Improving skills for Smartfarming as an innovative tool for rural development and economic growth

SmartFarmer

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Learning objectives/outcomes

This section is intended to help the readers to use all the knowledge that they will accumulate from Unit 11: to address complex real life issues related to sustainable Ecoagriculture, and be linked to real life practitioners in the field.

Estimated duration

The estimated learning duration for this unit is 90 minutes.

Summary

Unit 11 starts by providing a background and context for Ecoagriculture. The main chapters combine theory with general approaches and information for eco-friendly cultivation practices.

The ultimate objective of Unit 11 is the learner (farmer) to fully understand that his/her production to be economical, competitive and sustainable should be ecological. This approach is one of the basic key aspects of Smartfarmer’s training program.

All parts of Unit 11 are applicable in a Pan European level.
Learning (reading) resources

**Defining Ecoagriculture**

Agriculture is an integral part of the new complex rural landscape. Each landscape has its own social construct, and of course the territorial identity. These are the assets of a landscape.

**AGRICULTURE** in the training material includes all methods of modifying natural ecosystems, through nurturing of domesticated species of plants and animals, for the production of goods and services for human needs.

**Biodiversity** consists of the diversity of life on Earth, species of animals, plants and microorganisms and the genes that contain, and the ecosystems that enhance this diversity.

**Ecoagriculture** refers as a holistic approach to ecologically and socially responsible land use, represents a vision of rural communities managing their landscape and resources to jointly achieve three goals:

- Enhance rural livelihoods;
- Conserve or enhance biodiversity and eco-system services;
- Develop more sustainable and productive agricultural systems;

The core of this ecological-based farming is ensuring that business or agricultural activity is consistent with the natural functions of ecosystems. Thus, farmers will no longer depend on costly chemicals and artificial pest control.

The term "eco-agriculture" was coined by Charles Walters, economist, author, editor, publisher, and founder of Acres Magazine in 1970 to unify under one umbrella the concepts of "ecological" and "economical" in the belief that unless agriculture was ecological it could not be economical.

"To be economical agriculture, must be ecological."

Eco-agriculture is both a conservation strategy and a rural development strategy.

**The ecological agriculture as a key to competitiveness**

The main concern of stakeholders representing typically innovative agricultural operations is to increase agricultural productivity and profits, despite the conservation of biodiversity (Walters and Holling, 1984).

Antle and Pingali (1994) showed that pesticide use had a very negative effect on farmer health, that farmer health had a positive effect on productivity, and that there were likely to be social gains from a reduction in insecticide use in Philippine rice production.
Nowadays, farmers should be targeted on both **economic and environmental performance** of the agricultural value of their holdings. Main objectives of this direction is to try to optimize the management of natural resources, enhance the resilience of farms, and encourage the diversification of agricultural products and biodiversity.

The implementation of the new Common Agricultural Policy (CAP) at European level is in this direction, so it can be "effective for the environment, feasible for farmers, and acceptable to society. This ‘greening’ of CAP, with 30% of direct payments to farmers (Pillar 1), and 30% of payments for rural development (Pillar 2) used as a reward and incentive for ecoagricultural practices".

**Integrated Ecoagriculture** approaches seek to jointly achieve -at a landscape scale- three critical elements:

- Enhanced rural livelihood;
- More sustainable agricultural productive systems (crops, livestock, forests, fisheries); and
- Protected or enhanced biodiversity, including genetic resources, ecological communities, ecosystem services, wild flora and fauna.

Making ecoagriculture work requires a favorable institutional environment, suitable financing and good dissemination of information (Mishra, 2013). According to Mishra (2013), "to boost real agriculture development, it needs to develop biodiversity reserves that":

- Benefit local farming communities;
- Develop habitat networks in non-farmed areas;
- Reduce land conversion to agriculture by increasing farm productivity;
- Minimize agricultural pollution;
- Modify management of soil;
- Modify farm systems to mimic natural ecosystems.

**Sustainable Agriculture**

Sustainable agriculture is a complex issue associated with producing food, while maintaining the biophysical resources including soil, water and biota with no adverse impacts on the wider environment.

It should:

- Maintain or improve the production of clean food;
- Maintain or improve the quality of landscapes, which includes soils, water, biota and aesthetics;
- Have minimal impact on the wider environment;
- Be acceptable to society.
Concerns of Eco-friendly sustainable agriculture

The Agenda 21 for eco-friendly cultivation practices includes:

Water quality and quantity concerns
Issues here include leaching of nutrients and pesticides, water extraction and drainage and flooding. Contamination of both ground and surface waters caused by high levels of production and use of manure and chemical fertilisers is a serious problem, particularly in areas of intensive livestock or specialised crop production.

Air quality concerns
The issues here are emissions of ammonia and greenhouse gases. At EU level for example, agriculture is responsible for about 8% of total greenhouse gas emissions but due to the pastoral nature of Irish farming, the proportion here rises to 30%.

Biodiversity concerns
Issues include genetic, species and ecosystem diversity. The intensification of agriculture has led to widespread reduction of species and habitats.

Landscape concerns
The marginalisation of agricultural land can lead to its abandonment if farming ceases to be viable. Alternatively, intensification of agriculture can lead to the loss of important landscape features such as hedges and ponds, the enlargement of fields and the replacement of traditional farm buildings with industrial structures.

Soil erosion concerns
Overgrazing particularly in mountain areas has led to the erosion of vegetation cover with the consequent loss of soil, the silting of rivers, etc.

Food safety and animal welfare concern
There is concern about the consequences for the quality and safety of the food supply of the increasing use of pesticides and drugs, as well as the consequences of introducing genetically-modified organisms.
Eco-friendly approaches

Mishra’s eco-friendly approaches (Mishra, 2013) are as:

A. Organic farming

Organic farming is a production system, which avoids or largely excludes the use of synthetically compounded fertilizers, pesticides, growth regulators, and livestock feed additives. To the maximum extent feasible, organic farming system rely upon crop rotations, crop residues, animal manures, green manures, off-farm organic wastes, mechanical cultivation, mineral-bearing rocks, and aspects of biological pest control to maintain soil productivity, to supply plant nutrients, and to control insects, weeds, and other pests.

*Nature will always be there to lend a hand.*

B. Biological farming

Biological farming allows the use of selected chemical fertilizers (avoiding disruptive materials such as anhydrous ammonia and potassium chloride) and adopts low-input approaches to use of herbicides and insecticides.

C. Nature farming

Nature Farming parallels organic farming in many ways but includes special emphasis on soil health through composts rather than organic fertilizers, when possible.

In addition to the above methods-based approaches to sustainable farming, regenerative agriculture and permaculture are widely recognized. However, these latter systems, like sustainable agriculture, are more conceptually oriented than methods-based.

D. Regenerative Agriculture

In regenerative agriculture bunds on nature’s own inherent capacity to cope with pests, enhance soil fertility, and increase productivity. It implies a continuing ability to recreate the resources that the system requires. In practice, regenerative agriculture uses low-input and organic farming systems as a framework to achieve these goals.

E. Permaculture

Permaculture is concerned with designing ecological human habitats and food production systems, and follows specific guidelines and principles in the design of these systems.

*Remember “To be economical agriculture, must be ecological...”*
Case Study 1

Ecoagriculture: An Ecological Model for Agriculture in France

In France, the new draft law for agriculture, food and forestry goes beyond greening. It promotes the transition to an ecological model of agriculture. In future, farmers will have to meet the twin objectives of economic competitiveness and environmental performance.

It is expected that 50 per cent of farms will be so transformed over the next 10 years. As well as improving economic performance, this ecological model of agriculture (agro-ecology) seeks to optimize the management of natural resources, strengthen the resilience of farms, and encourage diversification and biodiversity.

Economic and Environmental Interest Groups (GIEE) will be created to accompany this transformation. These groups bring together farmers, researchers, advisors and others to make agriculture more innovative, competitive and ecological. By creating such groups, farmers will benefit from increases in agricultural support payments.

This new law implies a change in strategic priorities for investment support. Future priorities could include incentives for:

- reducing or optimizing the consumption of farm inputs,
- management of manure and slurry,
- improving self-sufficiency on the farm and diversification of production systems,
- enhancing organic nitrogen, particularly through anaerobic digestion,
- improving the health status of livestock,
- production of renewable energy, and
- optimisation of working conditions on livestock farms.


Case Study 2

A Growing Movement for Ecoagriculture

“We believe that mobilizing a movement of diverse stakeholders inspired and committed to ecoagriculture and the improvement of rural livelihoods together with preservation and restoration of ecosystem services will build synergies and achieve globally significant benefits for food security, human health and nutrition, poverty alleviation and environmental sustainability.”

Nairobi Declaration on Ecoagriculture, 1 October 2004

Ecoagriculture Partners, an international NGO, was formed to catalyze strategic connections, dialogue and joint action among key actors at local, national and international levels whose work is essential to develop and scale up Ecoagriculture systems. These include: community-based organizations, farmers’ organizations, conservation and agricultural NGO’s, international
research organizations, Universities, private sector companies, inter-
governmental organizations and public agencies.

The goal of Ecoagriculture Partners is to lay the institutional foundations for scaling up Ecoagriculture. This work program responds to recommendations made by Ecoagriculture innovators from 46 countries who participated in the International Ecoagriculture Conference and Practitioners’ Fair in Nairobi, Kenya in 2004.

Collaborative activities aim to enhance understanding of Ecoagriculture through research and documenting practice; build the capacity of Ecoagriculture innovators by linking communities and institutions worldwide; and promote strategic institutional, policy and market changes at national and international levels that support Ecoagriculture.

Ecoagriculture Partners approaches have received growing recognition from the agriculture, conservation and rural development sectors, and have been endorsed by a number of international policy processes and dialogues as a valuable strategy for achieving the Millennium Development Goals:

- Agricultural think-tank Agriculteurs de France (SAF), (2013);
- United Nations Millennium Project (Task Forces on Hunger, Water & Sanitation, Environment, 2005);
- Millennium Ecosystem Assessment (2005);
- Nairobi Declaration on Ecoagriculture (2004);
- Community Shamba Recommendations on Mobilizing Ecoagriculture (Nairobi, 2004);
- International Biodiversity Conference: Science and Governance (Paris, 2005);
- 1st World Congress of Agroforestry (Florida, 2004);
- Community Commons Declaration (New York, 2005).

Adapted from: Jefrey A., et. al. (2001), Common ground, Common future: How ecoagriculture can help feed the world and save wild biodiversity, The World Conservation Union (IUCN), (www.ecoagriculturepartners.org/reports.htm)

Case Study 3

RIVERLAND DAIRY BIO FARM LTD

Established in 2004, Riverland Dairy Bio Farm is the first of its kind in Cyprus to breed, using organic feeds and practices, sheep and goats for producing certified organic milk based products. The farm is currently based at Psimolofou village, close to Nicosia and its organic pasture land occupies an approved area of more than 25 hectares around the main farm. Riverland Farm is certified organic by an independent certification body and conforms to all EU legislation requirements (regulations 2092/91 and 1840/99). This means that the animals are grazed in certified organic land and their dietary needs are supplemented by certified organic, GMO free, feed pellets. Animal health and welfare is achieved by applying strict hygienic practices at the farm level which include the use of modern technology equipment and a low
animal population per m² of grazing land. Hence, preventive actions are
central in practicing organic farming and minimise the need for medical
intervention. A combination of factors ensures that the farm can consistently
deliver organic milk and meat of the highest quality, free from chemical and
antibiotic substances.

Milk processing is contracted out to a regional cheese processor and
logistics are well monitored so that the organic milk does not mix with
conventional milk supplies. The whole production and processing chain is
inspected by an independent certification body, approved by the EU which
carries frequent checks from the farm premises to the end product.

The farm is owned and run by Mr Vasilis, an experienced vet characterised
by his young and energetic enthusiasm for promoting organic practices
beyond his farm. Despite many setbacks, he remains a devoted scientist in
training other farmers in the practices of organic farming and teaching the
long term benefits that can be offered.

Riverland Bio Farm along with his contracted processor produces a range of
traditional milk products, supplying the local market through a chain of
organic retail shops. With a gradual expansion of the farm output, the
company has recently embarked in the export trade, beginning with the highly
nutritious organic kefir shipped to the Greek market in substantial quantities.
Additionally, the farm has started a small scale activity of organic poultry,
producing certified organic eggs of the highest quality.

Commitment to healthy food production in a sustainable way

Biofarm is committed to the production of clean nutritious traditional milk
based food using organic farming principles, which according to the company
"are based on the consideration for the health and welfare of consumers, the
animals in their care, and the environment we all live in."

Adapted from: http://www.cyprusfoodndrinks.com

Exercise/activities

From your knowledge of this section, please provide brief responses to each
of the following questions:

1. Define briefly the meaning of Ecoagriculture.

2. Can Ecoagriculture convert into a lever to enhance the competitiveness of
   the agricultural sector?

3. The term "eco-agriculture" was coined by Charles Walters, economist,
   author, editor, publisher, and founder of Acres Magazine in 1970 to unify
   under one umbrella the concepts of "ecological" and "economical" in the
   belief that "unless agriculture is ecological it could not be economical". Do
   you support Walter's concept. Name and describe the reasons why.
4. How can ecological agriculture fail its purpose? In your opinion which are the directions for the effectiveness of an ecoagricultural system?

5. Name and describe all eco-friendly cultivation practices that are included in the Agenda 21.

6. Sustainable agriculture is a complex issue associated with producing food, while maintaining the biophysical resources including soil, water and biota with no adverse impacts on the wider environment. In your opinion, how can this complex issue be accepted by the agricultural society?

Bibliography


