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Republic of the Philippines Mindanao State University Barangay Fatima,

General Santos City Knowledge on Rice Pest Control Submitted by:

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The rice plant is an ideal host for many insect species. All of the plant parts are vulnerable to insect-feeding from the time of sowing till harvest. There are over 800 insect species damaging rice in one way or another, although the majority of them do very little damage (Nwilene, F., Stout, M., Hadi, B.

, Freitas, T. 2017, pp. 1). Pest is an enemy of farmers in their rice crops.

From the past up and to the present time, pest causes a big trouble to the farmers. Rice pest is a threat to the large scale and small scale farmers. It can lose a lot of grains of rice. Specifically, it can damage a large part of a rice farm.

And also, it will lead to a problematic and serious situation. There are many pests attacked in the wide range of farms. Since the rice plant starts to grow up to the time of harvest, a lot of pests occur to attack the rice plant.

The destruction of pests brings too much loss to the production of yields. And it may cause a greater amount of loss in income. This kind of situation brings conflict in the farmers. For the past years, rice farmers practiced various strategies to prevent danger made by the rice pest. This knowledge practiced is coming from the different factors that influenced them. In the past and present days, many rice farmers have their own knowledge in order to fight against their enemy. Farmers' strategies or techniques might be coming from different sources. These strategies influenced them in handling and managing their farms.

Obviously, these techniques are already their customary practices. Also, they know how to apply different strategies when there is a pest attacked to their farm. It is understood that they already know how to handle their farm when pest violate. The strategies or techniques is coming from the factors that affect the knowledge of many farmers. This knowledge may come from the people that they interact every day.

Additionally, they use the techniques acquired in interacting people. The methods in pest control are classified as mechanical, chemical, physical, or cultural. These methods are used by farmers in controlling pest. And also, they can be measured by different factors. These factors that influenced the small scale farmers, tenants and large scale farmers used to help in reducing the harm made by different pest. In this concept, it will explain and understand the knowledge of rice farmers in controlling pest.

The concept of controlling pest will explore all the knowledge acquired by farmers in interacting to the group of people. The education, cooperation, access to technicians, experiences in farming or coming from their ancestors can be explained on how and what they do these kind of patterns in farming. According to Rogers (1995), knowledge and awareness of a new technology is the first ways of adoption. This is the case especially for interventions that are skill or knowledge based (David and Asamoah, 2011, pp. 18). Knowledge in different techniques helps farmers to adjust pest attacked.

It is believed that rice is the world's most important staple food crop. More than half of the world's population relies on rice as the major daily source of

calories and protein(Kasmaprapruet, Paengjuntuek, and Saikhwan, & Phungrassami, 2009, pp. 100).

One reason to help the rice yields is having a good production (GTNRDS, 2009, pp. 5). Mostly, farmers challenge in rice production is low yield.

According to Hushnawati, Kwong-ching, LinPing-Shih (2012) there are different pest and diseases in the rice crops. They are rat, bird, apple snail, rice bug, stem borer, rice leaf roller and bacterial leaf blight. Farmers face different kinds of risks. Farming rice in rural areas is influenced by human selection and management. Environmental, biological, and cultural factors influenced a farmer's decision to accept or reject various strategies in cultivation. They face production risks from natural phenomena and economic risks from market fluctuations and related economic phenomena. If all relevant variables were known with certainty, farmers would face the classical maximization problem: maximizing profits.

However, after decisions are made, natural and economic conditions change, and with this new setup, previously optimal decisions become suboptimal (Rola, A. & Pingali, P., 1993, pp. 41-42). Along this line, Antle (1983) advanced the hypothesis that risk matters primarily because production is a dynamic phenomenon and that production and price uncertainty therefore affect expected productivity and expected income. The analysis of dynamic, uncertain models shows that farmers' optimal decisions are affected by risk whether they are "risk neutral" or "risk averse." This suggests that dynamic, risk neutral models may be more useful than

conventional static risk averse models (Anderson et al 1980) for understanding the role of production risk in farm management. (Rola A. & Pingali, P. 1993, pp. 42). Farmers' pest control activities reflect their individual perceptions, not necessarily the actual situation (Tait 1977; Mumford 1981, 1983; Norton and Mumford 1983; Pingali and Carlson 1985; Carlson and Mueller 1987 pp. 7). Indigenous pest control methods employed by local rice farmers, after having been identified, were classified into: cultural (9), chemical (2), mechanical (5), biological (2), and physical (2). Two practices such as uttering of prayer while fertilizing the plants and offering foods to the Gods, saints, and spirits were categorized as "cultural worships". (Nicolas, A.

& Cabarogias, . 2015, pp. 442). And also, these farmers deflect the ideas of farming from the individuals they encounter. Agriculture in Bangladesh are used to control pest using other traditional methods besides insecticide.

In these cases they used indigenous knowledge to control pest not to avoid the hazard of pesticide, mainly to minimize the production cost. Among the other methods, 40% of the farmers used crop rotation as an alternative to chemical pesticides use, 19% used timely planting and 15 % used resistant varieties. Only 2% of the farmers used Integrated Pest Management (IPM) technique to control pest of rice. Bio-controls means that they use bird to feed the insect.

Remaining 12% farmers used other methods such as, soap, kerosene oil, light and net trap to control insect. (Sultana, P. & Nobukazu N.

, pp. 116). In certain extent they pull the insect larvae by hand also. The knowledge of farmers was greatly influenced by their level of education.

The average level of education of the farmers was 6 years of schooling.

(Sultana, P. & Nobukazu, N., pp.

123). Farmers also use pesticides as rice pest control to their farm. Farmers believe that pesticides are effective in controlling pest production. Many farmers think that the pesticide is a medicine to treat the crop to be recovered from the pest attack. Most farmer-respondents (67%) spray their fields when a neighbor sprays to prevent the pests from transferring to their farms (Rola, A. & Phrabu P. 1993,). The issues, which were not perceived by the farmers, they showed neutral attitudes towards them.

It might be due to the influence of socio-economic characteristics such as, age and education and occupation (Rola and Pingali 1993 pp. 124). Agricultural education is needed to facilitate learning, which instills a favorable attitude towards the use of improved farm practices (Nkamleu and Manyong 2005, pp. 66).

Farmers obtain their knowledge about pesticide dosage from government technicians, pesticide sales people, pesticide labels, and other farmers. Knowledge of farmers is acquired from technicians who gave them ideas in farming. Technicians assist farmers in proper handling of the pest control. Proper training about correct dosages is imperative for government technicians because industry sales people may tend to convey a message of higher dosages and frequent application to increase their sales (Rola, A.

Pingali, P., 1993, pp. 33). According, Msangya & Yihuan(2016) lack of technician in farming influence in rice productivity. It is stated that technical assistance shall be needed in farming rice. Strategies in farming also form from the ancient practices. These practices were acquired from their ancestors and passed down from generation to generation by word of mouth.

Plastic straws with plastic bags or cans are tied around the rice field (Nicolas, A. & Cabarogias, A. pp. 441-444). Another rice pest that attacked in the rice crop is the bird named "maya".

Maya is also a pest that affects growth of the rice crop. Many farmers find different strategies to avoid the destruction made by the birds. The straws produce a sound as the wind strikes on it. Some use gunshots or firecrackers to scare away birds that may feed on the grains.

Farmers collect the rice straws that were ejected by the thresher, dry them, and burn. They consider it a good practice for it kills the immature stages of insects present on it. When the crop has already been harvested, farmers offer some of their produce to the church for thanksgiving. They believe that when they give thanks to the Lord, they will be continuously blessed with good harvests (Nicolas, A. & Cabarogias, A. pp.

441-444). Furthermore, the use of domestic ducks has been key to knocking back snail populations to manageable levels. Where multiple strategy control systems are in place, the addition of domestic ducks significantly reduces the time and labor spent in hand removal of snails and reduces crop loss and damage to less than ten percent (Levin, P., 2006, pp. 86). Farmers need to have training to improve knowledge, attitudes and skills on better

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farming practices in order to increase productivity and alleviate poverty in rural areas (Kebede, 2010, pp.

10). A study on diffusion of biotechnology in Cotton in China showed that training helped farmers to change their cotton bollworm spraying practices (Lifeng, et al., 2007 pp. 10). The intensity of participation during training increases the probability of farmers adoption of new farming practices (Kijima, et al.

, 2010; Noltze, et al., 2012 pp. 17). Additionally, the undergoing training and exposure in the demonstration field made by 335 farmers applied over an area of 609 hectares in 11 districts of Giang. This proved that training or exposure can influenced knowledge of farmers in farming.

Major practices in rice production over the last 100 years essentially evolved out of the changes in the varieties introduced and planted by Filipino farmers, which subsequently changed the manner production and postharvest operations had to be done. Rice production practices are expected to continue to evolve to the changing challenges and needs of the times-when both Filipino scientists and rice farmers come up with innovations that would pursue rice self-sufficiency and global competitiveness in farming. Direct seeding, mechanization, and integrated nutrient and pest management will continue to be refined and practice on a wider scale (Bautista, E. U. & Javier, E. F., 2008, pp.

100). The practiced of the farmers regulate in the form of interacting various group of people. The knowledge they acquire remains because it will continue to transfer from one farmer to the other groups of

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farmers. Conceptual Paradigm - FIGURE 1 References : Rola, A.& Pingali, P. (1993). Pesticides, rice productivity, and farmers' health and economic assessment.

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