

Conference Paper

Integration of Agricultural Research Planning and Its Implementation to Improve Food Security Through Development of Agricultural Research Information System (SIPP)

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Abstract

Food security has broader dimensions and involves many development sectors. The success in food security development is not only determined by the performance of one sector but also that of the others. Thus, synergies between sectors, academicians, agricultural business actors, governments and society are highly necessary as the key success of food security development.

This research aims to conduct an implementative study on integrating research planning which may result in sustainable food security improvement. Many researches have been repeatedly conducted, yet various results have not been implemented due to the lack of sufficient and accessible information. In addition, accesses to primary data tend to be expensive and difficult to obtain which result in relatively slow development of agriculture and food researches. Thus, this research is conducted in order to integrate all food security sectors through the development of Information and Communication Technology (ICT) by creating an Agricultural Research Information system (SIPP).

The results show that rapid and precise information in agricultural research integration may improve research information which may result in more responsive and accurate research implementation. Agricultural research information, such as planning, information mapping of agricultural product commodity prices that farmers may determine where they may sell their agricultural products to generate greater benefits. In addition, other information, such as weather conditions, seeds, post-harvest agricultural commodities, and etc, may also be easily obtained to support the agricultural development. The agricultural information integration may be obtained by establishing an agricultural research information system through Information Technology (IT) to connect researches with academicians, development, central government, local governments, and agricultural institutions as well. Capacity building through ICT in agricultural researches provides new areas in model implementations to improve researches through ICT technology for those researchers in the field of agriculture.

Keywords: Integration, Food Security, Planning, Mapping, Agricultural Research Information System.

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1. Introduction

Food is an essential and strategic commodity for Indonesian people as food is human basic need that should be fulfilled by the government together with the community as mandated by Law No. 7 of 1996 on food. The law mentions that government is the one who organizes regulations, guidance, control and supervision, while community organizes production processes and supplies, trading, and distribution as well as has the function as consumers to generate food which is sufficient in quantity and quality, safe, nutritious, diverse, equal, and affordable by their purchasing power.

Government Regulation No. 68 of 2002 on Food Security as the implementing regulations of Law No. 7 of 1996 asserts that in order to fulfill the consumption needs which continuously increase over time, efforts on food supply availability are conducted by developing food production system based on resources, institution, and local culture; efficiency of food business system; food production technology; food production infrastructures and facilities; as well as maintaining and developing the productive lands.

Various studies in developing countries show that frequently research results may not be obtained by the farmers [1], including those in Indonesia [2, 4]. There have been various technologies created by the public research institutions, yet those implementations are still relatively low obtained by farmers (Agricultural Research and Development Agency, 2004). The low adoption level of technologies created by those research institutes, is due to the following: a) the created technologies are not based on social and economic conditions or majority cultures of farmers' household, b). The created technology is not the main problems of majority farmers, c). Lack of pressures in order that researches may only focus on innovation needs to result in optimum added values, socially, economically and culturally reasonable, and highly required by the users, d). Lack of or even without supports required to adopt the recommended technologies, such as the required credit and production facilities [2], e). Less/ ineffective dissemination and transfer of technology made by the research institutions to the users (extension activities and stakeholders) as well as to farmers and other agribusiness actors [2, 4].

2. Research Methods

The Research utilizing ICT performed in extension activities uses a qualitative method [5]. A qualitative method is used to answer questions on ICT utilization to set-up ICT

system in the research areas. In addition, a qualitative method is also used to assist establishing the ICT system institutional model to develop.

The research areas are in Central Java, especially in stakeholders' agricultural research institutions and involving researchers from various institutions such as *BBTP*, *Bakorluh*, Agricultural Office and academic researchers in agricultural field.

This research uses a qualitative analytical approach to complete and support the data on a quantitative analysis. To obtain information in a qualitative analysis focus group discussions and in-depth interviews are conducted. The FGD involves the extension agency, extension activity targets and regional governments.

3. Programming Analysis

Based on the research requirements in the field, qualitative and quantitative analytical method, as well as statistical instrument, an analysis is then conducted to organize Flowchart Programming with Web-based php and mysql. Criteria for Program Input and data processing should be "traceable, documented, and validated."

4. Results and Discussions

4.1. Information system approach of agricultural management

Agricultural Research Information System is an information system dealing with agricultural research data collection and processing. SIPP establishes several important functions, as follows:

1. Data collection and storage on research activities and data processing.
2. Turning data processing into information used in decision making processes.
3. Appropriately controlling organization assets.

SIPP sub-system processes various qualitative and qualitative data that directly influence data processing of agricultural researches. SIPP consists of three sub-systems: data collection, processing, and reporting.

The benefits of agricultural research information system are the added values through the following:

1. Providing accurate and immediate information that the main activities may be effectively and efficiently performed at the value chain.

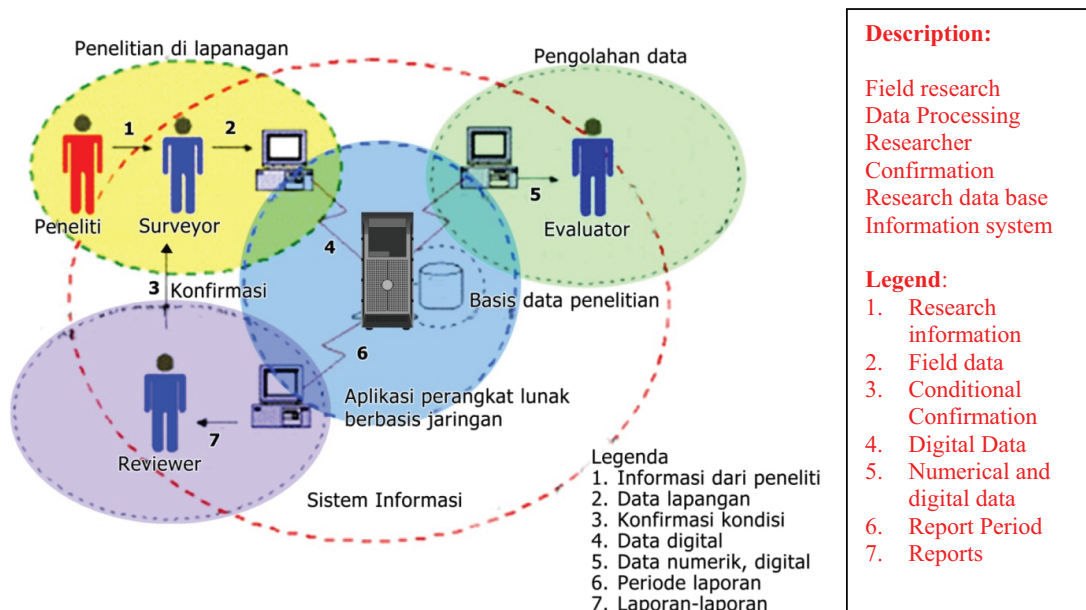


Figure 1: Agricultural Research Information System Scheme.

TABLE 1

Data collection System	Processing	Reporting
Fiend Data Input and Researcher Personal Judgment	Data Processing with the program and statistics	Providing, patterns, tendency, quantitative and qualitative data distribution with particular purposes, as well as information for decision making

2. Improving quality and reducing cost of field research such as surveys, data homogeneity, and data processing speed resulted
3. Increasing efficiency
4. Improving competence in decision-making
5. Improving knowledge sharing
6. Increasing working efficiency in agricultural researches

5. About Information Management System

Management Information System is an information system which generates output by using input (input) and various processes required to meet certain objectives within a management activity.

Information System General Purposes in agricultural researches are:

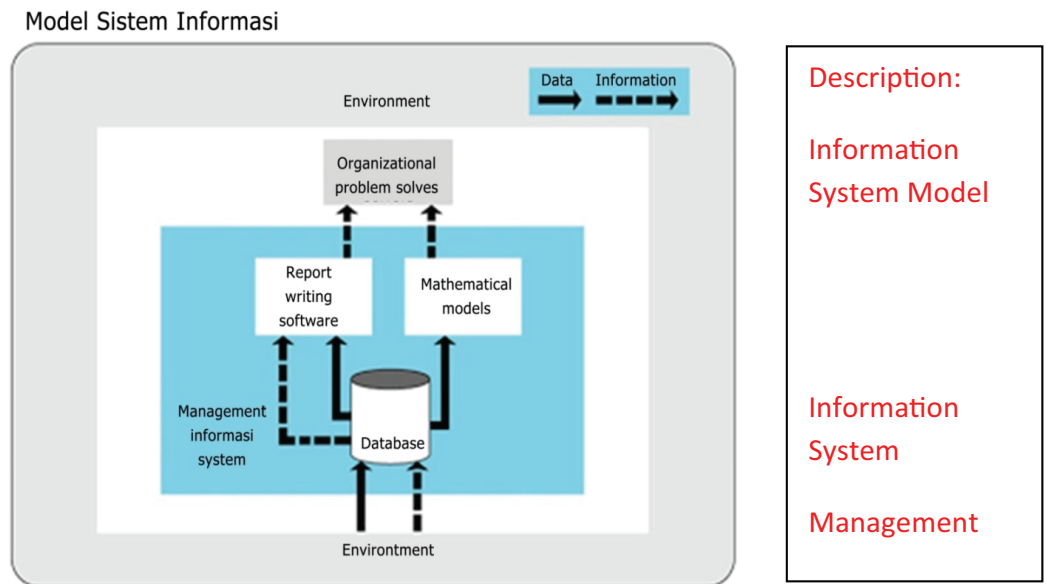


Figure 2: Agricultural Research Information System Scheme.

1. Providing information used in agricultural researches, product surveys, program implementations, and other purposes desired by management
2. Providing information used in sustainable planning, control, evaluation, and improvement.
3. Providing information for decision making.

Users may use SIPP to managerially help them identify a problem, solve the problem, and evaluate the performance required and utilized in all management stages, including planning, controlling, and decision making.

Data sources are divided into two: (1) human; and (2) non-human. Human data sources have the function as subjects or key informants, while non-human data sources are from documents of implementer organizations and those of other related agencies. Informants are determined based on the following criteria: (1) subjects are engaged with the research field and its target activities; (2) subjects must be still active; (3) subjects have adequate time to provide information; (4) subjects have no special relationship with researchers. Due to the research objectives, informants are selected using a purposive sampling technique. This technique is used to direct data collection based on requirements and is conducted by selecting informants who really have factual information and understand the existing problems and are trustworthy. Purposive sampling technique gives researchers freedom from formal process boundaries. It means that researchers may determine samples required by the research objectives based on its subject matters. The samples are not those

representing population, but based on the relevance and depth of the obtained information.

To obtain holistic and integrative data while considering data relevance with the research focus, problems and objectives, data are then collected through the following techniques: (1) in-depth interviews; (2) observations; (4) questionnaires; and (5) documentation studies. The obtained data are then digitized through SIPP inputs in such a way that interpretations, graphs, sample trends and data distribution may be immediately obtained, traceable, and documented from time to time.

6. Conclusion

The research results and studies on food security show that food security dimensions are extremely broad and involve many development sectors. The success of Food Security development is determined not only by the performance of one sector but also that of others. Thus, synergies between sectors, academicians, agricultural business actors, governments and society (including business world) are highly necessary as the key success of food security development. Rapid and precise information agricultural research integration may improve research information which may result in more responsive and accurate research implementation. Agricultural research information, such as planning, information mapping of agricultural product commodity prices that farmers may determine where they may sell their agricultural products to generate greater benefits. In addition, other information, such as weather conditions, seeds, post-harvest agricultural commodities, and etc, may also be easily obtained to support the agricultural development.

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