COMPETENCY OF AGRICULTURE EXTENSION AGENTS IN TRANSFER OF TECHNOLOGY AND ITS RELATIONSHIP TO WORK PERFORMANCE IN IADA KOTA BELUD, SABAH

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FP 2018 9

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UNIVERSITI PUTRA MALAYSIA

SERDANG, SELANGOR

2017/2018

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BY

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A project report submitted to Faculty of Agriculture, Universiti Putra Malaysia,

In fulfilment of the requirement of PRT4999 (Final Year Project) for the award

of the degree of Bachelor of Agricultural Science

Faculty of Agriculture

Universiti Putra Malaysia

2017/2018

ENDORSEMENT

This project report entitled "Competency of Agriculture Extension Agent in the Transfer of Technology and Its Relationship to Work Performance in IADA Kota Belud, Sabah. Prepared by Nur Diana Binti Halim and submitted to the Faculty of Agriculture to fulfil the requirement of PRT4999 (Final Year Project) for the award of the Bachelor of Agriculture Science.

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ACKNOWLEDGEMENT

Alhamdulillah, all praises are only dedicated to Allah for all the blessing and strength that He gives me in completing this thesis. Most special appreciation goes to my one and only supervisor, Dr Salim Hassan, for his supervision and constant support. His invaluable help of constructive comments and suggestions throughout the thesis work have contributed to the success of this research. Not forgotten, my appreciation to all the Postgraduate's students under Dr Salim especially Munifah Siti Amira Yusof Binti Yusof, DK. Norhajijah Binti AK. Mohiddin and Nor Latifah Binti Mohd Hanif for their kindness, motivation and help throughout the process of completing this thesis. I would like to express my appreciation towards my partners Huril Ain Ami Nordin. Siti NorBazilah Binti Mustafa, and Siti Nadzirah Binti Mohahammad Daud for their support, advices and kindness during my study. Thanks for all the memories and friendship. Last but not least, my deepest gratitude goes to my beloved parents; Halim bin Taib and Jelaiha binti Ramli and also to my brothers and sister for their endless love, prayers and encouragement. To those who indirectly contributed in this research, your kindness means a lot to me. Thank you very much.

ABSTRACT

Government has established granaries area to ensure the food security and maximize the rice production in Malaysia. In order to fulfil government's hopes, the role of extension agent in transferring technology should be focussed, mostly in their competency and work performance. A survey research was carried out at IADA Kota Belud, Sabah. The main objective of this study was to determine the competence level of extension agents in rice technology transfer based on planning, implementing and monitoring activities and work performance. Other objective was to determine the relationship between the competency of extension agent in transfer of rice technology based on planning, implementing, and monitoring activities (IV) with work performance (DV). Also, it was to find the highest independent variable contribute to work performance. This study was based on the Ice Berg's Theory. The research involved 179 respondents from seven areas registered under IADA Kota Belud. The questionnaire distributed to the farmers was an established questionnaire which comprised of 5 sections. The data is analyzed using descriptive analysis, correlation coefficient and regression. Based on the analyzed data, the competency level of extension agents in planning, implementing and monitoring are high. Result also indicated that monitoring is highly correlated towards work performance while both planning and implementing show moderate relationship with work performance. Moreover, competency in monitoring has indicated strongest contribution which led to performance of extension agent in IADA Kota Belud. Hence, new strategy should be introduced to improve the skill along with work performance of extension agents so that they can perform well in their work.

ABSTRAK

Kerajaan telah menubuhkan kawasan jelapang padi untuk memastikan keselamatan makanan dan memaksimumkan pengeluaran beras di Malaysia. Untuk memenuhi harapan kerajaan, peranan pegawai pengembangan dalam pemindahan teknologi harus difokuskan, terutamanya kecekapan dan prestasi kerja mereka. Satu kajian soal selidik telah dijalankan di IADA Kota Belud, Sabah. Objektif utama kajian ini adalah untuk menentukan tahap kecekapan pegawai pengembangan dalam perancangan, pelaksanaan dan pemantauan dan prestasi kerja. Objektif lain adalah untuk menentukan hubungan antara kecekapan pegawai pengembangan dalam pemindahan teknologi berdasarkan perancangan, pelaksanaan dan pemantauan (IV) dengan prestasi kerja (DV). Selain itu,objektifnya adalah untuk mencari pembolehubah bebas yang tertinggi menyumbang kepada prestasi kerja. Kajian ini berdasarkan "Ice Berg's Theory". Penyelidikan ini melibatkan 179 responden dari tujuh kawasan yang berdaftar di bawah IADA Kota Belud. Soal selidik yang diedarkan kepada petani terdiri daripada 5 bahagian. Data telah dianalisis menggunakan analisis deskriptif, koefisien korelasi dan regresi. Berdasarkan data yang dianalisis, tahap kecekapan pegawai pengembangan dalam perancangan, pelaksanaan dan pemantauan adalah tinggi. Keputusan juga menunjukkan bahawa pemantauan menunjukkan korelasi tertinggi manakala perancangan dan pelaksanaan menunjukkan hubungan yang sederhana dengan prestasi kerja. Tambahan pula, kecekapan dalam pemantauan menunjukkan pengaruh paling kuat yang menyumbang kepada prestasi kerja pegawai pengembangan. Oleh itu, strategi baru perlu diperkenalkan untuk meningkatkan kemahiran serta prestasi kerja ejen pengembangan supaya mereka boleh melakukan yang terbaik dalam pekerjaan mereka.

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INTRODUCTION

2.0 Introduction

Chapter one is actually an overview of this study. This chapter briefly explained the reality of Agriculture in Malaysia, Paddy sector in Malaysia, Granary areas, Food Security, Competency of Extension Agents, Rice Check Technology, IADA Kota Belud Sabah as the study area, the problem statements and objectives of the study.

1.1 Agriculture Sector in Malaysia

Agriculture is a well-known sector around all over the world whether in developed or developing country because it is the main sector that supplies the food to meet the demand of the community as well for the development of the country. The increase of awareness on the importance of agriculture in Malaysia has changed over time. Starting with primitive and subsistence levels practiced by rural communities, the evolution of agriculture sector has taken place since British government era in our country. British has set up large-scale plantations and introduced new commercial crops (rubber in 1876, palm oil in 1917, and cocoa in 1950). Three main crops, rubber, oil palm, cocoa have dominated agricultural exports since then.

Malaysia had serious development agenda for agriculture in national development goal. This effort can be seen through the establishment of several government agencies aimed at providing advisory, financial assistance and marketing

opportunities to farmers so that agricultural products can be improved in terms of quantity and quality.

Ministry of Primary Industry and Commodities which has established in 1972, is the known government agency for most of the agriculture activities, especially for estate sub-sector. In 2004, this ministry was reshuffled and renamed as the Ministry of Plantation Industries and Commodities (MPIC) and is responsible to supervise the plantation and commodities sector which is usually run by the large company and private sectors. The commodity which comprised of oil palm, rubber, timber, cocoa, pepper and tobacco has contributed significantly to the country's economic development for the past 50 years through it export earnings. Meanwhile, smallholders have been supervised by the Ministry of Agriculture and Agro-Based Industry (MOA, 2009).

Besides, there are also special agencies established by government to help the agricultural sectors in Malaysia like Department of Agriculture (DOA), Federal Agricultural Marketing Authority (FAMA), Malaysia Agriculture Research and Development Institute (MARDI), Federal Land Development Authority (FELDA), Rubber Industry Smallholders' Development Authority (RISDA) and many others a that are related directly or indirectly in agricultural sector. All of this agencies work as a team to achieve the same goal that is to boost out the output of agricultural sector in Malaysia as the government realizes the contribution of Agriculture sector to community development and country's economy.

According to Department of Statistic Malaysia (DOS), in 2015, the agriculture sector contributed RM94.1 billion (8.9%) to the GDP. Agriculture is one of the main contributors that boost up the government economy. This contribution mostly comes from the export value of food commodities produce from our agriculture product. Despite all other reason, the most important key to agriculture sector production is to fulfill the demand for food which keeps increasing as population keep increasing year by year. This is important to ensure our food security.

Table 1.1 below shows the production of major agro-food commodities by the year 2014. It clearly states that paddy production is increased from the year 2010 to 2014. This means that rice as a staple food has an increase in demand for Malaysian as they consume it in their daily life.

Table 1.1: Production of Major Agro-food Commodities (metric tonnes)

Commodities	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Paddy	2,511	2,465	2,579	2,599	2,604	2,645
Fruits	1,603	1,642	1,624	1,595	1,545	1,589
Vegetables	623	872	938	974	1,434	1,439
Cash Crop	164	156	170	273	238	238
Herbs & Spices	46	34	41	47	61	61
Industrial Crops	817	979	981	982	885	878
Flowers (pots / cutting)	410,872	414,244	417,066	419,990	484,434	508,662

(Agro-food Statistic of Malaysia, 2014)

1.2 Paddy farming in Malaysia

Oryza sativa belongs to the Poaceae (grass family). It is a perennial grass's plant that originated in India, Thailand, and Southern China. This crop was domesticated and diversified in ancient times, and is now cultivated in wet tropical, semi-tropical, and warm temperate areas around the world for the production of its cereal grain.

Rice (*Oryza sativa*) is the staple food that serves as primary sources of food for 50% of world population (FAO, 2004). Most interestingly, 90% of rice is consumed in Asia, where it is a staple food for the population in most developing countries and also the region's 560 million hungry people. Malaysia which is one of the developing countries with the population over 31.7 million peoples in Asia has increased it demand for rice consumption. Hence, paddy farming in Malaysia is seriously considered and monitored by the government.

Malaysia which has Udic regime's temperature and high rainfall distribution is advantageous for paddy cultivation all year round even under rain fed condition. Paddy Statistic Malaysia (2014) stated that paddy is the third most extensively cultivated crop in Malaysia after oil palm and rubber. In 2014, a total of 679,239 hectares of land were cultivated with paddy which include those cultivated twice a year. Paddy production in Malaysia covers the Peninsular Malaysia and Borneo Island which the cultivation includes both wetland rice and dryland rice. Table 1.2 shows the planted paddy areas in different provinces

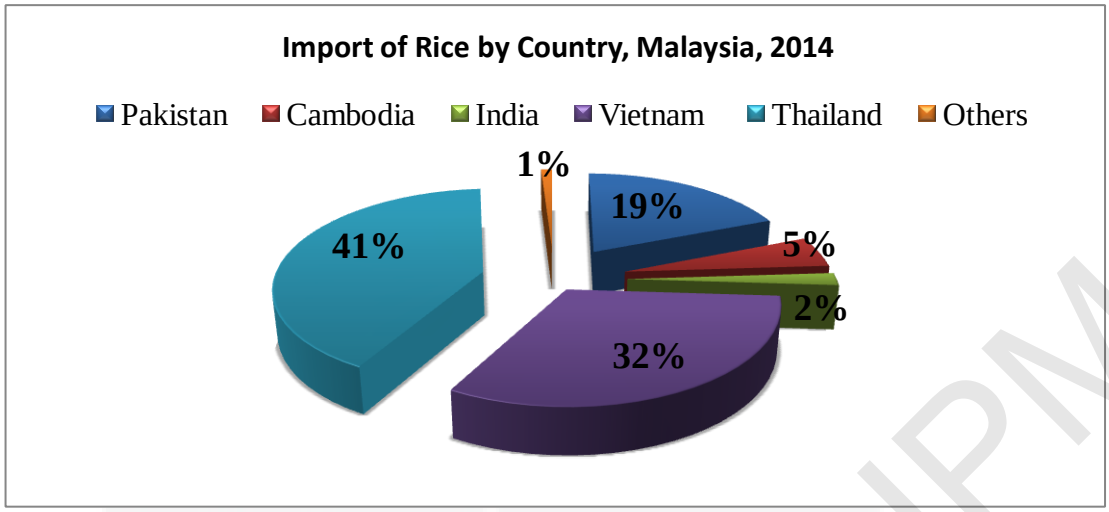
Table 1.2: Overall Planted Paddy Area in Malaysia (2010-2014)

Planted Paddy Areas	Area (hectares)				
	2010	**2011**	**2012**	**2013**	**2014**
Peninsular Malaysia	512610	517586	510606	498805	514381
Sabah	43353	43331	44902	38614	41387
Sarawak	12921	127023	129037	134260	123471

(Paddy Statistic of Malaysia, 2014)

Data released by the department of statistic (2015) showed that per capita consumption of rice in 2014 was 78.6 kg per year. This value is estimate to continually increase as the population in Malaysia keep growing. Thus, the supply of food should be seriously considered as to maintain the availability of food resources and ensure food security.

According to data statistic from Department of Statistics (2015), in 2014, Malaysia achieved 71.6% of self-sufficiency ratio (SSR) for rice as compared to 71.7 percent in 2013. The rest 28.4% are still being imported from others countries. High importation of rice may apply to fulfill the domestic demand if the low paddy production in country continuing to occur.



(Paddy Statistic of Malaysia, 2014)

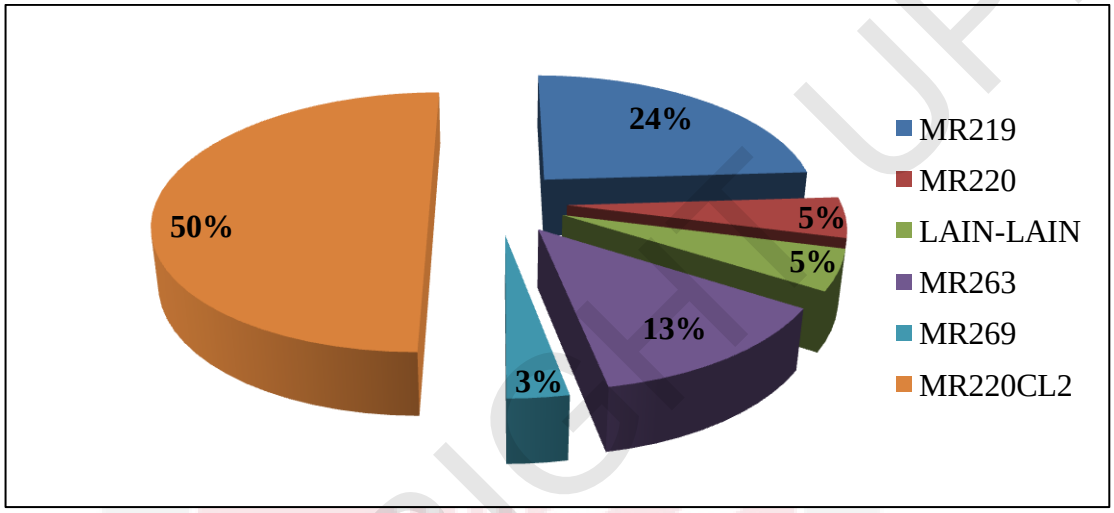
Figure 1.1: Rice Importation by Country, Malaysia, 2014

According to data released in Paddy Statistic of Malaysia, 2014 (Figure 1.1), Malaysia has imported 920,648 MT of rice from countries such as Pakistan. Cambodia, India, Vietnam, and Thailand. All of this importation is important to cover 30% deficit.

To improve paddy production sector, the government has come out with the various approach. Firstly, is to increase the productivity means that the yield needs to boost up. This can be achieved through current technology. The important step needs to be highlighted is the transfer of technologies which is the crucial task of extension agent. Other strategies can be conducted are increasing the yield potential through research, increase utilization of marginal land through technology and regional cooperation.

In paddy statistic 2013, it stated that the improved varieties that have been cultivated in eight granaries are MR220 (2003), MR 263(2010), MR220CL2 (2010), and

MR219 (2001). Meanwhile, according to data Paddy statistic 2014 (DOA, 2015), the total hectare of paddy planted in overall granary area in Peninsular Malaysia for 2014 was 400,733 ha. From total hectare of paddy planted area, 50 % of the area was planted with variety MR220 CL2 and the rest were MR219 (24%), MR269 (3%), MR263 (13%), MR 220 (5%) and others (5%).



Notes: Total hectareage of paddy planted is 400,733 ha

Figure 1.2: Hectareage of Paddy Varieties for Overall Granary Area, Peninsular Malaysia 2014

1.3 Granary Area

According to Paddy Statistic 2014, granary areas are defined as dominant irrigation schemes (areas greater than 4,000 hectares) and recognized by the Government in the National Agricultural Policy as the major paddy production areas. There are 8 granary areas in Malaysia, namely MADA, KADA, IADA KERIAN, IADA BLS, IADA P. Pinang, IADA Seberang Perak, IADA KETARA and IADA Kemasin

Semerak. These eight granaries were introduced by the National Agro-Food Policy (NAFP) as strategies to increase rice production. According to paddy statistic 2014, total granary area planted with paddy is 400733 hectare (DOA, 2015).

Table 1.3: Hectareage of Planted and Harvested Areas, Average Yield and Production by Granary Area, Peninsular Malaysia, 2014

Granary Area	Planted Areas (Hectares)	Harvested Area (Hectares)	Average Yield (Kg/ha)
MADA	190,127	190,127	5,539
KADA	50,268	50,268	4,297
IADA KERIAN	41,944	41,944	4,514
ADA BLS	37,842	37,842	6,403
IADA P. PINANG	25,564	25,564	5,872
IADA SEB. PERAK	27,594	27,594	4,484
IADA KETARA	9,752	9,752	5,738
IADA KEM. SEMERAK	6,512	6,512	3,715
IADA PEKAN	6,030	6,030	2,671
IADA ROMPIN	5,100	5,065	3,442
JUMLAH	400,733	400,571	5,212

(Paddy Statistic of Malaysia, 2014)

In order to increase rice production to meet the domestic demand and ensure food security, the Malaysian government has established another four new granaries area. At the presentation of the 2013 Budget in Parliament, Prime Minister Datuk Seri Najib Tun Razak announced that the government will open four new rice bowl area of 19,000 hectares. Those granaries that have been established include IADA Kota Belud, IADA Batang Lupar, IADA Rompin and IADA Pekan, Pahang.

1.4 Food Security

According to World Food Summit (1996), food security achieved when all population, at all period, are physically and economically able to get access to enough, secure and balanced food to fulfill their desire and dietary needs for a healthful life.

Basically, there are three components need to be understood in order to describe food security which are availability, stability, and accessibility. Availability is directly related to the level of food production and importation. Food stability is affected by the extent of post-harvest losses, while food accessibility is hugely determined by the purchasing power of the consumers (Aremu et al., 2015)

Food security is a non-stop issue that was greatly discussed in countries all over the world. This issue is important as demand for food keep increasing as the result of the increasing world population. The food supply is important to meet the demand continues and to supply safe and balanced food for the population. According to World Bank (2010), great consideration has been given to eliminate the food insecurity and hunger all over the world.

Aremu et al., (2015) further add that, to eliminate rural poverty, provide food security and continual advancement in population, research-based technologies must be widely delivered and accepted by the target farmers at the same time.

1.5 Competency of Extension Agents

Competency may be referred as someone traits and specialty showed by that person, it may lead to enhancement of work quality to achieve the best work performance (Cernucca & Dima et al., 2007). In the transfer of technologies (ToT), competency of the agent in delivering the technologies to the farmer is mainly analyzed through planning, implementing, monitoring activities. The competency can be used to indicate the performance of agents in their work performance. According to Klemp (1980), competency can also be described as hidden characteristics of an individual which brings out the effectiveness and high commitment to the work.

Katz and Kahn (1986) grouped competency into three areas which later expanded into the following four:

1) Technical or Functional (knowledge, attitudes, skills, etc. associated with the technology or functional expertise required to perform the role);

2) Managerial (knowledge, attitudes, skills, etc. required to plan, organize, mobilize and utilize various resources);

3) Human (knowledge, attitudes, and skills required to motivate, utilize and develop human resources); and

4) Conceptual (abilities to visualize the invisible, think at abstract levels and use the thinking to plan future business

In this research, the components that are being focused are the planning, implementing, and monitoring activities in the transfer of rice technologies to the farmer.

1.6 Rice Check Technology

Rice check technology was established as a guideline to farmers and also extension workers to supervise paddy production in order to meet the target. Rice check comprises of ten main components and must be followed by farmers, extension agents, supervisor, and workers in order to get the higher yield. This Rice Check system is a strategy by the government to achieve the target of 10MT/Ha and also to meet the rice demand by increasing the self-sufficiency and ensure food security. The main components of rice check that must be followed and practise consistently are (i) suitability of land, (ii) design of land, (iii) land preparations, (iv) sowing, (v) Fertilizer application (vi) water management, (vii) pest and disease control, (viii) weed control, (ix) harvesting and (x) quality of rice (DOA, 2002).

1.7 Integrated Agriculture Development Area (IADA) Kota Belud

Kota Belud is the main rice producer in the State of Sabah and to further strengthen it, this area has been selected to implement EPP 11 project in the ETP program under the Agriculture NKEA. An area of 5,000 hectares of paddy land has been targeted for commercial rice production.

IADA Kota Belud was established on 28 September 2012 during the 2013 budget presentation by Minister of Finance. The establishment of IADA Kota Belud as new granary area was a strategy to fulfill and support the government's desire to make the paddy cultivation areas in Kota Belud as the main producer of rice in this state.

Sabah State Cabinet has approved the establishment of IADA Kota Belud on 23 May 2013. The objectives of this establishment focussed on coordinating and managing the infrastructure development besides to commercialize paddy cultivation in IADA Kota Belud.

The Ministry of Agriculture and Agro-based Industry (MOA) has set up the office on an interim basis on Wisma Danbandang at Kota Belud, Kota Kinabalu. Now the office of IADA Kota Belud is located at Kompleks Allappbana, Blok Flot Bawah 35-0, 36-0, 37-089150 Kota Belud, Sabah, which is near to granary area to ease the monitoring work.

The total area of IADA Kota Belud is 8500 ha. This area of paddy field is being planted with paddy varieties such as TR8 and TR7 which are suggested and supplied by Department of Agriculture, Kota Belud. Other varieties being planted by farmers are Crystal's variety, 'Padi Wangi', and other local variety. There are two planting seasons in IADA Kota Belud which are January-August and August-December. IADA Kota Belud has set the target of rice production to 6.0 Mt / ha by 2020. The current yield achieved was 2.5 Mt/ha (IADA Kota Belud, 2016) and most of the farmers here generate an average income of RM900/ha/season.

1.7.1 Objectives of Establishment of IADA Kota Belud

1) Increase yield of paddy from 2.5 Mt/ha to 6.0 Mt/ha.
2) Increase the income of farmers to a minimum of RM1200 /month through increased rice production.

3) Expand the use of performance-quality rice seeds through Rice Seed Program.
4) Increase rice production to 51,000 Mt/season by 2020.

1.8 Problems Statements

The government has established eight granaries area since ten years ago in order to increase the productivity of rice production sector and also to ensure the continued availability of food supply since rice is a staple food in Malaysia. Many strategies and technologies have been delivered to the farmer to boost up their performances and increase rice productivity. However, the national rice self-sufficiency level (SSL) is still low. To meet the consumption demand there is high dependant on imported rice.

Over the past ten years, old granaries area still shows the low productivity of its yield and the current yields of the old granaries area are not satisfied enough to meet the demand. The paddy's yield in old granaries area is lower than the potential yield set by the government, which is 10tan/ha. Much research has been done on existing or old granaries area in order to evaluate and analyzed the reason for the low productivity of rice in granary area. There are many reasons that could lead to this problem. However, the problem of the low productivity in rice production sector may cause by technologies which are not fully applied by farmers. This may relate to the inefficiency of agriculture extension agents in delivering the rice technologies to the farmers.

In line with country development, there were also four granary areas that have been established in order to support and maximize the rice production in Malaysia. One of those new granaries areas is Integrated Agriculture Development Area (IADA) Kota Belud, Sabah. Government expectations were high and positive on IADA Kota Belud rice production scheme as a new granary area.

However, according to IADA Kota Belud (2016), the current rice yield in IADA Kota Belud is only 2.5mt/ha, which is much lower than potential yield of 6.5 mt/ha that has been set up before. The need for early detection of the root cause of low yield in IADA Kota Belud is essential as it will avoid replica of Old granary. Unfortunately, IADA Kota Belud is a new granary area and there is not much data collected to access the effectiveness of rice technology transferred to the farmer. A research needs to be done in order to determine and access the productivity of rice sector and the efficiency of technology transfers by extension agent in this area. The purpose is to detect the problems IADA Kota Belud based on technology transfer and the result can be set as benchmark to monitor the rice production in IADA Kota Belud, so that the problems occur is not overlooked and early strategies planning can be done efficiently to make sure the effectiveness in the transfer of rice technologies by extension agent to the farmers. Hence, maximum productivity will be achieved when new technology is successfully delivered to the farmer.

1.9 Research Question

1. What is the competence level of agricultural extension agents in the transfer of technology based on planning, implementing and monitoring in IADA Kota Belud, Sabah?
2. What is the relationship between competency of agriculture extension agents in transfer of technology and work performance in IADA Kota Belud , Sabah?
3. Which competency of agriculture extension agent in technology transfer gives the highest contribution in determining work performance at IADA Kota Belud, Sabah?

1.10 Research Objectives

The general objective of this project is to evaluate the competency of extension agents in the transfer of technology based on the Rice Check.

Specific Objectives:

The study also aims to achieve the following objectives:

1) To determine the competence level of agriculture extension agent in the transfer of rice technology based on planning, implementing, monitoring (IV) and work performance (DV).

2) To determine the relationship between competencies of agriculture extension agent in transfer of technology based on planning, implementing, monitoring (IV) and work performance (DV).

3) To find the highest competency of agriculture extension agent in transfer of technology (planning/implementing/monitoring) (IV) that contribute to work performance (DV).

1.11 Research Hypothesis

a) Hypothesis (1)

Null Hypothesis: The competence level of extension agents in planning, implementing and monitoring and work performance is **low to moderate**.

Alternative Hypothesis: The competence level of extension agents in planning, implementing and monitoring and work performance is **high.**

b) Hypothesis (2)

Null hypothesis: There is **no relationship** between competencies of agriculture extension agents in planning, implementing and monitoring in the transfer of rice technology and work performance.

Alternate hypothesis: There is a **significant relationship** between competencies of agriculture extension agents in planning, implementing and monitoring in the transfer of rice technology and work performance.

c) Hypothesis (3)

Null hypothesis: There is none highest **independent variable** (competency in planning, implementing, monitoring) contribute to the dependent variable which is work performance.

Alternate hypothesis: There is at least **one highest independent variable** (competency in planning, implementing, monitoring) contributes to the dependent variable which is work performance.

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