Why the biodiversity crisis concerns humanitarian actors

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In the field, when confronted with a disaster or a conflict, humanitarian actors do not always have in mind the links between humanitarian crises and biodiversity, both in terms of causes and consequences. As 2010 is the International Year of Biodiversity, we felt that it was important to take a look at this issue, which is an essential factor to take into account to improve the quality of aid.

2010 was declared the International Year of Biodiversity by the UN. The two main events are the 15th Conference of the Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (in Doha, in March) and the 10th Conference of the Parties to the Convention on Biological Diversity (in Nagoya, in October) which will focus particularly on the situation in developing countries.

The International Year of Biodiversity is taking place at a time when the majority of scientists believe that we have reached the planet's 6th wave of mass extinction, the last one having caused the extinction of the dinosaurs. The notable difference about this mass extinction is that it has not been caused by a natural disaster, but by one species: Homo sapiens. And yet, our destiny is inseparable from that of the species that surround us. The biodiversity crisis is already the cause of numerous humanitarian crises, and this trend will only get worse in the future.

After outlining why biodiversity and ecosystems are important, we will look at how humanitarian actors, who often have to deal with both a humanitarian crisis and a biodiversity crisis, can take this into account in their programmes.

The notion of 'ecosystem services'

Ecosystem services, that is to say, services delivered by ecosystems, are the benefits that we draw from nature in terms of water supply, food, fuel, materials, but also soil regeneration, climate regulation, etc. This concept was developed by the Millennium Ecosystem Assessment commissioned by the UN in 2000(a), which distinguishes between provisioning services, regulating and supporting services related to natural cycles, and cultural services.[1]

The provisioning services supplied by ecosystems at the individual and local levels are an important *means of subsistence for households*, particularly for the very poor, who are sometimes completely dependent on them. Marine ecosystems are the principal source of protein for more than a billion people.(b) In Central Africa alone, the forest and savannah ecosystems provide more than 2 million tonnes of bush meat (the equivalent of 2.5 million oxen) per year.(c)

At the local and regional levels, ecosystems both *regulate natural cycles* by maintaining local rainfall, maintaining water table stocks, limiting erosion, purifying water, reducing pollution, etc. and *prevent disasters*. These essential functions are sometimes impossible to replace by technological means (either because they are too expensive, or because it is technically impossible).

Haiti is a sad example of the human consequences of damaged ecosystems and the vicious circle which links this damage to poverty. It is one of the most environmentally damaged countries in the world, with less than 2% of its original forest cover remaining. Massive deforestation has had a series of disastrous ecological and human consequences: soil erosion has led to the reduction of arable land; the reduction of evapotranspiration has led to a reduction in rainfall and therefore, irrigation capacity; the bare hillsides are no longer able to retain rainwater and even moderate rainfall now causes devastating flooding; these floods lead to the build up of polluted sediment in the water table and rivers[2]; the build up of sediment in the water prevents the hydro-electric dams from functioning, etc. Haiti is currently one of the poorest countries in the world[3] and the environment continues to be further damaged.(d)

Finally, at the global level, ecosystems are the key factor in *the fight against climate change and desertification*, as underlined in the reports by the UNFCCC[4] and the UNCCD[5].

Ecosystems are indispensible at all levels – local, regional and global. Preventing future humanitarian crises therefore involves preserving ecosystems and the biodiversity that underlies them. Yet, 60% of ecosystem services are currently being damaged or

used in an unsustainable way. The indirect, long-term and collective benefits that they bring are often sacrificed for direct, short-term and private gain. As they are provided free by nature, they are overlooked by classical economic systems.

To illustrate the difficulty of replacing these services provided by nature (for those that are replaceable at least!), their economic value was estimated by a study, *The Economics of Ecosystems and Biodiversity*[6]. This study calculated that the services provided by nature (water purification, prevention of erosion, pollination of plants, etc.) represented 5 000 billion dollars a year. If no action is taken, the loss of biodiversity will cost 7% of global GDP by 2050.[(e)]

From a purely economic point of view, it very often costs less to preserve ecosystems. In Vietnam, for example, the planting and protection of 12 000 ha of mangrove which protects the coast from erosion costs 1.1 M$ per year. But this saves around 7.3 M$ per year in terms of dyke maintenance[(f)]. And how much would a disaster cost if the dykes were not properly maintained? Also to be counted among the benefits of the mangroves are the products which come from hunting and fishing, fuel and materials, etc.

Ecosystem services are particularly important for the very poor, for whom they represent more than 40% of their "revenue" and who do not have any means of compensating for their loss: how can water or construction materials be bought on a market with less than a dollar per day?[7]

The importance of biodiversity for the survival of ecosystems

The importance of ecosystems is now broadly recognised, but much less so that of biodiversity. For example, though it may be clear why a forest ecosystem should be preserved, protecting certain of its constituent parts – antelopes, bats, butterflies or orchids, for example – may appear of secondary importance, particularly in a crisis context.

In reality, biodiversity is a *precondition for the viability of ecosystems*. When a species disappears, it may mean that a flower is no longer pollinated, that a seed is no longer disseminated or that the expansion of a plant or a destructive insect is no longer controlled, leading to a chain reaction which ultimately leads to the deterioration of the ecosystem and the services that it provided before[8]. The metaphor of the aeroplane is a good way of understanding the importance of biodiversity: an aeroplane can continue to fly despite having lost a rivet, then another…until it loses one rivet too many.

Each year, around 40 000 tonnes of Brazil nuts are harvested from the natural forests of Bolivia, Brazil and Peru. This represents a major source of revenue for the castanheiros. For the tree to produce nuts, its flowers need to be pollinated by a particular bee, which itself depends on a particular orchid to reproduce. Seeds are dispersed by agoutis, large rodents, who thereby ensure that subsequent generations of the tree grow. As a result, the extinction of a bee, an orchid or a rodent could lead to the collapse of the Brazil nut industry.[(g)]

Ecosystem services and humanitarian action

Humanitarian actors use ecosystem services in their programmes. For example, when a refugee camp or IDP site is set up, they rely on the nearby forest ecosystem for firewood, construction materials, animals and plants for food or medicine, etc. Numerous nutritional studies have shown how important this wild food is for people's coping strategies.

The use of an ecosystem for humanitarian aid is judicious as long as it is preserved and its services are used in a sustainable manner (that is to say that the rate at which timber, animals and plants are taken is lower than the rate at which they are renewed). But when an ecosystem is damaged by a programme to such an extent that it can no longer deliver these services, the consequences are disastrous. Not only does it mean that the services need to be provided for the beneficiaries of the programme, they also need to be replaced for the local population who also used them.

It then becomes necessary to find alternatives to the products used by the population: heating and cooking energy, building materials, food, etc. Programmes have to compensate for lost regulating ecosystem services: construction of water ponding to replenish the water table, protection of the soil against erosion to preserve farming potential, establishment of nurseries to regenerate vegetation, etc. Certain agencies have been forced to implement programmes to allow this type of resource to be restored in countries affected by chronic conflict. These programmes, which are carried out in addition to those already in place, are often difficult to implement and expensive.

In the north of Eastern Chad, where there is no more timber around the refugee camps, humanitarian actors have to transport fuel, including oil, which is then distributed. But as armed groups covet this resource, the convoys and the storage points need to be protected by armed guards. The distribution of oil is expensive and is dangerous for both humanitarian staff and beneficiaries.[h]

In addition, as the disappearance of ecosystem services threatens people's well-being and livelihoods, it reduces their autonomy, compromises the chances of a crisis resolution and increases the risk of conflict.

In the savannah of Africa, there is a connection between the reduction in numbers of big cats and certain conflicts between crop farmers and livestock farmers. With the disappearance of their predators, large herbivores like antelopes were no longer eliminated when they were sick causing disease to spread to the livestock. This led to significant losses and even famine for the livestock farmers as well as conflicts due to changes in seasonal migration routes.

Habits to develop

Humanitarian actors should be able to rely on ecosystem services to carry out as many tasks as possible, and therefore need to help preserve the environments which provide them.

→ During an operation in a biodiversity rich area, it is in the interest of humanitarian actors to *establish close ties with the Conservation NGOs and institutions* present in the area. WWF, UNEP, UICN, Conservation International, the Wildlife Conservation Society, the African Wildlife Foundation and African Parks are some of the international organisations who work in regions where there are humanitarian situations. Conservation organisations are sometimes perceived to place fauna and flora above human needs. In reality, they are very well aware of the interaction between nature and society, poverty being a major contributor to the deterioration of the environment. Different forms of collaboration and synergy should be explored/developed between humanitarian actors and organisations specialising in biodiversity.

→ During the needs assessment and the project design, humanitarian actors should *include biodiversity in their analysis*. They should identify the existing ecosystem services (by using participatory tools, for example), then try to find out how these are being disturbed or are threatened by the humanitarian crisis, how the humanitarian action might affect these services and what corrective action can be taken. Donors' handbooks often have a section on the environment which includes biodiversity (e.g. World Bank, European Commission)[i]. It may be useful to use an expert in biodiversity in certain cases.

→ It is important that humanitarian organisations aim to *reduce their impact on biodiversity as much as possible* : using certified materials (wood), providing employees with food from sustainable sources[9], using local seeds as much as possible and, above all, keeping in mind the sustainability of resources for all economic recovery activities (e.g. fishing).

→ Humanitarian actors need to *pay attention to the way biodiversity is being used in conflicts* and, if need be, they should inform the authorities and conservation organisations. Illegal international trafficking of animal and plant products is currently the second most important cause of extinction and the third highest source of illegal revenue[10] after arms and drugs.[j] It affects tens of thousands of species[11] and concerns almost every country in the world. In several countries at war, animal trafficking contributes to maintaining conflict and insecurity.

In the Chad-Sudan-CAR region, certain leaders of armed groups benefit from the lucrative illegal trade in ivory which is exported to the Yemen and ultimately Asia (particularly China). Attacks by often heavily-armed bandits sometimes have tragic consequences for the inhabitants: in the north of CAR, several villages have been burned down and their inhabitants massacred.[k]

Exploiting the opportunity provided by biodiversity in programmes

Provisioning ecosystem services provide *numerous possibilities for economic activities* as long as they are socially and economically appropriate and resources are exploited in a sustainable manner. These activities can be put in place to help a local population which has been the victim of a disaster to recover, and can also benefit IDPs or refugees in long term situations for whom income-generating programmes provide a certain amount of autonomy.

Forest ecosystems, in particular, provide many means of subsistence. The *non-timber forest products (NTFP)* encompass all forest products other than tim-

ber, which provide food for humans, fodder for animals, drink, fuel, construction materials, raw materials for medicine or aromatic products, colorants and dyes, utensils, handicrafts, ornaments, clothing, etc.[12]

Focus: Taking biodiversity into account in agricultural recovery programmes.

Seed and tool distribution programmes which are part of humanitarian operations are both an opportunity and a risk for farmers. They are an opportunity in that they can allow them to restart production and they are a risk because they often involve seeds which are bought externally, which can contribute to reducing the biodiversity of crops. There are many cases of this: Somalia, Mozambique, Angola, etc.(l) The current debate about Monsanto providing seeds in Haiti shows how relevant this subject is.

In the majority of traditional agrarian and pastoral systems, agricultural production is based on a very broad agro-biodiversity: farmers use many different vegetable varieties and breed local species of animals. This is not some vestige of outdated practices, but is an integral part of production systems which are adapted to the local context. It is a way of optimising the use of the natural environment's various ecosystems and natural resources. Traditional species, which are the result of selection by generations of crop and livestock farmers, are adapted to non-mechanised techniques and local environments. By contrast, few commercial varieties are developed for these contexts, which are not considered "profitable" enough.

Traditional species are also "free", as selection and reproduction are carried out by the farmers themselves. This is a determining factor in developing countries where many farmers do not have capital to invest. Furthermore, seeds are produced directly by farmers, which means they are not dependent on suppliers, an important advantage in isolated regions or regions where there are crises.

Diversity is itself a form of insurance for the farmer. By increasing the number of species and varieties, the farmer is less vulnerable to climatic and phytosanitary risks. It is the principle of not putting all your eggs into one basket. Production will remain lower on average than the improved monoculture systems, but in the event of drought or some other incident, some of the crops, at least, will produce. This strategy is perfectly adapted to a context where there is little or no money, where agriculture is the source of subsistence and there is no insurance system or system for sharing risks.

The potential of this diversity is all the more important in the context of climate change: faced with a changing environment, agronomists are conducting research into new varieties which are adapted to higher temperatures, which are resistant to drought, flooding, the spreading of certain diseases, etc. Traditional varieties are a precious source of genes.

Agro-biodiversity plays an important role in terms of food security and poverty reduction in regions where there is still traditional family agriculture. Economic recovery programmes based on agriculture should take these principles into account and should pay special attention to traditionally used species and varieties.(m)

What would the planet be like if a great deal of biodiversity was to be lost? There would be far fewer occasions when the natural world filled us with wonder, but above all, this would weaken the often subtle mechanisms which make our planet habitable. Of all the environmental crises (including climate change, pollution, etc.), the biodiversity crisis is perhaps the most worrying of all as it jeopardises the resilience of our environment to current and future crises.

Faced with this situation, there needs to be mobilisation across the board. The mobilisation of the humanitarian sector is particularly important as it is involved in situations where ecosystems are particularly fragile. Taking biodiversity into account is not only a global responsibility, it also contributes to the quality of humanitarian action. It is only in a preserved environment which is rich in biodiversity that current crises can be limited and future crises can be prevented.

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[1] *Provisioning services* include food, water, fuel, materials, medicine and genetic resources; *regulating services* include the regulation of the local/global climate, protection of watersheds, purification of water and air, pollination, pest and disease control, reduction of erosion, flood prevention; and *cultural services* include spiritual and religious experiences and aesthetic, educational and recreational value.

[2] Almost 90% of Haitian children suffer from chronic infections caused by intestinal parasites in drinking water.

[3] More than 60% of its revenue comes from external aid; 65% of the population survives on less than one dollar a day.

[4] United Nations Framework Convention on Climat Change (Rio, 1992).

[5] United Nations Convention to Combat Desertification (Rio, 1992).

[6] *The Economics of Ecosystems and Biodiversity* was commissioned in 2008 by the European Commission and the German government. The cost of services provided by ecosystems is calculated in terms of what they would cost if humans had to provide them. See www.teebweb.org/

[7] Pavan Sukhdev, an Indian economist who coordinates the TEEB study, refers to biodiversity as *the GDP of the poor*.

[8] Ecologists speak of the silent forest syndrome: a forest without fauna is a forest whose functioning will be seriously altered in the medium term. It has been shown that elephants or apes play a primary role in the regeneration of African forests. See *Le rôle disséminateur des éléphants en forêt de Taï.* Alexandre, D.Y., 1978. *La Terre et la Vie,* 32 : 47-72.

[9] On road building projects funded by the European Commission, the companies were obliged to supply the workers with meat, which limited the impact on wild fauna (bush meat).

[10] This market is estimated to have a value of between 5 and 20 billion dollars per year, maybe more.

[11] The list of products involved in trafficking is long: stuffed or live animals, snake skins, precious woods like ebony or sandalwood, ivory, caviar, insects, coral, fur, cacti, orchids, etc.

[12] The classification of these products gives an idea of the wealth contained in a wooded area. Plant NTFPs: food; fodder; raw materials for medicine and aromatic products; colorants and dyes; utensils, handicrafts and construction; ornamental plants; exudates and other plant products. Animal NWFPs: living animals; hides, skins and trophies; wild honey and bee-wax; bush meat; raw materials for medicines; raw materials for colorants; other edible animal products and other non-edible animal products. Source: FAO.

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Nursery, Farchana, Chad

Choosing endemic (native) species is crucial to the success of nursery and plantation programmes. It gives plants the best chance of survival, makes the most of local knowledge and responds to the population's needs most effectively.

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