ROLE OF INTEGRATED CROP MANAGEMENT FIELD SCHOOLS IN INCREASING RICE PRODUCTION RESULTS

Lina Asnamawati[1], Rasoki Timbul[1], Is Eka Herawati[1]
[1]Agribusiness Study Program, Faculty of Science and Technology, Open University
Email: linaas@ecampus.ut.ac.id

ARTICLE HISTORY : Received [11 January 2023] Revised [02 May 2023] Accepted [18 May 2023]

ABSTRACT

Field School - Integrated Crop Management (SL-PTT) is a form of school where the entire teaching and learning process is carried out in the field, which is carried out on the land of PTT participating farmers in an effort to increase national rice production. This SL-PTT guide is the result of discussions with the Directorate General of Food Crops and the Agricultural HR Development Agency. So it is very interesting to examine (a) the role of integrated crop management field schools in increasing rice production. Respondents for this study were selected purposively, namely 1 extension worker and 4 heads of farmer groups. The research results show 1. The influence of adult education methods (andragogy) on farmers in SLPTT activities, namely the learning process in SL-PTT starts with activities which then provide personal experiences, express these experiences, analyze problems that occur, and conclude the results of activities. Every learner is encouraged to be able to observe reality, express experiences and ideas, analyze facts, make decisions, and carry out activities together. The role of SLPTT is to increase knowledge and skills in recognizing potential, preparing farming plans, overcoming problems, making decisions, and applying technology that is appropriate to local resource conditions in a synergistic and environmentally sound manner, so that farming becomes efficient, highly productive and sustainable.

Keywords: ***Role, Integrated Crop Management Field School, Rice Production Results***

INTRODUCTION

Increasing agricultural production and developing the natural resource base are ways to reduce poverty and malnutrition in rural areas. Agricultural extension has long been seen as a key element for enabling farmers to obtain information and technologies that can improve their livelihoods (Purcell & Anderson, 1997). Agricultural extension is an educational service to advise, train and inform farmers on practical and scientific matters related to their farming business, and influence them to use better techniques in their farming business, including animal husbandry and crop production, farm management, conservation and marketing. In the past, the technology transfer model adopted by most agricultural extension systems was a top-down approach (Röling, 1988) and extension workers were expected to acquire technology from researchers, package it, and transfer it to smallholders (Bindlish & Evenson, 1997).

Agricultural development programs

aimed at improving the livelihoods of smallholder farmers by reducing the capacities they face and advancing their farming systems rely heavily on changing practices through knowledge transfer (Larsen and Lilleør 2014). Currently, many technologies are inappropriately developed by researchers because they do not involve farmers in the technology creation process. Also, the failure to transfer knowledge, skills and technology to farmers is largely due to the farmer training methods used failing to recognize that farmers are adult learners who need adult education techniques for the training to be effective. The ineffectiveness of the traditional top-down approach to technology development and transfer has led many governments and development organizations to seek effective extension approaches. (Bunyatta et al., 2006).

There are many counseling methods that can be used so that the transfer of knowledge and technology becomes more effective. Training is the process of acquiring new skills, attitudes and knowledge in order to prepare for entry into or increase one's productivity in a job. (Arimbawa & Widanta, 2017). Group learning allows farmers to learn from other farmers. The learning approach used by fellow farmers is an attempt to find solutions to the problems they face (Haryanto et al., 2020).

Over the last fifteen years, agricultural extension approaches to knowledge transfer in low- and middle-income economies have evolved to become more demand-driven, client-oriented, and farmer-centred (Kiptot and Franzel 2015; Wellard et al. 2013). This change was driven in part by the recognition that information sharing is difficult in areas where farmers are widely dispersed, and have varying information needs and capacities to benefit from extension services (Feder et al. 2010; Ferroni and Zhou 2012).

According to Kiptot and Franzel (2015), contemporary extension approaches are increasingly based on learning theory which recognizes that solving smallholder problems requires observation, shared learning, reflection, negotiation, feedback, and subsequent modification of innovation strategies. The subsequent shift away from the traditional top-down approach to extension services has also resulted in a shift in the role of extension workers, who are now seen as the catalyst and facilitator responsible for helping farmers and farming communities determine their own goals and information needs (Kiptot and Franzel 2015).

There are various initiatives in counseling with the aim of increasing productivity and reducing poverty. Included in this, the Farmer Field School

(SLP) approach was developed in the late 1980s by FAO (Larsen & Lilleør, 2014; FAO, 2015). Farmer Field Schools were held for the first time in Indonesia ((Davis, 2012). According to Waddington et al. (2014), SLP is an adult education intervention that uses discovery-based learning methods with the aim of increasing abilities such as in integrated pest control (IPM) and empowering farmers and the community (Amanah & Seminar, 2022)

The Integrated Crop Management Field School (SL-PTT) is an innovation program to increase rice production programmed by the Ministry of Agriculture in 2009. The SL-PTT program as a learning forum for farmers to exchange information and knowledge is a program with a bottom-up approach. (Muchtar et al., 2014). The characteristics of SLP can be seen The characteristics of SLP can be seen as a form of learner-centered learning, there is interaction between farmers and assistance (Amanah et al., 2021).

The SLPTT program applies various components of farming technology through the use of efficient production inputs according to specific locations so as to produce high productivity to support sustainable production increases. The SLPTT method is also a method from the department of agriculture by teaching farmers about integrated pest control, climate field schools, and cultivation technology. Farmers are taught to practice integrated farming including the provision of SLP approaches that have the characteristics of being a forum for exchanging knowledge, for mutual learning and solving problems jointly by two or more people. The weaknesses of SLP include the tendency that SLP is closer to the diffusion of innovations to increase adoption (Waddington et al., 2014). An effective Farmer Field School is one that can prioritize the role of farmers as innovators, researchers and developers. Integrated Crop Management Field School is an effective way of learning for adults to transfer knowledge, skills and technology to farmers.

Field School - Integrated Crop Management (SL-PTT) is a form of school where the entire teaching and learning process is carried out in the field, which is carried out on the land of PTT participating farmers in an effort to increase national rice production. This SL-PTT guide is the result of discussions with the Directorate General of Food Crops and the Agricultural HR Development Agency. So it is very interesting to study (a) how do farmers self-development through SLPTT?; (b) How does the adult education method (andragogy) influence farmers in SLPTT activities?; (c) What is the role of SLPTT

in increasing farmer production?

RESEARCH METHODS

Method of collecting data

In this study, the informants were farmers participating in Field Schools or SL-PTT who were handed over to the Department of Agriculture or Agricultural Extension. Agricultural extension officers and the Agricultural Service as providers of empowerment programs are carried out by means of purposive sampling, namely the sample is selected based on certain considerations (Singarimbun and Effendi, 1995). This strategy can also be called taking non-probability respondents or taking respondents based on purposive considerations. This was done because the sampling frame could not be found and was difficult to identify, so it could not be done randomly. Respondents taken in this study were several farmer members of farmer groups who had conducted Integrated Crop Management Field Schools

In this study, to strengthen data collection and data collection, recommendations from key information were used, namely Mr. Dedy as the Field Agricultural Extensionist, Chairperson of each Association of Farmers Groups, as well as members of farmer groups which were taken purposively on the basis of the consideration that the respondents appointed by the key information were respondents. who have carried out and understand the Integrated Plant Management Field School program, namely Agricultural Extension. Then after conducting in-depth interviews with several informants and it was felt that the data received was sufficient and all the answers from these informants all reached similarities between one and another.

The data analysis used in this study is a qualitative descriptive data analysis. According to Arikunto (2002) descriptive analysis is an analysis that describes a situation, phenomenon, and field facts naturally, as they are in a normal situation and not manipulated by circumstances and conditions. Meanwhile, according to Sugiyono (2008) qualitative data analysis is the process of searching and systematically compiling data obtained from interviews, field notes and other materials so that they can be easily understood, and the findings can be informed to others. Data analysis is done by organizing data, breaking it into units, synthesizing, compiling into patterns, choosing which ones are important and will be studied, and making conclusions that will be told to othersFarmers' behavior in managing farming with the application of integrated crop management was surveyed to determine its effect on the progress of community farming. Guide

questions and interviews were conducted to obtain data.

RESULTS AND DISCUSSION

Field school is a non-formal learning process for farmers to increase their knowledge and skills in recognizing potential, developing business plans for identifying and overcoming problems, making decisions and applying appropriate technology with existing resources in a synergistic and environmentally sound manner so that farming is more efficient with high productivity and sustainable. Sipayung Village was used as the research location, because in that village extension activities were quite advanced.Sipayung is a village in Sukajaya sub-district, Bogor Regency, West Java, Indonesia.

There are 10 farmer groups in Sipayung Village, namely Gunung Putri, Pasir Munding Jaya Kramat, Mawar Mekar Sari, Gunung Payung Maju, Rancage, Sumber Fortune, Sauyunan, Sari Tani, Gotong Royong, Mawar Mekar. For this study, the informants who were interviewed were members of the Gunung Payung Maju farmer group. In this research, it was conducted on the Gunung Payung Maju farmer group.

Self-Development of Farmers Through Integrated Plant Control Field Schools

The activity of implementing the transfer of technology, skills and knowledge to farmers is not an easy thing, there are also many obstacles encountered in practice. Field schools are places of non-formal education for farmers to improve their knowledge and skills, especially in identifying potential, preparing farming plans, overcoming problems. Farmers don't take new technologies or ideas for granted at first hearing. To get to the receiving stage, it takes a relatively long time. One of the inhibiting factors in the adoption of technology by farmers is the farmers' lack of confidence in the benefits of the technology itself before seeing it directly. Farmers are often worried whether the production results will be as expected, especially if the costs incurred are higher than the previous method (Hutapea et al., 2012)

Farmer Field School (SLP) is a forum for sharing and learning between farmers/women farmers/business actors. In the current era, SLP is also implemented through digital communication and information media. Digital communication media are used to share knowledge and information. The Dalima Women Farmer Group is able to produce agricultural products which are marketed through direct sales and e-commerce until the end of 2021. There is one business group that produces herbal drinks from butterfly pea

flowers. All farmer groups have obstacles in the availability of water for agriculture, member participation and innovation. Farmer groups learn from other villages to solve these problems. It can be concluded that, SLP as CoP is practiced in accordance with the issues encountered in the field (Trust & Seminar, 2022)

The Integrated Crop Management Field School (SLPTT) which was held at the Trirahayu III Farming Group in Medanglayang Village, Panumbangan District, Ciamis Regency, had a positive impact on the level of application of PTT technology in lowland rice farming, the application of technology that had been obtained while participating in SLPTT, especially lowland rice cultivation technology which can increasing production, for example by counseling, demonstration plots using superior varieties, using organic fertilizers and according to recommendations, using young seeds, setting legowo row spacing and intermittent irrigation of paddy rice plants (Nursyamsi et al., 2007).

Characteristics of Farming Business

Land Ownership Status	Total Land Area	Production cost					Results of Farming Business	Sales system
		Seeds / Seedlings	Solid Fertilizer	Liquid Fertilizer	Pesticide	Labor		
Cultivator Owner	½ Ha	12 kg	150x50	5 bottles	2 bottles	5.5 million	25 ton	Jump with Grinder
Cultivator Owner	3 ha	39 kg	150x50	10 bottles	5 bottles	5 million	30	Jump with Grinder
Cultivator Owner	½ Ha	30 kg	300	100	100	3.2 million	20 ton	Jump with Grinder
Cultivator Owner	2000 m2	20 kg	600	4 Bottles	2 Bottles	3.5 million	30 ton	Jump with Grinder

Paddy Integrated Crop Management Field School (SLPTT), is one model of agricultural technical training that aims to increase knowledge and skills and change farmers' attitudes in implementing integrated crop management (PTT) in paddy rice. Through SLPTT it is hoped that farmers will get direct learning in the field and they will learn to analyze and break down the SLPTT program carried out by farmers, the basis for decision making is agricultural officers,

influence. SLPTT paddy rice is training for farmers designed as a refinement of paddy rice cultivation technology that is already owned by farmers with integrated crop management (PTT) technology assemblies that are specific to the location and as needed to increase paddy rice productivity.

Farmers Knowledge About SLPTT

The superior varieties recommended for planting are super invari 35. Methods of tillage for rice namely Processing aims to change the physical properties of the soil so that the initially hard layer becomes flat and muddy. That way weeds will die and decompose into humus, soil aeration will be better, the subsoil will become saturated with water so it can save water. In cultivating paddy fields, repairs and arrangements of paddy field bunds and ditches are also carried out. The bunds (galengan) of the paddy fields are strived to keep them good to facilitate irrigation arrangements so that water is not wasted and it makes it easier to care for the plants.

I. **Land processing stages**

The stages of paddy field processing in principle include the following activities:

1. Improvement of Bunds/Drains and Channels

Before land cultivation begins, Pematang/Galengan must be cleared of grass, repaired, and made high enough. The main function is to hold water during tillage so that it does not flow out of the plot, because in cultivating the ground water should not flow out. The next function is closely related to the regulation of water needs as long as there are rice plants.

Channels or ditches are repaired and cleared of weeds. This activity aims to facilitate the flow of water and reduce the number of weed seeds that are carried into the plots. Residual straw and plant residues in the tilled fields are cleaned before the land is processed.

2. Grazing

After the bund/galengan and canal repairs have been carried out, the next step is hoeing. The corners of the plots are hoeed to facilitate the work of the plow or tractor. This work is carried out simultaneously with the time of land preparation.

3. Piracy and Hacking

Piracy and harrowing are related activities. Both of these activities aim to make the paddy fields muddy and ready to plant rice.

a. Piracy

Water the paddy fields a week before plowing, to soften the soil and prevent the soil from sticking to the plowshares. First, a groove is made at the edge and in the middle of the paddy field so that the water can quickly wet the channel plot. Depth in plowing + 15-25 cm. Until the ground is completely overturned and destroyed.

The benefits of piracy are as follows:

1) Weed eradication, because by plowing plants and weed seeds will sink.

2) Add organic elements, because the green manure that comes from the grass will sink and mix with the soil.

3) Reducing the growth of pests and diseases.

After plowing the soil must be flooded immediately, to accelerate the decomposition of plant residues and avoid loss of nitrogen as well as soften the lumps of soil caused by plowing. Flooding is done for about a week.

b. harrowing

Before harrowing begins, first the water in the plot is removed, left a little to wet the lumps of soil. During harrowing, the water inlet and drainage channels must be closed, to ensure that excess water does not run out of the plot. By harrowing the soil lengthwise and transversely, chunks of soil can be destroyed. With repeated scratching:

1) The downward infiltration of water is reduced

2) The ground becomes flat

3) Planting seeds made easy

4) The existing grass will sink

After the first harrowing, the fields are flooded again for 7-10 days

c. alignment

The leveling process is actually the second harrowing, which is carried out after the land has been inundated for 7-10 days. This second change was made with the intention of:

1. Leveling the ground before transplanting
2. Immerse the base fertilizer to avoid denitrification
3. Mud the soil perfectly

The stages of tillage, starting from repairing the bunds/galengans to leveling, take ± 25 days or ± the same as the age of the seedlings in the nursery. Age of rice seedlingsIn general, what is often used for recommendations for lowland rice is the use of seeds aged 21 days after sowing (HSS) with the number of seeds of 1-3 stems/clump. It is recommended to apply the legowo planting system using spacing (25x25) cm between clumps in a row; 12.5 cm spacing in rows; and 50 cm as the distance between rows/aisles or written (25x12.5x50) cm.

The leaf color chart (BWD) is a rectangular-shaped tool that is useful for knowing the N content of rice plants. In this tool there are four color scale boxes, ranging from light green to dark green, which describe the greenness of the rice plant leaves. For example, if the leaves of a plant are green, it means that the plant is deficient in N nutrients, so it needs to be fertilized. Conversely, if the plant leaves are dark green or the level of green leaves is the same as the color in the scale box 4 on the BWD, it means that the plant

already has sufficient N nutrients so that it no longer needs to be fertilized. The results showed that the use of BWD in N fertilization activities could save 15-20% of the use of urea fertilizer from the dosage commonly used by farmers without reducing yields.

How to use BWD is as follows:

1. Before the age of 14 days after transplanting (HST), rice plants are given basic N fertilizer at a rate of 50-75 kg per hectare. At that time BWD was not needed.
2. Measurement of the green level of rice leaves with BWD begins when the plants are 25-28 HST. Measurements are continued every 7-10 days, until the plants are pregnant or in the primordia phase. This method applies to ordinary superior varieties. Especially for hybrid rice and new types of rice, measurements of the greenness of plant leaves are carried out until the plants have flowered 10%.
3. Randomly select 10 healthy plant clumps on a uniform bed, then select the top leaves that are fully open in one clump.
4. Place the center of the leaf on the BWD, then compare the color of the leaf with the color scale on the BWD. If the leaf color is between the two color scales in BWD, then use the average value of the two scales, for example 3.5 for the leaf color value which is between scale 3 and 4 in BWD.
5. When measuring plant leaves with BWD, the officer/conductor must not face the sun, because it affects the measurement value.
6. Whenever possible, each measurement is taken at the same time and by the same person, so that the measurement values are more accurate.
7. If more than 5 out of 10 observed leaves are within critical limits or with an average value of less than 4.0, the plant needs to be given N fertilizer at the rate of:
   - 50-70 kg of urea per hectare during the low yield season (in certain places such as Subang, West Java, the low yield season is the dry season).
   - 75-100 kg of urea per hectare during the high yield season (in certain places like Kuningan, West Java and Sragen, Central Java, the high yield season is the dry season).
   - 100 kg of urea per hectare for hybrid rice and new types of rice, both in low and high yield seasons.
   - If the color values of the leaves of hybrid rice and new types of rice when the plants are panicling and 10% flowering are on a scale of 4 or less, then the plants need to be given

N fertilizer at the rate of 50 kg of urea per hectare.

- Hybrid rice varieties such as: Intani 1, Long ping, Hipa 4, Rokan and the like are very suitable for using BWD as a basis for carrying out N supplementary fertilization, as well as for new superior rice such as: Invara, Invari 43.48 and the like. As for the types of local rice, glutinous rice and special rice, the principle is the same, but further studies are still needed.

Fertilization recommendations in the SLP-TT program Balanced fertilizer application is based on the needs and availability of plant nutrients. The government through this SLPTT helps provide organic and inorganic fertilizers. Farmers are encouraged to fertilize plants with the principle of the right amount, type, method and time. After participating in the SLPTT they started trying to use inorganic fertilizers (urea and SP360) according to the recommended dose. Besides that, they still used additional organic fertilizer, namely from shrimp head waste, which they had long believed could increase soil nutrient content. The government in this SLPTT provides assistance with inorganic fertilizers and organic fertilizers according to the recommended dosage.

Farmer Utilizing local microorganisms (MOL) is believed to be able to maintain soil fertility, increase soil microbial populations, protect the environment while maintaining and increasing soil productivity. Organic fertilizers can be divided into 2 (two) based on their forms, namely solid organic fertilizers and liquid organic fertilizers. One type of liquid organic fertilizer is what is commonly known as Local Micro Organisms (MOL) which is a fermented solution. The basic ingredients of MOL come from various sources containing micro and macro nutrients, bacteria decomposing organic matter, growth stimulants and pest/plant disease control agents. Therefore, MOL can be used as (a) liquid organic fertilizer, (b) decomposers or composters, (c) vegetable pesticides.

Main Advantages of Using Mol

The following are the advantages of using MOL

1. Making MOL is simple and easy with a relatively short time.
2. The cost of making it is cheap, because it uses materials that are underused and available around.
3. The organic fertilizer produced contains complex elements both macro and micro as well as beneficial microbes.
4. Environmentally friendly because it leaves no residue.
5. Protected soil biota so as to improve/maintain soil quality.

6. Increase the quantity and quality of plant products.

MOL is a liquid that contains self-produced microorganisms from natural materials around us (local), where these materials are the preferred place as a medium for the life and development of microorganisms that are useful in accelerating the destruction of organic materials (decomposers) or as a nutritional supplement for plants.

Main Materials for Mol

1) Source of glucose: granulated sugar, brown sugar or rock sugar diluted with water or finely crushed, can also be from sap or coconut water
2) Sources of carbohydrates: washed rice, stale rice, cassava waste, potatoes or wheat
3) Sources of bacteria: golden snail, snails, contents of animal intestines, banana weevils, fruits, animal waste

Fruit Mole

The fruits used are available around us such as papaya, mango, jackfruit, pineapple, banana & tomato. Excess Mol fruit is that it has a fragrant aroma like the original fruit aroma

Benefits and content

1. As a flower and fruit stimulant
2. Improving fruit quality such as durability and increasing the sweet taste of fruit
3. As a decomposer of organic matter or a compost maker

Tool

1. Large jerry can volume of 10 l/ gallon/ bucket + lid
2. Bottle of mineral water/syrup volume 1.5 l
3. Small plastic hose
4. Plasticine / huwas
5. Bucket / basin
6. Filter
7. Blender / mortar
8. Knife and cutting board

Material

1. 2 kg of fruit waste such as papaya, jackfruit, banana, mango, pineapple, tomato etc
2. 2 ounces of brown sugar
3. 2 liters of coconut water
4. 8 liters of leri water (washed rice)
5. Clean water

Ways of making

1. Crush (blender) the available fruits and then filter them
2. Enter the brown sugar that has been combed
3. Mix it with coconut water and leri
4. Put all the ingredients into the jerry can, cover tightly, give the top air hole then insert the hose that is connected to the bottle that has been filled with water, the end of the plastic hose must be submerged in water
5. Fermentation for ± 14 days

Concentration and how to use

1. For compost

Mix 5 l of water for every 1 l MOL. Add 1 ounce of sugar then spray into the organic ingredients mixture, cover tightly.

2. For fertilizer

Dilute with 15 liters of water per 1 liter of MOL. Spray on plants morning or evening

Weed control physically can be done by:

1. Soil processing. Land preparation using tools such as hoes, harrows, plows, tractors which function to eradicate**weeds**.
2. Clearing (trimming, mowing)
3. Inundation. …
4. Combustion.
5. Mulch (mulching, litter cover)

Integrated Pest and Disease Control

Integrated pest and disease control (IPM) is a control approach that takes into account ecological factors so that control is carried out so as not to disturb the natural balance and not cause big losses. PHT is a combination of various methods of pest and disease control, including monitoring pest populations and plant damage so that the use of control technology can be more appropriate.

Pests that often attack paddy rice plants are:

Golden snail

IPM on the golden snail is carried out throughout the planting with the following details:

- Pre-planting: take gold snails and destroy them mechanically.
- Nursery : take the golden snail and destroy it, spread more seeds for embroidery and clean the water channels of aquatic plants such as kale.
- Vegetative stage: plant seedlings that are a bit old (> 21 days) and the number of seeds is more, dry the fields up to 7 HST, no herbicide application until 7 HST, take the golden snail and destroy it, put the filter on the water intake, bait using the bottom leaf and papaya, put stakes so that snails lay eggs on the stakes, take and destroy snail eggs on plants and apply inorganic and vegetable pesticides such as saponins and crackers at 20-50 kh/ha before planting on caren.
- Generative stage and after harvest: take the golden snail and destroy it, and graze the ducks after the rice is harvested.

Chocolate candy

How to operate as follows:

- Use varieties resistant to brown planthoppers, such as: Ciherang,

Kalimas, Bondoyudo, Sintanur and Batang Gadis.

- Apply K fertilizer to reduce
- Monitor planting no later than 2 weeks
- If the pest population is below the economic threshold, use botanical insecticides or ento-mopathogenic fungi.
- If the pest population is above the economic threshold, use the recommended chemical insecticides.

Stem Borer

If the population is high (above the economic threshold) apply insecticides. If the puddle is shallow, apply granular insecticides such as carbofuran and fipronil, and if the puddle is high, apply liquid insecticides such as dimehipo, bensultap, amitraz and fipronil.

Mouse

Integrated rat pest control (PHTT) is based on understanding the ecology of rat species, carried out early, intensively and continuously by utilizing appropriate and timely control technology. Rat control emphasized at the beginning of the growing season to suppress the initial rat population from the beginning of planting before the rats entered the reproductive period. These activities include mass gropyok, habitat sanitation, installation of FFB (Trap Barrier System) and LTBS (Linear Trap Barrier System).

No Sangit

The way to control it is:

- Control weeds in the fields and around the plantations.
- Fertilize the land evenly so that plant growth is uniform.
- Catch fierce bugs using 15arrings before the flowering stage.
- Bait for stink bugs using rotten fish, spoiled meat, or chicken manure.
- If the attack has reached the economic threshold, spray insecticide.
- Spray in the early morning or evening when the stink bug is in the canopy.

Bacterial Leaf Blight (HDB)

How to control as follows:

- Use resistant varieties such as Conde and AngkKe.
- Use nitrogen fertilizer according to the needs of the plant.
- Clean up infected stumps and straw.
- Spacing not too close.
- Use healthy seeds or seedlings.

Blast Disease

The way to control it is:

- Use blast resistant varieties interchangeably.
- Use nitrogen fertilizers as directed.
- Strive for the right planting time, so that the initial flowering time is

not a lot of dew and continuous rain.

- Use a fungicide with an active ingredient of methyl thiophanate or phosdifen and casugamycin.
- Seed treatment.

For rice, the irrigation technique used is above-ground irrigation. There are 3 systems for providing water to lowland rice in irrigation networks, namely: continuous irrigation system, rotational irrigation system, and intermittent irrigation system. Rice harvest depends on the thresher used.

- Ani-ani is generally used by farmers to harvest local rice that is resistant to loss and tall rice plants by cutting the stalks.
- How to harvest new superior varieties of rice with a sickle can be done by cutting the top, middle cutting or bottom cutting depending on the method of threshing.
- The method of harvesting is by cutting the bottom, generally done when threshing is done by slamming or using a pedal thresher.
- Harvest rice by top-cutting or mid-cutting if threshing is done using a threshing machine.
- How to harvest is done by cutting the bottom (5-10 cm above ground level) using a sickle.
- The cut rice is collected or mounded using a 1m x 1m plastic mat. The delay of threshing in the form of bumps should not exceed 1 night.
- The mounds of rice wrapped in their mats are transported to the threshing site. The mounds are transferred to threshing mats made of plastic / tarpaulin measuring 6m x 6m.

Post-harvest handling of rice is an activity since the rice is harvested until it produces an intermediate product that is ready to be marketed. Thus, rice post-harvest handling activities include several stages of activity, namely:

1) Harvesting;
2) Stockpiling and collection;
3) threshing;
4) Cleaning;
5) Transportation;
6) Drying;
7) Packaging;
8) storage;
9) milling.

Cultivation of Healthy Plants Selection of varieties of seeds:

Reasons for selecting varieties

a. High production

b. Disease resistant

c. Rice is liked by consumers

d. Seeds are easy to get

e. Seeds are more stable

The Effect of Adult Education Method (Andragogy) on Farmers in Integrated Crop Management Field School Activities

The learning process at SL-PTT begins with activities which then provide personal experiences, express these experiences, analyze the problems that occur, and conclude the results of the activities. If the farmers participating in SL-PTT have felt the positive impact of the applied technology, both from material and non-material aspects, then they will apply the technology again the following season. Farmers feel proud after understanding and implementing their own studies on their own land with above average results, especially if they are the best in their own environment. Therefore, farmers need to be encouraged to improvise to produce better work. Several training activities that support farmers to learn. Lynton and Pareek (1990) state that training consists mostly of well-organized opportunities for participants to acquire the necessary understanding and skills. In conventional education students are required to adapt to a predetermined curriculum; in adult education, the curriculum is built around the needs and interests of students.

Furthermore International study tours (IST), especially those that combine adult learning theory and peer to peer learning, can be a valuable tool in agricultural development for both knowledge providers and seekers (Kumar and Watkins 2017). Adult learning theory is highly relevant in international agricultural development because any changes in farming practices introduced through development projects will be adopted by adult farmers. Agricultural development programs have long used the extension model to drive practice change through knowledge transfer (Haug 1999).

ISTs in agricultural development programs are gaining increasing acceptance as a central method of knowledge exchange due to their flexibility to adapt content to participants' knowledge gaps and their ability to leverage successful practices from one context to another. Although IST is relatively common in the literature of fields such as health and education (Kulbok et al. 2012; Tucker and Weaver 2013), there is little literature on agricultural IST. The World Bank and national governments across low- and middle-income economies are actively involved in facilitating agricultural IST (Kumar and Watkins 2017) however, there is little published information regarding the efficacy of IST and more specifically, how design can drive change. (Hainzer et al., 2021)

Field Schools are schools without

walls, without separators and boundaries, open and informal with the Adult Education (POD) approach to develop and empower farmers/farmer groups/communities through a learning system based on experience in carrying out forestry activities. (Ministry of Forestry, 2012). Field school as a method of extension or learning and education of farmers has special characteristics, principles, principles, stages that distinguish it from other extension and learning methods (Ministry of Forestry, 2012). Field schools are not formal schools, where learning takes place outside the classroom with limited time and space schedules.

Field Schools are usually limited, for sustainability and development to become independent and dynamic institutions it is necessary: (1) Strengthening Village Institutions; and (2) Network/Partnership Strengthening. 3. Monitoring and Evaluation It is necessary to establish instruments to measure the success of Field School activities. (Sadono, 2008).The Field School method is not a transfer of technology or information but prioritizes the study of experience to gain knowledge. Every learner is encouraged to be able to observe reality, express experiences and ideas, analyze facts, make decisions, and carry out activities together. They are positioned as subjects to lead themselves and drive the process of learning and collective action in a gradual and sustainable manner. (Richard et al., 2022)

The learning process in Field School activities is closely related to the view of human nature as active and creative living beings who are always 'thirsty' for understanding the meaning and purpose of life. The Field School pattern is designed in such a way that the learning opportunities for farmers are wide open so that farmers can interact with their realities directly, and discover for themselves the knowledge and principles contained therein. Field School is not just "learning from experience", but a process so that students, who are all adults, can master a process of "discovery learning" that is dynamic and can be applied in the management of their farming land and in everyday life. (Ministry of Forestry, 2012).

The field school learning process is based on adult education which is packaged in learning methods that are practical, systematic and interesting (not rigid). According to (Sri Astuti, 2012) Field School is seen as one of the methods in the teaching and learning process which is quite effective, because it is very suitable as a learning method for adults (Andragogy) because of its informal nature. To ensure an efficient learning process, field school activities are directed based on

the following points:

a) Field school participants are farmers or farmer groups in the demonstration plot area.
b) The place of study is on rice farms by observing the development of plants.
c) The Field School was held 3 times during the activity.
d) Subject matter on practice/application, observation, discussion and exchange of information and experience. The subject matter is truly the needs of farmers and is agreed upon with the farmers.
e) The learning process is guided by a facilitator whose function is to direct the learning process as an intermediary in conducting discussions.
f) Farmers as study participants have the same rights to speak and argue and it is the task of the facilitator to create a harmonious and balanced atmosphere in the learning process.
g) At the end of each learning process it is hoped that there will be a follow-up agreement including; readiness to apply technology that has been learned by participants, solving problems (how and when) prioritizing material at the next meeting and others.

The Role of Integrated Crop Management Field Schools in Increasing Rice Production

Problems that often exist in the field (by farmers) namely aspects of cultivation, starting with planting planning, planting preparation, tillage, fertilization, weeding, and other maintenance have not been planned and prepared optimally so that disease rates are suppressed. So far, the aspect of cultivation is still more aimed at making plants thrive and produce high, not to become more resistant. In addition, the natural enemies referred to in the IPM principle have little to do with natural enemies of plant pathogens. The problem is that microscopic pathogens also have microscopic natural enemies, so it is not easy for farmers to understand. Likewise, it turns out that not many studies have revealed the dangers of pesticides to the preservation of natural enemies of plant pathogens. (Nurasa & Supriyadi, 2016)

SL-PTT can be interpreted as a place of non-formal education for farmers to increase knowledge and skills in recognizing potential, preparing farming plans, overcoming problems, making decisions, and applying technology that is in accordance with local resource conditions in a synergistic and environmentally sound manner, so that their farming becomes efficient, high productivity and sustainable. Through the SL-PTT Program, there will be communication between field guides as message carriers and farmers as message recipients (Department of Agriculture,

2008). However, in reality in the field, the integrated crop management innovations that have been studied in field schools cannot be fully implemented by farmers. Based on this fact, it is necessary to look for the impact of the Integrated Crop Management Field School (SLPTT) on the application of PTT technology in lowland rice farming..(Nursyamsi et al., 2007)

The obstacles faced by farmers in adopting innovations at the Integrated Crop Processing Field School (SL-PTT) for rice and corn in post-harvest are internal constraints on human resources (work ethic) who don't want to be bothered with post-harvest handling such as drying, milling, selling generally carried out by collectors. The inhibiting factors for the rice SLPTT program which are one of the community empowerment methods are**first**; there is no reward and punishment for farmer groups who hold meetings according to the rules or not where each group has signed a statement of willingness to follow the rules of the non-hybrid rice SLPTT program. Appropriately farmer groups that can fulfill the SLPTT program contract can be given rewards that are useful in providing motivation to be able to play an even more active role. As understood that motivation becomes the spirit in empowerment (Wahyuni, 2000). Rewards can be given in the form of additional facilities or assistance quotas to groups that can fulfill or at least manage group meetings optimally. Likewise punishment should also need to be given to groups that cannot meet the specified number of meetings. Punishment can be given in the form of not including the farmer group to take part in another empowerment program at a later time. So that it is hoped that this will have a prudential effect on farmer groups to fulfill the provisions of the stipulated meeting.

Second, Lack of effort by farmer group administrators to make group meetings attractive to their members. Monotonous group meetings will have a boredom effect on farmer group members. In extension theory, there is a practical method which is very interesting to do. By involving farmers to participate practically in this meeting, it makes the meeting more interesting. There needs to be synergistic cooperation between farmer groups and extension workers to be able to determine the method of the meeting to be held. This is as expressed by Suryono (2005) that the presence of farmers and the role of extension agents also play a role in the adoption of innovations.

Third, The level of productivity is the only parameter of the success rate of community empowerment through the SLPTT program. In fact, with different levels of soil fertility and different

economic capabilities, the amount of input provided is also different. Changing the paradigm of assessing program success which is only based on productivity needs to be improved. As it is known that in the counseling process there is a constructive change in farmer behavior towards a better direction. Thus, the enthusiasm of farmers to institutionalize needs to be appreciated. (Cárdenas López, 2012).

Observation of pests and diseases Observation of pests on an irregular basis. Observational analysis, based on the number of pest populations. Important pests and diseases of rice plants, therefore rice plants need fertilizer according to the abiotic diseases they experience. Abiotic diseases in rice plants consist of deficiencies of nitrogen, phosphorus, potassium, sulfur, zinc, and iron poisoning.

a. Nitrogen deficiency by using fertilizerszwavevelzuure ammonia (ZA), because Nitrogen (N) is one of the main nutrients in the soil which plays a very important role in stimulating growth and giving the leaves a green color. Lack of nitrogen in the soil causes plant growth and development to be disrupted and plant yields to decrease because the formation of chlorophyll which is very important for the photosynthesis process is disturbed.
b. Phosphorus deficiency using SP 36 fertilizer, symptoms of phosphorus deficiency cause slow plant root growth. Dwarf plant, leaves are dark green and erect.
c. Potassium deficiency with the use of fertilizers, rice plants that lack potassium, rotting roots, stunted plants, and wilted leaves.
d. Sulfur deficiency using fertilizers, sulfur deficiency causes yellowing of old leaves, stunted plants, reduced number of tillers and panicles
e. Zinc deficiency with the use of fertilizers, zinc deficiency causes pale green leaves.
f. Iron Poisoning with the use of fertilizers, iron deficiency causes small brown spots on the leaves

Knowledge of Seeds/Seeds

Statement	Right	Wrong	Don't know
Seeds for seeds should come from healthy plants	100%		
If the soil is not covered, some of the urea fertilizer will be lost because it evaporates and is carried away by water	100%		
Manure loosens the soil	100%		
Complete fertilization is a mixture of urea with TSP and KCL	100%		

Statement	Agree	Don't agree	Doubt-Doubt
Crop rotation helps reduce pest attack	100%		
Natural enemies need to be conserved	100%		
Destroying diseased crop residues helps suppress disease attacks	100%		
When planted, they encountered caterpillars, the caterpillars were taken and killed	100%		
Weeding by hand or tools is more profitable than herbicides	100%		
After harvesting, rice straw is usually burned	33.33%		66.67%
Burning straw prevents rats from nesting in haystacks	33.33%		66.67%

Causes of pests and diseases in rice:

a. Infected from the surrounding plants and the climate is not suitable

b. Infected from the surrounding plants, seeds are not healthy, and the climate is not suitable

c. Infected from plants around Transmission:

a. Through the flow of water and wind

b. Through the flow of water, wind, touch

c. Through water flow, wind, soil, and vector insects

d. Through water and land

e. Through the wind

According to farmers, the use of pesticides can increase rice production. The outbreak of attacks by Plant Destruction Organisms often causes farmers to control them using chemical pesticides. According to the Minister of Agriculture Number 39/Permentan/SR.330/7/2015, Pesticides are all chemical substances and other materials as well as microorganisms and viruses that are used for:

1. eradicate or prevent pests and diseases that damage plants, plant parts or agricultural products;
2. eradicate weeds;
3. Kills leaves and prevents unwanted growth;
4. Regulating or stimulating the growth of plants or plant parts excluding fertilizers
5. eradicate or prevent external pests on pets and livestock;
6. eradicate or prevent water pests;
7. eradicate or prevent animals and micro-organisms in households, buildings and in means of transportation; and/or
8. Eradicate or prevent animals that can cause disease in humans or animals that need to be protected by use in plants, soil or water.

CONCLUSION

1. The influence of adult education methods (andragogy) on farmers in SLPTT activities, namely the learning

process in SL-PTT starts with activities which then provide personal experiences, express these experiences, analyze problems that occur, and conclude the results of activities. The Field School method is not a transfer of technology or information but prioritizes the study of experience to gain knowledge. Every learner is encouraged to be able to observe reality, express experiences and ideas, analyze facts, make decisions, and carry out activities together

2. The role of SLPTT is to increase knowledge and skills in recognizing potential, preparing farming plans, overcoming problems, making decisions, and applying technology that is appropriate to local resource conditions in a synergistic and environmentally sound manner, so that farming becomes efficient, highly productive and sustainable.

REFERENCE

Alfurqan, & Rahman, R. (2017). Pendidikan Orang Dewasa Yang Dikembangkan Rasullullah. *Journal of Islamic Studies*, *1*(1), 15–29.

Amanah, S., & Seminar, A. U. (2022). Sekolah Lapang Petani sebagai Community of Practice Pengembangan Inovasi Kelompok di Era Digital. *Jurnal Penyuluhan*, *18*(01), 164–176. https://doi.org/10.25015/18202240307

Arimbawa, P. D., & Widanta, A. . B. P. (2017). Pengaruh Luas Lahan, Teknologi dan Pelatihan Terhadap Pendapatan Petani Padi dengan Produktivitas sebagai Variabel Intervening di Kecamatan Mengwi. *Arimbawa, Dika Putu*, *6*, 1601–1627.

Cárdenas López, A. C. (2012). No Title طرق تدريس اللغة العربية. *Экономика Региона*, *10*(9), 32. https://dspace.ups.edu.ec/bitstream/123456789/5224/1/UPS-QT03885.pdf

Cooper, S. S. (1983). Principles of adult learning. *Occupational Health Nursing*, *31*(6), 17–19. https://doi.org/10.1177/216507998303100604

Cox, T. D. (2015). Adult Education Philosophy: The Case of Self-Directed Learning Strategies in Graduate Teaching. *Journal of Learning in Higher Education*, *11*(1), 17–22.

Hendayani, S. (2020). Dampak Pembelajaran Filsafat Bagi Pendidikan Dan Pembelajaran Di Indonesia. *Paper Knowledge . Toward a Media History of Documents*, *11*, 12–26.

Hutapea, Y., Lapang, S., Tanaman, P., & Padi, T. (2012). *(Kasus di Desa Pagarsari Kecamatan Purwodadi*. *6*(3).

Kecamatan, D. I., & Bogor, C. (n.d.). *Kata kunci:*

Maiti, & Bidinger. (1981). Landasan Ontologis, Oksiologis, Epitesmolosis Aliran. *Journal of Chemical Information and Modeling*, *53*(9), 1689–1699.

Majani, W. P. (2021). Understanding Adult Learning in Higher Education from African Philosophy of Education and Transformative Perspectives. *Papers in Education and Development*, *38*(38), 139–152. http://196.44.162.39/index.php/ped/article/view/3788

Mezirow, J. (1990). Reproductions supplied by EDRS are the best that can be mad. *31st Annual Education*

and Research Conference (AREC), *114*, 141–146.

Muchtar, K., Purnaningsih, N., & Susanto, D. (2014). Komunikasi Partisipatif pada Sekolah Lapangan Pengelolaan Tanaman Terpadu (SL-PTT). *Jurnal Komunikasi Pembangunan*, *12*(2), 1–14.

Nurasa, T., & Supriyadi, H. (2016). Program Sekolah Lapang Pengelolaan Tanaman Terpadu (SL-PTT) Padi: Kinerja dan Antisipasi Kebijakan Mendukung Swasembada Pangan Berkelanjutan. *Analisis Kebijakan Pertanian*, *10*(4), 313. https://doi.org/10.21082/akp.v10n4.2012.313-329

Nursyamsi, S., Soetoro, & Hardiyanto, T. (2007). Dampak Sekolah Lapang Pengelolaan Tanaman Terpadu (SLPTT) Terhadap Penerapan Teknologi PTT Pada Usaha Tani Padi Sawah. *Agroinfo Galuh*, *4*(3), 366–375.

Richard, B., Qi, A., & Fitt, B. D. L. (2022). Control of crop diseases through Integrated Crop Management to deliver climate-smart farming systems for low- and high-input crop production. *Plant Pathology*, *71*(1), 187–206. https://doi.org/10.1111/ppa.13493

Russell, S. S. (2006). An Overview of Adult-Learning Processes Adult-Learning Principles. *Continuing Education*, *26*(5), 349–370.

Sajeev, M. V, Venkatasubramanian, V., & Singha, A. K. (2021). *Identifying Training Needs of Farmers and Rural Youth of Nagaland*. *57*(2), 115–122.

Tanaman, P., Di, T. S., East, S. O. F., & Regency, L. (2015). *PANEN PADI DAN JAGUNG PADA SEKOLAH LAPANG KABUPATEN LOMBOK TIMUR JURNAL Oleh Sopian Hadi*.

Taylor, E. W., & Tisdell, E. J. (1996). Adult Education Philosophy Informs Practice. In *Adult learning* (pp. 6–10). http://robert-vroman.com/resources/Adult Education Philosophy.pdf