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Socialization of Apis Cerana Honey Bee Cultivation to Improve the Economy of the Kanagarian Community Malai Iii Koto Sungai Geringging Padang Pariaman

Sosialisa Budidaya Lebah Madu Apis Cerana Untuk Meningkatkan Perekonomian Masyarakat Kanagarian Malai Iii Koto Sungai Geringging Padang Pariaman

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Abstrac

The *Apis cerana* honey bee is a natural resource that may be developed as for beekeeping in Nagari Malai III Koto, Sungai Geringging District, Padang Pariaman, West Sumatra. The potential of these bees is developed, either as a single business as a honey producer or integrated with various types of plants. The main supporting factors for *Apis cerana* beekeeping are the presence of bee colonies found in people's gardens and the availability of abundant food throughout the year produced by plantation, fruit and forestry crops. In addition, there are human resources from academics and professionals scattered in various regions. The prospect of *Apis cerana* honey beekeeping needs to be socialized to the farming community through counseling so that the potential of *Apis cerana* bees can be maximized. The socialization was carried out by means of counseling and demonstration methods to farmers and their families as the target audience and accompanied by the government of Nagari Malai III Koto. The results obtained that socialization carried out by extension and demonstration methods could disseminate information, increase knowledge and interest of farmers and farming families about *Apis cerana* honey beekeeping

Keywords: Apis cerena; apiculture; potential, socialization

Abstrak

Nagari Malai III Koto, Kecamatan Sungai Geringging, Padang Pariaman, Sumatera Barat. Potensi lebah tersebut berpeluang dikembangkan, baik sebagai usaha tunggal sebagai penghasil madu maupun terintegrasi dengan berbagai jenis tanaman. Faktor penunjang utama untuk budidaya lebah *Apis cerana* adalah adanya koloni-koloni lebah yang terdapat pada kebun-kebun penduduk serta ketersedian makanan yang berlimpah sepanjang tahun yang dihasilkan oleh tanaman perkebunan, buah-buahan dan kehutanan. Selain itu, ada sumber daya manusia dari pihak akademisi dan propesional yang tersebar pada berbagai daerah. Prospek usaha budidaya lebah madu *Apis cerana* perlu disosialisasikan kepada msyarakat petanai melalui penyuluhan sehingga potensi lebah *Apis cerana* dapat dimaksimalkan. Sosialisasi dilakukan dengan metode penyuluhan dan demontrasi terhadap petani dan keluarga petani sebagai khalayak sasaran serta didampingi oleh pihak pemerintahan Nagari Malai III Koto. Hasil yang didapatkan bahwa sosialisasi dilakukan dengan metode penyuluhan dan demontrasi

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dapat menyebarluaskan informasi, meningkat pengetahuan serta minat petani dan keluarga petani tentang budidaya lebah madu *Apis cerana*

***Kata kunci** : Apis cerena; apikultur; potensi, sosialisasi*

PRELIMINARY

Nagari Malai III Koto is administratively included in the Sungai Geringging District of Padang Pariaman. Most of the population are as farmers. The most dominant agricultural business is coconut cultivation so that in general every family in the village has a coconut garden which is intercropped with areca nut (Figure 1a). The coconut plant is a monoecious plant, but the pollen and pistils in one flower have different maturity times so that the pollen cannot fertilize the pistil of the same flower. To transfer pollen from one flower to another coconut flower, a pollinator is needed so that pollination occurs optimally and if pollination occurs optimally then coconut production is also maximized. The most superior and proven pollinators for increasing various types of plants are honey bees such as coffee plants in Kepahiang Regency, Bengkulu (Saepudin*et al*., 2011) and south of Ndokwa West Local Government Area of Delta State, in the Niger Delta of Nigeria (Emuh and Ofuoku, 2012).

Coconut farmers in Nagari Malai III Koto do not know the coconut cultivation system well. Some farmers' habits that are damaging to the ecosystem in coconut plantations. Some of the activities that are often carried out by farmers are burning bee colonies found in the garden, either nesting in the cavities of coconut trees (Figure 1d) or on other parts of plant stems. Honey bee colonies that are often damaged by residents are*Apis cerana*and*A. andreniformis*. Honey bee colonies*A. food*wild potential for cultivation in Nagari Malai III Koto. The population density in lowland polyculture plantations is between 2.1 colonies (Inoue*et al*., 1985) to 5.2 colonies per hectare (Jasmi*et al*. 2014). If one bee colony can produce 1-1.5 kg of honey/month (Sari*et al*., 2013), then in a year as much as 60-90 kg of honey will be produced/ha or economically worth 9-13.5 million rupiah is wasted without being utilized. The occurrence of colony destruction and the large economic potential of bee colonies as a producer of honey has not been utilized because most people do not know the important role of honey bees in agricultural ecosystems, especially in coconut plantations. In order for potential honey bees*A. food*can be maximized, socialization is needed to the community about the important role of honey bees and their potential for cultivation.

Honey bee cultivation*Apis cerana*can bring additional income for the family. Honeybee*Apis cerana*including one of the natural resource potentials of Kanagian Malai III Koto which has not been utilized. From the results of Jasmi's research*you in the*. (2018) reported that dead betel nut is generally used by honey bees*Apis cerana*as a nesting site. The results of a survey at kanagarian Malai III Koto found that various places were used by honey bees*Apis cerana*to nest in the trunk cavity
coconut (Figure 1b). and areca nut (Figure 1c). On the other hand, coconut and areca nut plants are a source of feed which flowers all year round to support beekeeping efforts. Until now there has been no information to the public about the potential existence of honey bee biological resources*Apis cerana*which can improve the local economy. In this regard, a community service program has been carried out under the title***Socialize Apis cerana honey bee cultivation to improve the economy of the Kanagarian community of Malai III Koto Sungai Geringging Padang Pariaman.***It is hoped that the training will be useful for increasing public knowledge in honey bee cultivation

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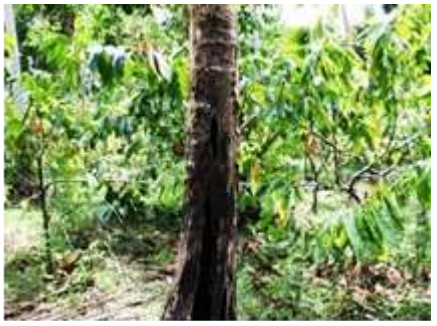

Figure 1. The condition of a coconut garden in kanagarian Malai III Koto, Sungai Geringging District, Padang Pariaman. a. Tumpeng sari coconut garden with various types of other cultivated plants.b. Bee colony*Apis cerana*Nesting in coconut tree cavities. c. Bee colony*Apis cerana*nests in the cavities of dead areca palms. d. Former colony*A. food*which the residents burned on coconut trees.

IMPLEMENTATION METHOD

The approach taken in overcoming community problems after identifying potentials is to make alternative activity plans. The steps taken to carry out the socialization of honey bee cultivation*Apis cerana*to improve the economy of theKanagarian Malai III Koto community in finding solutions to their problems there are several stages as follows, 1. The counseling stage about economic opportunities that have the potential to be developed as productive economic resources. 2. Introduction to the types of honey bees and their potential. 3. Introduction to honey beekeeping*Apis cerana*: a. Preparation phase. b. maintenance stage. c. Harvester Stage. d. Postharvest Processing Stage. This approach is expected to increase additional income for partners by optimizing livestock maintenance. Each stage is described in Table 1.

Table 1. Types of activities, forms of activities, target results and community participation in the socialization of beekeeping*Apis cerana*to improve the economy of the Kanagarian Malai III Koto Sungai Geringging community, Padang Pariaman, West Sumatra

Type of activity	Forms of activity	Activity Results Target	Society participation
1. . Economic potential that has the opportunity to be developed as a source of productive economy.	Presentation of information & discussion related to the potential of natural resources that can be developed as a new economic source.	Increasing public knowledge about the economic potential that can be developed in Nagari Malai III Koto as productive economic resource	Present and play an active role in discussion activities related to opportunities for productive conomurces.
2. . Introduction of honey bee types and their potential	Presentation of information & discussion related to the potential of honey bees can be developed in Nagari Malai III Koto as a source of productive economy	Increasing public knowledge about species and potential honey bees	Attend and play an active role in discussion activities related to the type of honey bee and its potential
3. Introduction to honey beekeeping*Apis cerana*	Presentation of information & discussion related to honey beekeeping *Apis cerana*(preparation, implementation, maintenance, harvest and post-harvest as well	Increasing community knowledge about techniques honey bee farming*Apis food*	Attend and play an active role in discussion activities related to beekeeping honey*Apis cerana*
4. Introduction to the types of plant sources of feed honeybee	Information presentation & discussion related to source plant species honey bee feed*Apis cerana*	Increasing public knowledge about species food sources for honey bees*Apis cerana*	Attend and play an active role in discussion activities related to beekeeping honey*Apis cerana*

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5. Introduction to land use yard	Presentation of information & discussion related to potential utilization yard as a source plant cultivation area honey bee feed and at the same time has economic value	Increasing public knowledge about species food sources for honey bees*Apis cerana*	Attend and play an active role in discussion activities related to land use

The method used for the implementation of community service activities is carried out using three methods, namely lectures, discussions and demonstrations. Each method is implemented as follows:

1. Counseling on the potential of honey bees*Apis cerana*
Lecture or counseling is an activity by way of question and answer between the target audience and the implementing team (Andriyanty*et al*., 2021). The counseling method is widely used by service teams from various backgrounds because they directly interact and get direct feedback with participants (Johar & Manihuruk, 2021). Counseling about economic opportunities that have the potential to be developed as productive economic sources. The counseling material presented was the economic potential of Apis cerana honey bees which are relatively common in people's gardens. Counseling on the concept of the economic potential of honey bees*Apis cerana*given by extension workers who came from lecturers from the Hiperkes and Occupational Safety Study Program at the Padang Indonesian College of Health and the Biology Department at Andalas University, Padang, while the participants were the Kanagarian Malai III Koto Sungai Geringging farming community, Padang Pariaman, West Sumatra. In this counseling, a lecture will be given to explain the important role of honey bees in supporting the community's economy. This method also describes the preparation for beekeeping, the principles of choosing good seeds to develop, caring for bees, harvesting and post-harvest processing as well as the economic benefits of beekeeping. Participants will be given simple materials and applications so that participants can easily understand and apply them.

2. Discussion
The discussion method used in guiding the socialization participants of Apis cerana honey bee cultivation is an informal discussion method. Referring to Daradjat (2014) that informal discussions consist of one discussion whose participants consist of a small number of socialization participants. In an informal discussion, only one person is the leader, there is no need for assistants, while the others are only members of the discussion. The material to be discussed includes preparation for beekeeping, the principles of choosing good seeds to develop,keeping bees, harvesting and post-harvest processing as well as the economic benefits of beekeeping.

3. Demonstratio
Demonstration is a method applied by an expert by demonstrating using tools to participants in a particular process, situation, or object being studied, both in natural (original) and artificial forms (Yahmin, 2012). In the outreach activity on beekeeping socialization, a demonstration of the stup and parts of the stup will be carried out to the socialization participants.

4. Community Participation
The people involved in this demonstration of bee cultivation were farmers or farmer families and the Kanagarian Malai III Koto Sungai Geringging government with a total of 35 participants. The role of the nagari government is to assist and facilitate the activity implementing team in outreach activities. Meanwhile, the role of the community is to organize the participation of farmers so that they can participate in the socialization of honey bee cultivation*Apis cerana*.The target audience for this dedication to the community is farmers and farmer families.

RESULTS AND DISCUSSION

1. Partner participation in program implementation.
Community participation in honey bee cultivation socialization activities*Apis cerana*consists of two forms, namely moral and material support. Moral support is attending and participating in honey beekeeping socialization activities*Apis cerana*from the beginning to the end of the activity (Figure 2). The number of people who participated in the socialization activity was 35 people. Material support is the use of existing rooms and facilities at the Wali Nagari Office to support outreach activities. Other material support is the provision of consumption for the implementation of honey bee cultivation socialization activities*Apis cerana.*

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2. Socialization

Results of socialization activities of honey bee cultivation*Apis cerana*carried out in the community consists of pre-socialization activities, socialization, post-socialization. The results of measuring the basic knowledge of the community on matters related to honey bee cultivation*Apis cerana*The pre-socialization carried out is shown in Table 1. From Table 1 it can be seen that the basic knowledge about honey beekeeping varies greatly. The least basic knowledge possessed by the community is how to cultivate honey bees, namely no one knows (0%), followed by the economic value of honey bees as much as 2 (5.71%), the role of honey bees in the garden as much as 3 (8.57%) and honey bee food as many as 4 (11.42%) participants. For the community's basic knowledge, the highest was honey, namely all participants knew (100%), followed by honey bees with 23 (65.71%), honey-producing animals with 20 (57.14%) participants.

The results of measuring the basic knowledge of the community on matters related to honey bee cultivation*Apis cerana*The post-socialization carried out can be seen in Table 1. The most widely absorbed socialization material by the participants was the type of honey bee in the garden (question no 4), namely out of 8 (22.85%) participants to 34 (97.17%) participants or an increase of 74.28% of the total participants, and followed by the role of honey bees in the garden from 3 (8.57%) participants to 28 (71.43%) participants or an increase 71.43% of the total participants. The socialization material that was absorbed the least by the participants was honey knowledge (question no 1), namely know (0%) or did not change from the beginning, and was followed byhoney producing animals(question no 2) namely from 20 (57.14%) participants to 30 (85.71%) participants or only an increase of 28.57%) of the total participants.

Socialization carried out using the general extension method can provide and disseminate new information to increase public knowledge (Table 1). According to Leilani*et al.*(2017) the majority of respondents (80%) in the Ranca Kembang group, Luhur Jaya Village, Cipanas District, Lebak Regency, Banten Province indicated that the counseling material provided by extension workers was new material needed by respondents. Whatever counseling material delivered by an extension worker must refer to the needs of the target community**.**

Table 1. Questions and the number of participants who responded to the increase in knowledge before and after the socialization of honey bee cultivation*Apis cerana*to improve the economy of the Kanagarian Malai III Koto Sungai Geringging community, Padang Pariaman, West Sumatra

Question	The number of people who responded		
	Pre-socializati	Post-socializatio	Participants with increased knowledge
1. Do you know about bee honey?	35	35	0,0
2. Do you know honey-producing animals?	20	30	28,57
3. Do you know about honey bees?	23	35	34,28
4. Does your mother/father/sibling know what kind of honey bees are in your garden?	8	34	74,28
5. Do you know about honey bee food?	4	26	62,85
6. Do you know about how to cultivate honey bees?	0	23	65,71
7. Do you know about the role of honey bees in the garden?	3	28	71,43
8. Do you know the economic value of honey bees?	2 5	21 25	54,28 57,14

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Figure 2. Documentation of outreach activities for honey bee cultivation socialization activities*Apis cerana*to improve the economy of the Kanagarian community of Malai III Koto Sungai Geringging, Padang Pariaman, West Sumatra. a= Malai III Koto Mayor's office as a location for socialization. b= Wali Nagari Malai III Koto gave a welcome. c= Members of the socialization team presented the honey bee cultivation material. d= One of the PKK group asked a question in the honey bee cultivation discussion.

3 . Demonstration activities

Demonstration activities were carried out to introduce beekeeping stup*Apis cerana*towards participants. Demonstration activities are carried out outdoors because the pilot stup to be introduced consists of stup containing colonies and empty stup. Demonstration activities were carried out in two sessions, namely the first session related to the bee stup and its parts, the second session was an introduction to the stup containing bees. In the first session, the outreach team members also gave an explanation regarding the stup and its parts and their functions (Figure 3a-c). In the second session, members of the socialization team demonstrated the harvesting method starting with opening the stup lid, lifting the frame from the inside of the stup, harvesting honey and rearranging the frame into the stup cavity and closing the stup again (Figure 3d). In this second session, members of the outreach team also gave an explanation of the structure of the hive and the function of each part of the cells in the comb.*Apis cerana* (Gambar 3e).

The results of the stup demonstration activities, the structure of the hive and bee colonies*Apis cerana*shows that the material for demonstration activities can be well received by socialization participants. This can be seen from a number of questions submitted to socialization participants (specifically questions numbers 4 and 6) showing that 65.71-74.28% of the total socialization participants gave a good response at the end of the socialization activity. Ramadhana & Subekti (2021) reported that the group method was the most effective activity in counseling because farmers could hold discussions, demonstrate tools and consult with extension workers in Tamansari Village, Wuluhan District, Jember Regency, East Java. Dwiyanti (2016) also reported that the process of implementing the extension method using the demonstration method was an effective method used in counseling on shallot farming in Pucak Village, Tompobulu District, Maros Regen

Figure 3. Documentation of demonstration activities on honey bee cultivation socialization activities*Apis cerana*to improve the economy of the Kanagarian Malai III Koto Sungai Geringging community, Padang Pariaman, West Sumatra. a = the leader of the extension team introduces the tools/materials needed in honey beekeeping activities*Apis cerana*. b = the head of the extension team introduces the stup and its parts. c = the extension team leader introduces the frame and the function of the wire contained in the frame. d= Extension team members demonstrate the harvesting method by lifting the frames from the

stup. e = Members of the extension team explain the structure of the hive and the function of each part of the cells in the bee comb*Apis cerana*.

CONCLUSION

Promotion of honey bee cultivation*Apis cerana*to improve the community's economy went well for 35 participating farmers and their families and supported by the Nagari Kanagarian Malai III Koto Sungai Geringging government, Padang Pariaman. Socialization is carried out by extension methods and demonstration methods. General extension methods can provide and disseminate new information to increase public knowledge about beekeeping*Apis cerana*. Through the method of demonstration of stup, hive structure and bee colony*Apis cerana*shows that the material for demonstration activities can be well received by socialization participants. With the high interest of the participants in Apis cerana honey bee cultivation, it is suggested that the relevant government parties facilitate training or workshops on Apis cerana honey bee cultivation for the Kanagarian community Malai III Koto Sungai Geringging Padang Pariaman.

THANK YOU

Thank you to Mr. Wali Nagari and the community of Malai III Koto Sungai Geringging, Padang Pariaman, who have provided facilities for the implementation of this community service activity. Thank you also to all parties involved directly or indirectly in the success of this community service program in the form of funding or collaboration.

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