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Empowering Farmers Through Innovation in Plant Clinic Development

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Abstract: This service aims to increase farmers' knowledge of how to control pests and diseases of rice plants by developing a plant clinic in Sumber Village, Trucuk District, and Klaten Regency. So that farmers have increased knowledge and capacity in dealing with the problems of controlling pests and diseases of the rice plants they manage. The community service method is counseling and direct interviews with the Association of Farmers Groups (GAPOKTAN) "Rukun Tani" at the village level. GAPOKTAN "Rukun Tani" consists of 3 farmer groups, including (1) Sumber Rejeki Farmer Group, (2) Sido Makmur Farmer Group, and (3) Margo Mulyo Farmer Group. Previously, there was a Plant Clinic in Sumber Village, but currently, the existence of the Plant Clinic is not developing, so one of the essential problems for GAPOKTAN Rukun Tani is to develop the existing Plant Clinic so that all members of the Farmer Group in Sumber Village can reuse, Trucuk District, Klaten Regency.

Keywords: Plant Pests, Plant Clinics, Farmer Groups

Introduction

In the past decade, rice pests have had many adverse effects on farmers, one of which is the occurrence of crop failure experienced by farmers due to pests that attack farmers' rice plants (Nurhijjah et al., 2019). Based on data from Klaten District, it is one of the areas that has a reasonably large rice field in Figures (2020) The area of Sumber Village, Trucuk District, which is 158.9 Ha, of the total area of Trucuk District in 2019 covering an area of 3,380.6 HaThe area of rice fields in Sumber Village is 103.0 Ha of the total area of rice fields in Trucuk District, which is 1,908.9 Ha. Sumber Village is a characteristic of rural areas, where in the region, most people's economic activities are as farmers, both rice farmers and crop farms. The total population of Sumber Village was 3,754 people per year in 2019, compared to the total population of Trucuk District, which is 81,715 people. The average rice production produced by GAPOKTAN Rukun Tani is 700 tons/harvest.

Figure 1. Existing Conditions of Community Service Locations-PPDM 2022

Crops in Indonesia are susceptible to pest explosions and disease epidemics. Various pests and pathogens have and are attacking a variety of essential crops (Somowiyarjo, 2021). Blast disease in rice has also experienced an unusual and alarming development; from 2001 to 2012, there was a sharp increase in the area of infested crops, up to 12 times (Saragih et al., 2021).

Many previous studies have examined pests of plant diseases; the first research was conducted by Field (Prihatiningrum et al., 2021); this study examines pest and disease control techniques for chili plants in Kebonlegi Village, Kaliangkrik District, Magelang Regency. Most farmers use chemical and technical controls, while biological and organic controls are less applied. Commonly used pesticide active ingredients include mancozeb 80%, Azoxystrobin, diphenoconazole, Abamectin, Spinetoram, methoxyfenozide, and cipermethrin. The lack of knowledge and interest of farmers in organic and biological control is an obstacle to controlling pests and diseases of chili plants. The second study was conducted by (Siregar, 2023). It discusses pest and plant disease control, especially using vegetable pesticides and integrated pest control (IPM) approaches. The journal also discusses other pest control methods, such as biological and physical. Furthermore, the third study was conducted by (Bayu et al., 2021). This study discusses the effectiveness of the entomopathogenic fungus Beauveria bassiana in controlling various insect pests in plants, including studies on its efficacy, mode of work, production methods, and applications. Beauveria bassiana shows potential as a biopesticide for environmentally friendly pest management.

Some studies focus on pest control techniques, while there is still a lack of studies that discuss the innovations that farmers must do in dealing with the spread of pests in agriculture; therefore, this research focuses on how to empower the community in innovating by develop plant clinics, to empower farmers, so that farmers have increased knowledge and capacity in dealing with problems pest and disease control of rice plants that they manage.

Research Method

Location of Activities

Community empowerment activities in empowering Plant Clinics were carried out in Sumber Village, Trucuk District, Klaten Regency with the Association of Farmer Groups (GAPOKTAN) "Rukun Tani" consisting of 3 farmer groups, including (1) Sumber Rejeki Farmer Group, (2) Sido Makmur Farmer Group, and (3) Margo Mulyo Farmer Group, with 60 farmers present.

Method of Activity Implementation

The method of implementing activities is based on the results of problem identification during site surveys. Through the results of this identification, the method of implementing farmer empowerment activities is divided into two methods of approach, namely:

1. Extension activities are available to farmers who are members of GAPOKTAN "Rukun Tani."
2. Technical guidance on strategies to strengthen the capacity of farmers in Sumber Village, Trucuk District, Klaten Regency.

Site Survey and Program Socialization Phase

Preparations began in December 2021 through a survey of locations. The Head of GAPOKTAN "Rukun Tani" Sumber Village, Trucuk District, Klaten Regency, and other GAPOKTAN members received the location survey. At this stage, a process of identifying problems and identifying the extent to which partners need capacity-building activities through community service activities.

Problem Analysis Stage

Based on the survey results, it can be identified as follows:

1. Farmers who join GAPOKTAN "Rukun Tani" have organic farming activities. They maintain agricultural cultivation without using chemical fertilizers in the onslaught of agricultural cultivation that relies on chemical fertilizers to increase agricultural output;
2. Farmers often find problems in the form of pests or plant diseases in the agricultural commodities they manage;
3. Farmers hope that there will be activities that can re-empower the Plant Clinic in farmer groups to increase farmers' capacity to manage their farms.

Program Preparation Stage

The program preparation stage is carried out based on the results of deepening the identification of problems faced by farmers in Sumber Village, Trucuk District, Klaten Regency, together with the head of GAPOKTAN "Rukun Tani" and several other members, adjusted to the needs of service partners to facilitate, and assist farmers in increasing their capacity.

Program Implementation Phase

In January 2022, an extension and socialization process was carried out on (1) Counseling on the types of pests that are often experienced by farmers in rice and crop commodities, which the local Agriculture Office will deliver, (2) Training and socialization for farmers on how to overcome pests of plant diseases that they can do themselves using pest exterminators that are friendly to the environment and that they can quickly obtain at local locations, so that the output of this activity is that farmers can produce simple and applicable technology-based pest control products (3) Empowerment for farmers how to utilize and develop the existence of existing Plant Clinics in Sumber Village, Trucuk District, Klaten Regency through Community Development-based Institutions.

The material provided was in the form of slides, and papers were distributed to all local farmers. The material provided is in the form of:

1. Types of pests, symptoms caused, and how to control rice plant pests.
2. Types of diseases that appear include symptoms of the disease, pathogens that cause disease, factors that affect the development of the disease (its epidemiology), and how to control the disease of rice plants.
3. The discussion was in the form of questions and answers given in two directions, asking several problems that arose in the field, including how to grow crops and produce rice plants.
4. Farmers can independently carry out pest exterminators of plant diseases that they cultivate using materials they can easily find around them.

Program Monitoring and Evaluation Phase

Monitoring and evaluation activities were carried out in May 2022. This activity aims to identify the obstacles community service partners face and the progress of activities, as well as measure the success of community service programs in Sumber Village, Trucuk District, and Klaten Regency.

Result and Discussion

Farmers in Sumber Village, Trucuk District, and Klaten Regency often face pests and diseases. Pests are organisms considered detrimental to causing physical damage to cultivated plants and becoming enemies of farmers (Balang, 2021). A disease is a form of abnormality in plants that disrupts the physiological functions of plants that farmers cultivate (Avivi, 2021).

In overcoming these problems, through this community service activity, we, together with farmer groups, do not want to remain silent and try to deal with these problems. Plants are the same as humans, so if humans are sick or have body disorders, they will visit the clinic. This also happens to plants, so the term plant clinics is the main goal for farmers if the plant is in a disturbance or abnormal.

In the implementation of community service activities, it is divided into two stages,

namely:

1. The first stage is an explanation of the activities carried out during the training and an explanation in the form of practical material from the training. This training was implemented in 7 meetings, which were divided into three activities: introduction, implementation, and closing. Recognition activities are carried out by explaining the activities to be carried out and providing tools to use. Implementation activities are related to the practice of implementation and closing activities in the form of closing activity events. The training implementation stage is carried out in several activities.
2. The second stage is the evaluation stage. In this stage, the implementer evaluates the plan with the realization of implementation. Also, the obstacles that occur and solutions that can be implemented should be evaluated.

Figure 2 Farmer Group Empowerment Socialization Activities in Plant Clinics

In previous observation activities, farmers complained about fertilizer problems that were still a problem and had always been discussed for years but still needed solutions. The existence of fertilizer subsidy schemes cannot boost agricultural output. The purchase price of fertilizer and the selling price of farm products are different, and farmers' income is still in the prosperous category; this condition is very different from factory workers who work in local locations. On the other hand, the use of organic fertilizers at affordable prices still needs to be in demand by farmers because there is no qualified agricultural technology support, especially since the millennial generation is not interested in entering agriculture. Hence, those in this sector are generally over the productive age. So, in addition to the need for socialization for farmers about the importance of knowing the types of plant diseases that farmers often encounter, there is also the need for farmers to be given training in making organic fertilizers. So that farmers' knowledge and empowerment will increase and they can overcome commodity problems that are managed independently.

Figure 3. Plant Clinic Introduction

Figure 4. Cultivated vegetable plants

Crops in Indonesia are susceptible to pest explosions and disease epidemics. Various pests and pathogens have and are attacking a variety of important crops. In the last five years, epidemics of dieback disease (the cause is still debated) in cloves have been reported in Central Java, East Java, and Sulawesi. Blast disease in rice has also experienced an unusual and alarming development; namely, from 2001 to 2012, there was a sharp increase in the area of infested crops, which is up to 12 times (Marwoto & Taufiq, 2017).

Figure 5. Pests that Attack Plants

Figure 6. Making Organic Fertilizer from Household Waste

Soemenaboedhy et al., (2022) Mentioned problems that often arise by farmers, among others, namely: (1) the bargaining position of farmers is generally weak because farmers lack access and market information, (2) conventional production activities do not see market opportunities or have not done agribusiness, (3) the institutional function of farmer groups has not run optimally. Therefore, institutional strengthening is needed to increase farmers' knowledge, capacity, and empowerment (Nusantara & Badrudin, 2020; Tanziha, 2011).

A plant clinic is a forum or place where interactions or services to the community related to various plant disorders occur. It is a forum for the primary distribution of information results – information about plant system management. A plant clinic is a center for investigating and diagnosing a plant health problem and a forum for distributing information about its control (Sains et al., 2005). The plant clinic is also a source of information about the problems faced by farmers, as well as a place to develop diagnostic techniques. Plant clinics also have roles and functions, such as connecting farmers with field experts. Become the center of plant clinic investigation and primary provider of surveys of crop problems and farmers' needs. The plant clinic is also a place for teaching staff and students to deal with pest and disease problems in the field (Kementerian Pertanian, 2016; Sadono, 2008)

Plant clinics are carried out in official bodies, either formed by the government or private parties or by community groups with facilities and infrastructure that mark and can help solve various problems faced in agriculture. The plant clinic has essential roles, such as clients and plant doctors. Clients have a role in a plant clinic, namely people or farmers who have problems with their cultivated plants, so they come to the clinic to find

information about the cause of the problem and how to overcome it. In addition to clients, plant doctors also have an essential role. Plant doctors can come from academics, plant disease pest researchers, or the government from the local agency.

Plant clinics are established to serve farmers who have problems with crop disorders. So it is hoped that these problems can be overcome immediately and production levels can be optimized, which will create an increase in the capacity of farmers to independently manage the plants they cultivate with plant clinic staff (Huda, 2021)

In addition, many things can be done in the plant clinic. It can provide services to the community and give much knowledge in the form of analyzing plant samples attacked by pests or diseases and making wise decisions and recommendations about the problems clients face. The Plant Clinic's role in the village is to empower homemakers to manage household waste, which can be used as organic fertilizer (Wijayanti et al., 2024). In addition, this activity program also found the enthusiasm of homemakers during the activity and was able to practice making organic fertilizer independently. This training provides new knowledge and skills for the Group.

Plant clinics are a form of empowering farmers through strengthening farmer institutions, including (1) Increasing human resource capacity and strengthening farm capital, (2) Models of empowering farming communities through strengthening farmer institutions, creating a social situation or climate, strengthening the potential or power of farmers and protecting them from all their weaknesses (Edy, 2018).

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The plant clinic has a meaningful activity that is mandatory and consistently done namely sampling; the sampling process is usually carried out by clients who have problems. Then, farmers will bring samples of plants affected by pests to the plant clinic to get information. Furthermore, identification is carried out by plant clinic officers, and samples brought by clients will be recorded accurately. Then, after identification, the plant clinic staff asked for a few days to observe the sample, which began to be isolated. After isolation, the next stage is reisolation. The next stage is a purification of the sample so that officers can find out various things related to the problems faced by the client. After the purification stage, the recommendation becomes the next stage, which is a decision containing recommendations on various effective control techniques after knowing the cause of the abnormality of a plant.

Thus, to strengthen the capacity of farmers, many parties are needed, both from academics and central and local governments. Together with the community, collaborate to provide solutions to farmers' problems, especially in the context of controlling pests or plant diseases. The role of local governments is to initiate and facilitate the implementation of empowerment in collaboration with social institutions, universities, and herbalists to conduct socialization, counseling, training, and assistance on herbal plant cultivation and processing. Empowerment programs are essential to increase motivation, understanding, and community skills in cultivating and processing herbal plants to improve socio-economic welfare and support the development of health clinics (Suswanto & Adi, 2021).

Conclusion

The activities of this community service program aim to include (1) providing socialization of the types of pests that attack plants, (2) socializing the importance of the role of Plant Clinics in Villages, (3) providing skills training for farmers in increasing the capacity of farmers in the context of making organic fertilizers. The targets to be achieved in this activity are: (1) farmers can understand the types of pests that attack plants and know how to solve them, (2) farmers realize the importance of the existence of Plant Clinics in the village so that farmers more easily control and control pests that attack plants and (3) farmers and surrounding communities can make organic fertilizers that are obtained easily around their homes, that is, it comes from household waste. This activity benefits farmers and the local community, especially women, as it allows them to be more independent, empowered, and able to utilize waste from home into fertilizer that benefits plants.

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