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ORGANIC SEED PORTFOLIO IN CLIMATE CHANGE

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SEEDS SAVER IN AGRICULTURE: CURRICULUM FOR TRAINERS

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INTRODUCTION:

In the initial phase of the project implementation, we focused on producing training material to create the Organic Portfolio Survival Kit for VET trainers. It contains the guidelines to recognize local organic seeds in partner countries and is a methodological guide for trainers in the agricultural field.

Then we tested all training material and developed this Curriculum For Seeds' Saver Trainers, including learning unities examples. It identifies the key issues to protect local agricultural biodiversity by preserving old local seeds.

This curriculum aims to give local farmers an entrepreneurial perspective on the reproduction of old agricultural seeds. It becomes an instrument of local biodiversity and the surrounding environment safeguard. The training material developed according to work-based/learning methodology is also useful for the self-training approach.

This Seeds saver in agriculture training’s curriculum objectives are to improve the skills and competencies for VET trainers on:

- How to increase the competencies for farmers in the protection of seeds
- How to create training models that take biodiversity and climate change into account.
- Basic knowledge to train a seed savers
- How to involve the local agricultural community in autochthonous seeds saving and process of custody implementation

HOW TO PROTECT BIODIVERSITY

Biodiversity in agriculture includes ensuring the right soil fertility structure, pollination of crops, prevention of soil erosion, adequate nutrient flow and good irrigation.
It influences the biological stability and sustainability of ecosystems, which are more resistant to abiotic and biotic stresses. Biodiversity also protects against crop failures, pest attacks, plant and livestock diseases.
Thanks to biodiversity, the farmer can achieve higher and more stable yields, the products are also of better quality and the use of pesticides can be reduced.

The most important and undeniable function of agriculture is food production. Not only does the food have to be of high quality, but in producing it, care must be taken to protect the environment and biodiversity and to care for the natural landscape.

Agricultural production draws primarily on the resources of the environment, soil, water, air and biodiversity. This is why it is so important to ensure that they are preserved in the best possible condition, which in the long term will ensure higher soil fertility and productivity in agricultural ecosystems, high pollination of crops and biological protection of plants and soils against erosion.
Components of biodiversity science are already being introduced into the learning outcomes of agricultural schools. of education. Familiarity with environmental and biodiversity issues is expected to lead to an increase in environmental awareness.

HOW TO PREPARE TRAINING MODELS THAT TAKE BIODIVERSITY AND CLIMATE CHANGE INTO ACCOUNT

The main purpose of the training modules is to develop the ability of participants to prepare and deliver training events on applied biodiversity conservation, based on a sound foundation of practical skills and knowledge. The future trainers will learn about developing the competencies of protected area staff to assess, manage and monitor important elements of biodiversity (species, habitats, and ecosystems) in order to achieve the conservation objectives of protected areas, including relevant Natura 2000 sites.

IT HAS TO PROVIDE TO PARTICIPANTS:

Technical knowledge and skills related to practical, applied biodiversity conservation. This work has to include an extensive component of practical fieldwork as well as:

- Background concepts and principles related to biodiversity conservation;
- Practical methods for conducting biodiversity assessments and evaluations.
- Key measures for maintaining the conservation of representative and threatened species, habitats, and ecosystems.
- Practical and replicable techniques for monitoring species, habitats, and ecosystems and the impact of management measures.

Skills in training: Participants learn through demonstration and practice a range of techniques for training others in what they have learned. They acquire skills in developing, managing, and assessing learning programs. Participants learn a range of practical skills for preparing and delivering training and learning programs and events and continued learning in the workplace.

Course objectives: by the end of the course, participants will have: an understanding and knowledge of the range of practical techniques managers can use to ensure the favorable state of the biodiversity in the areas for which they are responsible. **A good awareness of the minimum content** of a training program that addresses the capacity development needs for protected area staff engaged in applied biodiversity conservation.

BASIC KNOWLEDGE TO INCLUDE IN THE COURSE TO TRAIN A SEED SAVERS

MODULE 0

- Specific Goals
- Know the anatomy of flowers and fruits.
- Distinguish sexual and asexual reproduction in plants.
- Classify the fruits according to their type.
- Classify the seeds according to their type.
- Understand the factors that influence seminal production.
- Identify the advantages and disadvantages of seminal production

SEED SAVER TRAINING COURSE PROPOSAL:

UNIT 1

General part:

- The general guidelines of Community policies on the safeguarding of agricultural biodiversity and development tools at the national level
- Policies in support of agricultural biodiversity in partner countries.
- The community regulatory framework (community regulations and implementing rules) and opportunities for farmers who use organic seeds
- The conversion of the farm and the territories to organic farming
- The service and support systems for companies that want to use native seeds
- Research activity in the organic seeds sector
- National and regional funds
- Use of technological platforms
- Acquisition of teaching materials and audio/video documentation
- Consultation of sources

BASIC CONTENTS

BIOLOGY OF SEEDS

1. General notions of biology and reproduction.
   Flower and fruit anatomy
   Sexual and asexual reproduction in plants
2. Types of fruits and seeds.
   Simple fruits or multiple fruits
   Dry fruits or Fleshy fruits
   Dehiscent fruits or Indhiscent fruits
   Albuminous or exalbuminous seeds
   Monocotyledonous Seed or Dicotyledonous Seed
   Amylaceous, aleuro-amylaceous, oilseeds, aleuro-oilseeds seeds
3. Main factors of seminal production
   Seed Quality
   Numbness
   Moisture Content
   Temperature
   Gases
4. Advantages and disadvantages of seminal prodution

UNIT 2

SPECIFIC CONTENTS:

- Fertility of soils, organic matter, and humic balance
- Conservation techniques of agroecosystem biodiversity and seeds
- Organic plants production
- The techniques of "green defense" of crops
- Specific content part II:
- Organic animal production
- Biological transformations
- The alternative distribution channels

UNIT 3

SPECIFIC CONTENTS :

- The service and support systems for companies that want to use native seeds
- Research activity in the organic seeds sector
- national and regional sources of funding
- Use of technological platforms
- Acquisition of teaching materials and audio/video documentation
- Consultation of sources
- Internship in farms minimum 24 hours
- This internship will be developed on the basis of the survival kit guidelines and practical exercises
- Testing phase : the test is carried out by completing intermediate questionnaires and a final interview.
- Didactic material: Survival kit for trainers developed by this partnership ; Europe Community sources normative and national publications of biological technician; lecture notes and videos developed by the project.

HOW TO INVOLVE THE LOCAL AGRICULTURAL COMMUNITY IN AUTOCHTHONOUS SEEDS SAVING AND PROCESS OF CUSTODY IMPLEMENTATION

The seed system used in most traditional farming is based on the local production of seeds by the farmers themselves. Farmers consistently retain seed as a security measure to provide a back-up in case of crop failures. They always store seeds for three main purposes: consumption, sale and seed stock (for sowing in the next season).

Farmers practice seed selection, production, and saving for informal distribution of planting materials within and among the farming communities. Seed production in most cases is non-specialized. It is an integrated production of field crops, roots and tubers for consumption and marketing. This traditional seed supply system is an important backup to overall agricultural crop production. It is mainly based on the farmers' varieties with the exception of cases where the seed system depends on improved or introduced crop varieties. Usually, dependency on introduced varieties is created by the displacement of farmers' own varieties.

Farming communities have implemented conservation methods known to the formal sector as ex situ (off-field) and in situ (in-field) conservation strategies. They have been preserving or conserving their local crop types and varieties in gardens, back yards, fields and in their traditional storage facilities.

The farm household includes small stores (clay pots, gourds, underground pits, etc.) that represent a “de facto” ex situ conservation system that is probably more dynamic than the conventional one at a formal gene bank.

Traditional agro-ecosystems are sources of expertise for a sustainable, diversity based agriculture. Many species little known to science or industrial technology are still being managed by local communities.

These all together form a complex of dynamic communal gene bank systems. Endangered plant species as well as economically and ecologically useful crop types are usually included in the system as part of the community-managed environmental protection and species conservation schemes. Such species may include various wild trees, shrubs and grasses of traditional use to the communities as food, feed, medicine and sources of materials for fuel and construction.

Seeds are planted in the fields, i.e. on the same farm or in neighboring areas where it acquired its distinctive features. It is also frequently exchanged among farmers and communities to be planted across regions differing in agro-ecological conditions.

Local management includes also work on seeds diversity. Diversity provides security for the farmer against diseases, pests, drought and other stresses. It also allows farmers to exploit the full range of the region's highly varied micro environments differing in characteristics such as soil types, water availability, temperature, altitude, slope, and overall fertility.

Maintenance of diversity both within and among species is, therefore, crucial to supporting and developing agriculture that is ecologically sustainable and helps local communities cope with the challenges of climate change. This is especially true for smallholder farmers practicing agriculture under low-input conditions on difficult, often degraded lands.

DESIGN A PROGRAM AND A PLAN BASED ON THE AGRICULTURE IN SITU CONSERVATION APPROACH

For most farmers, sustaining their livelihoods and enhancing their quality of life has always been based on cultivating a variety of crops, trees and wild plant species, livestock, and aquatic species. As an economy and the environment are changing, its capacity to adapt and respond to these changes increases with the use of multiple species and varieties. A few major crops constitute the bulk of food security globally, and as a result of climate change, a limited number of varieties of these crops are becoming less and less reliable, raising concerns about the nutritional security and income security of farmers in the face of these declining prospects. In this section we address the role of on-farm/in situ conservation of crops.

A key process for effective in situ/on-farm conservation is the empowerment of farming communities, which facilitates the process of public participation in the decision-making process regarding gene resource management at a local level. Managing biodiversity in situ/on farms based on community-based management can provide a number of benefits

Implementation of biodiversity management approaches will require conducive policy environment in order to be truly effective and sustainable. Some relevant recommendations on how to best proceed towards a viable in situ/on – farm conservation system are also proposed.

The implementation of biodiversity management approaches requires an enabling policy environment to be genuinely effective and sustainable. We share some pertinent recommendations towards a viable in situ/on-farm conservation system.

WHAT IS AN EXAMPLE OF IN SITU CONSERVATION?

In situ conservation is the protection of biological resources by preserving them in the natural ecosystems in which they are located. Examples; National Parks, Reserves, Nature Reserves, Biosphere Reserves, Sacred Valleys, etc.

What is the main purpose of in situ conservation method?

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What are the benefits of in situ conservation?

A major advantage of in situ conservation is that entire ecosystems are protected, not just one specific species. Therefore, environmentalists believe it is more effective. Not only do they help species thrive, but they also support the habitats in which they thrive.

UNEP (1992) defined in situ conservation as “the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated and cultivated species, in the surroundings where they have developed their
distinctive properties”

In order to understand the role of in situ/on-farm conservation of agricultural biodiversity in the wake of climate change, it is also important to understand how communities have been using diverse types of plants and animals in integrated production systems to adapt and cope with climate change effects.

There are two ways: first, seed selection by farmers over seasons exerts selection pressure on populations of genotypes through the criteria used by the farmers to select the seeds and through the environment (Harlan, 1992).

Second, new genetic diversity is introduced into the farmer‟s seed system through the introduction of new varieties or new selection and introgression of genes from hybridization with wild species or varieties.

New varieties enter the farmer seed system through social seed network and exchange of seeds with other farmers, seed from local markets or from the project or commercial enterprises (Sthapit and Rao, 2009; Almekinders & Louwaars, 2002).

This system is very dynamic and integrated to cope with all kinds of pressures.

The common strategies used by farmers and communities to manage vulnerability caused by climate change are listed in following points:

Maximize the use of NUS as genetic resource base (buffer) for managing adversity and to cope up with changing climate scenario

Capitalize/ maximize the use of diversity-ecosystems", and species diversity integrated farming system (home gardens, livestock, aquaculture, perennials, bee keeping etc)

Maintain intra-specific diversity to cope with environmental and economic adversity (e.g.maintain richness in staple crops to cope with vulnerability)

Adopt farmer-to-farmer seed/planting materials exchange system (informal seed system) as a social seed networks to ensure local level community based adaptation strategies and enhance access to locally adapted genetic resources for unpredictable climatic situations Farmer selection from available or introduced or introgressed diversity to adapt local situation.

CONCLUSION

Saving old local seeds and fostering their protection is teamwork. Trainers, trainees, local farmers and institutions must cooperate to preserve the ancient seed biodiversity of each country. It very important is to awareness of people working in the agricultural sector to upgrade their skills and competencies in organic agriculture management

We hope that with this work we can contribute and do our parts in this crucial matter of Vocational and Educational context

PARTNERS

EUROPEA Slovakia

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