

Environmental Education Strategy in Local-Knowledge- Based Agriculture through Service Learning

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2.1. Environmental Education Strategy in Local-Knowledge-Based Agriculture through Service Learning

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Abstract

Agriculture based on local knowledge is an agricultural activity performed by our ancestors which did not solely oriented to economic interests. Therefore, in generating their products our ancestors did not rely on external inputs such as chemical fertilizers, pesticides, herbicides, hormones or quality seeds. In the current modern world local-knowledge-based agriculture has been adapted and developed under the title of organic agriculture or sustainable agriculture. The key feature of this agricultural system is to work harmoniously with nature so as to meet mankind's need for healthy food. In other words, organic agriculture is designed to become a farming system that follows the principles of nature in establishing a balanced agroecosystem in order to benefit the land, water, air, vegetation and all existing living beings in it (including nuisance organisms), as well as providing healthy comestibles. The principles of organic agriculture are based on: 1) the principle of health; 2) the principle of ecology; 3) the principle of justice; and 4) the principle of preservation.

Service Learning method (SL) includes: survey, preparation and planning, live in, reflection, and mini workshop. One of the important benefits of SL for students is as a very constructive learning to develop their soft skills, which they do not get in the classroom, and in particular as a means to increase their awareness of the great value and sacrifice made by organic farmers in preserving the environment. For organic farmers, it is expected to inspire them to be more enthusiastic in reducing the negative effects on the environment and to improve their welfare and quality of life in their work and efforts.

Keywords : *Local knowledge, organic agriculture, service learning*

1. Introduction

Agriculture has been the economic pillar of Indonesians since ancient time, when agriculture was carried out to meet the basic demands of life without being oriented towards economic interests (e.g., the sale of farming products). Farm produce such as rice, vegetables and livestock come from farmers' lands that have not been treated with chemical fertilizers, pesticides, herbicides or quality seeds. Farm produce was therefore carried out, while preserving the environment at the same time, to provide for the farmers and their families.

In time the development of farming system has abandoned local knowledge and is no longer based on the concept of nature, consequently production declines and crops fail.

At present agriculture in Indonesia has been increasingly directed to mechanization and intensification of agriculture through the use of chemical fertilizers and pesticides as an effort to achieve maximum production results, subsequently having adverse impact on the quality of land and other natural resources in the long term. In addition to contaminating the soil, the use of pesticides also produces residuals poisons on plants, poisons farmers who have direct contact with the pesticide, and if food produce by this farm is consumed regularly it will result in accumulation of chemicals inside the consumers' bodies which will eventually interfere with the consumers' health.

The application of an agriculture system based on local knowledge and is able to maintain natural resources as well as to keep up the development of agriculture is a practical solution towards a sustainable agriculture management system. It is not solely to create a profitable product for farmers but also to maintain the continuity of current natural resources. The only alternative to restoring the continuation of agricultural land is by organic farming, that is, back-to-nature farming, which does not use any chemical fertilizers or pesticides.

Organic farming or more widely known as sustainable farming is an agriculture system that is based on local knowledge and is particularly directed to maintain existing natural resources. It is capable to fuse and harmonize the relationship between humans and their environment without destroying each other and is able to fulfill any social need from surplus farm production. Sustainable farming, however, never declines both economic and technological aspects as long as it is conducted wisely particularly within ecological considerations. In general organic/sustainable farming has the following characteristics: 1) economically profitable, 2) possessing ecological insights, 3) possessing social justice, 4) humane and able to appreciate local culture, and 5) adaptable.

Service learning (SL) for student is intended to improve the learning systems through active participation, as a good opportunity to apply the skills and knowledge they have acquired in real life, broaden the horizons beyond the classroom, and is able to reflect on their experiences and works. For partners, in this regard the Organic Farmers, we expect they have the spirit to play a role in reducing the negative impact on their environment and to improve the welfare and quality of life in their work and business.

Every step in the product lifecycle, from raw material extraction to final disposal, places the burden on the environment. This study therefore considered a service-learning project that could help mitigate the impact, like planting a vegetable garden to supply your school cafeteria and then turn leftover food scraps into compost. The resulting compost could even be put back to help the vegetable garden grow (Edina, 2013).

Through environmental science project areas like this, youths will have the opportunity to learn and gain life skills, then use their new-found education and skills to improve their community through service learning (Schulz, 2012). The role of Higher learning is equated with ethical and honorable behavior and acceptance of the notion that the privilege of education also carries with it responsibility for the welfare for those not so privileged (Berry et al., 1999).

According to Flemming (2009) in Widianarko (2012) education is critical in the promotion of sustainable development and improving the capacity of people to address environmental and developmental issues. Education is also critical in achieving environmental and ethical awareness, values and attitudes, skills and behavior coherent with sustainable development, and for effective public participation in decision-making. Ward (1999) in Widianarko (2012) even stated that these two fields (environmental studies and service learning) have a natural fitness. The combination of these two is frequently referred to as Environmental Service-Learning (ESL) (Madigan, 2000). Through this amalgamation, the notion of community is broadened, no longer limited to human community but also embracing natural community. Furthermore, it is stated that through ESL students can see more clearly the impact of environmental neglect and witness the implications of policies at the grassroots level. ESL's more promising practices may include: (1) encouraging youth leadership and decision-making; (2) integrating and valuing community voice; (3) fostering civic stewardship; (4) providing opportunities for cross-cultural connections; and, (5) planning for the long-term sustainability.

Principles of Organic Farming on Health and Environmental Sustainability

a. Principles of Health

Organic agriculture should sustain and enhance the health of soil, plants, animals, humans and the earth as an indivisible whole. This principle suggests that the health of individuals and communities cannot be separated from the health of ecosystems; healthy soil will produce healthy plants that can support the health of animals and humans. In particular, organic agriculture is intended to produce high-quality and nutritious foods that support health maintenance and welfare. Bear in mind though that organic agriculture should avoid the use of fertilizers, pesticides, medicines for animals and food additives that can affect the health farm (Jaker PO Indonesia, 2005; IFOAM, 2005).

b. Principles of Ecology

Organic Agriculture should be based on ecological systems and cycles of life. To work, to emulate, and to strive to protect ecological systems and cycles of life. Organic management must be adapted to the conditions, ecology, culture and local scale. Ingredients intake should be reduced by reuse and recycle and efficient management of materials and energy in order to maintain, improve and protect the quality of the natural resources. Also in this principle should also be prudent in the use and management of water and soil. In practice organic farming should also be able to maintain clean air conditions and take advantage of existing biological diversity (Jaker PO Indonesia,2005; IFOAM, 2005).

c. Principles of Protection

Organic agriculture should be managed carefully and responsibly to protect the health and welfare of current and future generations and the environment. The perpetrators of organic agriculture are encouraged to increase efficiency and productivity, but they should not endanger the health and well-being of the farm. Consequently, new technologies and methods that already exist need to be assessed and reviewed. Science is needed to ensure that organic agriculture is healthy, safe and environmentally friendly. Organic agriculture should prevent significant risks by adopting appropriate technologies and rejecting unpredictable technological consequences, such as genetic engineering. The use of additives and supplementary substances must be limited in processing operations (IFOAM, 2000; IFOAM, 2005).

2. Method of Service Learning

Selection of Students as participants

Student recruitment was conducted through an announcement by the Dean of Agriculture Faculty. The success of the recruitment was also supported by the fact that it was integrated in lectures under the subject of Organic Agriculture System.

a. Investigation and Survey

Organic farming farmer groups were first identified and surveyed, in order to establish an organic farm where the groups could conduct service learning activities. Further exploration on the needs of the community/farmer groups, as well as requirements for their selection, are based on the following criteria: relevance to the curriculum, urgency of the interests, and capabilities of the resources.

b. Preparation and Planning

Activities included in this stage are initiating collaboration with partners and making a schedule for the implementation of service learning activities with said partners. After that a debriefing lecture on the topic previously established was held and participants were divided into groups. Each service learning group appointed a group leader. Finally, lecturers and students worked together to make work programme.

c. Live in

Student stayed at the combined farmers' garden and students were divided into groups of 5 or 6 each. Activities shared with the farmers include: cultivating the land, planting seeds, watering, maintenance, eradicating pests and plant diseases, harvesting, packaging and marketing. All activities avoided any residues of synthetic chemicals, both in the soil and water and the use in the planting process. Students also practiced creating their own seeds, bokhasi fertilizers, and natural pesticides. All activities were carried out using simple tools such as hoes, yells, and buckets. The activity was interrupted every one week for evaluation and assessment by the field supervisor based on the organic farmers' philosophy, that is: be patient, diligent, hardworking, honest and animated.

d. Reflection

After of the live-in activities were completed, the next stage was reflection activity. Basically the guide directed the students to reflect on three things: 1) recollection and sharing of what students had done during the study and during SL activities, 2) awareness, especially related to life as a (organic) farmer, of the difficulty and nobleness of the farmers' struggle in caring for their life and environment, and 3) commitment to support, implement and develop organic farming systems in their respective regions. The resulting joint commitment by the students was a strong desire to popularize organic farming in their respective areas, as they had become increasingly aware that organic farming system not only produces healthy food but can also save the earth from damage.

e. Mini Workshop

Mini-workshop activities are the activities of *service learning* exposure by students to local/farmers.

3. Result

Results of the implementation of Service Learning (SL) by sharing participants are summarized in Table 1.

Table 1 Results Activities Service Learning

Activity	Result
1. Investigation and Survey: exploring the needs and advantages of partners	<ul style="list-style-type: none"> ✓ Universities connected with the community.
2. Preparation: debriefing and planning program	<ul style="list-style-type: none"> ✓ Educating participants about the importance of Local-knowledge-based agriculture to health and environmental sustainability ✓ Critical and logical thinking
3. Live in: cultivation and post-harvest	<ul style="list-style-type: none"> ✓ Acquiring new skills by working directly with the public ✓ Increasing understanding of academic material ✓ Working with the community to help the participants aware of the strengths and weaknesses in person ✓ Understanding that Local-knowledge-based agriculture is not just a concept in text books but must be applied in everyday life ✓ Improving soft skills such as team work, communication, leadership, self-confidence, sense of responsibility ✓ Service learning is a very enjoyable activity
4. Reflection	<ul style="list-style-type: none"> ✓ Increasing empathy and awareness of participants on the weak ✓ Participants can learn, see, feel and appreciate the problems and the difficulties faced by the community ✓ Increasing student awareness of the values that made farmers sublime, particularly in preserving the environment and health food ✓ There was a shared commitment to the development value of Local-knowledge-based agriculture
5. Mini Workshop	<ul style="list-style-type: none"> ✓ Getting feedback and suggestions valuable as stock if they decide to work primarily in agriculture ✓ Encouraging participants so they are able and willing to try to open up business opportunities; participants are no longer looking for work (Job Seeker) but are capable of creating business opportunities (Job Creator)



(a)



(b)



(c)



(d)



(e)



(f)



(g)



(h)

Fig. 1. (a) Land cultivation and Planting seeds, (b) Visitation from the monitoring team, (c) Vegetable harvest activities, (d) Weighing and Packaging, (e) (f) The cleaning process and process of draining, and (g) (h) Reflection and the real development of organic farming to community

4. Conclusion

From the service learning activities that have been performed it can be concluded that:

1. For students, service learning activities are a learning method that is particularly useful for developing soft skills, which they did not get in a classroom learning, and increasing students' awareness of the values that made s farmerublimes, particularly in preserving the environment and healthy food

2. Service learning activities have been integrated into the curriculum especially in FP-UKWK so that they are easier to implement, despite being a new learning method.

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