

# Analysis of Technology Innovation Adoption of Plant Calendar in Cimanuk Pandeglang District, Banten Province

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## ABSTRACT

The Ministry of Agriculture has designed a planting calendar technology so that farmers can carry out the cultivation using the technical guidelines. But at the operational level the adoption rate of the planting calendar technology is still relatively low. This paper aims to describe how the process of adoption of agricultural technology innovation, especially regarding the planting calendar occurs in farmers in Cimanuk sub-district, Pandenglang, Banten. location-based rice specific and know the level of adoption.

The results of the study illustrate that the adoption of the planting technology innovation in the Cimanuk sub-district is influenced by the needs of the farmers themselves to the planting calendar technology itself. In addition, the nature of farmers' cosmopolitanism also influences how the adoption of the calendar planting technology is among them. On the other hand, agricultural extension workers have actually worked well in providing material related to planting techniques as guided by the planting calendar, and generally farmers in the Cimanuk Pandenglang sub-district gave a positive appreciation. It's just that the habits and the strength of their traditional farming patterns have occupied the highest position in their mindset in farming.

Keywords : Calendar of Planting, Adoption, Innovation, Technology.

## I. INTRODUCTION

The study that has been carried out by the Agricultural Technology Assessment Center has produced a lot of applied farming technology that is ready to be implemented at the farm level. But in reality, the level of technology adoption of the assessment results has not been optimal. One of them is the calendar planting technology (katam) which has not been well applied by technology users (farmers) and other stakeholders. The reality that we often are farmers actually re-carry out farming activities using the old way or after the study activities are over (Efendy, et al, 2005).

In practice, to spread agricultural information (in this case the planting calendar technology), it requires the involvement of various parties, such as bureaucracy, extension workers and farmers. Bureaucracy as a source of strength determines the stability of peasant societies in general, extension agents as suppliers of technology and farmers as users of the technology itself. This condition of interrelation cannot be avoided. The contribution or involvement of one of the parties is needed in this case, so that if there is no involvement, it will result in the distribution of agricultural information is not as expected (Kartasapoetra, 1996).

Agricultural extension workers are required to play an active role in the process of technology transfer, which is the planting calendar technology to farmers. In this connection, understanding the proper way of delivering information is a crucial dimension that needs attention. One indicator of the success of the implementation of the planting calendar program, as a manifestation of agricultural technology is how much the technology was adopted by farmers to be further applied in farming activities (Hanafi, 1988).

The high degree of adoption of innovations marked by the large number of farmers still carrying out their traditional business activities indicates that the planting calendar application program is not yet optimal in the Cimanuk sub-district, Pandeglang, Banten. The reality of these behaviors or phenomena needs to be immediately sought for a solution because after all the technology was created so that farmers reach optimal levels of efficiency and effectiveness. In this context, the right communication strategy in the process of delivering the calendar planting technology to farmers is an important factor in the successful adoption of innovation in the Cimanuk sub-district, Pandeglang district.

In the perspective of communication science, there are three main components that need to be considered in relation to the process of delivering agricultural technology information (Rogers & Shoemaker, 1971). The three components are: (1) source of information (source), which is a counselor who disseminates technology to farmers; (2) messages / information delivered (message) to farmers; and (3) media / channels used in the distribution of planting calendar information. This research will analyze the determinants that influence the adoption of technological innovations in the calendar planting case communication perspective in Cimanuk, Pandeglang, Banten.

## II. METHODS AND MATERIAL

Relating to the problems that appear in the previous description, the type of research that is appropriate to do is research with qualitative methods using case study design. From the formulation of the problem, the researcher intends to describe how the packaging calendar information packaging process is carried out by the instructor, and how the assessment passed by farmers is based on persuasion information on the planting calendar. Qualitative research is intended to present the following picture of understanding of how and why a phenomenon or reality of communication occurs (Pawito, 2007).

Yin said in the case study there were questions 'how' 'and' 'why' directed to a series of contemporary events, where the researcher had only a small chance or no chance at all to control the event (Yin, 2015). Patton sees that case studies are an attempt to collect and then organize and analyze data about specific cases regarding issues of concern to researchers so that the data can then be compared or linked with one another (in the case of more than one case) by sticking to holistic and contextual principles (Pawito, 2007).

The purpose of the case study is to try to find meaning, investigate the process, and gain a deep and complete understanding and understanding of individuals, groups, organizations from certain events, projects, programs or situations. Yin said for the source of evidence which is data for the purposes of case studies, it can be summarized from documents, archival records, interviews, direct observations, observations and physical devices that can be used (Yin, 2011). Along with what was revealed by Yin stating the source of evidence for conducting case study research can be drawn from documents, archival records, interviews, direct observations, observations and physical devices. Pawito also emphasized that in qualitative research data can be obtained from interviews or interviews, observations, and data

obtained from documents, narrated texts (Pawito, 2007). This study seeks to see the adoption of information technology innovations in the planting calendar based on the Rogers adoption-innovation principle.

### III. RESULTS AND DISCUSSION

#### **The Influenced Factor Adoption of Agricultural Technology Innovations.**

For farmers to make decisions about the choice of the presence of a technological innovation is a fairly long process. There is a long thought process that must be gone through before settling on whether to accept or reject the innovation of the planting calendar technology. The decision to accept innovation is a typical type of decision making because they have to choose new alternatives (innovation) and leave the old technology. Farmers' perceptions of the messages or technological innovations delivered are critical to the success in the process of adopting innovation.

The slow pace of adoption of the planting calendar innovation is influenced by the characteristics inherent in the innovation. Some characteristics of agricultural technology innovation include the level of difficulty (complexity) of technological innovation, easy to apply (triability) and suitability to the needs of farmers (selective exposure). The level of need for innovation becomes a major factor that supports and motivates them to adopt a technology (Rogers & Shoemaker, 1986).

This fact can be proven by the innovation of several superior rice varieties introduced in various study locations where almost all farmers adopted these superior varieties. The use of local varieties as used so far has turned out to be unsatisfactory results so that the emergence of improved varieties with significantly higher production has become an attraction for farmers to adopt. The above phenomenon is in line

with the opinion of Hanafi (1988) which states that it is rare for someone to open up to an innovation if they do not need the innovation. In the context of this research, innovation is not always welcomed by farmers, the problem seems to be that farmers do not yet need the innovation.

But we must also remember that the character of farmers in us cannot be like that, precisely what we are currently trying to break through is trying to include farm stalls as targets for our technology information delivery, one of which is the planting calendar. The reason is that the farmer stall is now the closest partner to the farmer, meaning that in the past, the assistant farmers' counterpart, the extension worker who became the most powerful figure in the eyes of farmers was considered an all-rounder so that his presence was almost very easily found at any time, if now the figure This is not evenly distributed, because of what, because the number of instructors who are scattered is very small.

“The present instructors do not only handle one village, sometimes the extension officer handles several villages, the coverage area is wide. So even in terms of time it is not as intensive as when the instructor has a large quantity so that it is proportional to provide assistance to farmers and farmer groups' (Interview with Sudi's informant, 2019)

Farmers stating that introduction of technology is lacking or even not in accordance with the needs of farmers because they think that the most important problem to be immediately addressed is the existence of farm capital assistance during the growing season, rather than just technical assistance. The above phenomenon shows that besides the aspect of technological innovation, the institutional aspect, especially microfinance institutions in rural areas, becomes a very urgent need to immediately find a solution.

Farmers have a good perception of technological innovation based on rice with a planting calendar. It's just that the case in the district of Cimanuk, Pandeglang, Banten does not need the planting calendar information system. This would be counter productive if related to the design of agricultural development in this republic. This is an internal trait of a person (farmer) such as the level of cosmopolitan. Based on the results of the discussion, people who have a relatively high level of cosmopolitanness are more open to the presence of an innovation even though they do not know for certain the advantages and reliability of the innovation. Some farmers may be categorized as being medium-sized, who feel the need to know the success of the technology being introduced even though only a small number of people apply it and value it successfully. Finally, farmers who adopt an innovation require a relatively long time because they must see most people succeed and believe in advance that the innovation is truly economically profitable.

The results of research conducted in Cimanuk Subdistrict, Pandeglang Regency, show that external factors include the pattern of relationships (cosmopolitan) and triability affect the adoption of the rice mina farming system while the complexity factor has no effect on farmers in adopting innovation (Abuasir et al., 2004). In connection with the adoption of technological innovations in the planting calendar, the intensity of coaching (technological assistance) conducted by agricultural instructors is an important part in supporting the acceleration of adoption. As Levis (1996) stated, the speed of innovation adoption is also determined by the increasingly intensive and frequent intensity of promotions conducted by local reform agents (in this case, extension agents) and or other parties who are also interested in the adoption process. According to informants in this study stated that:

"Yes, but we have a cooperative farmer that we think is the most suitable example for others, then we also train the field, this is important to shoot the target farmers with our katam info, so that in the first time be aware of the awareness that technology is given to them will answer their needs, can increase their production. Continue to be given examples and accompanied so that they feel this technology is better than the same old habits. So there is a strong extension role here to provide farmers with an appropriate communication strategy approach " (Interview with IMM, 2019)

Research results in the Cimanuk sub-district stated the need to increase the frequency of counseling, especially in the field of planting calendar technology (although not always getting feedback) so that knowledge and skills increase and can apply location-specific agricultural technology (Wahyunindyawati et al., 2003). Furthermore, Subarna (2007) stated in his study in West Java that counseling contributed more than the support of infrastructure to the performance of rice agribusiness. This indicates that fostering to farmers is more important than facilitation of facilities and infrastructure.

### **Level of Adoption of Agricultural Technology Innovations**

In certain cases, farmers are usually not able to accept the presence of a planting calendar innovation when they first find out. This reality was said by Soekartawi (1988) that the adoption of innovation implies a complex and dynamic understanding because it involves the decision making process in which many factors influence it. In the view of farmers the planting calendar technology introduced in general is still something new. Even though the farmers are well established with the planting model as they have done so far.

Under these conditions, the planting calendar technology is trying to approach how the user, that is, the farmers can be approached well by the technology itself. And the instructors of the technology carrier are the figures who bring technology and users closer. As revealed in the following interview excerpt from the informant:

" For the next follow-up of the planting calendar in my opinion the most important thing is even the information that is available should not be solely information technology from our research results, it can be pursued the first time is even the needs of farmers first approached with their local wisdom, by exploring local wisdom which can then be combined in existing planting calendars and combined with other climate elements, the most programmed planting calendar so that it is more user-friendly can even make this catam technology closer to their needs farmers to be in accordance with their position sir So they are accommodating from their real needs. Newly compiled in the planting calendar info that is very much the same for farmers ((interview with IMM, 2019).

Jamal et al., (2008) states that in dissemination in the form of technological correctional (planting calendar information system), directed to lead the target group to apply innovation, the indicator is seen from the percentage of targets implementing the innovation. The reality shows that farmers on average only adopt a part of the technology introduced. Of the several types of innovations introduced, the innovation of agricultural information systems for planting calendars in Cimanuk sub-district is less attractive, although it is very important for crop management every year. This is also implied as a paradox of how there is a kind of reverse farming logic.

## **Farmers' Perception of Extension and Communication Media**

Farmers' perceptions of agricultural extension researchers in Cimanuk sub-district as communicators in conveying messages on the planting calendar system technology include mastery of the material, communication attitude and the language of instruction used. Farmers' perceptions of communicators related to mastery of the material, friendliness in communication and easy to understand the language used by agricultural instructors as communicators are quite positive. This was done because the instructors went directly to the field, as this informant said:

" When it comes to farmers, the planting calendar is introduced directly to me when I go to the field. I told the farmers that if you want to plant the reference, you can see the planting calendar. I also saw the printed planting calendar, because if you use it, you don't like it on the cellphone. Yes, for me, it's just the same for me, but when I tell the farmers, it must be used by both of us, so I tell them back and forth. Same with farmers, you have to slow down if you tell. That's the same for farmers in general, so of course we tell the planting calendar when I visit to see the pattern of planting, or there are other activities, then again when monitoring. When I see the planting, I ask the farmers how the fertilizer is, how much is used, then I will tell them, sir, from the good planting calendar, this fertilizer is from the planting calendar. So I'll tell you right away " (interview with M, 2019)

From the above statement it can be said that information by agricultural instructors is positively perceived by farmers as potential users of technology both mastering the planting calendar material, communication attitude and language of instruction which are always used in the communication process. However, some farmers suggested that the use of the language of instruction should not be monotonous in

using Indonesian language but interspersed with local languages (local languages) so that the atmosphere of the meeting (coaching) is more familiar and easily accepted. Farmers must be slow when we want to communicate what we will talk about or discuss.

The use of local languages in the communication process is indeed allowed / or even recommended as a marker for the level of good communication skills of an agricultural instructor. In this way, the communicator can adapt himself well in the social and cultural system of the farming community. This is in accordance with the opinion of Hanafi (1988) that the creation of homogeneity in the communication process will make the communicant or in this context it is easier for farmers to absorb the message being communicated. Communication media as a means of conveying various planting calendar information (technological innovation) to farmers holds a strategic role as a catalyst for the process of adopting innovation. The results of the study indicate that the means of communication that is always used by researchers-instructors in conducting technology guidance is to use digital media, print and face-to-face as stated by the following informants:

" We are conducting socialization on the planting calendar through face-to-face and print media. When we do socialization we expect farmers to have knowledge about the use of the planting calendar so that it can increase rice production. The goal of our socialization is not only agricultural extension workers but also farmers as direct actors in the field. Constraints faced when we socialize are indeed farmers who still do not understand the use of the internet both on mobile phones and on PCs, this is where the role of instructors is expected to transfer information every planting season " (Interview with IMM, 2019).

In the context of this research, face-to-face communication by agricultural instructors is packaged

in the form of group meetings. In addition, there are media communication facilities such as paper, brochures and posters. The effectiveness of communication media in achieving goals depends on the nature of the media in the audience (Cangara, 2007). Most of the farmers expressed their desire to obtain a variety of media-owned agricultural information facilities produced by agricultural instructors in the Banten Pandeglang district as reading material to increase knowledge in farming activities. Therefore, the number of copies of the information media needs to be increased, so that the target farmers also get the distribution of these media through farmer groups.

### **Types of Communication in Adoption of Innovations**

In the event of communication, a farmer in receiving information both verbally or based on the object they see, will ultimately form the concept of perception. The formation of perception in relation to communication activities is a process in which information received by someone is then arranged into a meaningful whole and then interpreted. Communication on the adoption of this innovation calendar planting information system has two types, namely intra-personal communication (intrapersonal communication) and interpersonal communication. Intra-personal communication is communication that occurs within an individual, whereas interpersonal communication takes place between two or more individuals (Cangara, 2007).

The reality of intrapersonal communication in the adoption process of the planting calendar innovation generally occurs at the evaluation stage regarding the reliability of the technological innovation. At this stage, prospective adopters (farmers) begin to consider various aspects that can support and various inhibiting factors caused by the planting calendar information system. Usually intrapersonal communication occurs after the interpersonal communication process. Meanwhile, interpersonal matters are related to

innovations such as the use of superior varieties, planting, fertilizing, irrigating, and controlling pests / diseases between two individuals or in small groups that take place face to face and they interact with each other. The explanation received by prospective adopters both from extension workers, farmer contacts and fellow friends makes a distinct impression for farmers, which will then be processed in his mind. Personally, the farmer can give meaning to the innovation he observes, then experience the process in mind after getting stimulation from his senses. The results of the work of the mind caused by both intra-personal and interpersonal communication lead to decisions for farmers to accept or reject an innovation.

#### IV. CONCLUSION

The adoption of technological innovations in the planting calendar in Cimanuk sub-district, Pandeglang Regency is influenced by the level of farmers' needs for technological innovation, the nature of farmers' cosmopolitanism, triability and technological complexity and the intensity of coaching. Qualitatively, the level of adoption of farmer innovations in the planting calendar technology package varies depending on the type of activity. Farmers in Cimanuk generally give positive appreciation to the agricultural instructors as communicators in delivering the planting calendar information system. Finally, the findings of this study get an indication of how the communication factor plays an important role in technology socialization, where communication can influence the adoption of the planting calendar information technology itself.

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**Cite this article as :** Ari Surachmanto, Prahastiwi Utari, Andre N Rahmanto, "Analysis of Technology Innovation Adoption of Plant Calendar in Cimanuk Pandeglang District, Banten Province", *International Journal of Scientific Research in Computer Science, Engineering and Information Technology (IJSRCSEIT)*, ISSN : 2456-3307, Volume 5 Issue 6, pp. 371-377, November-December 2019. Available at doi : <https://doi.org/10.32628/CSEIT195456> Journal URL : <http://ijsrcseit.com/CSEIT195456>