

AGRICULTURE

An issue of survival

24/03/2010 – by Regine Andersen

Agricultural biodiversity is being eroded. This trend is putting at risk the ability of future generations to feed themselves. In order to reverse the trend, new policies must be implemented worldwide. The irony of the matter is that the poorest farmers are the stewards of genetic diversity. [By Regine Andersen]

Genetic erosion in agriculture is the result of one-sided policies that support intensive commercial agriculture, but are not conducive to maintaining the genetic diversity of crops.

Today's incentive structures promote the use of high-yielding genetically homogeneous crops. Loans, milling, processing, marketing and other business services are available for those who grow high-yielding varieties, but hardly to small-scale farmers who grow traditional, genetically highly diverse varieties of crops that have long standing traditions of cultivation (see box). Moreover, "modern" legislation is geared towards the commercial seed market: patents, plant breeders' rights (PBR) prohibit farmers from exchanging seed. In some cases, it is even forbidden to save seed of protected varieties at harvest time in order to plant the next crop.

In an increasing number of countries, plant-variety release regulations and marketing legislation prohibit the exchange of seed among farmers, even if these are traditional varieties of plants or have been further developed by farmers. Moreover, the sale of seed of traditionally-used varieties is often prohibited because these varieties do not meet the criteria for commercial production. Such rules are spreading to ever more countries, reducing the scope farmers have to cultivate land races and maintain our plant genetic heritage.

The argument for policies that focus on high-yielding crops is the need to ensure plant health and seed quality. This argument is short sighted, however. In the long run plant health and seed quality will depend on the availability of diverse plant genetic resources. Landraces and other traditionally used varieties provide humanity with such diversity. In comparison with the homogeneous crops grown by the commercial seed industry, such varieties are better suited to adapt to changes in their environments.

Since plant genetic variety depends on the diversity of traditional crops, they must be preserved. Policymakers, however, do not focus on this goal. One-sided legislation in favour of high-yielding varieties marks the beginning of the end of 10,000 years of agricultural plant genetic diversity development.

The Plant Treaty

How can this trend be stopped or even reversed? This question has been discussed in the negotiations for the International Treaty on Plant Genetic Resources for Food and Agriculture (Plant Treaty) under the UN Food and Agriculture Organisation (FAO). The Plant Treaty was adopted in 2001 and has been ratified by 123 countries so far. It includes comprehensive provisions on

- the conservation and sustainable use of crop genetic diversity,
- the regulation of access to these resources and
- the fair and equitable sharing of the benefits from their use.

So far, the Plant Treaty is the most important international instrument seeking change. A cornerstone in the Plant Treaty is the section on farmers' rights related to crop genetic diversity. Farmers' rights are about

enabling farmers to continue conserving and sustainably using crop genetic diversity, and about supporting and rewarding them for their vital contribution to the global genetic pool. As farmers are the custodians of crop genetic resources in the field, the implementation of these rights is vital to keep resources available for global food security. Basically, farmers must be allowed to use the seeds they harvest as they think is best.

Farmers' rights

In the Plant Treaty, the countries recognise the enormous contributions of past, present and future farmers to crop genetic diversity. Indeed, this diversity is the basis for humankind's food production. Accordingly, signatories of the Plant Treaty have agreed to implement farmers' rights. These rights, however, are not precisely defined. The reason is that the situations of farmers differ greatly from country to country. Therefore, governments are responsible for implementing farmers' rights according to local needs and priorities.

The Plant Treaty addresses four issues that are crucial components of these rights:

- the rights to save, use, exchange and sell farm-saved seed,
- the protection of traditional knowledge related to crop genetic resources,
- the right to participate in the fair and equitable benefit sharing arising from the utilization of these resources, and
- the right to participate in decision making at the national level regarding crop genetic diversity.

Despite huge challenges ahead in implementing these rights, there are already projects, legislation and policies in several countries which are contributing to their realisation. The Farmers' Rights Project of the Fridtjof Nansen Institute (www.farmersrights.org) collects such stories, including the following:

- India has adopted advanced sui generis legislation securing the rights of farmers to save, use, exchange and sell farm-saved seed.
- A potato catalogue project in Peru shows how it is possible to protect traditional knowledge against misappropriation by sharing it.
- Community seed fairs in Zimbabwe have been instrumental in exchanging seed and thereby fostering genetic diversity in rural areas.
- In Nepal, the approach of adding value to traditional varieties has helped farmers to improve their livelihoods substantially by participating in seed registration, seed selection, breeding and market access, thus benefiting from the diversity they maintain.

Donor agencies that strive to fight poverty in rural areas are recommended to emphasise the implementation of farmers' rights. Poor rural people tend to rely on a diversity of traditional varieties, because these plants are resilient and do not need expensive input. Diversity is also important to stem the risk of crop failure. In a very literal sense, traditional crops keep the poor alive – so it makes sense to invest in improving that potential. To scale up convincing local models to the national level, however, capacity building and funds are needed. Implementing farmers' rights requires support and the Plant Treaty foresees development cooperation in particular playing an important role.

High-yielding varieties and commercial agriculture are still needed, not least to feed growing urban populations. But we must realise that what matters most in terms of food security and poverty alleviation today is developing the potentials for food and agriculture in the more marginal areas, thereby maintaining crop genetic diversity. This implies putting science at the service of the farmers and allowing them to develop genetic potentials. Farmers' rights to use their produce as they think best must prevail over the rights of breeders. Whether our generation will succeed in ensuring the survival of the life

insurance of the poor – in other words, halting genetic erosion and preserving current crop genetic diversity – depends crucially on the implementation of farmers' rights.



SUSTAINABLE DEVELOPMENT

Sustainable development includes progress for people, climate protection and biodiversity, insists

German minister



FLOODING

Not having contributed much to climate change, Pakistanis suffer impacts

10,000 years of cultivation

The basis of all food production is plant genetic diversity. Plant species and varieties, whether wheat or apples, basmati or jasmine rice, can hold genetic traits farmers and plant breeders look for when they need to improve varieties or develop new ones. Such traits include things like

- resistance to drought, pests and diseases,
- particular nutritional qualities,
- texture, colour and processing qualities or
- simply good taste.

In any case, the improvement or development of a plant variety depends entirely on the availability of the plant varieties that hold the desired traits. Genetic traits cannot simply be engineered. This is true of farmers' selective breeding for traditional plant breeding and the development of genetically modified organisms alike.

Whether food production can adapt to changing environmental conditions, for example, climate change, depends on the availability of the relevant genetic traits. Agriculture can cope with just about anything as long as there are landraces available with the genetic traits required to develop necessary defences. Therefore, plant genetic diversity is the most important environmental factor in agriculture.

In light of the fight to eradicate poverty, it is crucial to understand that plant genetic diversity is what protects poor farming communities from hazards. Three quarters of the world's 1.2 billion poorest people live in rural areas and depend on

traditional farming. They cannot afford to buy expensive seed with fertilisers and pesticides. Besides, these technologies are not adapted to the often fragile environments in which most of the world's poor grow their food.

Instead, the farmers need a range of species and varieties to reduce the risks of crop failure due to drought, pests, diseases et cetera. Their plant varieties are normally genetically heterogeneous, meaning they have many different latent traits. This makes them more robust to environmental challenges and also more adaptable to these changes over time. It is also important to be aware that this diversity provides rural communities with varied nutrition and often plays an important role in traditional life and cultural identity.

Over the past 10,000 years farmers have developed an unconceivable wealth of plant genetic diversity. They identified food and fodder plants in the wild, domesticated them, selected the best seeds according to preferences, developed the strains, and exchanged seed over short and long distances. The result: more than 7,000 plant species used for food and up to several hundred thousand varieties within some of the oldest species adapted to all sorts of environment and human needs. However, during the past 100 years approximately 75 % of food plant varieties have disappeared due to the modernisation of agriculture.

Today just a few high-yielding genetically homogeneous varieties are grown at large scale, wiping out untold varieties of crops. This was done to increase food production to feed the world's ever growing population, partly with great success. But, because at the beginning of agricultural modernisation there was basically no awareness of the need to maintain crop genetic diversity, few precautionary measures were taken. It was already too late for many varieties by the time gene banks were established. Besides, gene banks are only a supplement to the maintenance of crop genetic diversity in farmers' fields. Not only may seeds lose their traits over time when regenerated outside of their original environments, but the related knowledge is often lost as well when the crops disappear from the fields. Gene banks have also eroded due to electricity shortages, lacking capacity and poor maintenance. Gene banks and farmers' sustainable use of plant diversity in the fields are complementary measures: both are needed in the battle to save and further develop our crop genetic heritage.