Risk Communication on Climate Change in Agriculture

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Abstract

The research aimed to study the risk communication on climate change, perception and awareness of risk in agriculture, based on empirical data in Bangnampriao district, Chachernsao province, Thailand. The data was collected using focus group and questionnaire survey. Results showed that effective risk information on climate change was insufficient. Furthermore, there was a lack of appropriate personal media and material media to integrate scientific knowledge with lifestyle of community. However, the personal media such as friends and relatives had potential influence on climate change adaptation for 36.52 percent. The material media that contained climate change information in the community were pamphlet, poster, and comic. Risk perception and risk awareness were important to ensure effective risk management.

Key words: Risk communication, climate change, agriculture

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Introduction

Climate change refers to any systematic change in the long-term statistics of climate elements (such as temperature, precipitation, or winds) sustained over several decades or longer time periods (American Meteorological Society, 2017). It was mentioned in the Intergovernmental Panel on Climate Change (IPCC) report that increased evaporation combined with regional changes in precipitation characteristics had the potential to affect the intensity of floods and droughts. The South East Asia region was vulnerable to climate change, including sea level rise, shift of weather pattern and more frequent occurrence of floods and droughts (Intergovernmental Panel on Climate Change, 2007).

According to the World Health Organization (WHO), risk communication is a "process which aims to help stakeholders define risks, identify hazards, assess vulnerabilities and promote community resilience" (World Health Organization, 2017). Emotions were determinants in risk perception (Sabine, R., 2012). The Experience in climate change, as a problem, affected risk awareness of people. Lower psychological distance was associated with high level of concern and preparedness to take action on climate change (Alexa, S. et al, 2012).

The content of media and communication mode were the challenge of effectively climate change communication (Benson Owuor Ochieng Consultant, 2009). The visualization content of risk, uncertainties and risk management should be related to the context of community (Paul, M. K. et al, 2008). However, the press did not pay role to convey agricultural information to the farmers (Rehman, F., 2011). The activity media in group learning process could stimulate the systematic thinking, critical thinking, awareness, and change attitude (Janot, M. de S, et.al., 2012). The community-based participation of different stakeholders could be effective to change attitude and behavior (Randy, R. et al, 2009). The perception of climate change risk was related to the public engagement in climate change communication (Nick, P., 2012). Risk perception was influenced by demographic factors (e.g. age, gender) and past experience as shown in Figure 1. Perceived risk was thought to be individual likelihood adaptation (Erin, M., 2012).

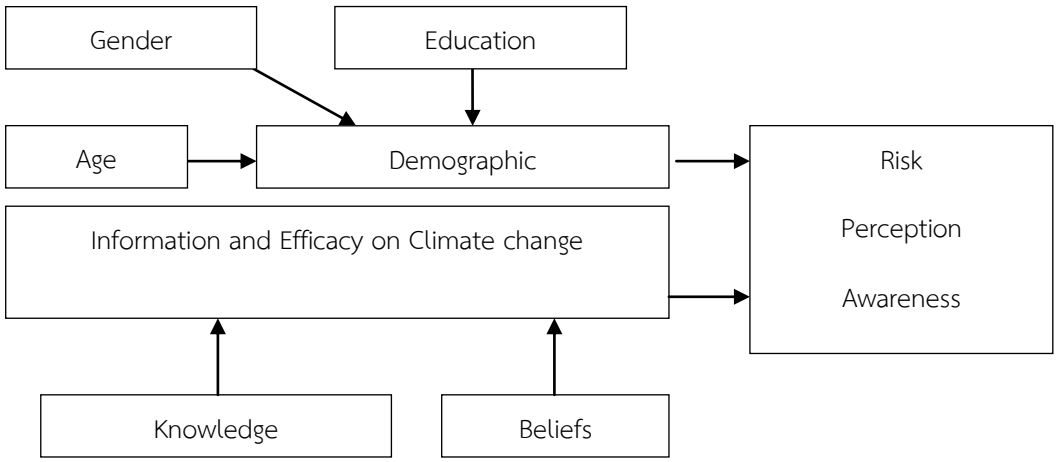

Figure 1 : A causal diagram on climate change risk perception

Source : Paul, M. K. et al, 2008

Furthermore, the provincial agencies had limited capacity to support the community in dealing with the impacts of climate change (The European Union, 2013). The local government structures played a key role in continuous supporting communities in building capacity for adverse consequences of climate change (Betty, H. M., 2009).

Thailand has faced with water resources problems, including drought and flood. Increasing climate change was expected to aggravate vulnerabilities on agricultural areas such as rice field, orchard, and fish farming in Bangnampriao District, Chachernsao Province (Charuvan, K. and Suppakorn, C., 2015). The simulation indicated that the rainfall during wet season (May – October) contributed to a rise in climate charge whereas that in dry season (November –April) led to decline. In addition, the sea level rise along inner Thailand gulf, affecting saline intrusion in this area through Bangpakong River, was likely to intensify. Adaptation strategies were needed to be put in place in order to enhance the resilience of the agriculture (Charuvan, K., 2015). Most of adaptive measures were under the concept of "sufficiency economy" (Ngigi S. N., 2009).

Research Objective

The objective of this study was to study the risk communication on climate change in agriculture in Bangnampriao district, which is located in the eastern sub-region of Thailand as shown in Figure 2.

Figure 2 : Location of Bangnampriao district in Chacherngsao Province.

Methodology

Firstly, the role of the media in risk communication on climate change in Thailand was investigated by means of media analysis. Quantitative and qualitative methodologies were used to identify communication mode of climate change and content of climate change.

Secondly, data collection by questionnaire was conducted. The questionnaire was divided into three parts. The first part dealt with personal information of respondents, including age, gender, and occupation. The second part was on climate change perception. The third part dealt with climate change awareness on flood, drought, and saline intrusion.

Results and Discussion

1. Media analysis on climate change

It was revealed that there was confusion in the understanding of the meaning of climate variability, and climate change in the mass media. The meaning of climate variability and extreme climate, which were defined as the way climate fluctuates yearly above or below a long-term average value and the frequent and intense larger weather events, respectively. This leads to natural disasters such as heavy rain, flood, and drought. The forecasted weather from Meteorological Department was used for management planning in disaster risk reduction, while the climate change variability, which was defined as

a change in the statistical distribution of weather patterns when that change lasts for an extended period of time (i.e., decades to millions of years). Climate change was the phenomenon global warming derived from continuous greenhouse gas emission whereas climate variability was the yearly variable of weather. Therefore, climate change can cause impacts in the next 30-50 years while climate variability can cause the natural disaster from extreme climate. Furthermore, the meaning of climate change mitigation strategies, which is the actions that either reduce the emission of greenhouse gas or enhance carbon sinks, differs from that of adaptation strategies, which refers to the efforts to reduce the severity of climate change impacts.

The print media, including the agricultural magazine, agricultural journal, newspapers, and pamphlets as well as radio and television programs, were poor in content and also in number. Furthermore, many people were still more familiar with traditional media, which were closer to their local cultures than the modern forms of media. It was observed that the print media were not playing their proper role in the dissemination of agricultural information among farmers. Risk messages which were not heard, not believed, led to no actions. A content analysis of the newspaper coverage from website www.iqnewsclip.com by using the keywords of climate change in Thailand during 2011–2013 was conducted. As shown in Figure 3, it was found that the total climate change news exhibited in the context of Thailand decreased significantly in 2013. It was evident that there were 719 pieces of climate variability news (33.36%) while climate change news contained 798 pieces of mitigation (37.03%), 388 pieces of climate change (18.00%) and 250 pieces of climate change adaptation (11.60%). Therefore, the climate change adaptation news was not the main content in newspaper. In addition, it was exhibited that the climate change adaptation news consisted of 224 pieces (89.60%), articles 14 pieces (5.60%), and pictorial news 12 pieces (4.80%). The content of climate change adaptation articles was the correct information for only 8 pieces (57.14%). Hence, the practical news of climate change adaptation was only 0.37 percent of overall news. This led to limited-transfer efficiency to agricultural community. Therefore, print media such as mass media were not playing a proper role to convey the agricultural information to the farmers (Rehman, F., 2011).

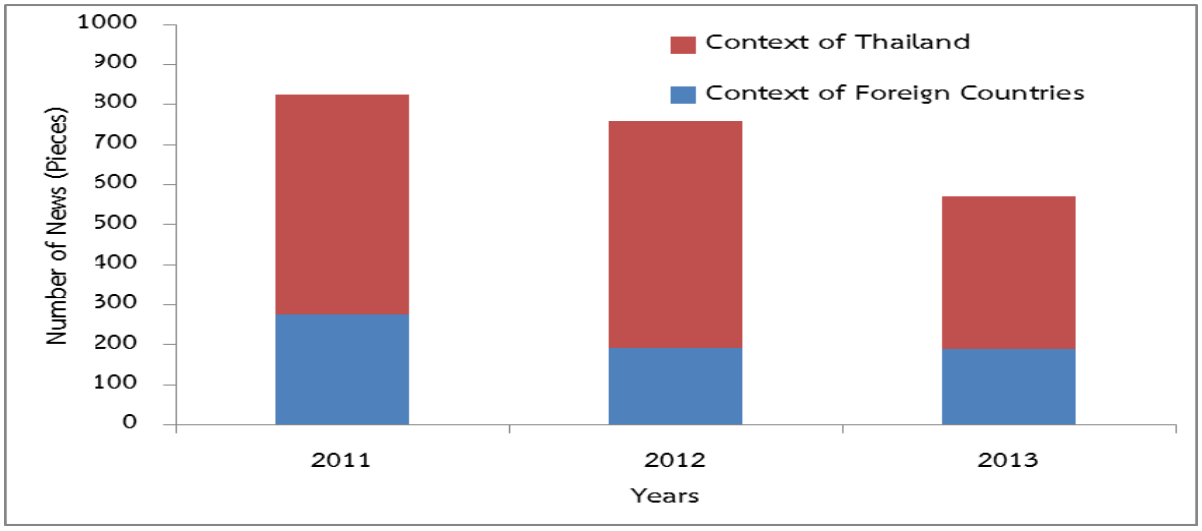

Figure 3 : Climate change covering on the press

Analysis of 21 articles related to climate change during 2011-2013 from website www.scholar.google.com revealed that there were 5 articles on climate variability (23.80%) while there were 9 articles on climate change news (37.03%), 6 articles on mitigation, and 1 articles on climate change adaptation (4.76%). The accessibility to articles was difficult due to the limited distribution. The academic language was also hard to understand because it was not related to the context of community.

Moreover, analysis of 17 articles related to climate change during 2011-2013 from website www.elibrary.trf.or.th (The Thailand Research Fund) and www.tnrr.in.th (Thai National Research Repository) showed that there was 1 article on climate variability news (5.88%), 4 climate change news (23.52%), 8 articles on mitigation (47.06%) and 4 articles on climate change adaptation (23.52). The accessibility to articles was difficult due to the limited distribution. The academic language was hard to understand because it was not related to the context of community.

Furthermore, analysis of information from website www.google.com by using the keywords of climate change, revealed that the movies related to climate change were The Water World, The Day After tomorrow, and The Inconvenient Truth, etc. The content of the movies was mostly concerned with climate change. The accessibility to movies was difficult due to the limited availability of playing equipment, and the language was not related to the context of community.

Finally, analysis of information from website www.google.com by using the keywords of climate change, showed that the percentages of Thais music related to climate change and mitigation were around 60 and 40, respectively. The accessibility to music was also difficult due to limited number of playing equipment.

2. Description of research sample.

Among 150 respondents, 53% were female and 47% male. Number of respondents in the age range 41-50 years were the largest (38%), followed by age 51-60 (30%), 31-40 (13%), 61-70 (13%), 71-80 (3%), 21-30 (2%), and <20 (2%). The median age was 49.3 years. Number of respondents having education lower than Junior High school were the largest (70%) followed by Junior High school (13%), Bachelor Degree (3%), Diploma (2%), and Master Degree (0%). Number of respondents having occupation as farmers were the largest (82%) followed by labourers (7%), aquaculturalists (6%), and vegetable growers (5%).

3. Perception of climate change in the media

Among 150 respondents, television (43.54%) was mentioned to be the most frequently reported mass media from which people obtained information about climate change, followed by radio (7.30%), internet (3.09%), and Newspaper/magazine (1.40%) (Table1). The data also show that the local personal media such as friend/relative (36.52%), followed by local officer (7.02%) and provincial officer (0.84%) had potential influence on community climate change adaptation. The results of the present study are consistent with those of Fariha, R. et al (2011) who found that the most effective forms of print media for livestock production technology were magazines, followed by books, newspapers and posters. While on flood disaster in 2011 in Thailand, television was found to be the most effective channel for disseminating flood information (58%) (Neelima, A. M. et al, 2016).

Table 1 : Climate change perception in the media

Media	Percent	Score
Television	43.54	4.67 (High)
Radio	7.30	1.99 (Low)
Internet	3.09	1.35 (Low)
Newspaper/Magazine	1.40	1.70 (Low)
Poster	0.28	1.52 (Low)
Pamphlet	0.00	1.51 (Low)
Provincial officer	0.84	1.91 (Low)
Local officer	7.02	2.77 (Medium)
Friend/Relative	36.52	4.66 (High)

Note: 1.00 –2.33 Low; 2.34-3.67 Medium; 3.68–5.00 High.

4. Climate change awareness

The awareness of negative effects of flood, i.e, damage and lower income, were (95-100 percent) while those on positive effects i.e., abundant aquatic animals, fertile soil and useful fertilizer were moderate (42-61 percent) as shown in Figure 4. However, climate change adaptive measure such as rice cultivation avoidance and re-sit cultivate were high (54–75 percent.)

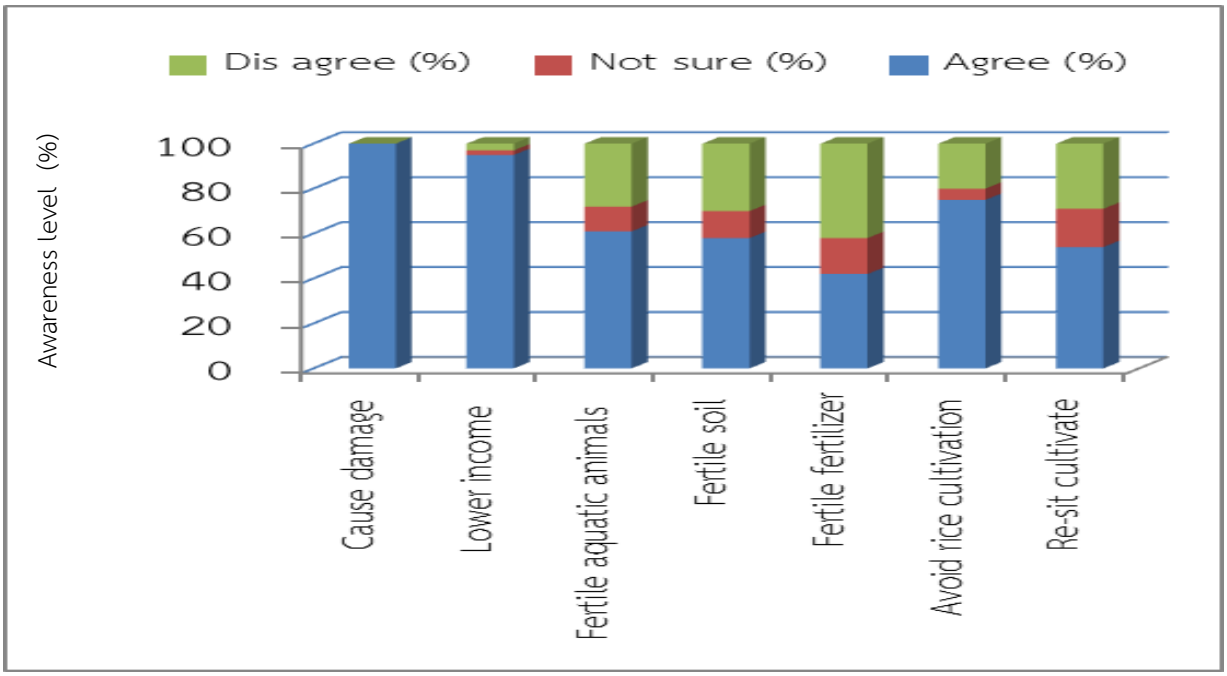

Figure 4: Flood risk awareness

The awareness of negative effects of drought i.e., damage and lower income was high (96-99 percent) as shown in Figure 5. While climate change adaptive measure i.e rice cultivation avoidance, unable to cultivate other plants and re-sit cultivate were quite high (62–84 percent).

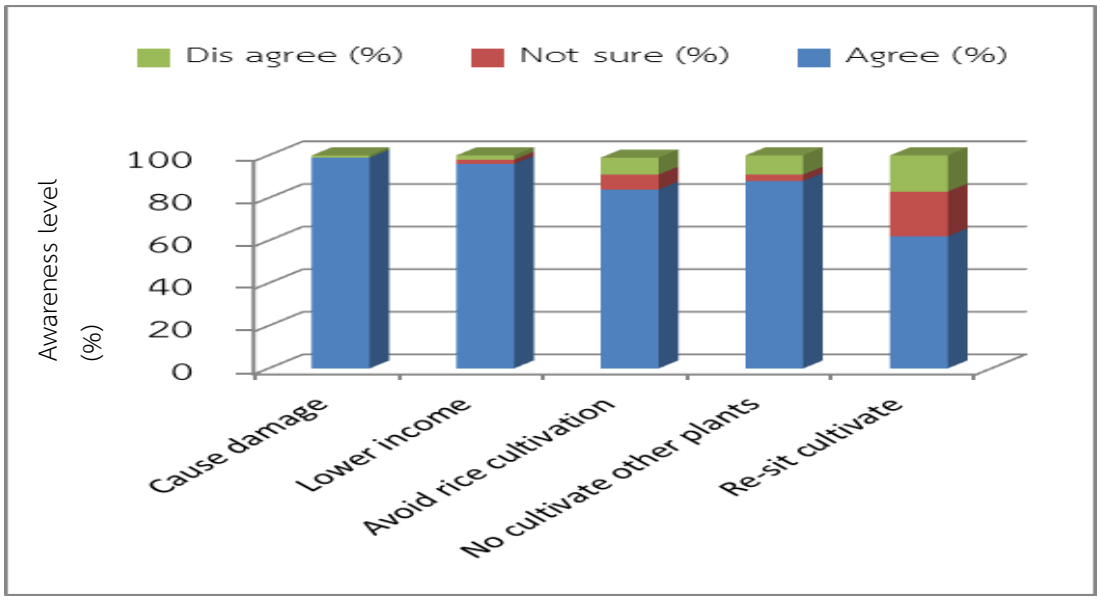

Figure 5 : Drought risk awareness

Risk perception was influenced by demographic factors (e.g. age, gender) and past experience (Paul, M. K. et al, 2008). Risk awareness was strongly influenced by personal experience such as location and history. Perceived risk was thought to be individual likelihood adaptation (Erin, M., 2012). However, personal exposure to adverse consequences of climate change increased fear but decreased perception of risks because of familiarity.

Concluding Remarks

Even though newspaper could be easily accessed, the numbers of climate change adaptation news or articles were just approximately 0.37 percent. Furthermore, the number of media that contained climate change adaptation information such as journal, academic report were not only limited but also confusing, particularly the concepts of climate variability and climate change. Therefore it is advisable that the concepts should be properly conveyed.

The accessibility of media such as movies and songs was difficult due to the limited number of playing equipment The content of climate change adaptation in newspaper, journal, academic report, and electronic media was significant but the language used was academic writing and difficult to understand due to low literacy and different context of community. However the local personal media such as friends and relatives have potential influence on community climate change adaptation. They could distribute the information through the printed media such as pamphlet and poster containing information about climate risk and adaptation in the context of community. The results also revealed that percentage of climate risk awareness especially negative effects of climate change was highest (95-100%). The local administrative organizations, therefore, should stimulate learning process and awareness in the topic of climate change adaptation in community.

By means of the National Board on Climate Change Policy in the Ministry of Natural Resources and Environment , climate change adaptation has to be systematically integrated into the strategic development plans of governments at different administrative levels to ensure participation and support of stakeholders such as personal media, especially the representatives from Department of Local Administration (DLA), Department of Water Resource, Department of Irrigation, Department of Agriculture , Department of Environment Quality Promotion, and the Community Development.

Climate risk awareness in vulnerable communities could be improved through both formal and non-formal media. Community engagement through community-based organizations (CBOs), to identify problems, define solutions and formulate action plans could increase awareness and involvement so that vulnerable people, especially experienced people, could make decisions about their response to a severe risk with their family and in the context of community climate. The perception of climate change as local risk was related to the public engagement in climate change communication (Nick, P., 2012).

Acknowledgments

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References

Alexa, S., Wouter, P. and Nick, P. (2012). "The Psychological Distance of Climate Change." **Risk Analysis**. Volume 32(6), **957-972**.

American Meteorological Society (2017). "Climate Change." Meteorology Glossary. http://glossary.ametsoc.org/wiki/Climate_change.

Benson Owuor Ochieng Consultant (2009). **Effective Communication of Science and Climate Change Information to Policy Makers.** The Ccaa/3rd East African Health and Scientific Symposium on Climate Change, Nairobi, Kenya.

Betty, H. M. (2009). **Risk Behavior and Risk Communication: Synthesis and Expert Interviews**: Miami. The NOAA Coastal Services Center: Social Research.

Charuvan, K. and Suppakorn, C. (2015). **Climate Change Scenario on Surface Water Resource in Bangnampriao District, Chachernsao Province.** The International Conference on Climate Change and Water & Environmental Management in Monsoon Asia: Bangkok, Thailand.

Charuvan, K. (2015). **Risk and Vulnerability Assessment of Agriculture on Climate Change: Bangnampriao District, Thailand.** The International Conference on Risk Assessment and Management: Amsterdam, The Netherlands.

Erin, M., Connie, R., Rajiv, N.R., June, A. F., Edward, W. M. and Anthony, L. (2012). "Information Seeking about Global Climate Change among Adolescents: the Role of Risk Perceptions, Efficacy Beliefs, and Parental Influences." **Atlantic Journal of Communication.** Volume 20, **31-52**.

Janot, M. de S., Pablo, S. and Carina, B. (2012). **Games for a New Climate: Experiencing the Complexity of Future Risks**: Pardee Center Task.

Neelima, A. M., Jatuwat, S., Parinda, T., and Hiroaki, F. (2016). "Proper Dissemination of Information to Improve People Awareness on Flood Disaster: A Case Study of 2011 Flood in Thailand." **Applied Environmental Research**. Volume 38(2), **1-12**.

Ngigi, S. N. (2009). **Climate Change Adaptation Strategies: Water Resources Management Options for Smallholder Farming Systems in Sub-Saharan Africa**: New York. The MDG Centre for East and Southern Africa.

Nick, P. (2012). "Climate Change Risk Perception and Communication: Addressing a Critical Moment?" **Risk Analysis**. Volume 32(6), **951-956**.

Intergovernmental Panel on Climate Change (2007) **Climate Change 2007: Impacts, Adaptation and Vulnerability**: UK. Cambridge University Press, Cambridge.

Paul, M. K., Sammy, Z., and Arnold, V. (2008). "Personal Efficacy, the Information Environment, and Attitudes Toward Global Warming and Climate Change in the United States." **Risk Analysis**, Volume 28(1), **113-126**.

Randy, R., Payam, S. **and** Tanyka, M. B. (2009). **A Guide to Enhance Grassroots Risk Communication: Among Low-Income Populations**: Maryland Department of Health and Mental Hygiene: MHS Myrtle Evans-Holland**.**

Rehman, F., Muhammad, S., Ashraf, I., and Hassan, S. (2011). "Factors Affecting The Effectiveness of Print Media in the Dissemination of Agricultural Information." **Sarhad Journal of Agriculture**. Volume 27(1), **119-124**.

Sabine, R. (2012). "Role Communication, Public Engagement, and Climate Change: A Role or Emotions." **Risk Analysis**, Volume 32(6), **1033-1040**.

The European Union (2013). **Climate Vulnerability and Capacity Analysis Report, South of Thailand Building Coastal Resilience to Reduce Climate Change Impact in Thailand and Indonesia (BCR CC)**: CARE Deutschland-Luxemburg e.V. in cooperation with Raks Thai Foundation.

World Health Organization (2017). "WHO Guidance." Risk communication. Available from: http://www.who.int/ihr/risk_communication/en/.