

Erosion of domestic biodiversity

European view

Definition and perception

Domestic biodiversity embraces all the varieties and races established by man. Varieties of wheat, fruit, vegetables, poultry and all domesticated species in general. A distinction is made in this respect between three levels of diversity:

- Interspecific diversity, i.e. the diversity of species domesticated and cultivated by man. It developed extensively in Europe in the past. Following the discovery of the Americas by Europeans, the latter adopted species of American origin such as potatoes, tomatoes and maize. Generally speaking, few species grown or cultivated by Europeans have been domesticated on European territory. The Middle East has been by far the place of primary domestication which has provided Europe with most species. However, the Chinese area has made a very important contribution towards enriching the number of species cultivated in Europe, particularly when it comes to fruit trees.
- Intraspecific diversity, a term which covers the different varieties which man has established within the same species. The diversity of varieties of apples, for example.
- Finally, intervarietal diversity, i.e. diversity within the same variety, among the individuals of which it is composed.

Current risks as regards domestic biodiversity

Most analysts agree that a great erosion of biodiversity is taking place at three levels.

- At the specific level, wheat, maize, rice and soya are tending to spread to the detriment of other crops (lupins, field beans, chestnuts, etc.). Cultivation of certain species has virtually disappeared or almost disappeared at one stage.

- At intraspecific level, the disappearance of varieties even within widely cultivated species is an established and even rapidly developing phenomenon. At world level, the FAO considers that in 1949 China had 10,000 varieties of wheat. By 1970, it only had 1,000 and it is suspected that erosion has increased even more since then. In the USA, of the 7,098 varieties of apples that were used between 1804 and 1904, 86% have disappeared. For cabbage 95%, for maize 91% for peas 94% and for tomatoes 81%. The European continent has obviously not been spared either. When it comes to milk, for instance, one race of cattle, the Prim'Holstein, now accounts for over 60% of milk production.
- Intervarietal erosion is less visible, but perhaps just as worrying. This is the tendency to grow increasingly homogeneous varieties. Populations then consist of identical individuals comparable to clones. Preservation and multiplication of the most "efficient" individuals in each generation, to the exclusion of the others, leads to the gene pool being reduced more and more.

This situation is generally considered to be problematical, with biodiversity being a factor in the resilience of agro-systems.

Controversial solutions

Faced with this situation, Europe has not yet established a consistent policy. There are several tendencies at present. These do not derive exclusively from theoretical arguments but also largely from the balance of force within a sector.

Let us recall briefly the underlying economic issues. According to the International Seed Federation (ISF), in 1998 the total value of the seed used around the world could be estimated at 50 billion American dollars. Of this amount, about 30 billion dollars would be involved in commercial transactions. International trade represents 3.6 billion, i.e. about 7% of world seed production and 12% of the marketed value. In terms of domestic markets, in 2000 seven countries passed the billion dollar mark: the United States (5.7), China (3), Japan (2.5), the CIS (Commonwealth of Independent States), essentially comprised of Russia (2), France (1.37), Brazil (1.2) and Germany (1). Taken as a whole, the European Union represents an internal market of 5.2 billion dollars.

Given the erosion issue and the present economic context, the different options available are as follows.

Counting on other continents

According to this perspective, the European continent would not worry about maintaining a pool of biodiversity. European companies would carry out “bioprospecting” among peasants, particularly in the areas where plants originate. In Peru, for example, 3,000 varieties of potato are still grown. In this way, the genetic progress of European commercial varieties would be achieved by regular crossbreeding with varieties originating in the Andes. It would be the same with wheat or maize. However, as these loans from peasant communities do not involve any payment in return, “bioprospecting” is sometimes referred to as “biopiracy”.

Establishing seed banks or even gene banks

Carrying on from the “collections” created between the middle of the 19th century and 1950, it would be a question of seed banks or, for animals, frozen fertilised eggs. These seed banks would allow biodiversity to be preserved. The most ambitious project in this matter is being implemented by the Norwegian government. They are preserving in the permafrost (constantly frozen soil) of the Svalbar archipelago 3 million samples of seeds of great use to the human race. The Norwegian Prime Minister, Jens Stoltenberg, has labelled it “Noah’s Ark”.

Other projects raised the possibility of setting up gene banks. In these cases, it would be a matter of preserving not seeds but simply genes, or even the “plan” of genes. The genomics would then be able to recreate any variety at any time. However, in the end these projects were never followed up, particularly due to the complexity of the genome and its expression. Nor can there be any guarantees about the possibility of such projects being successfully achieved.

Preservation in situ

Finally, the possibility is envisaged of reconsidering the present means of managing and marketing seeds and plants by involving farmers in their selection and preservation. This marginal vision 25 years ago is tending to gain ground as the only solution that would be effective and fair.

To contribute towards implementation of the convention on biodiversity, the EU introduced a Community programme for the conservation, characterisation, collection and utilisation of genetic resources in April 2004 (EC Regulation No 870/2004). However, a European Directive on traditional varieties is still pending. For the time being, the situation still varies considerably from one country to another.

Regulatory issues behind the different solutions

In fact, the application of each solution corresponds to very different economic models, which has given rise to numerous controversies at national, European or world level. In these controversies, the stumbling blocks are:

- The question of to what extent patents can be taken out on life. Here we understand, in the broadest sense, any claim to own a seed and above all – a fundamental point – its issue. The patent, like the catalogue system, presupposes a precise characterisation of the object or process that is patented (at least in theory). Patenting life or taking out any sort of patent raises ethical as well as technical and commercial questions.
- The question of whether the seed market should be free or controlled, i.e. are farmers free to use seeds of their choice at the risk of buying poor quality seeds or should their choice be limited at the risk of creating monopolies?

This produces four extreme cases:

	Free market	Restricted market
Extensive patents on life	Case 1	Case 2
No patents on life	Case 3	Case 4

- In case 1, the risk is that of moving quickly towards concentration in the sector, but all the same keeping the possibility open for farmers of producing their own seed in their own way.
- Case 2 would allow the concentration of the sector and make farmers an almost captive market.
- Case 3 is rarely envisaged; it is the situation which prevailed until a third of the way through the XXth century and still prevails today in many countries outside Europe.
- Case 4 would correspond to a State-controlled economy in which the State imposes upon farmers the seeds that they are to cultivate. This situation prevailed in the planned-economy countries of Eastern Europe. But it also still occurs in a less coercive manner when development programmes “offer” seeds or the downstream sectors demand a given seed quality.

Matthieu Calame



<http://creativecommons.org/licenses/by-nd/2.0/fr/deed.fr>