

Introduction of Integrated Pest Management Practices in Urban Farming in Mataram City During the Covid-19 Pandemic

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Abstract: The outbreak of the COVID-19 pandemic has encouraged people to adopt a healthier lifestyle and at the same time carry out a number of environmentally friendly activities such as urban farming. Besides helping to guarantee the food security aspect of urban areas, urban farming also helps create green open spaces. Even so, urban farming also has a negative impact, if it is carried out with a system that is not wise and effective, such as it can cause increased noise pollution, air pollution, flooding, water wastage, and even potential as a breeding ground for mosquitoes that transmit various diseases. Therefore, it is necessary to educate the public about various aspects needed in the implementation of urban farming, one of which is how to implement Integrated Pest Management (Known as PHT). The method used in this activity is the Action Research Method by applying the Participatory Action Program approach from the participants through discussion, and group work in all activities. The results of group discussions at KWT Bunga Matahari, and other urban farming groups in Kekalek and in Ampenan show that the majority of urban farming communities are very interested in developing various types of fresh vegetables and fruit in their yards as part of the Department of Sustainable Food Home Areas (KRPL) program. Food Security of the Province of NTB and the City of Mataram. Group discussions also revealed that group members became more active during the COVID-19 pandemic, especially during WFH in the early days of the pandemic. They feel the benefits of farming activities in the yard because it really helps meet the family's food needs, especially fresh vegetables. However, most of the target group members are still not familiar with environmentally friendly cultivation techniques, especially in terms of integrated pest management. Although in fact, they are not aware that there are several activities that include PHT, such as monitoring, planting ornamental plants (refugia) around vegetable crops, and mechanical control by directly killing pests that attack their plants.

Keywords: PHT; Urban Farming; Mataram

Introduction

Since the beginning of 2020, the emergence of the Covid-19 outbreak until now will even last until an unknown time, there have been very drastic changes significantly in various aspects of life around the world (Maison et al., 2021). As a result of the COVID-19 pandemic, which was followed by the implementation of large-scale social restrictions (known as PSBB) in Indonesia (Andriani, 2020), it has

encouraged people to adopt a healthier lifestyle and at the same time carry out a number of environmentally friendly activities. One example is the increase in farming activities in urban areas (urban farming).

The United Nations Development Program (UNDP) defines urban farming as producing, processing, and marketing food to meet the needs of consumers in urban areas or metropolitan areas by utilizing land and waters in urban areas or

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suburbs (Smit et al., 2001). Its application is through intensive production methods, and by using available natural resources and urban waste, to produce a variety of agricultural and livestock products.

Urban farming is an agricultural industry located in urban areas or on the outskirts of urban areas, as well as metropolitan areas, with a focus on producing, processing, and distributing a variety of food products using available resources and materials in and around urban areas (Satterthwaite et al., 2010). We can't deny, today's urban areas are getting denser. The number of people living in urban areas is expected to increase. As a result, urban areas face various problems that are not easy. One of them is the question of how to guarantee aspects of food security.

The city itself has so far been more dependent on the supply of food from rural areas (rural) (Nurul & Mustika, 2020). If this continues, then sooner or later, it will actually lead to more complicated problems. When supply is interrupted or there is a long drought in rural areas, for example, food crises can easily occur in urban areas (Workie et al., 2020). Therefore, urban farming is one of the solutions to help ensure food security in urban areas, even in the narrow yard. contribute to ensuring the food security aspect of urban areas, urban farming also contributes to creating green open spaces, which are really needed for the environmental health of urban areas (Tapia et al., 2021).

Even so, urban farming also has a negative impact, if it is carried out with a system that is not wise and effective, such as it can cause increased noise pollution, air, flooding, water wastage, and even potential as a breeding ground for mosquitoes that transmit various diseases. Therefore, it is necessary to educate the public about various aspects needed in the implementation of urban farming, one of which is how to implement Integrated Pest Management. With the knowledge and skills of urban communities about PHT, it is hoped that it will help anticipate the negative impacts that may arise due to the rapid development of urban farming.

Based on the description above, Universities are expected to play an active role in helping the dissemination of this technology to the community so that it can be applied sustainably in the form of Community Service activities. The objectives of this activity are 1) Introducing the principles and practices of Integrated Pest Management as an alternative technique in controlling environmentally friendly pests in the urban farming system 2) Motivating capacity building and the formation of community attitudes to develop alternative

techniques other than chemical pesticides in controlling pests in the urban farming system, 3) Increase urban community awareness of the importance of Integrated Pest Management practices to produce healthy products 4).

From the results of this activity, it is hoped that it will provide understanding and skills for urban farming communities at the location of the activity in finding alternative ways other than chemical pesticides to control pests in a sustainable manner. Furthermore, it will increase the motivation for the community to produce healthy food products with environmentally friendly production processes, by implementing Integrated Pest Management.

Method

Determination of Location of Activities and Target of Participants

This activity was carried out in several community groups doing urban farming in the city of Mataram, and the location chosen was a community group that has been practicing urban farming systems for a long time and sustainably. Participants consist of groups whose plants are or have been attacked by plant-disturbing organisms.

Method Approach

The method used in this activity is the Action Research Method by applying the Participatory Action Program approach from participants through discussion, and group work on all activities. The stages in this activity include the preparation stage, including problem identification, then survey basing using a descriptive exploratory method. The implementation stage starts with training with lecture techniques. The training materials presented include Garden Plant Cultivation Techniques in urban areas; Introduction to Plant Destruction Organisms, and Techniques for Controlling Plant Destruction Organisms based on PHT practices.

Assessment/evaluation

Assessment of community service activities is carried out based on:

- a. The suitability between the topic of action research carried out with the conditions of the location of the activity.
- b. The presence and participation of the participants (targets) in each activity from preparation to the end of the activity reflects the desire of the participants to know and adopt the technology introduced by the implementing team.
- c. Attitudes and responses of the participants to the activities carried out.

Result and Discussion

Activities with the BPP Team of the Mataram City Agriculture Service

The series of activities carried out began with a discussion with the Mataram City BPP Team as the Coordinator of the Women Farmers group and the urban farming group in Mataram City. From the discussion, it was explained that it was true that there was an increase in the number of urban

farming practitioners during the Covid 19 pandemic, especially in the cultivation of vegetables and ornamental plants in the yard. It was revealed by the builder and the community who were involved in urban farming that in controlling plant-disturbing organisms, most of the people only knew about chemical pesticides which were easily available at the production and production kiosks, so there were still few who knew the practice of Integrated Pest Management.



Figure 1. Team Discussion with the Mataram City BPP and a group of urban farming actors in Kekalik Kelurahan Village

Observation of identification of Plant Pests and Fruits in the Yard

In group discussion activities, the team and students taught and assisted in the introduction of pests and diseases on plants in the yard so that the proper control methods were known. From the joint observations, several pests that have the potential to attack plants in the yard were identified, including the aphid group that sucks plant fluids, especially the young plant parts. We also found pests from the order Lepidoptera or caterpillars that usually attack plants by biting and chewing with symptoms that the affected plant part will have bite

marks and usually leave dirt around the attacked part. There were several pests found and identified as leaf-eating pests of the order Coleoptera. From discussions with participating communities, to control these pests, if they are still few, usually by mechanical means, namely pests or plant parts that are attacked are cut or destroyed so that there is no spread to other healthy plants. This knowledge actually shows that the community has indirectly carried out the practice of Integrated Pest Management which in principle must be monitored to find out the presence of pests and symptoms of an attack on plants in the yard.



Figure2. Various types of pests are found on plants in the yard

Counseling and observation at KWT Bunga Matahari

The team also provided counseling to a group of women farmers who were already quite advanced in the center of Mataram city, namely KWT Bunga Matahari, Gomong. The meeting was attended by Lurtah and his staff, a team from Unram, group coaches, group assistants from the Mataram City Agriculture Service, and 35 group members. Participants were very enthusiastic about the discussion, which was shown by many questions related not only to Integrated Hamas Management but also to environmentally friendly plant cultivation techniques in urban areas. The Bunga Matarahri Women Farmers Group turned out to be a group that had been formed for a long time and was always accompanied by the Mataram City Service and fostered by an ASN officer so that his knowledge and skills in the field of plant cultivation and maintenance were quite good. However, their knowledge and skills in integrated pest management are still limited, although in fact there are some who have practiced it indirectly, such as

using vegetable pesticides from various raw materials (garlic, soursop leaves). There are also those who apply PHT by mechanical means directly destroying plants or plant parts that are attacked by pests. From joint observations, it was revealed that there is also a group that controls plant pests in the yard by planting refugia (kenikir) plants. This Refugia plant functions to conserve natural enemies of pests, both predators and parasitoids. Because the team explained that planting ornamental plants in the yard is one of the PHT practices, so many participants asked whether planting sunflowers could also help control pests on plants in the yard? The answer was yes, so it was agreed that all members of the KWT group would plant sunflowers as well as a symbol of the Sunflower Farmer Women's Group Area in Gomong village. This is a good idea and breakthrough. Besides its function as an ornamental plant, the sunflower also functions as a refugia plant for the conservation of natural enemies which is expected to help suppress pests on vegetable and fruit plants in the yard.



Picture 3. Yard of KWT Member Activity Center

KWT members' seed and pilot gardens

The Sunflower KWT group in addition to having an activity center location for discussion and cultivation practice, the group also has a seed garden that serves to provide seeds to be distributed to group members. This seed garden is

managed together and, in its maintenance, a schedule is made according to the time determined by the members. In this place, it is also used to prepare media and make organic fertilizer from animal waste and as a place to make compost as well.



Figure 5. KWT group sample gardens and seed gardens



Figure 6. Examples of the application of PHT using refugia plants around plants in the yard

PHT Practice in the Flamboyant Group

In KWT Flamboyant, cultivation is carried out in the yard using polybags and planted directly in the ground. The innovation made in controlling the pest is by using APH from the fungus *Trichoderma* spp. and vegetable pesticides from tobacco extracts. Pest control in the yard is done when the plants are attacked. Controls carried out at KWT Flamboyant are also combined with mechanical methods (cutting or removing the affected plant parts and rejuvenating the plants so that they are not overgrown). Vegetable pesticides are made from

soaked tobacco leaves and then mixed with dab soap. The application of this vegetable pesticide is at 7:00 and 18:00. For biological control agents (*Trichoderma* spp.) inoculated to the affected plants. The result is that vegetable pesticides from tobacco leaf extract are more effective in controlling pests than the use of APH. This was due to the lack of knowledge and skills of the women of KWT Flamboyant regarding the use of APH, so that the isolates of *Trichoderma* spp. died earlier than the OPT. The products produced by KWT Flamboyant are mostly for personal consumption by

farmer groups and a small part is for commercial (sold).

Most of the KWT members in Mataram City, except for resource persons at BPP Sandubaya and KWT Sopoq Angen, still do not know much about the various types of pests, the population of pests and it is still difficult to distinguish the symptoms caused between types of pests. In addition, most of them still consider only the use of vegetable/chemical pesticides and pesticides.

Mechanical is the best way to control pests. They also do not understand the basic concepts of PHT and control using biological control agents theoretically. The use of organic fertilizers also only knows that the fertilizer is good because it does not contain synthetic chemicals, but does not understand the detailed content in the fertilizer for plant growth and development. However, in practice, all members of the KWT assisted by the extension workers have been able to make their own mainstay.



Figure 7. Plants attacked by pests in KWT Sunflower, Selaparang (left) and KWT Flamboyant (right)



Figure 8. Plants attacked by pests in the yard of BPP Sandubaya (two photos from the left) and KWT Kebun Kopi Kreatif, Ampenan (far right)

Conclusion

Types of pests that develop in an urban farming-based agricultural environment in Mataram City include grasshoppers, Aphids sp., mealybugs, orange caterpillars, leaf caterpillars, Liriomyza sp. green ladybug, white mushroom, koksi beetle, white mushroom and upas mushroom. OPT management and control implemented by urban farming farmers in Mataram City include mechanical control (pruning, cutting of affected parts, removal of infected plants, rejuvenation), using botanical pesticides from various extracts of plant parts that smell pungent (as well as a mixture of dab soap and soap). or kerosene as a binder) and use chemical pesticides. Target participants (Urban Farmers) are very interested in participating in counseling and assistance in implementing Integrated Pest Management practices

References

- Andriani, H. (2020). Effectiveness of Large-Scale Social Restrictions (PSBB) toward the New Normal Era during COVID-19 Outbreak: a Mini Policy Review. *Journal of Indonesian Health Policy and Administration*, 5(2), 61–65. <https://doi.org/10.7454/ihpa.v5i2.4001>
- Maison, D., Jaworska, D., Adamczyk, D., & Affeltowicz, D. (2021). The challenges arising from the COVID-19 pandemic and the way people deal with them. A qualitative longitudinal study. *PLOS ONE*, 16(10), e0258133. <https://doi.org/10.1371/journal.pone.0258133>
- Nurul, D., & Mustika, A. (2020). ECONOMIC DEVELOPMENT STRATEGY THROUGH RURAL AREAS: A CASE STUDY IN TOBA SAMOSIR , NORTH SUMATERA ,. *Journal of Indonesian Applied Economics*, 8(2).
- Satterthwaite, D., McGranahan, G., & Tacoli, C. (2010). Urbanization and its implications for food and farming. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, 365(1554), 2809–2820. <https://doi.org/10.1098/rstb.2010.0136>
- Smit, J., Nasr, J., & Ratta, A. (2001). Problems Related to Urban Agriculture. *Urban Agriculture: Food, Jobs and Sustainable Cities*, 33.
- Tapia, C., Randall, L., Wang, S., & Aguiar Borges, L. (2021). Monitoring the contribution of urban agriculture to urban sustainability: an indicator-based framework. *Sustainable Cities and Society*, 74, 103130. <https://doi.org/https://doi.org/10.1016/j.scs.2021.103130>