EUROPEAN COMMISSION ON AGRICULTURE (ECA)

Forty-first Session

Budapest, Hungary, 1-2 October 2019

Agroecological food system: an innovative approach to plant health

Side Event 3

Tuesday, 1 October 2019

13.00 – 14.00 hours

Plenary meeting room

Background/objective

Nyéléni Food Sovereignty Movement in Europe and Central Asia (Nyéléni ECA) is a political and social alliance of grassroots, community based movements and organizations, representing small-scale food producers: peasants/small farmers, pastoralists, indigenous peoples, small-scale fisher people, agriculture and food workers; and supporting constituencies, such as urban poor; rural and urban women's and youth organisations; consumers, environmental, justice, solidarity, human rights organizations; community-based food movements, which politically respect the 6 principles of Food Sovereignty as agreed at the First Nyéléni Food Sovereignty Forum and sign up to the Nyéléni Europe Declaration from 2011.

We, small-scale food producers, who are right-holders and the most affected by agriculture and food-related policies and unsustainable food systems believe that true roots of agroecology lie in the ecological rationale of indigenous and peasant agriculture. For agroecologists, a starting point in the development of new agricultural systems is the very systems that traditional farmers have developed and/or inherited throughout centuries. Such complex farming systems, adapted to the local conditions, have helped small farmers to sustainably manage harsh environments and meet their subsistence needs without depending on mechanization, chemical fertilizers, pesticides or other technologies of modern agricultural science. Guided by an intricate knowledge of nature, traditional farmers have nurtured biologically and genetically diverse smallholder farms with a robustness and built-in resilience necessary to adjust to rapidly changing climates, pests and diseases, and more recently to globalization, technological penetration and other modern trends.

Agroecology combines indigenous knowledge systems about soils, plants and so on with disciplines from modern ecological and agricultural science. By promoting a dialogue of wisdoms and integrating elements of modern science and ethno-science, a series of principles emerge, which when applied in a particular region take different technological forms depending on the socio-economic, cultural and environmental context.

Agroecology does not promote technical recipes but rather principles:

1. Enhance the recycling of biomass, with a view to optimizing organic matter decomposition and nutrient cycling over time

2. Strengthen the "immune system" of agricultural systems through enhancement of functional biodiversity — natural enemies, antagonists, etc., by creating appropriate habitats

3. Provide the most favourable soil conditions for plant growth, particularly by managing organic matter and by enhancing soil biological activity

4. Minimize losses of energy, water, nutrients and genetic resources by enhancing conservation and regeneration of soil and water resources and agrobiodiversity

5. Diversify species and genetic resources in the agroecosystem over time and space at the field and landscape level

6. Enhance beneficial biological interactions and synergies among the components of agrobiodiversity, thereby promoting key ecological processes and services

Thus, agroecology is not an agriculture of inputs but rather of processes. In order for the technologies derived from the application of principles to be relevant to the needs and circumstances of small farmers, the technological generation process ideally must result from a participatory or farmer- led research process in which farmers along with researchers provide input into the research questions and the design, running and evaluation of field experiments.

Worldwide, small farmers maintain no less than two million crop varieties and about 7,000 animal breeds in some 350 million farms. Many traditional agroecosystems are located in centres of crop diversity, thus containing populations of variable and adapted land races as well as wild and weedy relatives of crops. Cycles of natural hybridization and introgression often occur between crops and wild relatives, increasing the variability and the genetic diversity of seeds available to farmers. The presence of these plants in peasant agroecosystems may represent progressive domestication.

Many farmers plant multiple varieties of each crop in their fields and regularly exchange seeds with neighbours. The resulting genetic diversity heightens resistance to diseases and other biotic stresses and enhances the nutritional diversity available to rural populations. Researchers have shown that the use of within-field crop genetic diversity reduces disease severity, and this method has been used commercially in some crops.

A salient feature of traditional farming systems is their degree of plant diversity in the form of polycultures (also known as intercropping or companion planting) and/or agroforestry patterns. Unfortunately, agricultural intensification has led to considerable losses in habitat diversity with great effects on the occurrence of general biodiversity. When we have monocultures, we need to start to apply external inputs and increase management intensity, because monocultures lack biological diversity, which plays key ecological roles. Monocultures can be conventional or even organic, which would still require inputs, where botanical pesticides substitute for chemical pesticides. In a natural forest, there is no need for these interventions, because all the organisms interact to form a self-regulating system. Monocultures are extremely vulnerable to pests, diseases and climate change and have contributed to the great famines in history, for example, in Ireland and India, where genetically homoge-

neous agriculture failed. Most major crops are genetically uniform and very vulnerable to pests and disease (as well as climate variability). This has given rise to an addiction to pesticides. Chemical pesticides do not work eventually because insects and weeds develop resistance, so we have to develop new pesticides and apply more; this is called the "pesticide treadmill". In fact, the advancement of monocultures is altering global agricultural landscapes and the ecosystem services they provide. Clearly, restoring landscape diversity can enhance biological control of insect pests in agro-ecosytems.

In many regions, mixed crop–livestock systems are the backbone of peasant agriculture. In well-integrated systems, locally adapted races of livestock provide draft power to cultivate the land and manure to fertilize the soil, and crop residues are a key feed resource for live- stock. Resources (crop residues, manure, power and cash) produced in such systems benefit both crop and livestock production, leading to greater farm efficiency, productivity and sustainability. Clearly, the complex and diverse food webs of microbes, insects, predators and associated crop plants promote a number of ecological, social and economic services that are beneficial to farmers and local communities.

A community of organisms in an agro-ecosystem becomes more complex when a larger number of different plant species are included, leading to more interactions among arthropods and microorganisms, components of above and below-ground food webs. As diversity increases, so do opportunities for coexistence and beneficial interference between species that can enhance agro-ecosystem sustainability. A more complex community typically exhibits more stable production and fewer fluctuations in the numbers of undesirable organisms.

On the other hand, agroecological systems are designed with an emphasis on the adaptation and application of the principles in accordance with local realities. For example, in one location soil fertility may be enhanced through worm composting, while in another location it might be through planting green manures. The choice of practices depends on such factors as local resources, labour, family conditions, farm size and soil type. This is quite different from the type of commercial organic farming, common especially in Northern countries that is based on recipe-like substitution of toxic inputs with less noxious ones from approved lists, which are also largely purchased off farm. Many of these alternative inputs have become commodified; therefore farmers continue to be dependent on input suppliers. In addition to increasing costs, many products used for one purpose affect other aspects of the system. Thus, farmers become trapped in an "organic treadmill." Gliessman (2010) argues that farming systems must be redesigned based on a new set of ecological relationships. This entails approaching conversion as an ecological transition of agriculture based on notions of agroecology and sustainability.

We also need to develop such strategies not only to enhance the ecological resilience of farming systems but also enhance social resilience (the ability of groups or communities to adapt to external social, political, or environmental stresses), which must go hand in hand with ecological resilience to achieve sustainability. To be resilient, rural societies must have the ability to buffer disturbance with agro-ecological methods adopted and disseminated through self-organisation and collective action. The vulnerability of farming communities depends on the development of the natural and social capi-

tal that gives small-scale farmers and their systems resilience against climatic (and other) shocks. This adaptive capacity resides in a set of social and agro-ecological conditions that influence the ability of individuals or groups, and their farms, to respond to climate change in a resilient manner.

** The text is based on the book "**AGROECOLOGY SCIENCE AND POLITICS"** by Peter Rosset and Miguel Altieri, 2017, Published by Fernwood Publishing and Practical Action Publishing*

Key messages/expected outcomes

- Plant health has to be dealt with a systemic approach. The approach based on intensive use of only chemical pesticide has clearly failed. The global food production system is broken as we are destroying the very base of agriculture with unsustainable practices.
- Sustainable food systems based on agroecology are the basic strategy to assure a healthy environment for the plant and this also guarantees healthy and nutritious food for all. Agroecological practices encourages synergism so that the agroecosystem may sponsor its own soil fertility, natural pest regulation, and crop productivity.
- Agroecological methods are more resilient to the impacts of climate change and have a high mitigation potential.
- A systemic approach enables small-scale food producers to improve plant health, while reducing costs, and the pressure on environment and improve overall well-being of the smallholders. This approach can enhance the opportunity to find innovative solution based on the different knowledge of food producers and also with the contribution of the researchers.
- A governance model with full participation of all the actors involved is key in occasion of outbreaks of pests to find resilient solutions.

Language: The language of the side event will be English

Provisional Agenda

Moderator: Olcay Bingöl, European Coordination Via Campesina (ECVC)

Side event coordinator: Olcay Bingöl, ECVC

Speakers:

Ministry of Agriculture (Name TBC)

European Agroecology Knowledge Exchange Network (EAKEN): sharing experience to build Agroecology in ECA: a systemic approach to plant health (Name TBC)

Academia: New approach on sustainable plant health strategies (Name TBC)

Carolina Starr FAO REU: Agroecology, the ten elements approach in plant health

Andrea Ferrante, Schola Campesina: The case of *Xylella fastidiosa* outbreak's and a new governance model to address emergency