosafety policy environment. As previously reported by ACB, a plethora of players and projects are involved in promoting the uptake of GM crops on the continent (ACB, 2017).

United States Agency for International Development (USAID), in particular, has funded capacity building, technology transfer and infrastructural development through an intricate network of institutions and programmes and has, in many instances, assisted with the founding of new African bodies to oversee biosafety policy development, technical guidelines and GM public relations

(FOEI, 2015). USAID has also supported the development of harmonised biosafety policies within Regional Economic Communities to promote expedited and seamless regional trade in GM seeds and grains, which is already the case with the Common Market for Eastern and Southern Africa (COMESA) (ACB, 2017).

The BMGF has been instrumental in funding both policy interventions and scientific projects, particularly on GM indigenous crops, such as cowpea, pigeon pea, sorghum, cassava and banana. This has been a strong political tool to transfer technology to local scientists, develop risk assessment and other regulatory procedures and garner lobbying power in scientific and government circles. Meanwhile, agribusiness corporations have entered into public-private partnerships to promote the adoption of GM crops. For example, Monsanto has 'donated' its off-patent and outdated Bt technology (MON 810) and a questionable drought tolerant trait through the WEMA project; the same throwaway Bt technology is used to develop GM cowpeas in order to take over the lucrative and growing West African cowpea market; the DuPont Business Foundation is the principal technology donor of the African Biofortified Sorghum project aimed at increasing levels of essential nutrients in sorghum; Pioneer Hi-Bred is involved in research and development on GM sorghum in Kenya and Burkina Faso; and Arcadia Biosciences gave the AATF a cost-free licence, granting access to Arcadia's nitrogen use efficiency, water efficiency and salt tolerance technologies, to develop NEWEST rice (ACB, 2015).

Crucially, the recent past has seen an aggressive GM cotton push in various countries. Malawi was faced with a commercial release permit but, due to opposition, this has been put on hold and further trials are now underway. The Nigerian government authorised the commercial growing of GM cotton, but, due to opposition in that country, the trials have not yet begun (HOMEF, n.d.)

9. Reuters. 'Burkina Faso settles dispute with Monsanto over GM cotton'. 8 March 2017. <http://www.reuters.com/article/us-burkina-monsanto-idUSKBN16F1N3> (Accessed 5 May 2017).





An application for the commercial release of cotton was also made to Kenya but an import ban is still in place there (Kenya Biosafety Clearing House, n.d.; Gebre, 2017). Swaziland has also recently joined the GM cotton fray by authorising Bt cotton field trials<sup>10</sup> and Cameroon is also far down the line in its field trials involving GM cotton (Sixtus, 2015).

As mentioned above, Mozambique is one of the five African countries taking part in the WEMA project, along with South Africa, Tanzania, Kenya and Uganda. In Tanzania, political pressure from those involved in the WEMA project in that country resulted in changes being made to Tanzania's biosafety laws in regard to field trials involving GMOs, in order to relax the strict liability provisions to fault-based ones. Field trials are underway in Tanzania with regard to GM DT maize and a fresh application for a stacked GM maize variety involving Bt x DT has been lodged with the biosafety authorities in that country. Further recent pressure to relax the biosafety law for commercialisation is underway. (See box below.)

Similarly, in Mozambique, biosafety laws have been changed in order to allow field trials of GM DT and Bt maize to take place. The trials on GM DT Maize are due to start in June/July 2017. In Kenya, a ban on the importation of GM seed issued by the Kenyan Cabinet and political infighting and/or inertia have stymied efforts towards the commercial growing of GM maize (Bt maize). Field trials of DT maize are also well underway in Kenya (Kenya Biosafety Clearing House, n.d.). In Uganda, the biosafety law has not yet been passed and there is considerable pressure for this to happen, in order to bring GM crops to the commercial market. However, field trials of GM DT maize are well underway in Uganda (WEMA, 2016).

The WEMA project, however, also produces non-GM conventional DT varieties (possibly in collaboration with the DTMA project). Many hybrid DT maize varieties emanating from

these projects (WEMA and/or DTMA) have already been rolled out in varying degrees in the five WEMA countries to farmers over the past few years. These WEMA hybrids are branded as DroughtTEGO™ and have been sub-licensed to at least 22 seed companies in Kenya, Uganda, Tanzania and South Africa (CIMMYT, 2015).

In February 2017, WEMA launched the release of genetically modified maize varieties in South Africa, branded as TELA (CIMMYT, 2017). Confusingly, this maize is not marketed as drought tolerant; it is engineered to resist stemborers. This GM event – MON89034 – belongs to Monsanto and has been commercially available in South Africa since 2010 (USDA, 2016). Five seed companies have now been licensed to sell TELA in South Africa, and trial seeds are being given out free by government extension workers to smallholders, along with training on how to manage Bt crops and the need to plant refugia (CIMMYT, 2015). WEMA will play a clear role in ushering in what is ostensibly Monsanto's Bt maize in the other pilot countries in a similar manner, and has been instrumental in gaining approval for Bt maize field trials in Kenya, Uganda, Mozambique and Tanzania.

The drought that has ravaged many parts of Africa, including parts of these five countries and, indeed, elsewhere, has provided a great deal of political and public support for the project. The media has been fully engaged to deploy reports in Kenya, for example: 'WEMA varieties could provide yields 24–35 per cent higher under moderate drought, compared to varieties available to farmers today' (AATF, n.d.). Further, much is being made by the WEMA project of the fact that the maize seed will be made available (a) to small-scale farmers; (b) royalty free.

10. *Observer on Saturday*. 1 April 2017. 'Swazi farmers wait for Bt cotton'. <https://www.pressreader.com/swaziland/observer-on-saturday/20170401/281728384360776> (Accessed 8 May 2017).



### **Changes on strict liability clause in Tanzania**

Tanzania amended its Environmental Management (Biosafety) Regulations of 2009 in 2015 (United Republic of Tanzania, 2015) as a result of sustained pressure from the research community, supported by the biotechnology industry, to weaken the country's biosafety law. The researchers relentlessly lobbied and pressured the government to change the strict liability clause that provided strong legal protection against any harm, injury or loss caused by GMOs.

The introduction of the WEMA project in Tanzania was a key driver for this huge push towards the revision of the Tanzanian law, which was said to be unduly restrictive. The researchers claimed that the strict liability clause prevented them from undertaking any research. However, the Tanzanian law does not restrict any person from engaging in GMO activity, so long as they are aware that they will be strictly liable for any damage that may arise. This push captures the extent to which those involved in GM research do not want to take any responsibility for damage that is likely to arise, for instance, contamination of local varieties of seed. After several contentious meetings between the government and GM lobbyists, amendments were affected to certain strict liability clauses in the biosafety regulations. These were published by way of a government notice in February 2015. The process for revision of the law did not involve the public and was done internally by the Ministry of Environment. Efforts done by civil society prior to the amendment which called on the government to uphold the strict liability clause were futile as the biosafety regulators bowed under the pressure from the biotech industry and lobbyists.

Prior to the amendments, strict liability in the biosafety regulations applied to all approvals for introduction of GMO or their products in the country. This means that the strict liability was to be imposed on any person carrying out any activity in relation to GMOs or their products where they directly or indirectly caused harm, injury or loss. The amendments now exempt research and research activities from strict liability and instead they are held accountable under a fault-based system. Research in this context applies to any activity done in confined or contained use. Thus, the strict liability still extends to other GMO activities and has only been changed in regard to research purposes. Unfortunately, these amendments opened the door for GMO field trials to commence in the country in October 2016 under the auspices of the WEMA project, despite resistance from civil society in the country (Lynas, 2017).

The pressure is still on to further revise the biosafety regulations in order to allow for the commercialisation of GMOs in Tanzania, a move which researchers are eager to see happen in the near future.

### **Importation of GM maize grain into Mozambique**

As mentioned above, in the past, the government of Mozambique showed little appetite for GMOs and legislation restricted their importation and cultivation. Nevertheless, during the period 2008–2009, when the two decrees imposing restrictions on GMO activities were in force, Mozambique imported many millions of tons of GM maize grain from SA, ostensibly as food aid during an emergency situation in the country and in response to the food shortages experienced at the time. This is permissible in terms of Article 8(1) of Decree 6/2007 which provides that importation of GMOs or their products for emergency purposes, officially decreed by the competent body, may only be carried out with the authorization of National Authority and only in cases of extreme necessity, provided that there are no alternative solutions to respond in time of emergency, and shall only be allowed for products intended for human consumption. (2) Genetically modified foods imported under this regulation must be processed before being made available to final recipients, with a view to avoiding their use as seed. (Decree No 6/2007, Article 8)

However, the 'new revised legislation' now also allows for the importation of GM food under non-emergency situations (Decree No 71/2014 Article 13).



## The WEMA project in Mozambique and changes to Mozambique's biosafety and seed laws

Mozambique has a population of 25 million people, many of whom live in rural areas and farm on small plots less than 1ha. The agricultural sector is the main driver for socio-economic development. It employs 80% of the working population and contributes 90% of Gross Domestic Product (GDP). The majority of farmers are subsistence smallholder farmers, who experience low productivity; practising their farming under rain-fed conditions, with low use of improved technologies.<sup>11</sup>

Mozambique joined the WEMA project in 2009 and in 2010 through IIAM, CIMMYT and DTMA, conducted hybrid maize trials involving non-GM DT maize. The trials have been conducted in drought-stricken areas, to resolve the problem of drought that characterize areas such as Chicualacuala, Mabalane, Chókwè, Tete and Nampula and initiated as the first phase of the WEMA project. The second phase consists of field trials of GM drought tolerant and Bt maize.

Mozambique is one of five participating countries in the WEMA Project, along with Kenya, Uganda, Tanzania and South Africa. In Mozambique, the WEMA project is a public-private partnership, involving Monsanto, CIMMYT, the BMG, Buffet Foundation, USAID, IIAM and Ministry of Higher Education, Science and Technology. The role of CIMMYT within the Mozambique WEMA project consists of training the staff of the IIAM and farmers on new technologies to produce the new DT varieties of maize, conducting field trials and promoting both GM and hybrid DT maize. USAID funds the project via Feed the Future project in the central and northern regions

of Mozambique, while the IIAM has carried out the hybrid DT maize trials in partnership with CIMMYT. The Gates Foundation's role is directed at agricultural policy reforms support, agricultural technology transfer, engagement with smallholder farmers, value chain development and financial support. The Ministry of Higher Education, Science and Technology provides institutional support for the implementation of the project on the ground. According to Roseiro Moreira, the WEMA project came to Mozambique with the support of the former Minister of Science and Technology, Mr. Venâncio Massingue.<sup>12</sup>

The project partners of WEMA have agreed to make available their best maize germplasm lines, with Monsanto 'donating' the drought tolerant transgenic technology. Much of the germplasm from CIMMYT is the result of another BMGF-funded initiative, the DTMA project, which has worked to release both drought tolerant open pollinated varieties and hybrid maize in several African countries. Nevertheless, under the guise of philanthropy and fighting climate change, the WEMA project is seeking to lay the groundwork for the acceptance of GM crops across the board and, as we have seen already, WEMA has so far made excellent strides in persuading government to relax biosafety related legislation in Tanzania and Mozambique, as well as gaining acceptance for field trials of GM traits unrelated to drought tolerance (Bt) in Kenya and Uganda.<sup>13</sup> Another boon for Monsanto in the WEMA project has undoubtedly been increased access to African maize germplasm in national and CIMMYT collections, because their GM traits are only valuable when inserted into locally adapted and high performing conventional varieties.

In Mozambique, the germplasm is provided by IIAM, linked to the Ministry of Agriculture and Food Security, which is responsible for maintaining the national gene bank. It is tasked with collecting local germplasm of agrarian crops in the country. The WEMA

11. Drought Tolerant Maize for Africa: Country Report: Mozambique. December 2014.

12. Interviews with: Roseiro Moreira, communication officer of WEMA project in Mozambique, Maputo, 24 April 2017 at IIAM.

13. Profiting from the climate crisis, undermining resilience in Africa: Gates and Monsanto's Water Efficient Maize for Africa (WEMA) Project. 2015. Available at: [https://acbio.org.za/wp-content/uploads/2015/05/WEMA\\_report\\_may2015.pdf](https://acbio.org.za/wp-content/uploads/2015/05/WEMA_report_may2015.pdf).



project in Mozambique is hosted at IIAM and all trials are to be conducted in partnership between IIAM and the WEMA project. Indeed, the GM varieties being tested in Chókwè will take place under the auspices of the WEMA project, in partnership with IIAM, in line with an agreement signed between the government of Mozambique and the WEMA project.

As mentioned above, IIAM, through the WEMA project, conducted trials of 18 drought tolerant hybrid maize varieties in Mozambique<sup>14</sup> in 2010; part of the first phase of the WEMA project. The second phase consists of field trials of GM maize. However, due to the stringent regulations that restricted the import and use of GMOs in the country at the time, in 2012 an inter-ministerial committee – comprising the Ministries of Agriculture and Food Security; Science, Technology and Higher Education and techno Professional; and Justice – began the process of revising the regulations. In 2013, a Ministerial Diploma of December 2001 was changed and then in 2014, Decree 6/2007 was also changed, allowing for both the importation and field trials of GMOs in Mozambique.

Once these two revised legal instruments came into effect, field trials of DT and Bt maize were approved and set to start in 2014. It is instructive that during the annual planning and revision workshop of the WEMA project in Nairobi, as long ago as December 2012, Kenya took a decision for the trials to go ahead. Civil society organisations and small-scale farmers were not included in this workshop. Mozambique was represented by Roseiro Mário Moreira, a technician at the IIAM.<sup>15</sup>

However, further amendments also took place in regard to seed regulation. The Ministerial Diploma 184/2001 of 19 December, which provided rules of production, quality control and certification of seeds, banned the importation into and use of GMOs seeds in Mozambique. According to the Diploma:

*the imported seed should not be GMOs; for*



**Figure 1: WEMA-IIAM field trials of drought tolerant hybrid maize in Chókwè**

*the purposes of the previous paragraph, the Regulation required the submission of a declaration made by the competent bodies of exporting country confirming that the seed in question is not GMO and the seed must be certified and fulfil the established requirements; the submission of a statement confirming that the seed is not a genetically modified variety (GMO). (Ministerial Diploma 184/2001, Article 33, p.17).*

The Ministerial Diploma 184/2001 referred to above was revised on 19 February 2013, and in its place the Council of Ministers approved Decree 12/2013. The country now has a new regulation for the production, trade, quality control and certification of seeds, which makes it possible for GM seed to be imported for the purposes of field trials. The change that the Decree 12/2013 brings is evident in Article 47, paragraph 3, which states that ‘the import of GMO seed is allowed in accordance to the provisions of specific legislation. Thus, while Ministerial Diploma 184/2001 did not allow for the importation and use of GMO seeds in Mozambique, Decree 12/2013 allows for GMOs seeds to be imported for trial purposes only.

Decree 6/2007 –the Biosafety regulation – was also revised on September 2014 to allow for the importation of GMOs for food, feed and processing, as well as for field trials (specifically to allow for the of DT and Bt maize trials

14. <http://www.rm.co.mz/index.php/component/content/article?id=11837:mocambique-milho-geneticamente-modificado-refem-de-regulamentacao>

15. Bulletin of IIAM (Agricultural Research Institute, Ministry of Agriculture and Food Security), October-December 2012.

**Table 1: The relevant laws governing regulation of GMOs in Mozambique**

Laws	What the regulation provides in relation to GMO	Date of change	Status
Decree 6/2007: biosafety regulation	<p>Allows imports of GM crops intended for direct use as food, feed or for processing but requires authorisation from the National Biosafety Authority.</p> <p>The applicant has to submit a report on the risk assessment and management for human health and the environment, including monitoring measures.</p> <p>The applicant could also be required to submit samples for testing purposes.</p> <p>The imports of products for food aid are generally authorised in emergency situations, but only for commodities destined for human consumption and only if there are no alternative solutions to respond to emergencies in a timely manner.</p> <p>The GM food grains imported must be milled before distribution, in order to avoid utilisation as seeds.</p> <p>Allows field trials to be conducted, but elements of the legislation require the technology provider to bear responsibility for any negative impacts.</p> <p>All packages and/or containers housing GMOs and their products shall have a label or an informative booklet in accordance with the valid national or international rules regarding labelling, and in clear, visible letters, stating 'CONTAINS GENETICALLY MODIFIED ORGANISMS'.</p>	30 September 2014	Revised
Ministerial Diploma 184/2001 of 19 December: production, quality control and certification of seeds	<p>Does not allow the import and export of GM seeds into and out of Mozambique.</p> <p>Requires submission of a Declaration made by the competent bodies of the exporting country confirming that the seed in question is not GMO.</p> <p>The seed must be certified and fulfil the established certification requirements.</p>	19 February 2013	Revised
Decree 12/2013: production, trade, quality control and certification	<p>Allows the import of GM seeds for field trials (the import of GMO seed is allowed in accordance with the provisions of specific legislation).</p>	Replaced the Ministerial Diploma 184/2001 of 19 December	In force



Laws	What the regulation provides in relation to GMO	Date of change	Status
Decree 71/2014: biosafety regulation	<p>Allows the import of GMO food for human and animal consumption.</p> <p>Requires submission of samples for the purpose of testing.</p> <p>After assessment of the required documentation, the National Biosafety Authority shall take a decision on the application for importation of GM products for human or animal consumption, or processing, and communicate it to the operator within ninety days.</p> <p>The applicant has to submit a report on the risk assessment and management for human health and the environment, including monitoring measures.</p> <p>Allows the import of GM seeds for trial purposes; the applicant must submit an application to register the GMO variety and its products.</p> <p>The technology provider must bear responsibility for any negative impact that may arise during the field trials.</p> <p>All costs arising from the application process, implementation of the terms and conditions of authorisation, adoption of control measures and risk assessment, repair of damage caused by GMOs as well as the supervision of activities with GMOs are borne by the proponent.</p>	Replaced Decree 6/2007	In force

to proceed under the aegis of the WEMA project). The new biosafety regulations, Decree 71/2014, Article 16, paragraph C states that, in the case of conducting field trials of GMOs in Mozambique, there is need to register the variety. The Article does not, however, relate to the commercial release of GM seed varieties but only to the designation that the GMO has gene X. In order for a variety to be registered and released it must be tested at the national level under the auspices of the Sub-Committee of Registration and Varieties Release. After the testing has been completed and if the variety performs in an acceptable manner, the variety may be registered and commercially released, but it must also still be approved by the National Biosafety Authority; the Ministry of Science, Technology and Higher and Professional Education; and technical professionals responsible for biosafety regulation in the country.

The confined field trials that are being conducted in Chókwè are said to be taking place under quarantine conditions, as the

idea is to test the efficiency of the transgene. This represents the first stage of GM trials and then the second stage will consist of confined fields of the same GMOs, released into the open environment.<sup>16</sup> In order for the GM maize varieties to be released into a more open environment, outside of the 'quarantine' conditions, the WEMA project and IIAM will have to submit a new application to the National Biosafety Authority, accompanied by a risk assessment, risk management reports (including a monitoring plan) and a report on the potential or likely socio-economic impact of the proposed activities (Decree 71/2014, Article 31). If approval is given and after the confined field trials have been conducted, further trials will take place in multi locations in the south, central and northern regions of Mozambique. It is anticipated that pressure will be put on lawmakers to change the country's biosafety law to allow for commercialisation of the GM maize seed. If this happens, then it will be the first step towards the acceptance of GMOs in Mozambique's agriculture systems



## Chókwè GM field trials

Chókwè district is located in southern Mozambique, a strategic location to implement agriculture activities. In the past, Chókwè was nicknamed 'the barn of the nation', but today the area has little to supply in terms of agriculture products, because the land has become infertile, due to the overuse of huge quantities of synthetic fertilisers. The district has been selected by the government and the WEMA project for field trials of drought tolerant hybrid maize, and, later, Monsanto's BT and GM drought tolerant maize, in ostensible attempts at rehabilitation.

The ACB/ADECRU research team has tried on many occasions, without success, to gain access to the applications for field trials from various government agencies, including the Ministry of Science, Technology and Higher Education and Techno Professional teams involved in the field trials. Before the GM maize trials were authorised, the Ministry of Science, Technology and Higher Education and techno Professional demanded that the WEMA project build the necessary infrastructure to seal off the trials in order to avoid the contamination of other crops. Arsénio,<sup>17</sup> the site manager elaborated to the research team that in South Africa and Tanzania, trials are being conducted in open spaces:

*We do not know why there is a fence here because in other countries the place is not sealed. The most important issue is to separate the field trial from another maize variety at a distance of 600 meters to not contaminate other crops. It is required because maize is a variety of open pollination. And in this field we have used the same methodology; we separated the field of other varieties to a distance of 600 meters.*



The WEMA infrastructure that will host the trials of GMO Maize in Chókwè

According to Pedro Fato, these trials are under quarantine conditions in order to test the efficiency of the gene, and, after this stage, the trials will be conducted out of confined fields, in the open environment.<sup>18</sup>

According to Arsénio,<sup>19</sup> during the field trials, WEMA will use NPK 12-24-12 fertilisers to ensure that the maize is robust. In addition, 45% of urea will be used during the trials to ensure the vegetative growth of the maize. He insists that Mozambique must rely on GM seeds for food production because it reduces labour and resolves the problem of food shortages. According to Moreira,<sup>20</sup> the Bt maize variety sown in February 2017 is already in the flowering stage, and people will be invited to visit the trials station in Chókwè during field visits to be announced.

What the authors of this paper were able to ascertain is that planting of conventionally bred, hybrid, drought tolerant maize took place during the second week of August 2014. Crop management of WEMA breeding nurseries in Chókwè was put in place and flowering occurred in July, 2014.<sup>21</sup> According to Roseiro Moreira, this was an important phase of trials because it laid the groundwork for the implementation of the second phase,

16. Interview with Pedro Fato, project manager of WEMA project, Mozambique, 19 April 2017.

17. Interview with Arsénio, site manager of WEMA field trial, Chokwé-Maputo, 24 October 2016

18. Interview with Pedro Fato, project manager of WEMA project, Mozambique, 19 April 2017.

19. Interview with Arsenio, site manager of WEMA field trial, Chokwé-Maputo, 24 October 2016

20. Interview with Roseiro Moreira, technician at IIAM, 25th April 2017.

21. WEMA Bulletin 56, June 2014

involving the GM DT and Bt maize trials, both of which involve GM maize seed where the transformation has been made using the non-GM, conventionally bred maize variety. In other words, at the second stage of GM field trials, the WEMA project will use the non-GM DT maize varieties released in the first phase of the project and then introduce the two genes, the GM drought tolerant and Bt genes.

The Bt and DT GM maize seed that is being used in the confined trials in Chókwè by IIAM and WEMA project was imported from USA and authorised by the Ministry of Science, Technology, Higher Education and Technological Professional, the National Biosafety Authority.

The government and WEMA project have deliberately excluded civil society organisations and especially associations of small-scale farmers from discussions about the introduction and authorisation of GM trials in Mozambique. To implement a project of this nature, and taking into account the deep changes that it can provoke in food production systems, the government was obliged to organise and conduct public consultations, in order to hear the views of small-scale farmers on whether they accept the introduction of GM field trials and the implications of this for the environment, society and human and animal health and wellbeing. The Mozambique government is, in any event, obliged to do so in terms of the Biosafety Protocol.

The GM maize field trials is not just a government and WEMA issue but one of great concern to all Mozambicans who participate directly and indirectly in the country's food production systems. Therefore, all stakeholders should have been consulted and have had their views heard and taken into account before the project was implemented on the ground.



List of planted trials, WEMA project, Chókwè

## Grave concerns with the GM push in Mozambique

The changes in national laws are seen by many actors as heralding a bleak future for the country. Mozambicans will be condemned to consuming GM maize – a staple food – without their knowledge or consent. The changes will allow seed companies to start importing and commercialising GM seeds as a way to guarantee the survival of both the profitmaking of seed companies and the technology. To add insult to injury, there is much scientific scepticism about the capacity for this technology to deliver on its promises; the use of a single gene to confer drought tolerance is scientifically dubious and MON810, which should confer pest resistance, has already failed in South Africa. Furthermore, Bt crops require special management techniques to allay insect resistance and it is questionable whether smallholders will implement them.

Due to the 'philanthropic' orientation of the project, WEMA looks like a convenient vehicle for Monsanto to introduce their commercial products into African countries that have, to date, rejected them. What the countries will receive is faulty and obsolete technology, in return for reducing vital biosafety regulatory hurdles and liability, opening up the market for GMO seed and entrenching smallholders in an agricultural system over which they have little control. As an extra boon for Monsanto, it has



improved its access to precious African maize germplasm and it gets an image boost for 'donating' useless technology.

When small-scale farmer associations look at the changes made to the two regulations, they are of the view that the country is fast walking into an abyss. According to the UNAC Executive Co-ordinator, Luis Muchanga, 'the revision of the two regulations constitutes a major coup against Mozambicans and peasants'.<sup>22</sup>

According to KULIMA,<sup>23</sup> a national Civil Society Organization, the revision of the two regulations is associated with international pressures that the country has fallen victim to. In order to accommodate the interests of international development agencies, the two instruments were revised. Furthermore, Consolo and Saraiva asks 'are these reforms which consist of accommodating GMOs due to a lack of capacity to produce food? In other words, is there really poor productivity, as the narratives try to show, in order to promote the uptake of GMOs?'.<sup>24</sup> For this Civil Society Organization, the use of GMOs is a curse for small-scale farmers and not sustainable, because small-scale farmers do not have the financial capacity to acquire the seeds and associated technological packages. Farmers are also not able to replant farm-saved seed. KULIMA advises the government to promote mechanisms of food production using local varieties of seed and to certify local seeds. They also believe that it would not be sustainable for the government to introduce GMOs, because it would have difficulty providing free seeds to thousands of peasants in Mozambique.

## Conclusion

The WEMA project field trials herald the beginning of a GMO era for Mozambique, which will completely alter its food and farming systems, its biodiversity and the agricultural

value chain. Only a handful of companies will offer packages of GM seeds, pesticides and fertilisers for sale. GMO crops will result in a decrease in seed diversity and, most certainly, farmers will not be able to sow farm-saved seed. The implications for farmer managed seed systems in Mozambique will be both dire and far-reaching.

The introduction of GM maize is a way to extend the power of multinational companies, such as Monsanto, to take control over the seed and food production systems of small-scale farmers and make large profits, while impoverishing the majority of small-scale farmers. GM-based agriculture will dislocate seed and food systems of small-scale farmers, who produce 95% of food available on the market by using their own local varieties of seed. Civil society organisations and small-scale farmers, as the guardians of agricultural diversity, must be watchful and stand together to defend small-scale food production systems, which are clearly under threat.

According to farmers, they are confronted with countless agronomic and post-harvest challenges. The Bt and GM DT solution responds only to one narrow aspect of production (pod borer and drought seasons), it requires a significant increase in input costs (certified seed with technology costs added, synthetic fertiliser, infrastructure, land rent and interest repayments), and it threatens to destabilise functioning socio-ecosystems. The single silver bullet approach promised by Bt cowpea, Bt cotton and Bt maize is reductionist and simplistic.

There is an urgent need for greater cohesion within civil society in Mozambique. Civil society organisations (CSOs) should engage with both farmers and decision-makers about alternative farming systems that are socially just, ecologically sustainable and climate resilient. Networks of CSOs and small-farmer organisations should work together towards achieving seed and food sovereignty in

22. Interview with Luis Muchanga, UNAC, Maputo, 17 November 2016

23. Civil Society Organisation that works with small-scale farmers in Mozambique

24. Interviews with Manuel Consolo and Paulo Saraiva, Maputo, 18 November 2016



Mozambique and stopping the entry of GMOs into Mozambique's food and farming systems.

Due to the health and environmental impacts driven by GMO push, the government should be encouraged to foster investments and support small-scale farmers in sustainable and agro-ecological techniques in order to increase productions and productivity, maximize food security and face climate changing.

Even if the testing has been completed and the variety performs in an acceptable manner, before the variety can be registered, released, and receive the biosafety approval

for commercialisation, the National Biosafety Authority, the Ministry of Higher Education and Technology and the Ministry of Agriculture and Food Security must organise and conduct a public consultation to hear whether the Mozambique people – in particular the small-scale farmers – accept the commercialisation and use of GMOs in Mozambique. The government of Mozambique cannot neglect the wish of the majority. As worthy representatives of Mozambique's people, the government must respect the Constitution and other laws in force because no-one is above the law.



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