

From Genetic Resources to Ecosystems, via Micro-organisms

Analysis

The Challenge of Conserving Local Practices, Knowledge, and the Living World

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When examining initiatives for the conservation of animal, plant and microbial resources, the relationship with local know-how often proves hazy, or even inexistent. Of course, local varieties, breeds and microbial strains constitute biological and cultural assets, the result of an accumulation of knowledge, practices, adjustments and representations. In this respect, the correlation between biology and culture is implicitly contained in the characteristics of the resources in question. But what is the reality of this connection today and how can it be exploited in the numerous possibilities for conserving and managing these multifaceted living resources? Are local knowledge and practices condemned to being simply recorded for storage in the collective memory, or is there a possibility they could be truly activated, thereby contributing to maintaining these resources? What do they really represent? And what is their status and purpose?

The terminology used to describe local plants or livestock breeds masks realities that are sometimes unclear, even for the users themselves. The difference between the concepts of 'local'

*The choice
of terms: local,
old-fashioned
or traditional?*

and ‘old-fashioned’, for example, can be a subtle one, especially where fruit and vegetable species are concerned. The tendency is to connect them or even to fuse them into a single category. However, although local resources are generally old-fashioned, as they tend to have a historic dimension, old-fashioned resources are not necessarily local. Some local varieties — sometimes known as ‘farm varieties’ — may have been distributed at a national or even international level. The same applies to horticultural varieties* (fruit, vegetables or flowers) that are created in a specific place and then distributed at different levels. Cultivated plants have always traveled a great deal and knowledge has followed them, and been adapted and modified. Consequently, the geographical distribution area of plants and animals, and their cultural dimension have often become inextricably intertwined, with the place in which they are found sometimes being enough to give them ‘local’ status. Furthermore, some varieties considered modern may in fact be old-fashioned: Golden Delicious, Granny Smith and *Reine des Reinettes* apples, to name but a few, are over a hundred years old and are distributed over a huge area. In such conditions, is it possible to establish the local character of Limousin Golden Delicious apples, recently awarded an AOC (registered designation of origin), and of the practices associated with their production? The equally vague term ‘traditional’ is used to describe local cultivars*, but also horticultural varieties, most of which were created during the late 19th or early 20th century. The term ‘forgotten’ fruit and vegetables introduces a comprehensive category, which bypasses the ambiguity of using ‘local’ or ‘old-fashioned’, and implies the possibility of reviving these resources. Used to refer to property or a common legacy, both genetic and cultural, the term ‘heritage’ is even more all-encompassing. It also includes the emotional dimension, a vital factor that is generally overlooked, being considered neither operational nor scientific.

Most varieties became local because they were once adopted in an area where they suited the ecological and weather conditions, the soil, the crop cultivation methods available and above all the local requirements. It is quite common to find varieties that are foreign to a particular area but have been integrated locally. Their production has left marks, reflecting their role in the local economy and the collective memory. Local or traditional status, associated with vernacular knowledge, is acquired on site over the years. It is the result of a combination of factors, including social relations, requirements, the technical and emotional contexts and language.

* Glossary: See p. 261.

The challenge of simultaneity

Conserving and managing biological diversity is one thing; connecting this task to local knowledge and practices is quite another. Although there is a vast range of initiatives for the conservation of local resources (for both animals and plants), the importance given to the cultural dimension varies according to the objectives, stakeholders and means involved.

The aim of projects may be storing genes for potential use in improvement or selection programs, demonstrating and explaining, or exploiting one or several products as part of local development activities. The methods and techniques used vary according to their objective: animals, plants, micro-organisms or ecosystems. And within each of these classes are further technical scales directly linked to the biology of the resource (plants, for example, can be divided according to mode of reproduction, allogamy, autogamy and annual or biannual status).

Furthermore, certain categories of living organisms are more suited than others to this exercise, enabling biological and cultural aspects to coexist or even work in synergy. This is the case of fruit trees, which have become the object of significant public and media interest that is showing no signs of diminishing. Their durability makes it easier to manage plantations and means they are at relatively less risk of extinction than other plants. The fact that they accompany humans throughout their lives gives them a relatively solid status and their longevity enables observers to commit to memory a certain number of characteristics. Of these fruit trees, apple trees win all the votes with conservation associations. This is no surprise, given the range of varieties found in the regions of France, their ability to adapt to different conditions, the fact that they are easy to manage within conservatory orchards, their symbolic importance and the popularity of this fruit.

However, it seems that effort has been focused on the easiest and least pressing elements, as this is far from the case for vegetables and cereals, plants that are considered more 'temporary' for different reasons: repeated multiplication cycles, a risk of losing seed with annual or biannual species, or major plant health problems. Knowledge and practices in this case are less stable.

The history of vegetable variety selection clearly shows how the formation of vegetable heritage corresponds to an accumulation of knowledge and practices that is difficult to define. Here, knowledge is primarily professional and old-fashioned or

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*Precision,
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local varieties are often conserved to meet future needs. The same goes for working collections managed by plant breeders and plant improvement specialists, whether public or private: these are first and foremost gene pools used by specialists. Local knowledge — which implies traditional methods of cultivation, use and consumption — and symbolic aspects are rarely documented.

Where animal breeds are concerned, while recognizing local status and ethnozootechnical specificities should pose no problems, conservation methods require a certain level of technical skill, which not everybody has. As for microbial organisms, they interest almost nobody outside the professional sector that uses the strains managed in collections. Clearly in this case technical limits are quickly reached, as microbial strains can only be conserved within specialized structures. But that which is invisible to the naked eye is not impervious to local knowledge and practices, as shown by a significant number of cheeses and fermented drinks. Recreating the microbial ecosystems inherent in certain local cheeses — especially AOC cheeses — is in fact becoming an ever more pressing concern in the dairy food chain, making it necessary to reflect on conservation methods that are inevitably linked with local practices.

Conservation projects are increasingly looking to do more than simply protecting resources from inevitable erosion; they are combining precision, technical skills, visibility and local development. Knowledge and practices relating to living organisms and nature in general are in great demand and can be reactivated and reclaimed by taking these requirements into account. But how? Is there not a risk that development and exploitation projects will focus solely on their practical and usable aspects, thus neglecting all the subtlety and complexity that characterizes them?

Choosing the method

Before tackling conservation and especially exploitation strategies, it is first necessary to identify, inventory, describe and document. In the initial stages — which are often underestimated and taken for granted — this step is of great importance to local knowledge. Documentary sources can be precious. The considerable 19th and 20th century pomological and horticultural works, for example, contain old-fashioned knowledge providing greater understanding of the evolution of fruit, vegetable and flower biodiversity, as well as their geographical distribution.

*The risk of
a break from
social reality*

At field level, this stage implies locating resource persons and sites, and investigating breeding or farming practices, associated customs, symbolism and denominations. The next stage involves sampling and collection. As for the conservation method itself, it is important to decide which is the best option: *in situ**, *ex situ**, or a combination of the two.

In *ex situ* conservation — which takes place outside the natural and cultural environment, usually in collections, botanical gardens or gene banks — it is difficult to manage knowledge and practices as the genetic resources concerned tend to free themselves from social reality and evolution. If such knowledge and practices are taken into account, there is generally no option but to put them away for safe keeping. However, *ex situ* schemes often safeguard specific know-how relating to selection and improvement. This is the case for collections of ornamental plants, for example (dahlias, roses, cannas, etc.), some of which represent an invaluable source of original, historical heritage. If these varieties are attached to a specific place, the data gathered by the gardeners and managers of botanical gardens can also be highly interesting. But it is clear that conservation work in the strict sense of the term is complex, costly in time and money and requires the greatest discipline, leaving little or no room for local knowledge.

Unlike certified commercial varieties, which must meet criteria for distinction, homogeneity and stability, local varieties form genetically heterogeneous populations. They have often evolved within their habitat and adapted under the multiple and complex effects of the pressure of human and natural selection. How does this evolution affect the choice of conservation strategies today? The *in situ* option — conserving resources in their natural habitat — seems more suited to the conservation of these varieties, in that it can reap the mutual benefits of conservation and exploitation. This benefit-sharing is increasingly found in initiatives to revive plant or animal products, whether unprocessed or processed.

Associating conservation with the maintenance of biodiversity and local knowledge is particularly fruitful in the production of local agricultural food and foodstuffs, or *produits de terroir*. These products are generally connected with the animal, plant or microbial world. Processed specialties such as cured meats, cheese and fermented products in general, are often the result of biological processes, and their production relies on various human interventions, such as cultivation, breeding, or fermentation. Technical knowledge and practices have a strong influence

* Glossary: See p. 261.

on their underlying biological diversity. Other factors of varying importance also have a role to play in this process: food habits and organoleptic preferences, local customs, memory (individual, collective, oral or written), symbolism, social organization, the timescale (cyclical, long-term or short-term), land management and exploitation, political and economic parameters, and difficulties accessing the area. Today, combining initiatives for exploiting heritage and reviving animal or plant products (processed or unprocessed), along with the appeal of the protection of geographical indications — registered designations of origin or protected geographical indications — offer the possibility of maintaining local resources and associated know-how in their own habitat. Here, the future of the biological resources involved in local production may depend on their conservation in their natural environment.

In situ conservation becomes indispensable when the aim is to conserve the system itself and the way in which it functions, supported by the knowledge and practices implemented. Traditional orchard meadows* of hardy trees are an example of this, as are bocage landscapes (farmland criss-crossed by hedges and trees), agroforestry systems (such as chestnut groves), agropastoral systems with mountain pastures, or fish farming in wetlands. It is significant that most of these productions have instituted procedures to obtain protected geographical indications: Pays d'Auge cider, Domfront perry, Ardèche chestnuts, Abondance or Beaufort cheese, and carp and other fish from the Dombes region all indicate a trend that appears to be gaining momentum. Geographical indications, which are first and foremost a way of protecting names, work to preserve the resource in question by means of dynamic conservation with an economic outcome. These ethno-ecosystems not only generate well-identified, specific local products, they also perform a range of different roles, such as providing shelter for endangered species, sustaining a variety of wild flora and fauna, and landscaping, etc. Certain productions are supported by complex structures that maintain biological diversity on different levels, from whole landscapes, to local varieties or species, right down to microbial ecosystems.

By definition, these systems fall within a framework of multifunctionality, and this long before the term became indispensable in the world of agricultural administration. To go on existing, they must be conserved *in situ*, which implies taking into account specific knowledge and practices. One solution may lie in establishing agreements with farmers that they will maintain local varieties or breeds, in a context of localized production: this

* Glossary: See p. 261.

*New questions
raised by
sustainable
development*

was done in the Normandy orchard in the 1980s for local varieties used in cider and perry production, and is a process that must be developed.

Continuing with the example of orchard meadows, replotting, storms and changes in farm systems are just some of the hazards that put them at risk and almost got the better of these humanized ecosystems. However, they are currently regaining their position and status in a society that is now seeing them in a new light. Sustaining these systems is dependent on specific knowledge: choosing and assembling varieties; growing standard trees* when most production orchards are now composed of dwarf trees; grafting; and understanding fruits and their biological and technological characteristics. They permit combinations that also produce induced biodiversity, such as multiple productions (grass, milk, meat, dairy products, drinks) and mixed species hedgerows.

A new form of conservation

Neither *ex situ* nor *in situ* conservation is a perfect strategy. The first is based on the implementation of strict protocols and techniques that are not yet fully controlled. The profound changes that have long been affecting agrosystems and the destructuring of traditional farms have weakened the application of *in situ* conservation. However, a third system is emerging, one that takes into account geographical and cultural factors: creating schemes for conserving and maintaining genetic heritage, while implementing exploitation initiatives at a local level.

The concept of sustainable development has returned technical practices and local ecological knowledge to the forefront. It raises new questions about conservation linked to the management of local resources. Conservation is now vital not only to safeguard genes, but also to develop exploitation initiatives. Many projects are currently underway demonstrating that these two roles can coexist and complement each other throughout the living world, from animals and plants to ecosystems and microbial organisms.

But things are not as simple as they appear: there are still many technical difficulties and significant disparities remain between the methods and means of conservation employed by different stakeholders, whether public or private institutions, associations or hybrid structures. Added to this is the complex issue of sustaining financial and logistic means, a vital condition for the viability of any conservation program.

* Glossary: See p. 261.

Reinforcing discussions and exchanges, and sharing ideas, experience and methods for action is the new challenge facing stakeholders. The debate has everything to gain from being extended to the international level, since these issues are clearly far from concerning France alone.

TO FIND OUT MORE:

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