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Public Perception of Climate Change in Labutta Township, Myanmar

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Abstract:

Identifying the perception about changing climate and adverse effects and the related influencing factors are imperative in producing support for policymakers to promote the response to climate change. There are a number of studies identified the level of public perception and the influencing factors on public awareness and knowledge of climate change and its impacts. Nevertheless, little studies have examined the public perception of climate change in Myanmar. This study purposes to examine the perception among residents about climate change and the influential factors in shaping such perceptions using a household survey in the most vulnerable area to the severe impacts of climate change. This research aimed to examine how the public perceives about climate change in Labutta township. 220 respondents were selected to collect data for the study through the multi-stage stratified random sampling. The socio-economic characteristics were collected from the households as primary data including gender, occupation, age, and educational status. The survey data were analyzed using descriptive statistics. The ambition of this paper is to improve the understanding of public perceptions of climate change, find out how they are affected by climate change impacts. Age, gender, education, occupation, traditional knowledge, climate information, and social media are realized as influential factors on public perception of climate change. In supporting policymakers to develop strategies and plans in responding to climate change, understanding public perception about climate change and its trends is essential.

Keywords: climate change, perception, awareness, influencing factors, extreme weather events, Myanmar

1. Introduction

Climate change is possibly the major issues to human lives and environment and developing countries become the most vulnerable to the increasingly diverse effects of climate change in the twenty-first century. The variation of the global climate system is increasing, and there will more likely to confront more severe and intense effects in the future (IPCC 2007). The level of climate change impacts varies in different regions but the sustainable development of every region is facing climate change problems and challenges and human existence is being threatened (Adejuwon, 2004). Another study pointed out that the major sources of climate change are caused by the contribution of the emission of greenhouse gases from human activities especially using oil and gases and changing the land-uses (Houghton et al., 2001). Climate change becomes the priority of government agendas in Myanmar. After facing the most severe cyclone Nargis in 2008 which devastate enormous livelihoods, the country recognized its vulnerability and exposure to the adverse impacts of climate change (Drakenberg and Wolf, 2013). Myanmar is vastly vulnerable to climate change and is vulnerable to different kinds of disasters including earthquakes, storm surges, and flood in coastal areas and landslides in hilly areas that caused enormous loss and damage to the community (Anna et al., 2016).

In order to achieve climate actions and response to changes, it is fundamental to understand the climate system and subsequent impacts (Standish, 2005). The awareness and understanding of climate change are crucial in developing climate change strategies and master plans to promote adaptive capacity and mitigation efforts as well as the resilience of the community and in improving the capacity building to encounter the extreme weather events (Singh et al., 2010). People with higher education level are more capable of understanding and changing their behaviors, predicting the future scenario and approaching updated climate information and better practice and opportunity (Uddin et al., 2014). Climate actions can be undertaken to mitigate the severe climate change impacts by the understanding of local and global climate risks.

In current conditions, Labutta Township is the most vulnerable to climate change in Myanmar and due to the projected scenarios, there will be greatly increased in its vulnerability. The main causes are the poor infrastructure and ecological system condition and socio-economic situation, and the related impacts of climate change.

2. Objectives

This study aims to evaluate the perception of the citizens of Labutta township about climate change and its impacts and identify factors influencing the perception about climate change. With this objective, the specific objectives of this study are:

- (1) To evaluate the public perception of climate change and
- (2) To identify the factors influencing the public perception of climate change.

This study is interested in finding answers to the followings questions:

- (1) What is the level of perception of the citizens of Labutta Township on climate change?
- (2) What are the influential factors on the public perception of climate change?

3. Material and Methods

3.1 Study area

The study is carried out in Labutta township which is one of the most vulnerable areas to the impacts of climate change especially flood and storm in the Delta region. Labutta town hosts both the Labutta Township administration and the Labutta District, which is one of the six districts that form the Ayeyarwady Region. The regional government of the Ayeyarwady Region is located in Patheingyi. Labutta is a town with concentrations of population predominantly engaged in agrarian activities. The district and township level administrative functions are provided by Labutta administration office and respective organizations in health, education, social and community services.

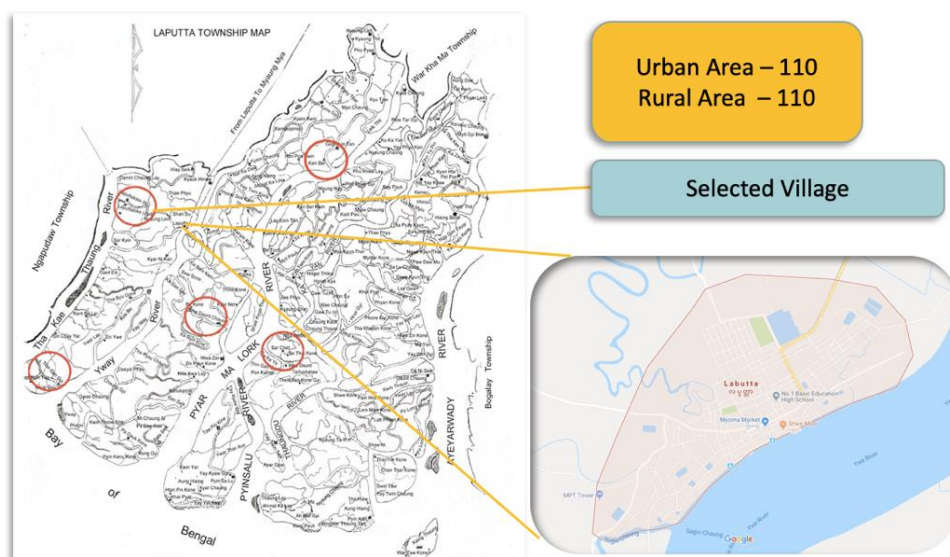


Figure 3. 1 Map of Labutta township

Source: Township administration office, Labutta

3.2 Samples and sampling method selection

In the Labutta township, municipal wards in district town were studied as urban area units and villages consisted in the township were studied as rural area units. The questionnaires were structured to conduct the survey in selected areas by interviewing face-to-face to respondents. The targeted respondents consist of:

- Household members: Adult persons aged 18 years and above; and
- Local government representatives, the staff of NGOs and other self-employees.

Multi-stage stratified random sampling technique was applied to survey selected households as the respondents. A 50:50 male-female ratios were maintained. Depending on the township population, 220 number of sample size is supposed to be sufficient to get reliable estimation and outputs for the study area. For urban coverage, all wards within the township were studied as the study area and for rural, Pein Ne Kone village, Bo Kone village, Kha Pyat village, Kyar Kan village and Thin Gan Gyi village were considered. For urban sampling, all the wards were divided into blocks fundamentally in which each block comprises around 50 households and among them, two blocks from each ward were selected and visited the households keeping a standard house-gap. For selecting sampling for the rural area, each selected village was measured depending on the number of population. Then, the sampling units were practically divided into blocks in which each block comprises around 50 households. Among them, one block was then chosen randomly in each village and the required number of households was visited maintaining a standard house-gap.

Data collection and analysis

Applying a questionnaire survey is one of the methods to collect the required data in a specific area. Using structured questionnaire is one of the effective instruments to collect data and information from respondents to evaluate their opinion and perception of climate change, impacts and required measures to adapt and mitigate climate change impacts (Neuman, 2006). This approach is also suitable for the study as the observation of UNEP (2006) pointed out that questionnaire survey can be used to gauge the opinions, capabilities, and level of awareness of key stakeholders on climate change. Nachmias and Nachmias (1997) also mentioned that it is suitable to use a descriptive survey design to identify the opinion and awareness of the community. For studying in social research, descriptive research is normally applied to demonstrate the detailed situations. The descriptive statistics were applied to

summarize the collected data from the respondents. Cross-tabulation in the statistical package for social science (SPSS) was used to identify the factors influencing the perception of the respondents from different areas with data on gender, education, occupation and age.

4. Results and Discussions

This sub-chapter comprises the summary of findings analyzed from the answers of the respondents including local government officers, representatives from NGOs and the household's members of the community.

- (1) Most of the surveyed respondents have heard about the term “climate change” but they gave different responses when asked what first comes to their mind when they hear the phrase ‘climate change’. It is assumed that people understand the term “climate change” according to the particular extreme weather events they normally face throughout their lifetime.
- (2) Almost all the respondents accepted that climate change is happening and they are concerned about climate change impacts. The main source that makes more concerned about climate change is their own experience to the severe disasters e.g. Flood, and another source is media channels including television, internet, and news report. The majority of the respondents felt that climate change is affecting most in their country and their community and they don't perceive it is a global issue.
- (3) Both urban and rural respondents chose the more planting trees option for both mitigation and adaptation measures as for both mitigation and adaptation measures and, the high percentage of choosing “other” option highlighted that the people don't understand very well how to mitigate and adapt to climate change. The areas severely affected by cyclone Nargis in 2008 and the cyclone destroyed the vast areas of mangrove forest which protect the coastal line from storm surge and therefore, the people believed that planting more trees will increase the resilience of the community. Moreover, due to their traditional knowledge, people believe that planting trees can beneficial to rehabilitate the mangrove forests that was largely destroyed in Cyclone Nargis and forests are the places where their livelihoods, food, and materials availability rely on and that prevent them from hazards and disasters. Although people know how to adapt to the changing climate, they mentioned that they don't have money and technology for adaptation.
- (4) The respondents from both urban and rural areas are well aware of changing the climate but they are not clearly aware of the impacts of climate change

very well because they answered there was not harmful impact to their health in one question and in another, the health hazard is the most affected by climate change to their livelihood.

- (5) Although the government has been implementing actions to respond climate change effects in different areas such as building embankment and cyclone shelters in coastal areas, water and drainage channels, forest rehabilitation and awareness raising programs, the majority of respondents do not perceive about the efforts. When asking if they have heard of climate change policy and strategy developed in Myanmar, only half of the respondents are familiar with this term and the major source they get information about climate change policy and strategy are television and Facebook for urban people while rural people rely on the television and radio to access the information.
- (6) Both urban and rural respondents are willing to get involved local level planning of climate change and participate to act climate actions, and they want to get more information on climate change efforts.

Based on this study, the internal and external factors that influence the public perception of climate change in Labutta Township by using cross tabulation in SPSS are:

Gender

The study observed how much public perceive climate change based on gender in two areas. Due to the double or triple burden responsibilities at home and work especially in agriculture, women perceive and concerned about climate change and related impacts more than men. As shown in (Table 4.1), 87.5% of respondents answered “no” to the happening of climate change are male as well as the percentage of male answered “no” among all respondents is also higher than female. As shown in Table (4.2), 85.7% of respondents answered “not at all”, 54.2% with “A little” and 62.3% with “Moderate” to the perception about the impacts of climate change are male as well as the percentage of male answered “not at all”, “A little”, “Moderate” among all respondents is also higher than female while almost equal percentage of answer on “Yes”, “A lot” and “Very much”.

Table 4. 1 Distribution of perception of climate change on Gender

Gender * Do you think climate change is happening? Crosstabulation				
			Do you think climate change is happening?	
			no	yes
Gender	Male	Count	7	117
		% within Gender	5.6%	94.4%
		% within Do you think climate change is happening?	87.5%	55.2%
		% of Total	3.2%	53.2%
		Total		124
Gender	Female	Count	1	95
		% within Gender	1.0%	99.0%
		% within Do you think climate change is happening?	12.5%	44.8%
		% of Total	0.5%	43.2%
		Total		96
Total		Count	8	212
		% within Gender	3.6%	96.4%
		% within Do you think climate change is happening?	100.0%	100.0%
		% of Total	3.6%	96.4%
		Total		220

Table 4. 2 Distribution of impacts perception on Gender

Gender * How much do you think climate change is currently harming? Crosstabulation							
			How much do you think climate change is currently harming?				
			Not at all	A little	Moderate	A lot	Much
Gender	Male	Count	6	13	33	53	19
		% within Gender	4.8%	10.5%	26.6%	42.7%	15.3%
		% within How much do you think climate change is currently harming?	85.7%	54.2%	62.3%	53.5%	51.4%
		% of Total	2.7%	5.9%	15.0%	24.1%	8.6%
		Total					124
Gender	Female	Count	1	11	20	46	18
		% within Gender	1.0%	11.5%	20.8%	47.9%	18.8%
		% within How much do you think climate change is currently harming?	14.3%	45.8%	37.7%	46.5%	48.6%
		% of Total	0.5%	5.0%	9.1%	20.9%	8.2%
		Total					96
Total		Count	7	24	53	99	37
		% within Gender	3.2%	10.9%	24.1%	45.0%	16.8%
		% within How much do you think climate change is currently harming?	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	3.2%	10.9%	24.1%	45.0%	16.8%
		Total					220

Age

The study observed the public perception of climate change based on age in two areas. As shown in (Figure 4.1), the respondents with the age between 36–45 and 46–60 have higher perception about climate change while the percentage of the rest of age classes distribute almost equally but the higher percentage of the answers “Not at all”, “A little” and “Moderate” to the impacts of climate change in all age classes under 45 years highlighted that old people have higher awareness on climate change impacts than young ones due to the experience throughout their life to different kinds of hazards and disasters.

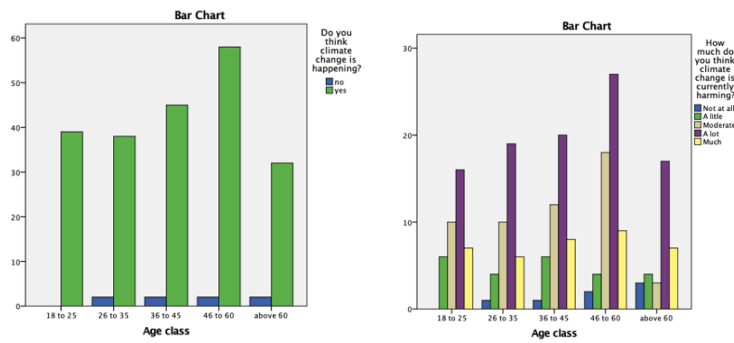


Figure 4. 1 Distribution of perception of climate change on age

Education

The study observed the public perception of climate change based on education in two areas. As shown in (Figure 4.2), 50 % of respondents with primary school level and 50 % of respondents with middle and high school level answered “no” to the happening of climate change while people with Bachelor and Master degree level answered 100 % “Yes” as well as the percentage of respondents with primary school level answered “no” among all respondents is also highest among all classes. The higher percentage of respondents answered “not at all”, “A little” and “Moderate” to the perception about the impacts of climate change are people with primary, middle and high school level as well as the percentage of their response answered “not at all”, “A little”, “Moderate” among all respondents is also higher than other classes.

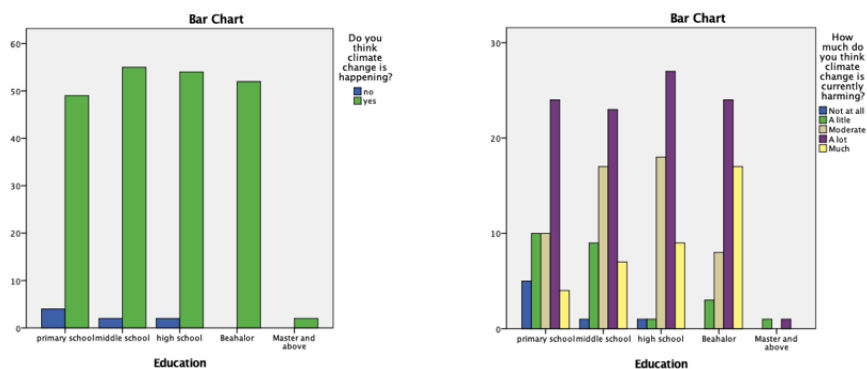


Figure 4.2 Distribution of perception of climate change on Education

Occupation

The study observed the public perception of climate change based on occupation in two areas. Depending on the occupational exposure to extreme weather

events, the level of perception fluctuates in different occupation fields. Although most of the respondents are aware of climate change is happening, some of the government employees, private company employees are worried about the subsequent impacts and most of the self-employed and unemployment disagree with very much the impacts of climate change. The relationship between occupation and perception of climate change is shown in (Figure 4.3 and 4.4).

Table 4.3 Distribution of climate change perception on Occupation

Occupation * I am very concerned about global warming and climate change? Crosstabulation								
			I am very concerned about global warming and climate change?					
			Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Occupation	Government employee	Count	5	16	1	3	0	
		% within Occupation	20.0%	64.0%	4.0%	12.0%	0.0%	100.0%
	Private company	Count	2	3	0	1	1	7
		% within Occupation	28.6%	42.9%	0.0%	14.3%	14.3%	100.0%
	Self-employee (farmer)	Count	1	22	2	6	1	32
		% within Occupation	3.1%	68.8%	6.3%	18.8%	3.1%	100.0%
	Self-employee (fishery)	Count	2	7	1	2	0	12
		% within Occupation	16.7%	58.3%	8.3%	16.7%	0.0%	100.0%
	Self-employee (others)	Count	3	61	8	6	0	78
		% within Occupation	3.8%	78.2%	10.3%	7.7%	0.0%	100.0%
	Self-employee (seller)	Count	0	2	0	1	0	3
		% within Occupation	0.0%	66.7%	0.0%	33.3%	0.0%	100.0%
	Unemployment	Count	1	11	1	5	0	18
		% within Occupation	5.6%	61.1%	5.6%	27.8%	0.0%	100.0%
	Casual	Count	2	12	2	3	1	20
		% within Occupation	10.0%	60.0%	10.0%	15.0%	5.0%	100.0%
	Others	Count	1	19	4	1	0	25
		% within Occupation	4.0%	76.0%	16.0%	4.0%	0.0%	100.0%
Total		Count	17	153	19	28	3	220
		% within Occupation	7.7%	69.5%	8.6%	12.7%	1.4%	100.0%

Table 4.4 Distribution of perception of impacts on Occupation

Occupation * How much do you think climate change is currently harming? Crosstabulation								
			How much do you think climate change is currently harming?					Total
			Not at all	A little	Moderate	A lot	Much	
Occupation	Government employee	Count	1	1	6	10	7	25
		% within Occupation	4.0%	4.0%	24.0%	40.0%	28.0%	100.0%
	Private company	Count	0	0	1	3	3	7
		% within Occupation	0.0%	0.0%	14.3%	42.9%	42.9%	100.0%
	Self-employee (farmer)	Count	1	7	8	11	5	32
		% within Occupation	3.1%	21.9%	25.0%	34.4%	15.6%	100.0%
	Self-employee (fishery)	Count	1	2	2	6	1	12
		% within Occupation	8.3%	16.7%	16.7%	50.0%	8.3%	100.0%
	Self-employee (others)	Count	3	3	19	37	16	78
		% within Occupation	3.8%	3.8%	24.4%	47.4%	20.5%	100.0%
	Self-employee (seller)	Count	0	0	1	1	1	3
		% within Occupation	0.0%	0.0%	33.3%	33.3%	33.3%	100.0%
	Unemployment	Count	0	3	6	7	2	18
		% within Occupation	0.0%	16.7%	33.3%	38.9%	11.1%	100.0%
	Casual	Count	0	4	4	10	2	20
		% within Occupation	0.0%	20.0%	20.0%	50.0%	10.0%	100.0%
	Others	Count	1	4	6	14	0	25
		% within Occupation	4.0%	16.0%	24.0%	56.0%	0.0%	100.0%
Total		Count	7	24	53	99	37	220
		% within Occupation	3.2%	10.9%	24.1%	45.0%	16.8%	100.0%

Information

The perception of climate change is basically connected with the access to information on climate change. The more the people have the chance to access to climate information, the more they can prepare and improve their resilience to the

severe impacts. The respondents mentioned that they are willing to be involved in climate actions and want to get the information beforehand in order to promote adaptation measures to respond to extreme weather events. Information can improve not only the awareness of the community but also the practice and measures in their livelihoods and the study identified the information as an external influential factor to public perception of climate change.

Traditional Knowledge

Local people have been trying to respond to the climate change effects by applying their traditional knowledge and sometimes following climate change strategies. In the past decades, communities have experienced severe storms and cyclone and people came to understand the advantages of the existence of the vast areas of mangrove forests that protect them from disasters. The majority of the respondents believe that the existence of forests can prevent climate-related risks and enhance the resilience of the community and therefore, they chose the planting more trees options as for both mitigation and adaptation measures and traditional knowledge was identified as an external influential factor to climate change perception.

Media

The awareness and understanding of climate change and its related impacts depends on how much local people are accessible to the information on weather and climate information. To access climate information, respondents have heard of climate change and related policy from television, newspapers, Facebook and the radio and it is assumed that the mass media (radio/TV and newspaper) was the principal source of information on the climate change occurrence. Some respondents reported that they are accessible to climate change information was informal contacts with friends and their administrators. Therefore, the study highlighted that media plays a key role to promote public awareness and identify it as an external influential factor to public perception.

5. Conclusion and Recommendations

5.1 Summary

This study examines the public perception of climate change in Labutta township by identifying the following aspects: understanding of the phrase of climate change, perception about the main causes of climate change and its impacts, perception about government efforts to act in response to climate change and the study also identify the influential factors on public perception of climate change.

In summary, most of the respondents from both rural and urban areas are aware of climate change and weather patterns change and the term “climate change” is well-known within their societies. Nevertheless, the study highlights the wide-ranging of public understanding and awareness of the causes of climate change and related impacts. Some people assumed that climate change is identical with changing rainfall pattern, many imagine climate change as storm/cyclone, higher temperature, or flood.

Although the country committed to international treaty and agreement related to climate change by following required contribution by plans, programs and actions, most of the people do not notice the efforts in international cooperation and national implementation in response to climate change. The unfamiliarity with government efforts is almost the same among normal respondents and those from governmental organizations and non-government organizations at the local level. The study reveals that public perception of government efforts in response to climate change is not high although one of the pilot projects on climate change was implemented in Labutta township and due to the pilot project, some adaptation actions including building embankment and cyclone shelters in coastal areas, constructing and renovating water and drainage channels, and awareness raising programs were undertaken within township. Only respondents from the areas where cyclone shelter, embankment, and forest rehabilitation were implemented are aware of government efforts. Supporting by that pilot project, consultation workshops and meetings were held frequently in Labutta township to develop climate change policy, strategy and master plans and therefore, half of the respondents are familiar with them and the major source they get information about climate change policy and strategy are television and Facebook for urban people while rural people rely on the television and radio to access the information.

The community in Labutta township need to understand clearly the main causes of climate change is human activities or natural process and the difference between mitigation and adaptation measures to respond and adapt to climate change impacts. The respondents from Labutta township have experienced different kinds of climate-related disasters over decades and they have been trying to address and respond by applying their tradition knowledge. After experienced Cyclone Nargis in 2008, they came to understand the important role of forest that protect them from disasters and people believe that planting more trees is the most important way to protect impacts but they don't have money and technology to promote adaptation measures and to promote the resilience against the related issues.

The respondents from two different areas perceive and understand climate change differently. The factors identified that influence the public perception of climate change comprises gender, age, education, occupation, traditional knowledge and access to climate and weather information and social media.

Based on the conclusions above, the following recommendations are put forward:

The study indicates that the people are willing to be involved with climate actions and follow-up activities to address climate change and they want to get the climate and weather-related information beforehand and therefore, the government should monitor the public involvement and manage the public participation appropriately in strategic planning and implementation to cope with the response to climate change. The government and main responsible focal department for climate change commitments should enhance the dissemination of knowledge the causes and impacts of climate change, the difference between mitigation and adaptation measures with understandable interpretation to the public in order to improve the understanding of causes and impacts of climate change and promote their willingness to participate in climate actions.

The study opines that it is crucial to design better governance system to promote collaboration among government organizations, civil societies, non-government organizations and international developers because responding climate change impacts is much diverse and requires cooperation from different sectors in different areas. The study also reveals that people are aware of climate change impacts

and want to adapt to the current impacts but they don't have money and technology to adopt measures. Therefore, the government should explore and seek international climate funding sources or contribute local climate funds to mainstream climate change mitigation and adaptation into different sectors for promoting mitigation and adaptation measures of the community.

Moreover, traditional knowledge should be taken into account to adopt compatible adaptation measures for the community based on their long period of experiences passed on their generations. The study suggests to identify some more traditional knowledge and ways of local people to enhance existing adaptation measures and to integrate traditional knowledge and ways into planning, strategies and implementation of climate efforts in future.

The government should make efforts into not only implement adopted climate change strategies and master plans but also publicizing the current actions, vision, and mission through the social media to make people aware of the government assistance, roles and responsibilities and promote their confidence to government efforts to act in response to climate change. The study also suggests to strengthen the public awareness of climate-related risk at work and need to reduce exposure to extreme weather condition and improve current prevention methods. Furthermore, awareness raising programs and educational training should be implemented with a focus on especially young and old workers with uneducated or low levels of education at work.

5.2 Research limitation

For limitation of time and resources, the small sample size was used, the external data collectors were used for survey and the information was sent by respective reporting officers. Given the current research design, there is no way of separating traditional knowledge from perception. For the future, if somebody wants to separate it, they can design the survey differently.

5.3 Future research agenda

The study was carried out in only one township under the Ayeyarwady region in Myanmar. Although the survey area covers the most vulnerable area to climate change impacts in a coastal area, it would be better to study in different kinds of topography features including central dry zone and mountainous areas to produce a better idea for policymakers and end-users. Further studies should explore the factors influencing

public participation in climate actions and examine the interactions between climate change, strategies implementation, traditional knowledge and focus on integrating climate change into disaster risk reduction to improve the resilience of the community through insightful comparative studies.

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