

Agroecology: developing food systems for environmental and human health

Environmental and human health are tightly interlinked. They are connected in many ways but perhaps the most important one is through food and the so-called food systems. These systems include all processes and people somehow involved in the production of food, its processing, handling, distribution, consumption, and finally discharge of its waste. Each of these stages has an impact on the environment and people. Over the years, this impact showed to be extremely negative, causing water scarcity, air pollution, poor diets and poverty in rural livelihoods. Agroecology appeared to be an internationally agreed approach that helps to identify ways to make food systems work better for people and for the environment.

What does agroecology mean?

Although agriculture and natural sciences might seem to be complicated, once you know the principles, you will easily understand why what is healthy for the environment is also healthy for humans.

There is such a concept internationally known as agroecology. Many people around the world have been doing agroecology without even calling it so or knowing this term but its meaning is reflected in the structure of the word: 'agro' and 'ecology'. It basically means marrying what we know as the science to produce food and the science which shows how natural systems work.

Agroecology, however, is also about traditional knowledge developed and accumulated over hundreds years by farmers, peasants, indigenous peoples who directly manage the land and natural resources while producing food. For this reason, in agroecology scientific evidence and producers' knowledge go hand in hand giving rise to a common shared vision and understanding of what is best for agriculture and food systems.

Traditional knowledge also plays an important role in local culture and food traditions which evolved together with people who developed food habits adapted to their environment and conditions. It gave rise to rich and diversified culinary traditions reflecting the identity of different peoples and nations, where these make a better use of food varieties available to them.

Nature at the heart of healthy food systems

First, food systems are about how food is produced. The two sciences working together show how many people around the world made agriculture similar to what is happening in nature, that is having different plants, insects and animals co-existing in a way, that there is no waste, no excess of toxins, sufficient water, and the system is productive and flourishing. All these processes are called ecosystem services which peasants and farmers have been able to use wisely in agro-ecological systems. These skills and practices make part of the knowledge producers have been creating together to use the potential of their territories and to sustain themselves.

These nature services, however, have been seriously affected over the past decades by conventional agriculture. This approach consists in planting one type of crop on big surfaces of land (monoculture) where machines would gather the yields faster than people would do it manually. Together with synthetic fertilizers and pesticides - products that help to fight weeds, pests and diseases, this approach spread all over the world very fast becoming a common practice. At the same time, overuse of synthetic fertilizers contributed to soil degradation making crops less resistant to pests and diseases. It happened because the soil has a complex community of micro-organisms which all

together create a healthy substrate for a crop to grow. Also, these crops produced in monoculture (and not in combination with other crops, flowers and trees) led to overuse of pesticides which can be toxic not only for pests but also for soil, insects, and can contaminate water. Moreover, the soil in these conditions becomes drier and degrades, losing its fertility.

Pesticides and fertilizers are also known to affect human health both directly and indirectly. For instance, pesticides' residues are often found in food, but also in water bodies and even in the air. They have a tendency to accumulate in the human body causing a variety of diseases. The first group of people who are exposed to these risks are farmers and rural workers who are directly involved in agriculture and handling of food.

Agroecology, however, helps the producers to reduce and eventually fully avoid using pesticides and synthetic fertilizers. It consists of a variety of crops, trees, flowers and animals. It reminds of what we see in the wild – a mix of elements. This diversity and beneficial interactions between these elements create conditions for healthy soil allowing crops to grow stronger, more resistant to floods, droughts but also pests and diseases. Likewise, by reusing leaves and food waste, it is possible to have high yields without the use of synthetic fertilizers which require a lot of energy to be produced in the first place. Lastly, but not least, within such system, fruits and vegetables are able to accumulate more nutrients such as proteins, vitamins and other micro-elements making them more valuable for the human diet. As a result, agroecological systems are more beneficial for nature but also for producers' and consumers' health, while offering a variety of food with higher nutritional value.

Healthy food systems also mean a healthy relationship

Agroecology is not only about plants, animals, water and soil, or how humans interact with the environment. It is also about humans interacting with each other. After food is produced, it needs to be sold. It can be sold directly to the consumer or through intermediaries. And how it happens makes difference to the environment.

The more packaging and the more transport we use to get this food to the consumer, the more energy is consumed, and more greenhouse gas emissions are released into the atmosphere. However, when we buy food from resellers, we do not know much about its producers, and as more intermediaries there are, less of its final value goes to the producer. Also, through direct interaction, we build relationships with the producer based on trust. There are examples when such trust would make organic certification unnecessary due to the established relationship between consumers and producers, sometimes developing into agreements like cropsharing – when the consumers subscribe to the harvest of a certain farm or group of farms. Both share the risk of farming and agree on a price that is fair for both sides. For instance, the price that consumer pays includes the production costs and the profit that producer gets from the selling. If producer can reduce the costs, the final price for food can be lower while producer gets the same profit. One way to lower costs is to reduce the use of synthetic fertilizers which producer would usually buy. Instead, together producer and consumer can create a common system for doing compost. Consumers can collect the remains of food separately from other waste and make compost out of it. Called by some producers black gold, it reduces their costs of production, but it also reduces greenhouse gas emissions, pollution as well as the use of synthetic fertilizers so damaging for the environment. It helps to close the cycle as it usually happens in nature where nothing is wasted. All this makes consumers more aware and knowledgeable about the sustainability of their food systems, but even more importantly, more empowered.

Knowledge being at the heart of agroecological systems is something that connects producers for a better and more efficient production on one hand and connects producers with academia and experts on the other. By being closer to producers, these can easier exchange knowledge and experience –

something that will help them to solve better common problems. That is how, for example, farmers can learn from each other which crop varieties can resist better to drought or pests and diseases. At the same time, science can help to organize better the existing knowledge while helping producers to keep improving their systems, for example by making a faster transition to fully organic agro-ecological production. As in agroecology producers try to imitate nature, science can help identify new opportunities for producers to apply in their systems. That can be a certain combination of plants, flowers, trees. This co-creation of knowledge creates healthier relationship between scientific community and producers, making them work together not only for healthier food production but also for healthier ecosystems in which farms are embedded.

In this sense, farmers and peasants are not mere food producers, they are land stewards who manage natural resources in a way that while offering us food, they keep the system in good health. This is also crucial in a broader context as it could help better integrate farms into the landscape helping to restore nature and many species of plants and animals which have been continuously disappearing over the past decades.

Overall, agroecology and its principles can provide a solid base for what we know as food systems. Through a more united society, trust and closer relationship between each other and with nature, it can help us achieve the common goal - food systems which keep the environment and people healthy.

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