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Social Vulnerability and Adaptive Capacity to Climate Change Impacts of Women-headed Households in the Philippines: a Comparative Analysis

ABSTRACT

This study analyzed the social vulnerability and adaptive capacity to climate change impacts of women-headed households in two remote coastal communities in Lagonoy, Camarines Sur. Quantitative method following descriptive-correlational research design was employed. Out of 281 WHHs, 162 were randomly selected as the respondents of this study. Descriptive statistics, principal component analysis (PCA), t-test for independent samples, and multiple linear regression analysis were used to analyze the data. Women-headed households in the two remote coastal communities have moderate to high vulnerability in terms of demographic, economic, and social factors. No significant difference was found in their level of social vulnerability; however, a substantial difference was found in the adaptive capacity of the respondents from the East and North coastal communities. Multiple linear regression analysis revealed that the number of household members with disabilities, affiliation with social groups, time travel of the respondents, and household size were significant factors influencing social vulnerability in the two remote coastal communities. The study recommends formulating effective climate change policies and responsive strategies that enhance the rights and welfare of these households for equal distribution and access to resources, especially in socio-political structures in the community.

Key words: *adaptive capacity, climate change impacts, coastal communities, social vulnerability, women-headed households*

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INTRODUCTION

The reality of climate change has confronted billions of people all over the world (*Daze 2011*). Its impacts on humanity are exacerbated by social inequalities and other emerging ecological challenges, especially affecting sectors comprised of women. Hence, this study aims to analyze the social vulnerability (SoV) and adaptive capacity (AdCa) to climate change impacts of women-headed households (WHHs) in two remote coastal communities of Lagonoy, Camarines Sur, Philippines, where typhoons and other devastating natural calamities are experienced.

The disturbing typhoons, abrupt and unrestrained flooding, storm surges, extensive period of heavy rainfalls, prolonged extent of drought, landslides, and other natural calamities (*Junio et al. 2015*) are the enduring hazardous climatic challenges in the Philippines today that render Filipinos socially and economically vulnerable. In 2006, the Philippines was hit by three extremely devastating typhoons. Typhoon Reming (International Code Name: Durian), which occurred on November 30, was the most destructive, severely affecting all the six provinces in the Bicol Region, including Camarines Sur. The storm brought 466 mm of rainfall, the highest in 40 years and damaged 18,786 ha of land planted with rice, investment losses costs at PhP 153.8 million (US$ 1.00 = PhP 54.07) (*Food and Agriculture Organization of the United Nations 2010*). Since the risk of typhoons remains high, particularly in the north of the country which has historically been the most frequently affected like the Bicol Region (*World Food Programme & Sweden Report 2015*), the East and North coastal communities in Lagonoy, Camarines Sur are extremely vulnerable and exposed to climate change impacts (CCIs). Its geographical location defines tremendously experiences the brunt of climate change suffered by the people who reside along the Lagonoy Gulf.

Unfortunately, the complex causality of these climate change issues to social systems primarily affects the social and economic aspects of individual and household sectors (*Rance and Funfgeld 2014*), specifically WHHs. Women-headed households are operationally defined as

the lone mothers who bear both the responsibilities of being a mother and father in the household. In this study, this also refers to single mothers (widow or legally/ not legally separated) who solely provide for day-to-day household necessities, uplift the family's standard of living, and who are exposed and sensitive to CCIs. In the Philippines, WHHs has significant increase in their headship in the last 20 years, which contribute tremendously in the role of women in decision making (*Miralao 1992*). In fact, the Filipino households consist of an average of 4 persons, where 21% of these households are headed by women (*Philippine Statistics Authority and ICF 2018*). Nevertheless, the composition of households headed by women differ evidently across countries and regions.

Generally, 70% of women throughout the world are inclined to be marginalized (*Bradshaw et al. 2017*) by political and economic influences and have limited access to financial and material resources, which make them subject to the impact of climate change (*Alam et al. 2015*). This perspective leads to the idea that WHHs are considered the poorest of the poor because of feminization of poverty and feminization of responsibility or obligations (*Chant 2014;1997; Bradshaw et al. 2017*). *Chant* (*2008*) overtly elucidates feminization of responsibility or obligations as "the perpetuation of traditional gender roles and female-oriented norms of altruism by development programmes leave poor women largely responsible for meeting poverty alleviation targets."

This notion is often associated with the feminization of household headship with female heads (*Bradshaw et al. 2017*) because of three reasons. First, the incidence of poverty is greater among women than men. Second, the women's poverty is rising relatively to men's poverty over time mainly in urban areas. Third, the women's increasing disposition to poverty is linked with growing proportions of female-headed households (*Chant 2014; 2003*). A priori argument by *Chant* (*2014*), given the disadvantages faced by women in general, WHHs might be at greater risk than men-headed households, that is why, this study highlights analyzing mainly the SoV and AdCa of WHHs than comparing to their counterparts. Likewise, *Yabaki* (*2006*) identifies women in rural communities to be among the most disadvantaged groups who lack the resources and power to tackle challenges.

Women, particularly WHHs, are affected more adversely by climate change than their counterparts that aggravate their social vulnerability (*Jonsson 2011*). The concept of social vulnerability is a consequence of social inequalities. It is defined as the susceptibility of social groups to the impact of exposures as well as their resiliency or ability to adequately recover from them (*Cutter and Emrich 2006*), and determined by the physical, social, economic, and environmental factors or processes that increase the susceptibility of a community or an individual to the impact of hazards (*Singh et al. 2014*). Further, these women considered socially and economically vulnerable because they are less likely to adjust in a particular environmental scenario (*Jianjun et al. 2015*), and more sensitive to risk (*Jonsson 2011*). However, these women are more prepared for behavioral changes and more likely to support radical policies and measures on climate change (*Jonsson 2011*). Consistently, comparing with other women, widows and female divorces are most likely disadvantaged in income-earning activities (*Aelst and Holvoet 2016*).

On the other hand, the Intergovernmental Panel on Climate Change (IPCC) *Third Assessment Report* (*2001 p. 982 as cited in Smith et al. 2010*) defines adaptive capacity as "the ability of a system to adjust to climate change, to moderate potential damages, to take advantage of opportunities or to cope with the consequences." *Smith et al.* (*2010*) mentioned that the IPCC definition acknowledges that adaptive capacity may not only offset potential harm by improving the feasibility of adaptation options but it could also exacerbate vulnerability to climate change under certain conditions.

Herewith, women play an essential role in the formulation of strategies for prevention, adaptation, and mitigation in the face of climate change (*Bousquet and Jovanno 2015*). Despite of their limitations (on job or economic opportunities and policy decision making) they can still manage their role in strengthening adaptation to climate change through a variety of practical solutions (*Muthoni and Wangui 2013*). In reality, they use their traditional know-how in various fields (*Bousquet and Jovanno 2015*) to create innovative and localized solutions to build resilient communities (*Alam et al. 2015*) particularly in the Philippines, where the gender roles and empowerment as well as socio-political aspects are paramount for the inclusive development of community-based risk reduction management strategies (*Alvarez and Cardenas 2019; Ramalho 2018*). Thus, albeit women have always been in a situation of vulnerability and are considered as the most disadvantaged, they are already vital actors of sustainable development whose contribution to the fight against climate change and other socio-environmental related issues must be recognized and strengthened (*Bousquet and Jovanno 2015*).

As the world invokes the borderless and multi-dimensional effects of climate change, it is vital that the impact of climate change on WHHs be addressed. The alterations in the environment caused by climate change ultimately add to the SoV of WHHs who are more vulnerable to climatic hazards due to their physical characteristics (e.g. women are not physically strong than men, when it comes to labor participation), having limited skills and opportunities but have more responsibilities in safeguarding family members (*Mendoza et al. 2014*). Nevertheless, women are also agents of change with essential perspectives and indigenous knowledge, which can inform and influence solutions to address climate change (*Alam et al. 2015*). With this, examining and understanding the WHHs' SoV and AdCa will help them become more responsive to and knowledgeable on natural disasters brought about by climate change.

In conceptualizing this study, the SoV factors such as demographic, economic and social factors; and the AdCa resources such as economic, social, institutional and human resources are explicitly expounded their respective indicators and functional relationship to climate change and its subjects (**Figure 1**). The demographic factors deal with the characteristics (structure and composition) of a population that predispose communities, households or social groups to the effects of climate change and variability. The structure and composition of populations are related to factors such as age, household size, dependency ratio, and proportion of the population that is literate and economically active (*Dumenu and Obeng 2016*). This factor was measured using the following indicators: household size, number of years the household head spent in school, age of the household head, number of dependents (unemployed family members), number of household members with disabilities, and the time it takes for the household heads to travel from the community to the Poblacion (main village) (in hours).

Further, the role of economic factors in contributing to vulnerability to climate change and variability is well-recognized. Those individuals who have limited economic privileges have a higher of dependence and are arguably highly vulnerable in the case of shocks resulting from climate change impacts. This was measured using the following indicators: average per capita income of the household, number of sources of income and ratio of debt to total household income. In terms of social factors, these are the factors related to beliefs, social networks and ethnicity that influence the thought, choices and behavior of individuals, groups or communities. Social

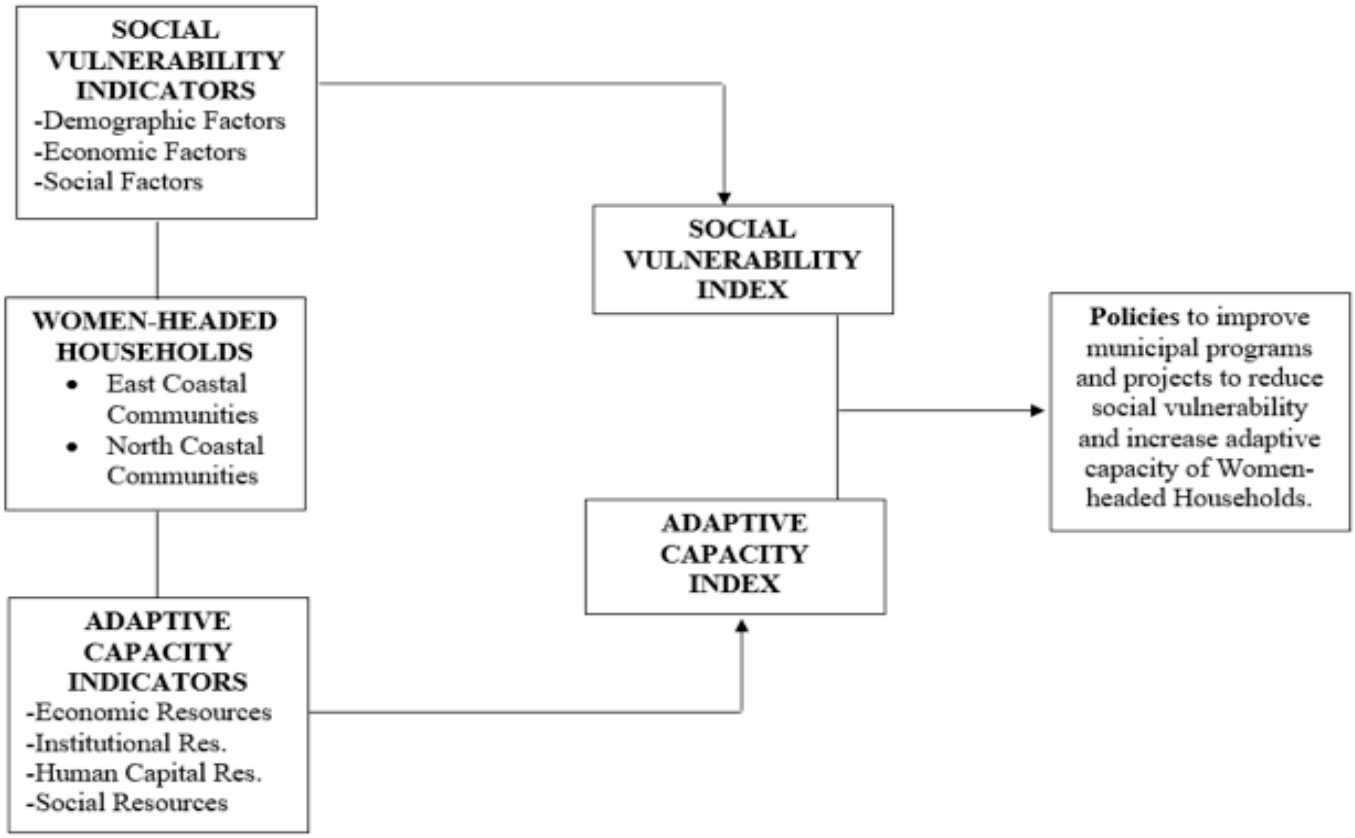

Figure 1. Conceptual paradigm of the study .

networks that a person or household creates and belongs serve as channel of information delivery and avenues for economic and social support. These factors influence the level of awareness and knowledge about possible resources and measures to resist, cope and adapt to a possible disaster or climate change event (*Dumenu and Obeng 2016*). This was measured by using the following indicators: number of times that the households received climate change-related information (e.g., from brochures) from local government units; the number of a household's livelihood-related activities obtained primarily from forest or marine resources; the number of household members employed in the government and the private sector; and the number of social group memberships the household head has.

Conversely, several variables for assessing AdCa have been identified and used. These are economic, social, human capital, and institutional resources adapted from *Byrne* (*2014*). The notion of measuring the AdCa through its components of WHHs was based on the principle adopted from *Adger et al.* (*2007*).

The concept explicates that, if a group of individuals or households has more significant economic resources, their AdCa increases, and when they lack financial resources, they limit their adaptation options. Moreover, the lack of technology limits the potential to adapt to CCIs. Less technologically advanced households are less likely to develop and implement technological adaptations. For information skills and management, families who lack informed, skilled, and trained members reduce their adaptive capacity, whereas greater access to information increases their timely and appropriate adaptation. Regarding infrastructure, the characteristics and location of facilities also affect the adaptive capacity of an individual, such that a greater variety of infrastructure can provide more options, thus enhancing adaptive capacity. Furthermore, well-developed social networks may increase the adaptive capacity of particular social groups or individuals, but policies and regulations may constrain or enhance their capacity to adapt. Lastly, the equitable distribution of resources might increase their capacity, but the availability of and entitlement to resources are essential.

Although most of the literature considered the AdCa as part of vulnerability, in this study, it is vital to have reflective and distinct understanding about the theoretical context of SoV and AdCa to climate change impacts of WHHs. It is because of its separate focus of attention on different domains of a problem that lead to different research questions; new knowledge; and by identifying current policies, programs or initiatives that could be used to respond to climate change. The variables used in this study specifically the economic and social factors and resources, albeit they were closely linked, these variables were assessed and measured using different assessment approaches and methodologies which is critical in understanding the concept of SoV and AdCa to climate change impacts of WHHs.

This study analyzed the SoV and AdCa to climate change impacts of WHHs in two remote coastal communities of Lagonoy, Camarines Sur, Philippines. Specifically, it aimed to examine the level of SoV of women-headed households to CCIs in these two remote coastal communities of Lagonoy, Camarines Sur; Assess the AdCa of the WHHs in these remote coastal communities in response to climate change impacts; Analyze the difference in the SoV and AdCa to climate change impacts of WHHs in these two remote coastal communities; and Analyze the factors that influence SoV and AdCa of women-headed households.

MATERIALS AND METHODS

This study employed the quantitative research method following the descriptive-correlational research design. The east coastal (EC) and north coastal (NC) communities of Lagonoy, Camarines Sur were the study sites (**Figure 2**). These communities were purposively chosen due to their geographical location where WHHs are exposed and sensitive to CCIs that render them socially and economically vulnerable (*Singh et al. 2014*).

Women-headed households were the respondents of this study. Only the widows or separated mothers who own or rent a house in these communities and who live together with their children were purposively chosen as the subjects of this investigation. The respondents must not have any disabilities, are capable of working, and are not dependent on their parents nor on their children with families. Single mothers who are under the custody of their parents, and widows supported by their children are not considered as respondents of this study.

Employing the multi-stage sampling technique, the researchers randomly selected 162 respondents of the study out of 281 WHHs (this constitute the whole population in the said two remote coastal communities) using the Cochran's formula. For the respondents to have an equal chance to be selected as representatives, random sampling technique (lottery method) was utilized to eliminate or avoid subjectivity or biases in gathering information or data. Both the EC and NC areas had 81

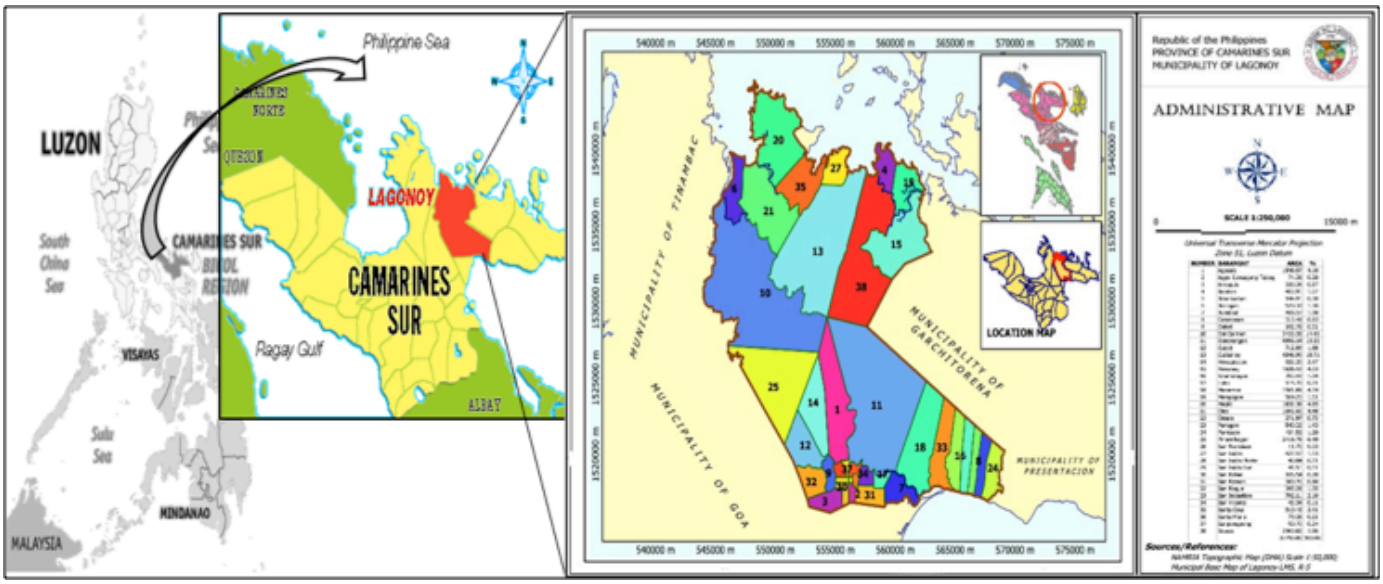

Figure 2. Map of Lagonoy, Camarines Sur, Philippines (*Source: Google Map & Local Government of Lagonoy*)

WHHs who were interviewed. The contact information about the WHHs was gathered from the barangay's (village's) data. Also, to safeguard and respect the privacy and confidentiality of the respondents, the researchers initially sought their willingness to participate through an informed consent letter.

The data were gathered through a household survey with the use of a researcher-made questionnaire that underwent content validation by experts. Content validation was done to determine whether an instrument assesses the relevant and important aspects of the concept it was designed to measure. The validation used face-to-face assessment and the experts who evaluated the survey questionnaire were conversant, have upmost level of expertise about this concept, and have published research articles. The instrument was pre-tested in the EC communities of Lagonoy, specifically in Kinahulugan, Omalo, and Cabotonan, to ensure its content validity. Cronbach's alpha was used to test its reliability with a score of 0.90. The score means that the content of the survey questionnaire was highly reliable and consistent with whatever it measured. The vernacular language (Bicol) was used for the respondents to understand the questions clearly. Furthermore, triangulation was utilized to verify some information from the respondents through field observations and key informant-interviews (KII). A face-to-face KII was used to have in-depth discussions with people who know what is going on in the community or specific activities conducted thereto (*UCLA Center for Health Policy Research nd*). The key informants in this study were the municipal disaster risk reduction council officer and Punong Barangay (Village Chief) of the identified communities. They were purposively chosen as informants because they were the individuals who have substantial information or data about the training activities, social networks and other domestic commitments on climate change impacts in the community.

Descriptive statistics specifically percentages and means, was used to measure the AdCa of WHHs. The major components and indicators for AdCa were adapted from *Byrne* (*2014*). The t-test for independent samples was used to measure the mean difference in SoV and AdCa of WHHs between the two remote coastal communities in the Lagonoy, Camarines Sur.

Principal Component Analysis (PCA) was employed to measure the level of SoV of WHHs. The key components in SoV are the demographic, economic, and social factors of the respondents adapted from *Dumenu and Obeng* (*2016*). On the other hand, standardization of scores or responses was used as the first step in indexing, following the equation below:

$$Index_{sd} = \frac{s_d - s_{min}}{s_{max} - s_{min}}$$

where:

sd= is the original sub-component of each of the major components,

$^s min$= the minimum (lowest) value among all the respondents, and

$^s max$= the maximum (highest) value among all the respondents.

After standardization, SPSS v20 was used to determine the social vulnerability index (SoVI) with the unweighted index or has equal weights in the indicators.

The SoVI was scaled from 0 (least vulnerable) to 1 (most vulnerable), using the scale adapted from *Mendoza*. (*2013*) as follows: 0.00-0.49 Not Vulnerable, 0.50-0.79 Moderately Vulnerable, 0.80-1.00 Highly Vulnerable.

Multiple Linear Regression was used to analyze the factors affecting the SoV and AdCa of the respondents to climate change impacts. The two dependent variables (SoV and AdCa) were measured separately, following the equation below:

$$Yij = a + \beta X1ij + \beta X2ij + \beta X3ij + \beta X4ij + \varepsilon ij$$

RESULTS AND DISCUSSION

Level of Social Vulnerability of Women-headed Households to Climate Change Impacts

The EC communities, the WHHs were highly vulnerable in terms of: the number of years spent in school; the number of dependent household members; the average per capita income; and the ratio of debt to total household income, with 0.85, 0.91, 0.87, and 0.82 loading scores, respectively. The respondents were also moderately vulnerable in terms of: their age; household size; number of household members with disability; hours spent in traveling from the community to the Poblacion; the number of times the household obtained information about CCIs; livelihood-related activities obtained primarily from agricultural resources; number of household members employed in the government or non-government sectors; and the membership to specific groups (**Table 1**). The key elements and indicators used in this study were adapted from *Dumenu and Obeng* (*2016*).

Conversely, the respondents from the NC communities were also highly vulnerable in terms of: household size; years spent in school; number of dependent household members; number of household members with disability; average per capita income; and ratio of debt to the total household income, with 0.81, 0.86, 0.81, 0.83, 0.92, and 0.92 loading scores, respectively. However, the WHHs in both coastal communities were not vulnerable in terms of the sources of income. This implies that most of the women who lead the households have at least one source of income to help provide for the basic household needs.

Respondents from the two coastal communities were exposed and sensitive to SoV because they were both moderately to highly vulnerable, particularly in terms of demographic and economic factors. Individually, the NC communities were more susceptible than the EC communities based on the loading scores (**Table 1**). The susceptibility of WHHs in these communities was found to be affected by the occurrence of climatic changes (e.g., typhoons, flooding, heavy rainfalls), especially in terms of their economic or livelihood activities, the distance or location of communities from the center of commerce in Partido area (time travel), and the proximity of dwelling place to disaster prone areas. Since there were identified WHHs whose sources of income are hinged on agriculture-related livelihood activities, most probably, their vulnerability on economic factor was due to the climatic changes of the environment today. Similarly, the households with high level of dependency on natural resources might indicate lower range of livelihood opportunities because climate variability might extremely disrupt their production and later increases vulnerability (*Dumenu and Obeng 2016*). Insofar, it would contribute

Table 1. Level of social vulnerability of women-headed households to climate change impacts.

Components	Indicators	Component Loading/Scores	
		East Coastal Communities	North Coastal Communities
Demographic Factors	Age	-0.75**	-0.77**
	Household member (size)	0.66**	0.81***
	Years in school	0.85***	0.86***
	Number of dependent household members	0.91***	0.81***
	Number of disabled household members	0.71**	0.83***
	Hours spent in traveling	0.67**	-0.62**
Economic Factors	Average per capita income of household	0.87***	0.92***
	Sources of Income	-0.48*	0.17*
	Ratio of debt to total household income	0.82***	0.92***
Social Factors	Times received reports	0.78**	-0.75**
	Livelihood related activities obtained from agricultural resources	-0.72**	0.74**
	Household members employed in government and private sectors	0.79**	0.61**
	Affiliations in certain groups (membership)	0.65**	-0.76**

*Not Vulnerable, **Moderately Vulnerable, ***Highly Vulnerable

to upsurge their household debts.

The WHHs were more vulnerable to CCIs and natural disasters because of their limited access to resources, restricted rights, and limited mobility and voice in the community and to household decision making (*Jianjun et al. 2015*). It justifies also that those with characteristics of increased marginalization, with low level of education, no access to early warning information (number of times obtained info about climate change impacts), and perceived changes in climate (*Opiyo et al. 2014)*, tend to be the most vulnerable sector in the society (*Baptiste and Kinlocke 2016*). *Dumenu and Obeng* (*2016*) further posited that illiteracy (pertaining to attendance in school) tend to have least set of employable skills and have reduced access to information with low level of risk acknowledgement. Moreover, they also elucidated that having large number of household members tend to have more economically inactive dependents which in turn increases vulnerability.

Likewise, the WHHs in both coastal communities are quite big with an average of six members. The SoV is aggravated if these have a substantial number of dependents and family members with disabilities. With these, the adaptive capacity of the respondents is also compromised. The age level of the respondents may also depressingly affect their vulnerability and chances to adapt because at some point the government may have a tough time instilling in them the critical practices on how to survive amidst natural catastrophes. The limited affiliations with certain groups or social networks to lending institutions like microfinance programmes and social protection program implemented by the government like Conditional Cash Transfer (CCT) Program may lead to the households' vulnerability. According to *Willis* (*1993*) most household members who have such social networks may use them for daily purposes such as food preparation and for more intermittent needs of the households such as information about job opportunities.

Having high, multi-faceted SoV could eventually lead to poverty and societal inequalities that require multidimensional solutions from individual and socio-political structures (*Bohle et al. 1994*). Therefore, the theory of SoV should be addressed with a multifaceted approach by all concerned government and non-government entities to gradually reduce its manifestations in WHHs in Lagonoy, Camarines Sur. *Rufat et al.* (*2015*) mentioned that the context of SoV includes the geographical setting of the disaster; the pre-existing social, economic, and political conditions; hazard characteristics; the degree of exposure; scales of impact; and response and disaster phases. *Paul and Routray* (*2011*) also highlight that, in reducing SoV, adopting coping strategies can be a strong tool, however, the strategies depend and vary according to temporal, spatial, and across socio-demographic settings. Women also depend on their ability to adapt to the demands of climate change based on the degree of their control over and their access to economic and financial resources (*Watch, UN Women 2009*).

Adaptive Capacity of the Women-headed Households to Climate Change Impacts

The EC communities, the average monthly household income (in Philippine pesos) (US$ 1.00 = PhP 54.07) of the respondents was PhP 3,676. Seventy-five percent of them have at least one source of income with one livelihood-related activity (**Table 2**). When it comes to access to information, most of the respondents have at least one television set and a radio, no laptop or iPads or tablets, and an average of two smartphones per household. For most of the respondents from the EC communities, the total value of the equipment they used in livelihood-related activities was less than PhP 1,000, and most of them have no vehicles. The key components and indicators used in this assessment were adapted from *Byrne* (*2014*).

In the NC communities, out of 81 WHHs, 44 or 54% have a monthly household income range of PhP 1,000-5,000, or an average of PhP 3,421. Most of them have at least one source of income. Regarding access to information, all of the respondents from the northern communities have no television set or radio. Similarly, 79 or 98% of the WHHs do not have laptops or iPads even tablets but have at least one smartphone per household. The total value of the equipment used in livelihood activities average PhP 2,304 and the respondents also do not have vehicles.

The findings denoted that the WHHs in both the east and north coastal communities of Lagonoy have limited economic opportunities (*Mendoza et al. 2014*). Limited access to information and technologies render them vulnerable and result to low AdCa. *Defiesta and Rapera* (*2014*) justified that households having better financial standing signifies a higher ability to finance adaptation or coping measures and recovery mechanisms to CCIs. Likewise, *Thathsurani and Gunaratne* (*2018*) found that a household that lacks financial resources will adversely affect the household's ability to recover from catastrophes in terms of rebuilding infrastructure and reinvesting in damaged sectors.

Table 2. Economic resources of women-headed households in the east and north coastal communities of Lagonoy.

Indicators	East Coastal Communities		North Coastal Communities	
	Frequency (n=81)	Percent	Frequency (n=81)	Percent
Presence of alternative economic activities				
Monthly Household Income (in PhP) (US$ 1.00 = PhP 54.07)				
<1,000	24	30	26	26
1,001-5,000	42	52	44	54
5,001-10,000	14	17	8	10
10,001-15,000	-	-	-	-
15,001-20,000	-	-	1	1
>20,001	1	1	2	3
Mean		PhP 3,676		PhP 3,421
Number of sources of income of the household head				
0	12	15	2	3
1	61	75	68	84
2	8	10	11	13
Mean		1		1
Number of livelihood related activities of the household head				
0	29	36	40	49
1	51	63	37	46
2	1	1	4	5
Mean		1		1
Access to information				
Number of Television				
0-3	76	94	81	100
4-6	4	5	-	-
>7	1	1	-	-
Mean		1		1
Number of Radios				
0-3	79	98	81	100
4-6	1	1	-	-
>7	1	1	-	-
Mean		1		0
Number of Laptops/ iPads/ Tablets				
0	77	95	79	98
1	4	5	2	2
Mean		0		0
Number of smartphones				
0-3	67	83	79	98
4-6	9	11	2	2
>7	5	6	-	-
Mean		2		1
Access to technologies				
Total value of equipment used in livelihood-related activities (in PhP) (US$ 1.00 = PhP 54.07)				
<1,000	56	69	67	83
1,001-5,000	7	9	5	6
5,001-10,000	3	4	3	4
10,001-15,000	-	-	1	1
15,001-20,000	2	2	-	-
20,001-25,000	1	1	3	4
25,001-30,000	3	4	1	1

Table 2. Economic resources of women-headed households in the east and north coastal communities of Lagonoy. (cont.)

Indicators	East Coastal Communities		North Coastal Communities	
	Frequency (n=81)	Percent	Frequency (n=81)	Percent
Access to technologies				
Total value of equipment used in livelihood-related activities (in PhP) (US$ 1.00= PhP 54.07)				
>30,001	9	11	1	1
Mean		PhP 9, 179		PhP 2, 304
Number of vehicles				
0	68	84	80	99
1	12	15	1	1
2	1	1	-	-
Mean		0		0

Limited access to information about CCIs was found to increase the SoV of households (*Opiyo et al. 2014*) and trimmed down their level of AdCa. The respondents have limited access to information and advanced technologies that they can use to access social media platforms and help them increase timely and appropriately their adaptation strategies to CCIs. *Defiesta and Rapera* (*2014*) noted that affiliations to social groups provide access to useful information for climate change adaptation that may be a useful tool in increasing AdCa because the local environmental knowledge affects the level of the ability to adapt by the specific groups (*Junio et al. 2015*).

In the EC communities, the respondents were only 28 m away from the nearest major or national road. Comparatively, the WHHs from the NC communities were quite far from the road, with an average distance of 7,074 m. However, all the respondents from these communities responded that they were closer to the primary school, with an average distance of 107 m, compared to the respondents from the EC communities, which has an average distance of 223 m from the primary school. When it comes to distance to health facilities, the WHHs in the NC communities were nearer, with an average distance of 144 m, compared to those from the EC communities who walked or rode an average distance of 1,059 m to the health centers. Distance from drinking water facilities was not a problem to the WHHs in both coastal communities because they were only 16 m and 30 m away from this facility, respectively (**Table 3**).

The WHHs from the NC communities have limited access to transportation along the national roads. In the absence of this infrastructure, the WHHs from the NC communities have limited access to various facilities, particularly those related to economic and social activities, thereby affecting their SoV and AdCa. *Smit et al.* (*2001*) averred that households with greater access to infrastructure have greater potential to increase their AdCa to climate change impacts.

The respondents in the east and north coastal communities have an average of six and seven years spent in school, respectively. Out of 81 respondents, 79 or 98% have participated in 0 to 3 training activities from the EC communities. The women household heads from the NC communities have not attended any training activities (**Table 4**).

The WHHs in both coastal communities have low level of education and they were not well-informed about climate change impacts. *Smit et al.* (*2001)* stressed that the household that lacks informed, skilled, and trained household members regarding the effect of climatic alterations will compromise their coping ability. *Defiesta and Rapera* (*2014*) noted that, if the household heads are less educated or not educated at all, they have less adaptive capacity. Whereas, those having better, and well-informed household members are able to exploit resources in adapting to CCIs. Furthermore, the opportunity to attend an educational institution enhances one's chances for increasing knowledge and ability to appreciate and prepare for future situations such as climate change impacts (*Defiesta and Rapera 2014*).

In the EC communities, WHHs have an average of two working household members, whereas the respondents from the NC communities have an average of one working household member. Moreover, majority of the respondents in both coastal communities have no household members participating in at least one community organization or non-government organization

Table 3. Access to infrastructure of women-headed households in the east and north coastal communities of Lagonoy.

Indicators	East Coastal Communities		North Coastal Communities	
	Frequency (n=81)	Percent	Frequency (n=81)	Percent
Access to infrastructure				
Distance to the nearest major road (national road) (m)				
0-1,000	81	100	3	4
1,001-2,000	-	-	8	10
2,001-3,000	-	-	-	-
3,001-4,000	-	-	-	-
4,001-5,000	-	-	8	10
>5,001	-	-	62	76
Mean		28		7, 074
Distance from the primary school (m)				
0-500	77	95	81	100
501-1,000	-	-	-	-
1,001-1,500	-	-	-	-
>1,501	4	5	-	-
Mean		223		107
Distance from the nearest health facility (m)				
0-1,000	58	72	81	100
1,001-2,000	-	-	-	-
2,001-3,000	9	11	-	-
>3,001	14	17	-	-
Mean		1,059		144
Distance from clean drinking water (m)				
0-50	77	95	72	89
51-100	4	5	6	7
101-150	-	-	-	
>151	-	-	3	4
Mean		16		30

Table 4. Human capital resources of women-headed households in the east and north coastal Communities of Lagonoy.

Indicators	East Coastal Communities		North Coastal Communities	
	Frequency (n=81)	Percent	Frequency (n=81)	Percent
Number of years in the school of the household head				
0	-	-	4	5
1-5	22	27	25	31
6-10	53	65	46	57
11-15	5	7	6	7
16-20	1	1	-	-
Mean		6		7
Number of training and seminars attended				
0-3	79	98	81	100
>4	2	2	-	-
Mean		0		0

(**Table 5**). The findings implied that the WHHs in both communities have low social networks or limited social capital. Perhaps, this condition is found in both communities because of domestic obligations of WHHs that would coerce their work opportunities, and they do not want to compromise their position by accepting a job with diminutive flexibility over working hours (*Willis 1993*). In fact, *Chant* (*2014*) found out that women spend more than twice of time unpaid care work than men. This disparity of time between women's and men's work is usually observed in low-income sectors particularly in the Philippines where "the poorer the

Table 5. Social resources of women-headed households in the east and north coastal Communities of Lagonoy.

Indicators	East Coastal Communities		North Coastal Communities	
	Frequency (n=81)	Percent	Frequency (n=81)	Percent
Social Capital				
Number of working household members				
0	11	14	28	35
1-3	56	69	44	54
4-6	14	17	8	10
>7	-	-	1	1
Mean		2		1
Number of household members participating in at least one community organization or NGO				
0	81	100	71	88
1	-	-	9	11
3	-	-	1	1
Mean		0		0

household, the longer women work" (*Pineda-Ofreneo and Acosta 2001*). Thus, these results may lead to the reduction of the AdCa of the respondents because, according to *Defiesta and Rapera* (*2014*), people's relationship with each other through social networks and the association in their community can increase one's AdCa and decrease the influences of SoV.

In general, the WHHs in both coastal communities have limited resources for economic opportunities (start-up capital), job experiences (*Chant 2014*), access to information, and social capital (*Willis 1993*) that could affect the increase of their SoV. Thus, when households have limited or weak access and influence over the institutions and policies that govern their access to resources, they can do little to combat the underlying causes of vulnerability (*Tesso 2013*).

Difference in the Social Vulnerability and Adaptive Capacity to Climate Change Impacts of Women-headed Households

The computed weighted mean of both coastal communities is the same. However, the EC communities with the negative values connote that the WHHs in this area are less vulnerable compared to those from the NC communities, which shows positive values. The data also revealed that there is a mean difference of -0.09 and a standard deviation of 0.34 and 0.31 for the east and north coastal communities, respectively, with -1.77 t-value. The standard deviation implies that the data is highly dispersed in the EC communities of Lagonoy. With this result, the null hypothesis was accepted since the p-value of 0.07 is higher than the 0.05 significance level, although significant at 0.10. Hence, there was no significant difference in the SoV to CCIs of WHHs in the two remote coastal communities of Lagonoy, Camarines Sur (**Table 6**).

Consequently, the WHHs in both coastal communities have the same characteristics when it comes to SoV to climate change impacts. The WHHs from both coastal communities suffer from the same level of SoV since the data showed that there was no significant difference in their vulnerability attributes.

In fact, three indicators were found with a significant difference at 0.05, namely: the travel time from their community to the Poblacion; sources of income; and the household head's affiliation to particular social groups (memberships) (**Table 7**). These indicators showed that the respondents have different travel times due to the location of the communities and access to infrastructure such as national or major roads. In general, the respondents experience 4 to 7 h of travel time for the NC communities, whereas it takes 30 min to 1 h for the EC communities.

Thus, perhaps because of this travel time difference, the employment opportunities and the membership to social groups of household heads living in the NC communities are also compromised. This is unlike the respondents in the EC communities, who can easily access other sources of income not just for agriculture-related livelihood but also with regard to skills-related jobs. They can also immediately access membership to social groups because of location and road accessibility. Therefore, there is an initial outlook that at some point, due to these differences per indicator, the susceptibility of the WHHs in both coastal communities might be different but not significant.

Table 6. Difference in the social vulnerability index of the two coastal communities of Lagonoy.

	Communities	Mean	SD	Mean Difference	t	P-value
Social Vulnerability	East Coastal	-0.04	0.34	-0.09	-1.77	0.07**
	North Coastal	0.04	0.31			

**Significant difference at <0.10, but not at <0.05 (2-tailed).

Table 7. Difference on the social vulnerability per indicator.

Indicators	Communities	Mean	SD	Mean Difference	t	P-value
Age	EC	60.83	10.95	1.94	0.52	0.60
	NC	59.81	13.57			
Household size	EC	6.40	2.55	0.62	1.50	0.13
	NC	5.78	2.69			
Number of dependents household members	EC	2.59	1.99	0.46	1.49	0.13
	NC	2.12	2.00			
Number of disabled household members	EC	0.17	0.41	-0.08	-1.24	0.21
	NC	0.26	0.46			
Number of years in school	EC	6.32	3.15	-0.21	-0.43	0.66
	NC	6.53	2.94			
Travel time duration (in hour)	EC	0.88	0.51	-3.64	-19.49	0.00*
	NC	4.52	1.60			
Average per capita income of the household	EC	PhP 3,842.59	PhP 4,325.00	PhP 242.86	0.36	0.71
	NC	PhP 3,599.73	PhP 4,240.91			
Number of sources of income	EC	0.95	0.49	-0.18	-2.44	0.01*
	NC	1.14	0.46			
Ratio of debt to total household income	EC	PhP 1,309.63	PhP 1,960.66	PhP -99.91	-0.27	0.79
	NC	PhP 1, 409.54	PhP 2,659.47			
Number of times that the households received reports about CCIs	EC	0.25	0.72	0.04	0.45	0.65
	NC	0.20	0.68			
Number of household's livelihood-related activities obtained primarily from the direct forest or marine resources	EC	0.65	0.50	0.09	1.14	0.25
	NC	0.56	0.59			
Number of household members employed in the government and private sector	EC	0.42	0.89	-0.14	-0.97	0.33
	NC	0.57	1.04			
Number of household head's membership to the social groups	EC	0.41	0.61	0.23	2.94	0.00*
	NC	0.17	0.38			

*Significant at <0.05, n=162. Legend: EC=East Coastal; NC=North Coastal US$ 1.00= PhP 54.07

On the other hand, the difference in the AdCa to CCIs of WHHs in the two remote coastal communities is presented in Tables 8 and 9. The results showed that output of a computed mean of 0.05 is the same in both areas, but with different signs. Inversely with the SoV results, the negative value implies that the respondents from the NC communities have less AdCa compared to those respondents from the EC communities with the positive value. The data also revealed a mean difference of 0.11 in the standard deviation for the east and north coastal communities. It means that the respondents from the NC communities have higher variance when it comes to AdCa over the respondents from the EC communities. Thus, the null hypothesis was rejected since the p-value of 0.05 is equal to 0.05 significance level. Therefore, this study found that there was a significant difference in the AdCa to CCIs of WHHs in the two remote coastal communities.

Table 8. Difference in the adaptive capacity index of the east and north coastal communities of Lagonoy.

	Communities	Mean	SD	Mean Difference	t	P-value
Adaptive Capacity	East Coastal	0.05	0.45	0.11	10.25	0.05*
	North Coastal	-0.05	0.28			

*Significant difference at < or =0.05(2-tailed)

The WHHs in the two remote coastal communities have different AdCa levels. In fact, 10 out of 15 indicators were found with significant difference (**Table 9**). The indicators that have considerable difference in terms of AdCa of WHHs to CCIs were: sources of income; alternative livelihood activities; access to information indicators (e.g., TVs, smartphones); total value of equipment in livelihood-related activities; number of vehicles; distance to major roads, health facility, primary school and drinking water; and number of working household members.

The disparities between these indicators, especially when it comes to infrastructure (e.g., road constructions, building health facilities and school structures), are because of the various Local Government Unit (LGU) projects and programs implemented in both coastal communities. Perhaps, the location and accessibility of national or significant roads to these communities, particularly in the NC communities, motivated the LGU officials to implement government and even non-government projects and programs.

The LGU policies and regulations (e.g., community ordinances) regarding CCIs might also affect the AdCa of the WHHs. In fact, according to the respondents, which is attested by the Municipal Disaster Risk Reduction Management Council (MDRRMC) Officer, the LGU of Lagonoy does not have local ordinances imposed and implemented to help WHHs reduce their SoV and increase their AdCa. No relevant projects or programs and even activities spearheaded for WHHs alone to combat hazardous environmental concerns. Even significant livelihood and related entrepreneurial activities for WHHs are not well-provided by the LGU of Lagonoy.

Factors that Influence the Social Vulnerability and Adaptive Capacity of Women-headed Households

This study tested the hypotheses using the index or the standardized set of data. The most crucial factors that influence the SoV of WHHs in the EC communities of Lagonoy were the number of household members with disability, affiliation with specific social groups (membership), and household size with standardized coefficient beta scores of 0.23, 0.39, and 0.49, respectively. In the NC communities, the number of household members with disability, travel time from the community to the Poblacion, affiliations to specific groups (membership), and the number of household members with standardized coefficient beta scores of 0.28, 0.17, 0.14, and 0.51, respectively, were the influencing factors. However, all these variables found to contribute in decreasing the vulnerability level of WHHs (**Table 10**).

Furthermore, it can be observed that in the EC communities, the combined effects of the indicators on the SoV of the respondents have a strong relationship at 0.76. However, only 58% of the variance in the SoV can be explained by the identified indicators, and 42% can be explained by factors. On the other hand, in the NC communities, the results showed that there was a substantial relationship between the combined effects of the indicators on the SoV of the respondents at 0.67. Only 46% of the variance in the SoV of WHHs in the NC communities can be explained by the identified indicators and 54% can be explained by factors.

Thus, it can also be observed that there were significant factors identified since the p-value is less than 0.05. The factors that could influence the SoV of the WHHs in the EC communities were the number of household members with disability, affiliation to specific groups, and the number of household members. On the contrary, in the NC communities, the factors that could influence the SoV of WHHs were the number of household members with disability and the number of household members, at 0.05 level of significance. Travel time of the respondents from the community to the Poblacion (main village) was a significant factor at 0.10 level of significance. Thus, the null hypothesis was rejected, which means that there is at least one identified factor that influences the social vulnerability level of women-headed households in the two remote coastal communities of Lagonoy.

The findings corroborated research results that some variables have significant influence on SoV such as number of household members with disability, membership to specific groups (*Flanagan et al. 2011*), household size (*Narayanan and Sohu 2016; Opiyo et al. 2014; Nknondze et al. 2013*), and travel time of the respondents.

Table 10. Factors influencing the social vulnerability of women-headed households to climate change impacts in the east and north coastal communities of Lagonoy.

Social Vulnerability Indicators	East Coastal Communities			North Coastal Communities		
	Standardized Coefficient Beta	t	P-value	Standardized Coefficient Beta	t	P-value
(Constant)		-4.14	0.00		-2.60	0.01
Distance of dwelling unit to nearest disaster-prone area (m)	-0.01	-0.18	0.85	-0.14	-1.52	0.13
Migration status (years in the village)	0.09	1.03	0.30	0.01	0.15	0.87
Number of disabled household members	0.23	2.61	0.01*	0.28	3.13	0.00*
Affiliation with certain groups (number of membership)	0.39	4.60	0.00*	0.14	1.49	0.14
Travel time duration from the community to Poblacion (h)	0.06	0.72	0.47	0.17	1.85	0.06**
Age of the household head	0.04	0.46	0.64	-0.03	-0.33	0.73
Number of dependent household members	0.03	0.34	0.73	0.04	0.46	0.64
Number of household members (size)	0.49	4.44	0.00*	0.51	5.30	0.00*

*Significant factors at <0.05 (2 tailed). **Significant factor at <0.10 (2 tailed).
East Coastal Communities (R=0.76, R2= 58%) North Coastal Communities (R=0.67, R2= 46%)

Women-headed households are most likely to be vulnerable to CCIs when there are household members with disabilities. Numerous studies reported that there is also increased risk of psychological and behavioral symptoms among the family members of persons with disabilities (*Singer and Powers 1993*). However, even though disability increases SoV, most households that have a member with disability do not show psychological or behavioral problems. These persons have found ways to cope with this added burden in their lives (*Singer and Power 1993; Turnbull et al. 1986*).

Affiliation to specific groups also influences the SoV of WHHs in the EC communities (*Flanagan et al. 2011*). People's relationships through social networks such as membership in lending institutions (microfinance programmes) help increase the AdCa of WHHs (*Defiesta and Rapera 2014*). However, affiliation to many specific groups might increase their vulnerability. For example, numerous memberships to specific groups such as microfinance programmes might increase the women's economic problems because of several availed loans and financial assistance (*Bradshaw et al. 2018; Chant 2014; Willis 1993*). Since the women-headed families have limited access to employment opportunities and some have a greater number of dependents, the frequent availing of loans may cause additional social and economic burdens if loans are not paid immediately. Also, more memberships may cause time constraints to the respondents that may affect their attendance as well as the benefits that the social groups provide. This influence is foreseen in households in the EC communities because they have easy access to these institutions or social groups. In addition, the reluctance of WHHs to participate in social protection program implemented by the government (e.g., CTT program) might also contribute to the fondness of their vulnerability (*Bradshaw et al. 2018*), because this program aims to uplift the women's standard of living, specifically the economic aspect, in addressing feminization of poverty in a certain country (like the Philippines).

Moreover, the travel time of the respondents from the community to the Poblacion is another crucial factor that can increase their SoV. This factor is commonly experienced by women household heads from the NC communities. Due to the lack of major or national roads in these communities heading to the Poblacion of Lagonoy, the respondents travelled 4 to 7 h using bancas (municipal motor boats) to Tamban Port in Tinambac,

Camarines Sur. The distance to these communities tremendously increases the SoV of the respondents. The economic and social aspects of the WHHs are affected because they have difficulties transporting their local goods and products. Likewise, the municipal offices may have some difficulty in realizing some impacts from the programs and projects implemented in these communities because of the remoteness of the location.

Also, WHHs with 10 members found to be more vulnerable to CCIs (*Nknondze et al. 2013; Chen et al. 2013*), especially those who have more dependent members. Having more unemployed household members such as small children entails a substantial proportion of household income directed to them who cannot contribute much toward addressing household needs. *Damas and Israt* (*2004*) cited factors that influence SoV such as the lack of information and knowledge, lack of public awareness or limited access to political power (political vulnerability), poverty and hunger, poor health, low level of education, gender inequality, fragile and hazardous location. Also, lack of access to resources and services, including knowledge and technological means and disintegration of social patterns are the other factors that contribute to the SoV level of a particular group in the community. These factors may be considered additional indicators for further investigation in future studies.

This study tested the hypotheses using the index or the standardized set of data. In the EC communities, the crucial factors that could influence the AdCa of WHHs were their migration status, affiliation to specific groups, age of the respondents, number of dependent household members, and household size. Standardized coefficient beta scores were 0.11, 0.19, 0.19, 0.39, and 0.69, respectively. On the other hand, the factors that could influence the AdCa of the respondents residing in the NC communities were: the distance of the dwelling unit to the nearest disaster-prone area; migration status; number of household members with disability; age of the household head; and household size, with standardized coefficient scores of -0.16, 0.16, 0.10, -0.42, and 0.42, respectively (**Table 11**).

It can be observed that there were significant factors identified since the p-value is less than 0.05. The factors that could influence the AdCa of the WHHss in the EC communities were: affiliations with specific groups (membership); number of dependent household members, and household size. On the other hand, in the NC communities, the factors that could influence the

Table 11. Factors influencing the adaptive capacity of women-headed households to climate change impacts in the east and north coastal communities of Lagonoy.

Social Vulnerability Indicators	East Coastal Communities			North Coastal Communities		
	Standardized Coefficient Beta	t	P-value	Standardized Coefficient Beta	t	P-value
(Constant)		--0.64	0.52		0.49	0.62
Distance of dwelling unit to nearest disaster-prone area (m)	--0.08	-0.96	0.33	--0.16	-1.51	0.13
Migration status (years in the village)	0.11	1.08	0.28	0.16	1.55	0.12
Number of disabled household members	-0.05	-0.58	0.56	0.10	1.02	0.31
Affiliation with certain groups (number of membership)	0.19	2.06	0.04*	0.04	0.40	0.68
Travel time duration from the community to Poblacion (h)	0.04	0.45	0.65	0.05	0.49	0.62
Age of the household head	-0.19	-1.76	0.08**	-0.42	-3.67	0.00*
Number of dependent household members	-0.39	-3.40	0.00*	-0.06	-0.57	0.56
Number of household members (size)	0.69	5.55	0.00*	0.42	4.04	0.00*

*Significant factor at <0.05 (2 tailed). *Significant factor at <0.10 (2 tailed).
East Coastal Communities (R=0.68, R2= 0.47 or 47%) North Coastal Communities (R=0.60, R2= 0.36 or 36%)

AdCa of women household heads were their age and household size. Thus, the null hypothesis was rejected, which means there is at least one significant factor that influences the adaptive capacity of WHHs in the two remote coastal communities of Lagonoy.

The variables that showed significant influence on AdCa of the respondents from both coastal communities include: affiliations to specific groups (*Narayanan and Sohu 2016; Defiesta and Rapera 2014; Flanagan et al. 2011*); number of dependent household members (*Thathsurani and Gunaratne 2018*); age of the household head (*Narayanan and Sohu 2016*); and household size (*Thathsurani and Gunaratne 2018; Narayanan and Sohu 2016; Opiyo et al. 2014; Nknondze et al. 2013*).

The WHHs who were affiliated to social groups may have higher AdCa. Membership provides access and proper dissemination of relevant current information about climate change that may enhance their skills and knowledge on adaptation practices or strategies in case of the occurrence of natural hazards (*Thathsurani and Gunaratne 2018; Defiesta and Rapera 2014*). With diverse social networks, they can receive aid (financial or in-kind) from those who have enough resources. This factor can be experienced by the women in the EC communities of Lagonoy since they have easy access to these social groups. Moreover, membership by WHHs to lending institutions in the EC communities may improve their adaptive skills. However, they must be cautious because too much credit might hinder their AdCa (*Narayanan and Sohu 2016*).

Women-headed households with a relatively considerable number of dependent members were assumed to have lower AdCa that results to their vulnerability. If the household members entirely depend on the women household head, it negatively affects the women's AdCa because of their limited employment opportunities and sources of income (*Thatsurani and Gunaratne 2018; Opiyo et al. 2014*). This significant factor is experienced by the WHHs in the EC communities since they have at least three dependent household members compared to that of the communities in the north coast. Furthermore, the age of women household heads may also hinder building up their AdCa. The household heads aged 50 years old and above are more likely to be vulnerable and less adaptive compared to younger persons (*Opiyo et al. 2014*).

With older age, they are challenged to acquire the knowledge and skills to cope with the demands of CCIs. Age is also associated with employment status in providing stable financial resources that could help them increase their capacity to adapt. The older they are, the less opportunity there is for work (*Thatsurani and Gunaratne 2018*). This factor comparatively influences the WHHs who were from the NC communities, since 30% of them were more than 71 years old. For both coastal communities, the household size is an indicator that could influence the AdCa of the WHHs. *Thathsurani and Gunaratne* (*2018*) noted that households with bigger household size have higher AdCa due to available family support, which makes the family more sustainable.

CONCLUSIONS AND RECOMMENDATIONS

Generally, this study found that the WHHs in the two remote coastal communities of Lagonoy have the same level of SoV. Furthermore, regarding the AdCa of the WHHs, they both have limited access to economic and human capital resources. However, the respondents from the NC communities were less adaptive in terms of access to infrastructure, specifically transportation means and social networks. No significant difference in the SoVI of WHHs was found in this study in the two remote areas, but their AdCa was significantly different. This result means that the WHHs have diverse needs to increase their adaptive capacity.

Several factors could influence the SoV of WHHs such as affiliations to specific groups and travel time from their community to the Poblacion. In addition, their SoV level could be affected by the number of household members with disability and household size. On the contrary, the only factor that could influence the AdCa of the WHHs in both coastal communities is household size. Likewise, the capacity to adapt by respondents from the EC communities was affected by their affiliation to particular social groups and the number of household dependents. In the NC communities, aside from the household size, the age of the household head affects their adaptive capacity.

The following recommendations were formulated based on the findings and conclusions of the study. The WHHs in the municipality of Lagonoy should organize themselves as one entity for them to be able to represent and be involved in decision making landscapes in any form of organization in the society, particularly in policy-making bodies. To increase the AdCa of WHHs, the Philippine policymakers should understand vulnerability factors and consider this study to formulate effective climate change policies and responsive strategies that enhance the rights and welfare of these households for equal distribution and access to resources, especially in socio-political structures in the community.

The national government should create additional social protection programs integrating all concerned government agencies with a multi-dimensional approach (both for the human and ecological system) and a gender-sensitive framework to efficiently address the multi-faceted factors of vulnerability and improve the AdCa of specific marginalized social groups. This program should be headed by the Department of Social Welfare and Development (DSWD) and the Department of Interior and Local Government (DILG) through the National Disaster Risk Reduction Management Council (NDRRMC) to supervise providing financial support and priority assistance to WHHs before, during, and after disasters.

The NDRRMC as the governing body for this timely and emerging concern must conduct further comprehensive investigation with the broader scope of location and indicators regarding SoV and AdCa to CCIs of WHHs in the Philippines. However, this study suggests that the NDRRMC should revisit, re-plan, formulate and follow the specific protocols in passing particular policies to accentuate the risk reduction strategies or practices and to implement measures supporting local actions for efficient and effective disaster risk reduction.

Since the study findings revealed that WHHs have moderate to high SoV to CCIs when it comes to economic factors, and the office of the MDRRMC explained that there is no policy implemented by the LGU of Lagonoy, the LGU through the MDRRMC together with Municipal Social Welfare and Development should come up with the local ordinances or procedures that could enhance their economic status and opportunities to lessen their vulnerability. Perhaps, a memorandum of agreement between the LGU of Lagonoy and the state university in Partido area could plan and establish sustainable community-based livelihood projects or programs such as social enterprise or related entrepreneurial activities. By doing so, the WHHs may be able to cope and recover from the stress and have additional sources of income as well as social networks to somehow uplift their economic conditions while combating the impacts of natural disasters.

Since there is no single investigation on the vulnerability indicators that can be explored and represented through the development and application of quantitative vulnerability and AdCa indicators, this study suggests that other variables and indicators may be used by future researchers to provide in-depth empirical understanding and theories regarding the concept of vulnerability and adaptive capacity of women-headed households.

Further, since this study focused mainly on the SoV and AdCa of WHHs to CCIs and did not include a comparative analysis between men-headed households (MHHs), this study also recommends that future research about MHHs's vulnerability and adaptive capacity be conducted. Such study will present some findings on the differences among MHHs in the two localities that might be significant in future policy implementation.

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