International Treaty on Plant Genetic Resources for Food and Agriculture

Where does South Africa stand?

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South Africa is a member of the United Nations (UN) and therefore subscribes to bodies such as the Food and Agriculture Organization (FAO), which concerns itself with global food security issues for the sustainability of life. One of its latest treaties is the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), adopted in 2001, whose objectives are conservation and sustainable use of plant genetic resources for food and agriculture, and the fair and equitable sharing of benefits derived from their use, in harmony with the Convention on Biological Diversity. Sixty-four major crops and forages are the focus of this treaty, which is recognised by 127 member countries.

The Nagoya Protocol, already signed by 36 countries and the European Union (EU) and open for signature until 1 February 2012, is an international agreement which aims at sharing the benefits arising from the utilisation of genetic resources in a fair and equitable way. The ITPGRFA and Nagoya Protocol need to be ratified by member states and are legally binding instruments. All countries are aware of the importance of the Treaty in fighting hunger and poverty and its usefulness in the achievement of Millennium Development Goals (MDG) 1 and 7. More than 75 per cent of the material listed in Annex 1 represents crops and forages grown in South Africa; hence the call in this brief for South Africa to ratify the Treaty and protocol, if farmers and communities, consumers, the scientific community, the public and private sectors and future generations are to benefit from their plant genetic material. The brief argues the threat of effects of climate change on major staple crops also makes it imperative for the government to take action.
**Introduction**

A policy is typically described as a principle or rule to guide decisions and achieve rational outcomes. Policies will contain the ‘what’ and the ‘why’ and are generally adopted by the board or senior governance body within an organisation. They can be considered as ‘statements of intent or commitment’, and may be adopted by governments, private sector organisations and groups or individuals. Policies are developed to guide our actions towards achieving desired outcomes. They also refer to the process of making important organisational decisions, including identifying different alternatives such as programmes or spending priorities, and choosing between them on the basis of the impact they will have. Policies can be understood as political, managerial, financial, and administrative mechanisms devised to reach explicit goals. The Business dictionary simply defines policy as ‘the declared objectives that a government seeks to achieve and preserve in the interest of national community’.

The Department of Agriculture in South Africa has developed a number of policies that have guided it in reaching explicit goals. Good examples would include the policy on minimum wage for farm labourers, policies on farm evictions and farm killings and the policy preventing maize from being produced for biofuel or purposes other than for human consumption. South Africa, being a signatory to a number of international laws, has also developed policies that assist the nation to conform to some of these laws. For example, restriction of smoking to specified areas to protect citizens from health hazards, and the use and production of genetically modified organisms are guided by the Genetically Modified Organisms (GMO) Act 15 of 1997. The exchange of germplasm is also a very important aspect of agriculture that requires government intervention. South Africa is a member of the UN and therefore subscribes to UN bodies such as the Food and Agriculture Organization (FAO) which, among other things, concentrates on global food security issues for the survival and sustainability of life. This responsibility may involve the drawing up of treaties such as the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA).

**What is the ITPGRFA?**

For clearer understanding of what the Treaty is about, it is important for this brief to present available information on the ITPGRFA:

‘After seven years of negotiations, the FAO Conference (through Resolution 3/2001) adopted the International Treaty on Plant Genetic Resources for Food and Agriculture in November 2001. This legally-binding Treaty covers all plant genetic resources relevant for food and agriculture. It is in harmony with the Convention on Biological Diversity (CBD).’

The Treaty defines plant genetic resources as ‘any genetic material of plant origin of actual or potential value for food and agriculture that needs to be conserved for future generations’.

The Treaty’s objectives are therefore conservation and sustainable use of plant genetic resources for food and agriculture, and the fair and equitable sharing of benefits derived from their use, in harmony with the Convention on Biological Diversity, for sustainable agriculture and food security.

The 127 member countries had to agree on an efficient, effective and transparent multilateral system to facilitate access to plant genetic resources for food and agriculture, and to share the benefits in a fair and equitable way. This system would apply to over 64 major crops and forages, and the access and sharing would be managed through a governing body of the treaty through a ‘Material Transfer Agreement’. The Treaty addresses issues of concern such as access and benefit sharing, conditions of access, protection of farmers’ rights and Treaty beneficiaries.

‘The Nagoya Protocol, already signed by 36 countries and the European Union and open for signature until 1 February 2012, is an international agreement which aims at sharing the benefits arising from the utilization of genetic resources in a fair and equitable way, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies. It was adopted by the Conference of the Parties to the Convention on Biological Diversity at its tenth meeting on 29 October 2010 in Nagoya, Japan. The fair and equitable sharing of the benefits arising out of the utilization of genetic resources is one of the three objectives of the Convention on Biological Diversity and is a common objective with the International Treaty, which focuses on the conservation and sustainable use of plant genetic resources for food and agriculture.’

Recent reports indicate that the protocol now...
has 61 signatories, but it will only enter into force some 90 days after 50 countries have consented to be bound by it, which means they must ratify the text. The protocol envisages the setting up of an international regime on access and benefit sharing of genetic resources, which will lay down the basic ground rules on how nations could cooperate in obtaining genetic resources, according to the administrative offices of the 193-member Convention on Biological Diversity (CBD), which drafted the protocol. It outlines how benefits – for example, from when a plant’s genetics are turned into a commercial product, such as medicine – will be shared with countries and communities which have conserved and managed that resource, in some cases for millennia. Very few African countries have ratified the Treaty and protocol. South Africa is not one of them.

The treaty came into force on 29 June 2004, after 40 governments had ratified it, and was registered with the Secretariat of the UN on 15 December 2006 as No. 43345. After the registration of the treaty, each country that ratifies would be expected to develop the legislation and regulations it needs to implement the treaty. Very few African countries have ratified the Treaty and protocol. South Africa is not one of them.

Where does South Africa stand at the moment?

South Africa is one of the 127 parties that are members of the FAO. All countries are aware of the importance of the Treaty in fighting hunger and poverty and its usefulness in the achievement of Millennium Development Goals 1 and 7.

‘No country is self-sufficient in plant genetic resources; all depend on genetic diversity in crops from other countries and regions. International cooperation and open exchange of genetic resources are therefore essential for food security. The fair sharing of benefits arising from the use of these resources has for the first time been practically implemented at the international level through the Treaty and its Standard Material Transfer Agreement.’

According to a recent FAO report, more than a hundred policy makers and senior officials attended a briefing in Rome on the coherent implementation of the International Treaty and the Nagoya Protocol, on 30 June 2011. The brief by the Secretary of the ITPGRFA (Shakeel Bhatti) and the Secretary of the CBD (Ahmed Djoghlaf) was on the ongoing collaboration in capacity building for the coherent implementation of the International Treaty and the Nagoya Protocol. They explained to participants a rich programme of joint capacity-building events and activities for 2011 and early 2012, taking cognisance of the two-day capacity-building workshop that had taken place in Montreal at the beginning of June 2011. This had attracted 200 participants from around the world, and aimed to help governments to identify priorities and needs to build capacity for implementing their obligations under the Nagoya Protocol.

Both secretaries emphasised the fact that the International Treaty and the Nagoya Protocol were the only legally binding international instruments on access and benefit sharing, and it was imperative that they be implemented in a coherent and harmonious manner. They were also aware of the enormous challenges that countries might face to make these instruments a reality on the ground, and were therefore activating and pooling as many resources as possible to support technical officers and policy makers.

The role that agriculture plays in South Africa cannot be overestimated; economic development and food security can only be sustained when agriculture is given its rightful place in the country. This sector should be in the forefront of education, employment, health, rural development and safety and security of this nation. It can only be sustainable if the education of farmers and extension workers is taken seriously, while rural development is driven with vigour and passion, promoting extension of farmers’ cooperatives and infrastructure that links farmers with urban markets. This would lead to the creation of jobs and self-sufficiency in the production of healthy and nutritious food. A nation that is food secure is likely to be safe and secure.

How close or far is this sector from delivering on its mandate? The Agricultural Business Chamber’s analysis and proposal in the following statement is worthy of note.

‘In ensuring that the agricultural sector meets its formidable challenges and responsibilities, it is essential that an agriculture policy is developed and strategies implemented that create an enabling environment for agriculture to prosper and grow in an open and competitive market environment, while also addressing disparities and transformation in the sector, as well as ensuring the sustainability of the resource base in the sector.’

The resource base in the South African context would include not only natural resources, such as
Among the genetic resources listed in Annex 1 of the Treaty, 20 out of the 35 listed food crops are grown in South Africa.

The above analysis clearly shows that South Africa has to understand both international and national agricultural trends for it to remain competitive in the field of agriculture. The national agriculture and food environment calls for a major review of the continuous production of the same crops on the same piece of land for centuries, and the failure to produce other crops and farming systems that have been marginalised, yet are valuable for nutrition, soil preservation, crop protection and sustainability of life in rural areas. Climate change will soon force us to change our unsustainable farming patterns and even eating habits; some of our staple crops may need to be replaced, owing to either shortened growing seasons or changing temperatures.

It has been reported that other African countries have begun to prepare themselves for such changes. An article published in the Concord Times, Sierra Leone in March 2011 stated that: 

"...evidence-based research shows that changes in climatic parameters such as rainfall, temperature and extreme cold conditions are strongly showing in Sierra Leone. Research carried out by the African Technology Policy Studies Network (ATPS) revealed quite interesting findings; but challenging outcomes on climate change impacts on small-scale agriculture in Sierra Leone. It targeted 500 small-holder farmers across four agro-climatic regions in the country. According to the research, temperature is already averaging around 26 degrees centigrade, which means that crops which cannot grow well either at or above this limit (tolerance limit) are in danger, with such crops being identified to be rice, the country’s staple, which only survives at the maximum temperature of 25 degrees centigrade; cacao, surviving at between 18 to 21 degrees centigrade, and oil palm, with a survival limit of 25 to 28 degrees centigrade." 

The East African also reported, in March 2011...

"East Africans have to rethink their reliance on maize as a staple crop after a new study showed that yields of the crop are set to decline drastically as a result of climate change, hurting food security in the region. But if the region insists on maintaining maize as their food crop, then farmers will now have to work much harder and change tack to produce enough to eat. This follows predictions by scientists from Stanford University and the International Maize and Wheat Improvement Centre (CIMMYT) indicating that maize yields across Africa are set to decline drastically, by up to 65 per cent, for every rise in temperature of one degree Celsius. With the effects of climate change in the region expected to translate into drastic weather conditions..."
like drought, such temperature increases seem inevitable.

According to the Department of Environmental Earth System Science and Programme on Food Security and the Environment’s Dr David Lobell, who led the study that is published in Nature Climate Change journal, they investigated the impact of drought and heat stress on maize yields, based on historical data from over 20 000 African maize trials conducted between 1999 and 2007, together with daily weather records. From the study, the scientists found out that under drought conditions, all the areas currently cultivated would suffer yield losses of up to 20 per cent in three-quarters of this area. Besides, for each ‘degree day’ – a measure of the amount and duration of heat experienced by the plant – that the crop spends above 30 degrees C, the yield decreases by one per cent if the plants are rain-fed. This means that the region might have to embrace a new staple food crop to bridge the anticipated shortfall in maize production, or to invest in climate adaptation and mitigation measures to counter this. Already, the East African region is food insecure and the grim predictions only cast an even darker shadow in its future outlook.29

The abstract of a World Bank Policy Research Paper by researchers from the University of Pretoria, South Africa, points out: 17

‘The pressure on an already stressed water situation in South Africa is predicted to increase significantly under climate change, plans for large industrial expansion, ongoing rapid urbanization, and government programs to provide access to water to millions of previously excluded populations. This article employs a general equilibrium approach to examine the economy-wide impacts of selected macro and water-related policy reforms on water use and allocation, rural livelihoods, and economy at large. The analyses reveal that implicit crop-level water quotas reduce the amount of irrigated land allocated to higher-value horticultural crops and create higher shadow rents for production of lower-value water intensive field crops, such as sugarcane and fodder. Accordingly, liberalizing local water allocation within irrigation agriculture is found to work in favor of higher-value crops, and expand agricultural production and exports and farm employment. Allowing for water trade between irrigation

and nonagricultural uses fuelled by higher competition for water from urbanization leads to greater water shadow prices for irrigation water, with reduced income and employment benefits to rural households and higher gains for nonagricultural households.’

The researchers conclude: ‘The analyses show difficult trade-offs between general economic gains and higher water prices, which place serious questions on subsidizing water supply to irrigated agriculture, i.e., making irrigation subsidies much harder to justify’.18

As evidenced by the above three country reports, it is clear that African governments are faced with developing policies that will address not only challenges of climate change but also those of plant genetic resources, which are affected by climate change. The report on Sierra Leone concludes with the following recommendation to the government of the country:

‘A separate robust policy on climate change adaptation and sustainable agriculture is therefore needed in this country. And this requires well articulated and coordinated actions: (i) all actors and stakeholders including the Ministry of Agriculture, ATPS, national science and technology, to collectively collaborate and coordinate to promote research and development in the country’s agricultural sector. Agro-meteorological equipments should be provided and new agro-ecological zones demarcated to inform farmers of crops suitability in each region. There should be developed a science and science [sic] communications strategic framework and should include the formation of an advocacy committee to promote the adoption of science and technology for full scale mainstreaming in national sectoral development; the need to develop existing traditional technologies. Farmers must re-orient and change attitudes, be provided with market facilities, financial resources and other options.’29

South Africa produces neither rice, cacao nor palm oil, even though it has become a high consumer of rice and also imports rice and palm oil. The climate change impact on these crops will be indirectly felt through the global markets. The recommendations to the Sierra Leone government could be useful to the South African government. The report on East Africa is, however, very important for South Africa as it touches on South Africa’s major crop, maize, and the temperature changes in East Africa.
The FAO estimates that 75 per cent of crop diversity was lost between 1900 and 2000. (Kenya) that are affecting crop production cannot be disregarded by South Africa. It is only a matter of time before researchers report similar results in South Africa. Learning from both the Kenyan and Sierra Leone governments would be a strategic move for South Africa and would avert a lot of food security challenges that might arise as a result of crop production shifts. The report on East Africa reveals the following as decisions and steps being taken by the Kenyan government to handle the situation:

‘Following this development, experts have proposed a range of measures to deal with such an eventuality, ranging from improved agricultural practices to change of diet. Prof Ruth Oniang’o, a food security and nutrition expert, says that this is a wake-up call for the region to embrace other neglected food crops. “It is sad that we are now so dependent on maize, yet it was never our crop in the first place, let alone Africa’s staple crop.” Lately, there have been efforts to promote traditional crops in Kenya by the Ministry of Agriculture. The government announced that it would distribute seeds and vegetative cuttings of the “orphan” crops across the country in a $3.5 million [effort] jointly funded by the government, the European Union and the World Bank. The crops whose seeds will be distributed include sweet potatoes, cassava, pigeon peas, common beans, cow peas, green grams, chick peas, sorghum, finger millet, pearl millet and maize. Prof Oniang’o said the move by supermarkets in the region to stock traditional vegetables as well as specially milled and blended flours is in the right direction, adding that more needs to be done for Africans to embrace traditional foodstuff. “As we seek our independence on the governance side, we should also pursue the independence of our stomachs and begin to focus on our traditional foods,” she adds. On his part, Dr Lobell proposes strategies that would ensure that maize production continues with good yields.20

The FAO estimates that 75 per cent of crop diversity was lost between 1900 and 2000. A recent study predicts that as much as 22 per cent of the wild relatives of important food crops of peanut, potato and beans will disappear by 2055 because of a changing climate.21

To avoid disaster and manage the risk, South Africa needs to participate in some of the international policies that concern issues of food and agriculture. The ITPGRFA is very clear on how countries will benefit, especially by ratifying the Treaty. Immediate benefits, apart from those emphasised above, include training of national technical and senior officers dealing with plant genetic resources and material transfer, and the proper conservation of genetic diversity necessary to face unpredictable environmental changes, as seen in the case of Sierra Leone and Kenya above. Countries that have ratified the Treaty have access to genetic resources through the Material Transfer Agreement linked to the Treaty, and will also benefit from giving out their material through the Nagoya Protocol. If lifestyle and eating habits will be forced to change, then South Africa will need to give attention to other genetic material that it may need to source from outside the country. The questions to be asked here are:

‘Has South Africa ratified the Treaty and signed the Nagoya Protocol? If it has not, what are the reasons and what are the consequences of not ratifying this Treaty? The protocol has been approved by 36 countries and the EU and is open for signature until 1 February 2012. If it does not sign this protocol, what does it stand to lose?’

These questions are important for the South African government to seriously consider because of the importance of the materials at stake:

‘Plant genetic resources for food and agriculture are crucial in feeding the world’s population. They are the raw material that farmers and plant breeders use to improve the quality and productivity of our crops. The future of agriculture depends on international cooperation and on the open exchange of the crops and their genes that farmers all over the world have developed and exchanged over 10 000 years. No country is sufficient in itself. All depend on crops and the genetic diversity within these crops from other countries and regions.’22

South Africa is no exception. South Africa has a very strong agricultural research and scientific community which would benefit from the signing of the ITPGRFA. The Agricultural Research Council (ARC) of South Africa documented all plant, animal and microbial genetic material available within its research institutes in 2008. Most of this material is conserved in the national gene banks and some of it is in use by scientists. Some of the research institutes have agreements with international organisations to exchange germplasm for research purposes, and this may become difficult in future if our country does not ratify the ITPGRFA. In 2008, the ARC initiated engagement with the Treaty and prepared documentation that would assist with the Standard Material Transfer
Agreement of the Treaty. In other words, the groundwork seems to have been done in South Africa to assist the Department of Agriculture to move forward with the ratification. The Department of Agriculture should equally have a database of all South African germplasm, its use and impact on the national economic development, as we are all aware that “[g]enetic information held in certain crop varieties is crucial to the development of heat, drought, salinity, pests and disease-resistant, fast-growing, high-yielding new varieties, necessary to reduce food insecurity in the face of climate change.”

The UN promotes the application of international laws by encouraging member states to ratify, accede to or sign up with global conventions. A number of African countries have analysed the benefits of signing the Nagoya Protocol: According to the report of the annual UN event to promote support for global pacts and conventions, 26 September 2011, three African countries have signed a key protocol to a UN treaty aimed at encouraging more equitable sharing of the world’s genetic resources and their benefits. Niger and Cape Verde each added their signatures to the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity. Cape Verde and Mozambique also signed a protocol on biosafety on 26 September 2011. Nothing was reported on South Africa with regard to the Treaty and protocol.

**Recommendations**

This policy brief proposes the following recommendations to the South African policy makers: that

1. The Minister of Agriculture study the International Treaty for Plant Genetic Resources for Food and Agriculture and process it for ratification so that South African farmers, researchers, and the public and private sector can reap the benefits of ratification as stated above.
2. The Department of Agriculture task the ARC to conclude gathering data on the Material Transfer Agreement, if it has not done so, and make it ready for implementation after the Treaty is ratified.
3. The Department of Agriculture task ARC to research and without delay report on the effect of climate change on the country’s major staple crops, in order to mitigate possible negative effects on food security, and advise the nation on possible solutions that would ensure food security.
4. The Department of Agriculture ring-fence money for ARC to research the indigenous food crops of southern Africa, such as cowpea, bambara, sorghum and leafy vegetables, since they have a better survival potential in adverse environments, while vigorous gene manipulations are done on the current improved staple crops such as maize, potatoes and beans.

**Conclusion**

There is great expectation from the scientific community, which understands the importance of keeping pace with global changes (both positive and adverse) and international strategies being developed to mitigate erosion of genetic resources and climate change. Climate change will definitely affect and reduce the diversity of the traditional food crops, which South Africans always fall back on when ‘improved’ varieties succumb to aggressive pests and diseases or are beyond the reach of the poor. The Director of the FAO’s Plant Production and Protection Division, Dr Shivaji Pandey, during the launch of the Second Report on the State of the World’s Plant Genetic Resources for Food and Agriculture at FAO Headquarters, Rome, on 26 October 2010, could not help but state that ‘The genetic diversity of the plants that we grow and eat and their “wild relatives” could be lost forever, threatening future food security, unless special efforts are stepped up to not only conserve but also utilize them, especially in developing countries.’

**References**

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