

Perception Level of Respondents' toward Flood and Natural Disaster in Kelantan, Malaysia

¹Wisam Yako Aziz Masso and ²Noora Suhail Ismail Hawa,

¹Department of Agricultural Extension, Faculty of Agriculture and Forestry, University of Mosul, Iraq.

²Department of Statistics and Information, Faculty of Computer Science and Mathematics University of Mosul, Iraq

Abstract: Natural disaster in agriculture can affect human, material, economic and gives environmental losses. In Malaysia, a natural disaster occurred when the climate changes such as floods and droughts. Hence, the study conducted to determine Perception Level of Respondents' toward flood and natural disaster in Kelantan, Malaysia which was affected by the massive floods in 2014 that recorded at most RM105 million in losses. A questionnaire form was constructed in the Malay language as the main medium which contained 69 questions in several sections based on the objectives. The data were analysed using SPSS for descriptive analysis and chi-square analysis. In the chi-square analysis, there was a relationship between age and the total annual income of respondent toward post flood and natural disaster farm management. Provide more training on climate change is highly recommended to government and private agencies for improvement.

Keywords: Flood, Natural Disaster, practises, Agricultural extension

I. INTRODUCTION

The Malaysian agricultural sector has improved since the Federation of Malaya gained its independence from British colonization back to 58 years ago, forming what we know of today as Malaysia. Back then, the Federation of Malaya only focused on subsistence and traditional farming.

Agriculture production in Malaysia has diverse as the year has passed. The production of Malaysia crops not only contributes to national development in terms of export earning, gross domestic product (GDP) but as well as employment and income, involving about 420,000 smallholders and 53,000 estate agents (Tunku Mahmud, 2001).

According to the Rural and Environment Analytical Services (REAS) and Rural and Environment Research and Analysis Directorate (RERAD) in their final report of Risk and Risk Management Strategies in Agriculture: An Overview of the Evidence for the Scottish Government stated that although definitions of risk vary within the literature, in agriculture risks arising from uncertainties overdetermining factors returns to agricultural production (OECD 2008). Natural uncertainty and biophysical conditions influenced the quality of production as well as the value of production and output price. The risks in agriculture include climate and weather, natural catastrophes, pests, and diseases, which combine to cause highly variable production outcomes (Okezie and Baharuddin, 2012).

In general, Malaysia has not experienced frequent climate-related disasters such as floods and droughts that had a noticeable socio-economic impact to the country, although lately some minor climate-related disasters have been recorded. Landslides caused by heavy rains and strong winds occur in hilly regions and at the coast, the latter causing minimal damage (Mustafa, 2007).

There are five (5) general risks in agriculture including risk in production, price or market risk, risk in financial, risk in institutional, and human or personal risk (Economic Research Service, 2014).

Even though it is not big significant impact, the agriculture sector in Kelantan recorded about RM105 million losses to large floods from 15 December 2014 to 3 January 2015 which hit the state, said Ex Agriculture and Agro-based Industry Minister Datuk Seri Ismail Sabri Yaacob (Zin, 2015).

The most significant natural hazard worldwide maintain caused by flooding. Flooding is a natural phenomenon and has a devastating impact on communities. The effects of flooding are wide-ranging, impacting on the economy, social wellbeing and the environment.

II. LITERATURE REVIEW

In a synthetic review carried out to know the impact of Agricultural Extension Services by International Initiative for Impact Evaluation team in January 2010 found that agricultural extension and advisory services play an important role in agricultural development and to increase the welfare of farmers and other people living in rural areas (Waddington et al., 2010).

Agricultural extension confronts some of the inefficiencies in making extension and advisory services much more functional and performance driven. Especially when there are obstacles and challenges that pose a risk to the agricultural sector, the extent to which the agriculture extension agency's ability to tackle this problem at the same time developing the agricultural sector with a significant problem.

Agriculture extension agents are whom work with farmers as advisor or rural practitioners to transfer of knowledge to field's society which essential for adaptation measures. Knowledge transfer between scientists, political decision-makers and the farmers directly affected by climate. It is because weather and climate are often discussed with other farmers at social gatherings; with extension agents during farmer meetings; and with suppliers, buyers, and brokers during business transactions (Crane et al., 2010).

Farmer's production can also be hindered by adverse events during harvesting or threshing that can lead to loss of production (Jaffer, Siegel, and Andrews, 2008). Furthermore, agribusinesses selling inputs to farmers or purchasing the final product are also- at risk.

Sivakumar (2008) stated that Agricultural practices adopted in regions that are continuously prone to natural disasters such as droughts and floods can strongly impact soil functions in the short term, and farming technologies and management can play an important role in these processes.

In an integrated market, the price reduction is generally not correlated with local supply conditions, and, therefore, price

shocks may affect producers in a larger way (Agwe and Fissah, 2009). Changes in regulations, financial services, the payments level of price- or income-support and subsidies can significantly alter the profitability of farming (Jaffer, Siegel, and Andrews, 2008).

Natural disaster in other hand is a temporary events triggered by natural hazards that overwhelm local response capacity and seriously affect the social and economic development of a region (Anderson, 1990). The reported annual frequency of natural disasters is rising (Scheuren et al. 2008) increasingly affecting larger numbers of the world's population. Natural disasters include hydro-meteorological disasters and geophysical disasters (World Disaster Report, 2003). Flood is one of a hydro-meteorological disaster and among the greatest natural disasters known to mankind.

Natural disaster in agriculture can affect human, material, economic and gives environmental losses. In Malaysia, a natural disaster occurred when the climate changes such as floods and droughts. Sometimes, landslides due to excessive rainfall and strong winds occur in hilly areas and on the beach but the biggest worry of our nation is flood.

Every year, the floods remain the main problems we need to face. It is caused by the northeast monsoon heavy rain each year. Northeast monsoon heavy rain causes floods not only in the coastal area but also affects the river to cause major flooding in Kelantan. These floods cause a large number of disruptive and it is hard to the farmers to cope the losses by their own resources.

Agricultural agencies need to help those farmers through the agents. Agriculture agents play a big role to help farmers to cope with their losses but it is a big challenges to the agents as agencies and farmers depending on them to develop agriculture sectors in a place affected by the flood and natural disaster.

III. OBJECTIVE OF THE STUDY

- 1) To identify the respondents' profile
- 2) To clarify the perception level of respondents' toward flood and natural disaster.
- 3) To examine the perception level of respondents on practices, toward farm management after flood and disaster.
- 4) To determine the relationship between the socio-demographic factor and perception level of respondents on practices toward farm management after the flood and natural disaster.

IV. METHODOLOGY

This survey was conducted at Kelantan, Malaysia. In this study, 121 respondents were chosen to fill up the questionnaire form provided. The questionnaire contained 69 questions and designed according to several sections. Data from the questionnaire was analysed by using statistical package for the social science (SPSS) 21.0 version. For this study, two types of statistic procedures were used to analyse the data which are descriptive analysis and chi-square analysis.

V. RESULTS AND DISCUSSION

Table 5.1 shows the majority of respondents are in age range of 51 to 60 years old with 47 of the total respondents. Most of the respondents are male which contributed 77.7% of total respondents. Female respondents only contributed 22.3% of total respondents. It shows that male dominate as an extension officer in Kelantan compares to female. The table shows most

of the respondents education level is certificate courses which most of them learn for agriculture institute from government agencies which are represent 73.6% of a total number of respondents. Table 5.1 shows most of the respondents have employed in agriculture services for about 1 to 10 years which represent 36.2% of a total number of respondents. For about 25.9% of respondents have employed in a range of 31 to 40 years. Table 1.1show most of the respondents have lowest annual income up to RM50, 000 that represent 79.3% of respondents.

Table 5.1: Profile of the Respondents

Characteristics	n (121)	Percentage
Age	Frequency	Percent
21 to 30	16	13.9
31 to 40	35	30.4
41 to 50	17	14.8
51 to 60	47	40.9
Gender	Frequency	Percentage (%)
Male	94	77.7
Female	27	22.3
Male	94	77.7
Level of education	Frequency	Percent
Certificate Courses	67	73.6
Diploma	14	15.4
Bachelor Degree	8	8.8
Master's Degree	1	1.1
Ph.D.	1	1.1
Years Employed in Agriculture Services	Frequency	Percentage (%)
1 to 10	42	36.2
11 to 20	24	20.7
21 to 30	20	17.2
31 to 40	30	25.9
Total Annual Income	Frequency	Percentage (%)
Lowest to RM50,000	96	79.3
RM50,001 to RM100,000	10	8.3
RM100,001 to RM150,000	1	0.8

A. Perception Level of Respondents' Toward Flood and Natural Disaster

Table 5.2 shows the frequency, percentage, the mean and standard deviation for each of the variables in perception level of respondents' toward flood and natural disaster. The variable of "Agriculture extension agents know to recover from the massive flood and natural disaster costs all parties" has the highest mean (4.40), and the variable with the lowest mean (3.69) is "Agriculture extension agents know of theoretical/practical adaptive measures" statement. The item indicates that the agriculture extension agents mostly know the costs in recovering floods and natural disaster not only affect the farmers but also the agents and agencies itself. Besides, the item also shows that less number of the agriculture extension agents know adaptive measures in recovering floods and natural disaster.

Table 5.3 shows the level of perception of respondents' toward flood and natural disaster whether high, moderate or low. 81.0 percent of the respondents were high, 18.2 percent were moderate in level and the remainder (0.8 percent) was low in

level. The total mean is 4.08. Therefore, the majority of the natural disaster respondents have a high level of perception toward flood and

Table 5.2: Perception of respondents' toward flood and natural disaster (n=121)

Statements	Frequency (%)					M	S.D.
	1	2	3	4	5		
I have experienced the weather to be steady over the last 5 years.	1 (0.8)	18 (14.9)	17 (14.0)	39 (32.2)	46 (38.0)	3.92	1.092
The weather got hotter, rains became less and unexpected over the years	0 (0.0)	2 (1.7)	13 (10.7)	48 (39.7)	58 (47.9)	4.34	0.737
The weather becomes more unpredictable from year to year.	0 (0.0)	2 (1.7)	12 (9.9)	55 (45.5)	52 (43.0)	4.30	0.715
I believe that the perceived changes in the weather condition caused by environmental pollution and climate change.	0 (0.0)	2 (1.7)	27 (22.3)	44 (36.4)	48 (39.7)	4.14	0.820
Flood and natural disaster has most serious environmental impact to agriculture in Malaysia	0 (0.0)	5 (4.1)	20 (16.5)	48 (39.7)	48 (39.7)	4.15	0.843
I know that a lot of crops/livestock were lost during the past years because of the bad weather conditions.	0 (0.0)	5 (4.1)	24 (19.8)	46 (38.0)	46 (38.0)	4.10	0.860
The quality of the harvest/products has become worse in the past years due to changes in weather condition.	1 (0.8)	6 (5.0)	26 (21.5)	57 (47.1)	31 (25.6)	3.92	0.862
The quality of the harvest affected the sales of products.	0 (0.0)	3 (2.5)	23 (19.0)	60 (49.6)	35 (28.9)	4.05	0.762
I know farmers income decreased due to the loss of crops/livestock resulting from bad weather conditions.	0 (0.0)	4 (3.3)	14 (11.6)	65 (53.7)	38 (31.4)	4.13	0.741
I know it is not easy for farmers to cope with their losses on their own.	0 (0.0)	3 (2.5)	14 (11.6)	63 (52.1)	41 (33.9)	4.17	0.727
I know to recover from the massive flood and natural disaster costs all parties.	0 (0.0)	3 (2.5)	8 (6.6)	48 (39.7)	62 (51.2)	4.40	0.724
I know not every farmer knows about the climate change.	2 (1.7)	11 (9.1)	14 (11.6)	57 (47.1)	37 (30.6)	3.96	0.970
I know of theoretical/practical adaptive measures.	1 (0.8)	4 (3.3)	45 (37.2)	53 (43.8)	18 (14.9)	3.69	0.796
The adaptive measures provided by agencies are known to increase resilience to natural disasters among victims.	1 (0.8)	2 (1.7)	32 (26.4)	66 (54.5)	20 (16.5)	3.84	0.742
I know ex ante and ex post strategies can help from severe losses.	0 (0.0)	4 (3.3)	37 (30.6)	56 (46.3)	24 (19.8)	3.83	0.782
Providing information on natural disaster and climate change is not the responsibility of agriculture extension officer only but it concerns all stakeholders.	0 (0.0)	1 (0.8)	13 (10.8)	56 (46.7)	50 (41.7)	4.29	0.691
Overall Mean						4.08	0.804

Table 5.3: Level of perception of respondents' toward flood and natural disaster

Level	Frequency	Percentage (%)	M	S.D.
High (3.67-5.0)	98	81.0	4.08	0.804
Moderate (2.34-3.66)	22	18.2		
Low (1-2.33)	1	0.8		
Total	121	100		

B. Perceptions of Respondents' on practices toward Post-Natural Disaster Farm Management

Table 5.5 shows the frequency, percentage, the mean and standard deviation for each of the variables in perceptions of respondents' on practices toward post natural disaster farm

management. The highest mean is "I do contact the right agency in case of flood disasters" statement with 3.77 and the lowest mean is on "I apply various disaster management strategies from seminars and training I attended." statement with 3.36.

Table 5.5: Perceptions of respondents' on practices toward post natural disaster farm management (n=121)

Statements	Frequency (%)					M	S.D.
	1	2	3	4	5		
I have been organizing farmers to cope with the effects of natural disasters	2 (1.7)	6 (5.0)	44 (37.0)	52 (43.7)	15 (12.6)	3.61	0.836
I apply various disaster management strategies from seminars and training I attended.	4 (3.4)	12 (10.1)	47 (39.5)	49 (41.2)	7 (5.9)	3.36	0.871
I do contact the right agency in case of flood disasters	2 (1.7)	3 (2.5)	34 (28.8)	60 (50.8)	19 (16.1)	3.77	0.810
I have appropriately moved families affected by flood disasters	3 (2.5)	17 (14.3)	37 (31.1)	47 (39.5)	15 (12.6)	3.45	0.972
I disseminate the adaptive techniques and technologies to use when there is flooding in an area	2 (1.7)	10 (8.4)	43 (36.1)	51 (42.9)	13 (10.9)	3.53	0.862
I have practised the coping strategies to apply when there is flooding in an area	2 (1.7)	11 (9.2)	39 (32.8)	59 (49.6)	8 (6.7)	3.50	0.822
I have practically applying farm management practices after flood has affected an area together with the farmers	2 (1.7)	6 (5.0)	39 (32.8)	62 (52.1)	10 (8.4)	3.61	0.784
Overall Mean						3.55	0.851

Table 5.6 shows the level of perceptions of respondents' on practices toward post natural disaster farm management whether high, moderate or low. 50.4 percent of the respondents were high, 47.1 percent were moderate in level and the remainder (2.5 percent) was low in level. Total mean (3.55) is moderate in level and nearly to a high level. It shows that even though high percentage shows 50.4 percent but the mean level of the perception on practices is moderate and there is a need for improvement for better practices in post-natural disaster farm management.

Table 5.6: Level of perceptions of respondents' on practices toward post natural disaster farm management

Level	Frequency	Percentage (%)	M	S.D.
High (3.67-5.0)	60	50.4		
Moderate (2.34-3.66)	56	47.1	3.6	0.85
Low (1-2.33)	3	2.5		
Total	119	100		

VI. RELATIONSHIP BETWEEN SOCIO-DEMOGRAPHIC FACTOR AND PERCEPTION OF RESPONDENTS ON KNOWLEDGE, TOWARD FARM MANAGEMENT AFTER FLOOD AND NATURAL DISASTER

Socio-demographic factors tested in this study were age, gender, academic qualifications, current position, and the total annual income from both main employment and other sources. Table 6.1 shows the relationship between socio-demographic factors and the perception level of respondents toward practices toward farm management after the flood and natural disaster. From the previous result, 50.4% of the total respondents have high perception toward practices on farm management after the flood and natural disaster, 47.1% respondent at a moderate level and 2.5% of the respondent in low level. The result indicates that gender, academic qualifications, current position and experience in agricultural agencies have no significant relationship with the perception level of knowledge toward farm management after the flood and natural disaster.

Table 6.1: Relationship Between Socio-Demographic Factors And Perception Level Toward Practices Toward Farm Management After Flood And Natural Disaster

Variables	Chi-square ($X^2_{0.05}$)	df	Significance	Decision
Age	13.105 ^a	6	0.041	Reject H_0
Gender	0.259 ^a	2	0.879	Fail to Reject H_0
Academic qualifications	9.243 ^a	8	0.322	Fail to Reject H_0
Current position	5.868 ^a	4	0.209	Fail to Reject H_0
Experience in agricultural agencies	9.210 ^a	6	0.162	Fail to Reject H_0
The total annual income from both main employment and other sources	35.218 ^a	4	0.000	Reject H_0

There was a relationship between age and the total annual income from both main employment and other sources with the perception level toward practices on farm management after the flood and natural disaster. It is interesting to know that the extension personnel with range age of 51-60 years old can provide more practices on farm management after the flood and natural disaster because they are long in this service and high in experience. The respondents that have the lowest income from the main employment and other sources have high perception level toward practices on farm management after the flood and natural disaster. It is because these respondents don't care whether their income is less or more, they still can provide more practices on farm management after the flood and natural disaster.

CONCLUSION

The objectives of this study was to identify the respondents' profile and to clarify the perception level of respondents' toward flood and natural disaster, to examine the perception of practices of respondents toward farm management. Based on

the result, the respondents have a moderate level of perceptions practices toward post natural disaster farm management. The result shows the relationship between socio-demographic factors and perception based on the analysis, there was a relationship between age and the total annual income of respondent toward farm management after the flood and perception level toward practices. Agriculture agencies in Kelantan need to gives serious attention to this problem which can help farmers. The main cause of lack practices of the extension personnel is because of they didn't have much training on climate change which this is a responsible of government agencies and private agencies. To conclude, there is a room for improvement for better natural disaster farm management. To provide more training on climate change is highly recommended to government and private agencies for improvement.

References

- [1] Mustafa Kamal.(2007). Climate change – Its effects on the agricultural sector in Malaysia. Paper presented at National Seminar on Socio-Economic Impact of Extreme Weather and Climate Change, organized by the Ministry of Science, Technology and Innovation, Putrajaya, Malaysia. 21–22 June.
- [2] Okezie, C. A. and Baharuddin, A. H. (2012). Risk In Malaysian Agriculture: The Need For A Strategic Approach And A Policy Refocus. *Kajian Malaysia*, Vol. 30, No.1, 2012, 21–50. PenerbitUniversitiSains Malaysia.
- [3] Zin, Z. (2015, January 5). Banjir: Kerugian RM105j. Utusan Online. Retrieved from <http://www.utusan.com.my/berita/nasional/banjir-kerugian-rm105j-1.50021>
- [4] Waddington, H., Snilstveit, B., White, H. and Anderson, J. (2010). The Impact of Agricultural Extension Services 3ie Synthetic Reviews – SR009 Protocol January 2010. International Initiative for impact Evaluation.
- [5] Crane, T. A., C. Roncoli, J. Paz, N. Breuer, K. Broad, K. T. Ingram, and G. Hoogenboom, (2010): Forecast skill and farmers' skills: Seasonal climate forecasts and agricultural risk management in the southeastern United States. *Wea. Climate Soc.*, 2, 44–59.
- [6] Jaffer, S., Siegel, P. and Andrews, C. (2008).Rapid Agricultural Supply Chain Risk Assessment.Commodity Risk Management.Agriculture and Rural Development Department, World Bank.
- [7] Sivakumar (2008). Natural disasters and their mitigation for sustainable agricultural development R. Stefanski, P. Pasteris (Eds.), *Management of natural and environmental resources for sustainable agricultural development*, proceedings of a workshop held from February 13–16, 2006, in Portland, Oregon (AGM-10, WMO/TD-no. 1428), World Meteorological Organization, Geneva (2008), pp. 172–191.
- [8] Agwe, J. and Fissaha, A. (2009).Proceedings of Expert Meeting on Managing Risk in Financing Agriculture. Convened and co-sponsored by AFRACA, FAO, the Land Bank of South Africa, and the World Bank, Johannesburg, South Africa. 1–3 April.
- [9] Anderson, M. (1990).Analyzing the costs and benefits of natural disaster responses in the context of development.Environment Working Paper 29, World Bank, Washington, D.C., USA.
- [10] Scheuren J.M., O. le Polain de Waroux, R. Below, D. Guha-Sapir, and S. Ponserre. (2008). Annual Disaster Statistical Review: The Numbers and Trends 2007. Center for Research on the Epidemiology of Disasters (CRED).
- [11] World Bank (2007). World Development Report 2008: Agriculture for Development. World Bank, Washington DC.