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Cultivation Of Healthy Rice Towards Food Security For Rural Farming Households

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Abstract

The aim of this activity is to empower farmers through KKN-PPM activities in order to increase the food security of farmer households, increase farmers' knowledge and skills in terms of making organic plant concoctions and organic pest concoctions used for healthy rice farming, change farmers' mindsets so that they are willing to try healthy rice farming and its production exceeds previous production, improving land pH and micro elements in the soil, increasing farmers' management skills in managing the results of their farming business, providing opportunities for students to play an active role in helping farmers, increasing economic and scientific levels knowledge, as well as as a field laboratory for students to apply the knowledge gained on campus. Helping students apply science and technology and develop the ability to think analytically and logically, as well as increasing their concern for the environment. The method used to achieve this goal is through farmer involvement/participation, independence in the sustainability of activities, and partnerships between farmers and universities and related agencies with socialization activities, practical training, direct application and mentoring. The results of this KKN-PPM activity are the implementation of healthy rice cultivation and improved management of farmer groups through the transfer of knowledge and technology from students and implementing teams from universities and farmers as targets. Apart from that, there have been changes in the way of rice cultivation in the location of activities full chemical fertilizers and pesticides to minimize the use of chemical fertilizers, as well as increasing production from the previous MT. The output of the activity is healthy rice, organic ingredients, improvement of farmer group bookkeeping.

INTRODUCTION

Nagari IV Koto is one of the nagari in Batang Kapas District which is the northern part of Pesisir Selatan Regency. Geographically, it is located at 100 degrees 34.16 seconds – 100 degrees 53.62 seconds East Longitude and 1 degree 15.00 seconds – 1 degree 38.00 seconds South Latitude with an area of 395.07 km2 or 6.24% of the Regency Area South Coast. When viewed in terms of land use, this sub-district is still covered by forest areas. The forest area is 68.11% of the area. Land for agricultural cultivation is 21.45%, settlements 1.28% and 9.16% shrubs.

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There are 3 rivers that flow through this sub-district, namely the Batang Kapas river, the Tuik river and the Jalamu river. Specifically for lowland rice farming, there are 1,842 ha (5.13%). The average rainy days are 11.42 days and rainfall is 347.75 mm. If seen from a physical perspective, this sub-district has the potential to develop healthy rice farming businesses. Healthy rice farming is a farming business that minimizes the use of chemical fertilizers by adding organic materials found around the farmer. From a physical, social, economic and environmental perspective, it is very appropriate to carry out farmer empowerment activities by increasing land productivity by implementing healthy rice farming. By cultivating healthy rice, it can be used as a platform for land conservation and rehabilitation.

The farming community in Nagari IV Koto Mudik really wants technology that can reduce production costs because the prices of inorganic fertilizers and pesticides are increasingly expensive and farmers' purchasing power is decreasing. These obstacles cause the farming carried out to be less profitable for farmers. According to Ayesha (2014), such descriptions of farmers are some of the structural weaknesses of farmers, which can reduce their motivation to continue their farming business and leave the business. In order to support household food security, it is very necessary to increase production and cost efficiency in carrying out farming. With this efficiency, it is hoped that farmers' income will increase and, furthermore, the profits received by farmers will be better, so that they can meet their needs, both farming needs and other household needs.

Farming efficiency can be achieved, one of which is through cultivating healthy rice by utilizing materials available around them. This activity can increase production, reduce costs and improve the fertility of increasingly thin soil. This method also emphasizes improving the function of soil as a growth medium and source of plant nutrition. Through this system, soil fertility is restored so that ecological cycles can resume properly by utilizing soil microorganisms as providers of metabolite products for plant nutrition. Through this method, it is hoped that environmental sustainability can be well maintained. Food security at the household level is an integrated and sustainable system between food availability, distribution and consumption. This system guarantees the availability of food with even distribution and in accordance with the size of household needs. The food availability of farming households is very dependent on the results of their agricultural production. Poor farmers with limited land often experience food shortages, plus other factors such as disasters and unfavorable climatic conditions make farmers' conditions worse. Through cultivating healthy rice, it is hoped that it can increase the food security of farming households.

Formulation of the problem

1. How to empower farmers to increase income and food security of farming households through cultivating healthy rice?
2. How to increase farmers' knowledge and skills in making organic plant concoctions?
3. How to improve the pH of the land and the micro elements in the soil?
4. How to improve farmers' management capabilities in managing the results of their farming business?

Approach Method

The approach used is;

1. Farmer participation in activity planning, implementation, supervision in the use of organic ingredients for plants
2. Independence of farmer groups in sustainability of activities
3. Partnership, between farmers and universities and related agencies (Rahman et al., 2023).

Implemented technology

The technology implemented is

1. Healthy rice cultivation
2. Making organic plant concoctions from natural ingredients found around farmers
3. Implement good farming management

Partner Institutions

The institution that is a partner in this KKN-PPM activity is Balai District Extension (BPK) Batang Kapas District

Target group profile

So far, farmers have carried out conventional cultivation, namely using chemical fertilizers, but have not followed the recommendations. Fertilizer is used only based on the farmer's ability to access production facilities, such as purchasing chemical fertilizers. Farmers do not really understand the consequences of using chemical fertilizers without following recommendations (correct dosage). Apart from that, farmers also do not realize that the impact of continuous use of chemical fertilizers not only makes the land hard but also affects the health of farmers and their families. From the results of the survey to the location used as the KKN_PPM location, it turns out that farmers actually want to increase production and income through rice farming, which has become their main livelihood. Farmers responded positively to the technology applied. The technology is cultivating healthy rice using organic plant ingredients. Farmers actually want to change old habits that have been passed down from generation to generation in rice farming and farmers have also heard about organic rice, but have not dared to implement it because they do not know how to make organic concoctions and there is no one to assist them intensively.

Agricultural waste (straw) and livestock manure have not been utilized optimally, even though if used in rice farming they can replace inorganic fertilizers which are increasingly expensive. Based on the results of discussions with the target group, it is known that farmers really want assistance in making organic plant ingredients that can be directly applied to their rice farming and can produce organic/semi-organic rice.

Target and Outcomes

Target;

1. Production cost efficiency up to 25%
2. Minimum production increase of 10%
3. Groups can produce their own organic plant ingredients and use them on their land.
4. Increased student awareness and empathy for farmers' problems.
5. Get partners for the next farmer group so that there is program continuity
6. Preparation of the next KKN-PPM work plan to resolve the problems faced by rice farmers

External

1. System improvements, cost efficiency and increased production
2. Products (healthy rice and organic plant ingredients)

Achievement Indicators

1. There are differences in production, production costs, income and profits before and after using organic plant ingredients
2. There was a change in farmers' knowledge and skills in making organic plant ingredients and using them before and after the KKN-PPM activities were implemented.
3. Farmers are able to analyze their farming business

Objective

1. Increasing farmers' knowledge and skills in cultivating healthy rice. which

provides better profits to farmers.
2. Farmers are able to make organic concoctions for plants and implement the use of organic concoctions for these plants
3. Farmers are able to improve their farming management and analyze the farming they do.
4. Preserving the environment through sustainable agriculture
5. Improving farmers' health from chemical contamination
6. Restore soil fertility and eliminate farmers' dependence on inorganic fertilizers and pesticides.
7. Supporting the creation of food self-sufficiency.

Target

1. The creation of farmer groups that utilize science and technology and implement business management in healthy rice farming that is sustainable and simultaneously emulated by other similar farmer groups
2. Availability of organic plant concoctions and organic pest concoctions produced by farmer groups themselves
3. Availability of a model for empowering healthy rice farmers

IMPLEMENTATION METHOD

Step 1. Student recruitment.
Step 2. Outreach to the community using the KKN PPM program.
Step 3. Preparation of equipment.
The equipment that will be prepared is a permit letter from the relevant agency, student equipment for field use such as boots, gloves, hats, etc. *Step 4*. Student provision.

Implementation.

Activities were carried out in July and August 2016 with programs: socialization and training as well as demonstrations on making organic concoctions and cultivating healthy rice. Next, practice directly on the farmer's land. The methods used in this training are:

1. Lecture method: to explain the material that will be given, namely regarding organic vegetable cultivation, how to improve farmer group management.
2. Demonstration method: demonstrating the preparation of organic plant concoctions
3. Command method: to give instructions in carrying out training
4. Reciprocal method: a method characterized by an actor and an observer, so that participants can act on each other and evaluate each other's friends

Farmer Assistance in the Field.

Students accompany farmers directly in the field, students accompanied by DPL help farmers with how to cultivate healthy rice, make and use organic ingredients for rice plants.

Monitoring and Evaluation

This activity is monitored and evaluated by both the proposer, faculty and LPPM. Monitoring is also carried out by the funding provider (DRPM).

The program implemented

1. Socialization of healthy rice cultivation
2. Training in making organic concoctions
3. Demonstration and direct application in the field.
4. Accompaniment
5. Farming business analysis

RESULTS AND EXTERNAL

Kenagarian IV Koto Mudiek, Batang Kapas District consists of 3 villages, namely

Balai Lamo Village, Lubuk Bangka Village and Palo Banda Village which have a land area of ± 15,355 Ha consisting of a residential area of ± 433 Ha, an agricultural area of ± 782 Ha, an area of sleeping land of ± 11,537 and other land ± 136.5. Kenagarian IV Koto Mudiek has a distance of 6 km from the district with a travel time of ¼ hour, while the distance from the capital city/regency is 22 km with a travel time of ½ hour. In general, the people of IV Koto Mudiek earn their living by farming and raising livestock which is appropriate to the conditions of their area which has large areas of land. Around the left and right of the road you can see wide stretches of rice fields. Although there are also residents who earn other livelihoods.

Implementation of KKN-PPM

This KKN-PPM activity began with the recruitment of 30 students consisting of 4 faculties and 9 study programs, namely the Faculty of Agriculture, Economics, Social and Political Sciences and Law. Students involved must meet the established criteria, namely being registered at SIADAK, having fulfilled a minimum of 110 credits and being willing to become a KKN-PPM participant with the theme "Healthy rice cultivation towards food security for farmer households in rural areas" as well as following the training and regulations. rules that apply in implementing KKN-PPM. The number of participants was 30 people.

The provision of KKN-PPM students is carried out in collaboration with the university's regular KKN-PPM implementers and is supplemented with special material according to the program being implemented. Figure 1 is a KKN-PPM briefing event. At the University level, the briefing was attended by all KKN participants at Ekasakti University. Debriefing at the University level is carried out for 2 days and is continued with special debriefing in accordance with the main program carried out by students with funds from the Ministry of Research, Technology and Higher Education. Special briefing aimed at students participating in KKN-PPM was held on June 26 2016. The briefing location was on the Ekasakti University campus. The atmosphere of the briefing can be seen in Figure 1.

Figure 1. Providing KKN-PPM students

In this briefing, material was presented by 4 resource persons related to the program being implemented and technical implementation in the field. Students gave a positive response to the implementation of this briefing. This can be seen from his involvement in discussions and questions asked of resource persons. The materials provided during the debriefing are evaluated through the KKN-PPM debriefing exam and the value of this debriefing exam contributes to the student's final score. Implementation of KKN-PPM activities in the field was carried out from July 17 to August 20 2016. The first activity was handing over students to the nagari guardian at the location where the KKN-PPM was held. Proof of handover is in the form of an official report signed by the Nagari Mayor and DPL. Before the handover process, the team leader along with the DPL and accompanied by Nagari staff had found

accommodation to be occupied by students participating in the KKN-PPP. There are 2 houses that are used as accommodation, one for female KKN-PPM participants and the other for male KKN-PPM participants.

Gambar 2a. Handover of KKN-PPM students to the nagari guardian

Figure 2b. Handover of KKN-PPM students to the Nagari Mayor

On July 17 2016, socialization of the KKN-PPM program regarding healthy rice cultivation was carried out at the Wali Nagari Office, which was attended by the Wali Nagari himself and his staff, heads of farmer groups, community leaders and farmers who were partners in this activity. The participants' response to this socialization was very positive and they hoped that this activity would be carried out well and that Nagari IV Koto Mudik could become a foster village for Ekasakti University in Padang, especially in the agricultural sector because the majority (90%) of the population's main livelihood is as farmers, especially lowland rice. . Figure 4 is the atmosphere of socialization at the office of Wali Nagari IV Koto Mudik.

Figure 3. Program Socialization in the Community

From the picture, it can be seen that the students and socialization participants, in this case the people of Nagari IV Koto Mudik, have mingled well and the community accepts students with open arms and they open up opportunities for students to be able to use the knowledge they have gained on campus and also learn from farmers about various things that farmers have that they have not encountered on campus. The socialization ended with getting to know each other between students, the community and DPL. Thus, it is hoped that good cooperation will occur during the KKN-PPM activities. In implementing the KKN-PPM program it is divided into 3 parts, namely the main program, additional programs and supporting programs. The main program theme is healthy rice cultivation towards food security for farming households in rural areas. The main program can be seen in Figure 4.

Figure 4. Healthy Rice Cultivation Main Program of KKN-PPM Activities in Nagari IV Koto Mudik

Based on Figure 4, the implementation of healthy rice cultivation starts from land processing to harvest. When processing the land, assistance is provided to use solid organic fertilizer which is added to the rice fields when processing the land, then the seed sowing site also uses solid organic fertilizer, then planting is carried out when the seeds are 20 days old. Next is the maintenance phase. When the rice is 45 days old, weeds are cleaned and when the panicles start to fill, they are sprayed using a booster. The making of the booster was demonstrated by students and then made by the farmers themselves. Figure 5 is the training on making the booster which was

carried out at the Wali Nagari IV Koto Mudik office.
Participants in this training are rice farmers who are partners in KKN-PPM activities. Farmers are also given the opportunity to make their own booster using materials provided by the implementation team. The results of the booster that has been made are used to clean rice which at that time is in accordance with the conditions of the farmers' rice in the field. In Figure 5 you can see that DPL and students together with farmers are enthusiastic about producing booster. The results of the practice were officially handed over to Mr. Wali Nagari and then given to members of the farmer group who attended the training. To inform the wider community about how to make and use this booster, training materials are posted on information boards that are available in every village in Nagari 1V Koto Mudik

Figure 5. Boster making training at the Wali Nagari IV Koto Mudik Office
The results of observations by KKN-PPM students during field activities regarding several parameters in terms of healthy rice cultivation can be seen in Table 1. Vegetatively, healthy rice cultivation provides better results compared to conventional farming. Furthermore, if you look at the results of the farming business analysis, this business is worth continuing with an R/C ratio of 2.7 and the profit received by farmers is Rp. 11,244,075 /Ha

Table 1. Differences between healthy and conventional rice cultivation

	Healthy rice cultivation	**conventional**
Plant Height (cm)	120	82
Leaf Length (cm)	52	32
Panicle Length (cm)	31	26
Clump Circumference (cm)	30	20
Grain in one Stem (grain)	210	130
Grain in One Clump (grain)	5460	1440
Many Saplings (stems)	26	12

Additional programs are programs carried out by KKN-PPM students together with the community related to the nagari program and the abilities of each student. There

are several additional programs carried out by students.

1. Tree planting movement
2. Utilization of vacant land
3. Installation of information
4. Utilization of used bottles 5. Creation of a PKK Park
5. Commemoration of the anniversary of Indonesian Independence.
6. Home renovation

Constraints

1. In the process of making organic fertilizer it is still done manually so the results are less than optimal, namely in chopping and sieving
2. So far, livestock manure has not been collected properly, because in raising livestock it is not customary to keep them in cages but is released during certain seasons.
3. In terms of farmers' habits of planting rice, they are lazy about planting in rows because it takes longer than normal planting.
4. The price of healthy rice at the activity location is the same as the price of conventionally grown rice.

Solutions offered

1. At a minimum, farmers do not burn straw but spread it in the rice fields and soak it in water before the next land processing period.
2. Farmers are provided with assistance in designing cages that can utilize livestock manure, both in the form of feces and liquid.
3. Trying to help farmers by making proposals for requests for machine tools in the form of tools for planting rice.
4. Plan together with the farming group to make healthy rice products, so that what is sold is not in the form of rice but in the form of packaged and labeled rice.
5. Planning the next activity in the form of collaboration between the Nagari IV Koto Mudik community, in this case the Bukik Ubek farmer group and LPPM Ekasakti University

The long-term planning that will be carried out is to follow up by creating a collaboration between the nagari and Ekasakti University College to make Nagari IV Koto Mudik a village assisted by the Faculty of Agriculture, Ekasakti University so that lecturers can carry out routine service to the community facilitated by the local government and universities and follow up programs related to program management, partner and community involvement, a clear division of tasks is carried out so that program implementation can run smoothly. Partners make a follow-up plan, which is known by the local government (nagari) and approved by the relevant department, in this case the BPK.

CONCLUSIONS

Healthy rice farming can increase the income of farmers participating in the activity.

1. Farmers already have knowledge and skills in making organic plant ingredients (boosters)
2. The way to get farmers to want to try healthy rice farming is by mentoring and providing examples in the field directly.
3. How to improve the pH of rice fields and the micro elements in the soil by providing organic fertilizer where in making organic fertilizer dolomite (agricultural lime) is used
4. To improve farmers' management capabilities in managing the results of their farming business, farmer group bookkeeping training is carried out.

THANK-YOU NOTE

1. Ministry of Research, Technology and Higher Education (DRPM)

2. Chancellor of Ekasakti University
3. Chairman of LPPM Ekasakti University
4. Dean of the Faculty of Agriculture, Ekasakti University
5. Wali Nagari and Community IV Koto Mudik

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