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Women's Role in Disaster Response in Vietnamese Rural Families Today: Challenges in the context of climate change

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Abstract:

Vietnam is one of the countries most vulnerable to natural disasters. More than 70% of Vietnam's population has been affected by natural disasters and climate change at many different levels. Women in Vietnam, especially ethnic minority women, rural women and women living in mountainous areas are at highest risk of natural disasters because they work in agriculture and this type of work depends on the weather, natural conditions and natural resources such as soil, water and climate... This paper uses quantitative and qualitative data from the research “The response of women in Central Vietnam to climate change” with 368 household questionnaires and 25 in-depth interviews conducted in Ninh Thuan province in 2017. By analyzing documents and doing frequency, correlation and logistic regression analysis, the research results show that people in community in general and members in family in particular have suffered the influence of disasters in different ways. Gender gaps have been found in the level of suffering from natural disasters as well as in the way of responding to natural disasters. Women play a very important role in coping with natural disasters, but due to the unequal distribution of rights, resources and cultural standards, women have confronted a lot of difficulties in disasters response, especially in the context of climate change today.

Key words: Respond to Natural Disasters; The Role of Women; Women's Response to Natural Disasters.

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1. Introduction

Recent studies have shown that the impacts of a natural disaster vary for different individuals in a community or even for different people in the same household. The impact of natural disasters depends on the vulnerability of each social group, gender and country. Vietnamese women, especially those in rural areas are most vulnerable to natural disasters because more than 60% of them working in agriculture, which depends a lot on weather and natural resources such as land, water, etc. Natural disasters affect women by creating additional workloads as well as increasing women's vulnerability in poor households (Oxfam & UNDP, 2009; ActionAid, 2017).

Ninh Thuan is a province with a high proportion of agricultural economy and usually affected by from natural disasters. In recent years, under the impact of climate change, droughts have been increasing at a more severe level. This is even known as “the land of climate change”. The dry season in Ninh Thuan can last up to 8-9 months in a year (Vo Anh Kiet, 2019). Following each severe and long-term drought are heavy rains, making the system of canals, rivers and lakes unable to regulate in time, resulting in local flooding and thus seriously affecting the daily life and livelihoods of people, especially women in agriculture.

This paper aims to study the role of women in coping with natural disasters in rural families in Phuoc Nam commune, Thuan Nam district, Ninh Thuan province (one of those communes severely damaged by natural disasters in the past 5 years, using dataset of the recent study on “Women in Central Vietnam responding to climate change”, which was conducted in the year 2017-2018 by the author and granted by Institute for Family and Gender Studies. The study interviewed in person 368 male and female farmers. In addition, the study also conducted 25 in-depth interviews (IDI) and 4 focus group discussions (FGD) with local authorities and residents to collect information related to people's response to the most common types of natural disasters in the locality, which are droughts and floods.

2. Theoretical Approach

2.1. Key concepts

Natural disasters constitute serious changes in the normal function of a community or a society due to natural hazards interacting with society's vulnerable conditions that lead to widespread adverse effects on human, materials, economy or environment, and

require an urgent response to meet human needs and may require outside assistance to recover (IPCC, 2012: 31).

Climate change is the change in the state of the climate relative to the average and/or the fluctuation of the climate that persists over a long period often of decades or longer. Climate change can be caused by natural internal processes or external forces, or by human activities that alter the composition of the atmosphere or in land exploitation (IPCC, 2012).

Disaster response in the framework of this paper is understood as the human activities to prevent and minimize the negative impacts of natural disasters.

2.2. Theory of status and role

Social roles are actions and behavioral patterns that society expects or requires in a certain group of people or a certain social group to perform on the basis of their status. According to the Dictionary of Sociology, “role is the set of behavioral expectations associated with a given status... at this level, each role is a combination or group of behavioral expectations” (Endruweit and Rommsdorff, 2002).

Role is a key concept in sociological theory. It emphasizes social expectations associated with certain status in society and the functioning of those expectations. The social role of each individual is determined on the basis of their respective social status. To fulfill their social role, each individual or social group must perform certain functions. It can be said that roles are the demands of society on social status. These demands are often determined based on social norms. Each social form and stage have social norms that are not entirely the same, even different (Tony Bilton et al, 1993). Therefore, roles are both the result of an interaction process and as prescribed behaviors imposed for certain status. From the approach of status and role theory, this paper examines the role of women in responding to natural disasters in the current rural Vietnamese family, thereby providing the theoretical and practical basis for considering the role of women in relation to that of men in the family as well as in response to natural disasters. It is necessary to evaluate the contributions of women to the community in order to find out about their needs and aspirations, and to create conditions for them to fulfill their capabilities, and actively join with men in livelihood activities and effective response to natural disasters.

2.3. Literature review

Women and girls have effective ways to adapt to climate change through their knowledge and experience in using land, water, and forest resources, and in observing natural phenomena and weather. Women are also recognized as the first to prepare their families for the disaster as well as to bring them back to life after the disaster (Le Thi Thuong Huyen et al, 2013: 7). Today, women are still in a disadvantaged position compared to men despite the legal framework to support gender equality (Oxfam, 2017). According to the research by Pratiwi et al (2017), in Indonesia access to resources, control of assets such as houses, land, livestock, vehicles, gold and savings significantly increases opportunities in diversifying livelihoods and increasing income in the context of being affected by natural disasters.

The burden is even heavier for women in natural disasters as housework increases significantly and becomes more difficult (UNDP, 2009; UN Viet Nam, 2016; ISDS, 2016: 112). These perceptions of role are rooted in local gender structures and cultural practices that exist more commonly in ethnic minority communities and rural areas than in urban areas (Hoang Cam et al, 2013).

Studies have shown that women spend more hours each day doing unpaid care work than men of any status and ethnicity. Research in Pakistan shows that rural women work nearly 5 hours a day while men spent only half an hour on this job. Tanzania women spend three times as much doing these jobs than men. In Bangladesh, ActionAid has observed that gender roles increase inequalities in the division of unpaid care work. From an early age, girls are often taught to help mothers with housework more than boys. In addition, social norms of unpaid care work are often underpinned by religion, culture and social stereotypes and even indirectly in government policies (Omari, 2010; Oxfam, 2009; UN Viet Nam, 2016; ActionAid, 2017). Responsibilities and duties of women and girls, apart from gender stereotypes in education, are the main factors contributing to reducing their chances of learning and participating in income generating activities, thus exacerbate the effects of natural disasters and climate change on them, making it even more difficult for them to adapt to climate change and reducing natural disaster (Oxfam & UNDP, 2009; Dang Nguyen Anh et al, 2016; WB, 2012; Omari, 2010).

Women are at a more disadvantageous position in responding to natural disasters and environmental changes due to gender division of labor results in women working more

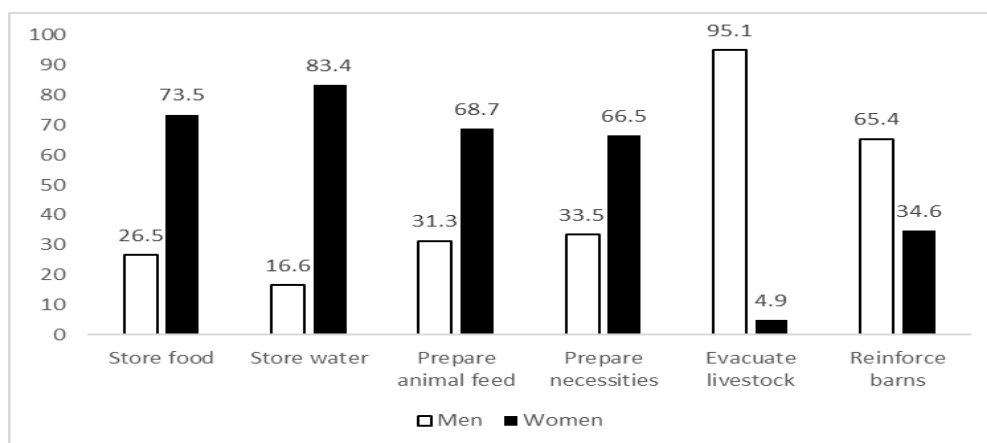
in agriculture and the informal sector. Furthermore, women are responsible for reproduction and care work (Omari, 2010; ADB, 2015). Women are responsible for both the housework and production. In the context of increased natural disasters resulting from the effects of climate change, gender gap in accessing resources making a living and career transitions have once again deepened inequalities (Le Thi Thuong Huyen et al, 2013: 7).

3. Research Results

3.1. The role of women in disaster preparedness

With the climate characteristic “lack of rain but excess in sunlight”, drought is the type of natural disaster that has the most impact on the life and agricultural production of the people in Ninh Thuan. Drought does not happen as suddenly and quickly as other natural disasters such as storms and floods. It takes place slowly and often, and cause both immediate damage and long-term consequences on a large scale. Preparing to respond to a drought includes 6 main activities: storing food; storing drinking and domestic water; preparing food for cattle and poultry; preparing necessities; evacuating livestock and strengthening of houses and barns (Figure 1), according to the respondents responses.

Figure 1. People in charge of drought preparedness (N=368)



Source: Survey in Phuoc Nam commune in 2017.

Out of 6 preparing activities to respond to drought, there are 4 activities mainly performed by women, which include 73.5% of female preparing food; 83.4% of women storing drinking water and domestic water; 68.7% of women preparing animal feed and 66.5% of women preparing necessities to cope with drought. Men carry out two other

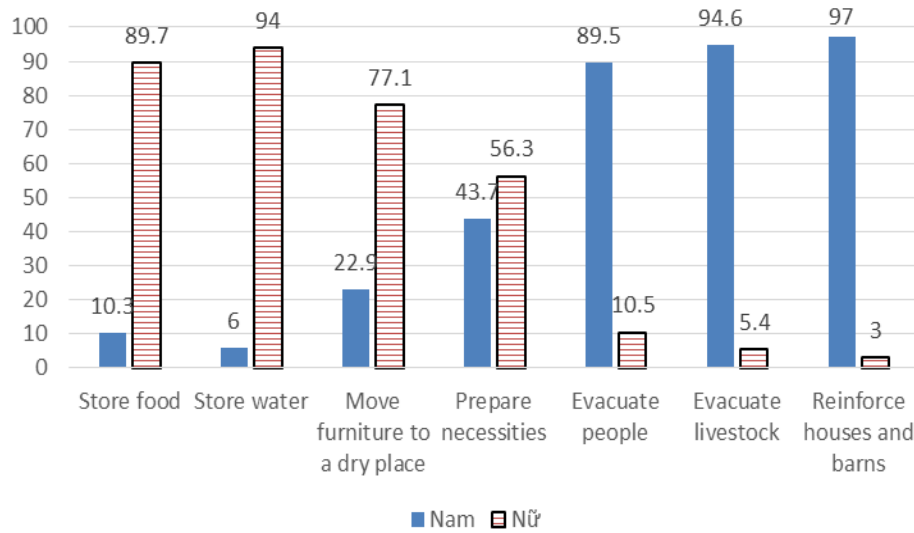
activities, evacuating livestock to other places to avoid drought (95.1%) and reinforcing houses and barns (65.4%).

The qualitative research data also shows that the evacuation of cattle is mainly done by men, but women are mainly responsible for the provision of food and the care of the herds.

“Cattle are often evacuated to Ninh Phuoc because there is less drought and more food for sheep, cows and goats there. I often go there with my husband to provide more food for the animals and take care of them because many are malnourished due to previous lack of food. The preparation and storage of animal feed is mainly done by wives” (IDI, female, 45 years old, Phuoc Nam commune).

In addition to preparation in the family, women are also participating in many stages of husbandry activities: “buying and storing hay, growing grass for cows, picking leaves for goats... we even have to find cactus and burn all the thorns to make food for sheep” (FGD, women, Phuoc Nam commune). “These jobs are usually not too heavy, but it also takes time” (FGD, men, Phuoc Nam commune).

Figure 2. Work allocation in preparation for floods (N=368)



Source: Survey in Phuoc Nam commune in 2017.

After long droughts, there are often heavy rains and the system of canals and rivers are unable to regulate in time, resulting in floods and seriously affecting people’s life and production. The 7 main activities to prepare for floods in Phuoc Nam commune are done mostly by women: storing food (89.7%); preparing drinking water (94.0%);

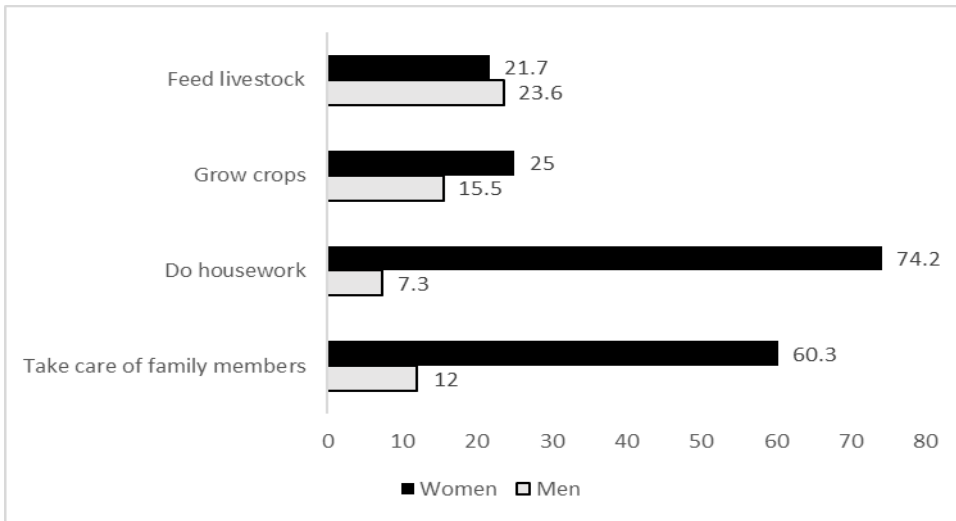
moving furniture to a dry place (77.1%) and prepare necessities (56.3%). Men are mainly responsible for reinforcement of house (94.6%), barns, and evacuation of livestock (97%) (data in Table 2). This result shows that gender roles are clearly shown in flood preparedness and response activities. The higher percentage of women performing 4 activities is closely related to the gender role in housework and care work such as preparing food and drinking water, storing furniture and necessities. The percentage of men performing health demanding jobs such as evacuating people, livestock, and reinforcing houses and barns is higher.

The qualitative information gathered from the studied areas also shows that there is labor division in disaster preparedness based on the expected roles of men and women. “When floods are announced, the women in the family, mainly the wives, are responsible for preparing household daily necessities such as food, water; moving furniture, preparing medicines, instant noodles, hot oil, flashlights... Men are in charge of checking houses and barns to see if there are crucial points that need reinforcement, repair, and evacuating animals to a safer place... Men do heavy work, and women do light work that is more suitable for their health” (FGD, men, Phuoc Nam commune).

3.2. The role of women in disaster response and post-disaster recovery

During a drought, women are still the main caregivers (Figure 3). The percentage of women being the main caregivers is 67.9%, and of both men and women is 26.1%. Male being the main caregiver accounts for a very small percentage (6.0%). Regarding housework, female is the main performer, accounting for 71.2%. Both men and women performing housework accounts for 24.2%. Only 4.6% of men being the main performer. Meanwhile, the percentage of women who take care of plants and animals is similar to that of men.

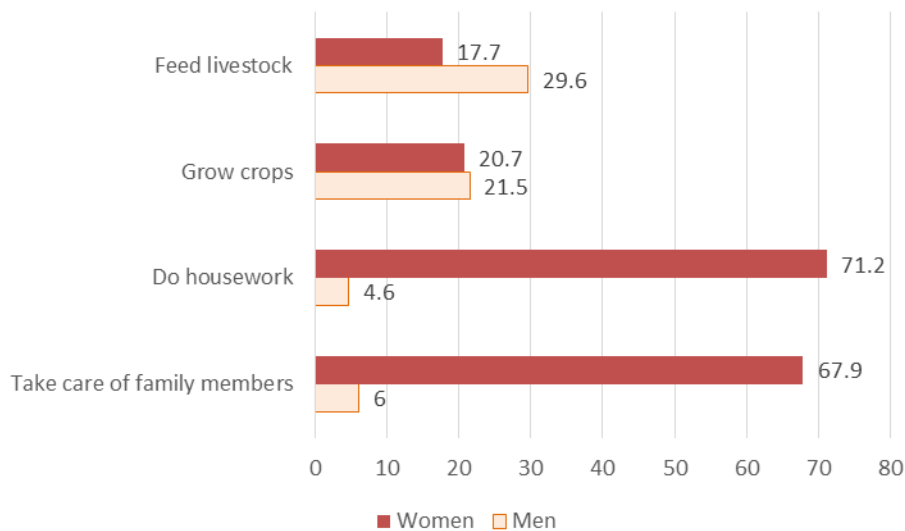
Figure 3. The main person to do care work during droughts (N=368)



Source: Survey in Phuoc Nam commune in 2017.

Research results show that women not only take on a lot of responsibilities in the household, but also play an important role in taking care of plants and animals in natural disasters, helping to increase resilience and restore agricultural livelihoods of households.

Figure 4. The main person doing care work during floods (N=368)



Source: Survey in Phuoc Nam commune in 2017.

The information from the female group discussions show that women often try to use their experiences and knowledge to diversify food sources for livestock by combining plants such as legumes, grape leaves to increase nutrition to goats and sheep. For lambs, they feed them with milk in order to increase their resilience, avoiding being weakened

and diseases. In drought conditions, water shortages and prolonged lack of natural food, often the husbands evacuate the animals or take them to eat earlier so they can get more food. Women prepare food reserves such as straws to ensure food security for livestock in case of prolonged natural disaster. The negative impacts of natural disasters have left a lot of work pressure on farmers, especially women.

Similar to the division of labor during a drought, in case of a flood, figure 4 shows that women, in addition to being the main persons who take care of the family, they also take care of plants and animals to withstand and minimize damages caused by natural disasters. 25% of respondents say that women are the main caregivers of crops during a disaster, while this percentage in men is only 15.5 %. Regarding livestock care, the proportion of women taking care of the work is not much lower than that of men (21.7% compared to 23.6%).

Harvesting agricultural products early in the event of a natural disaster is also a response that the people of Phuoc Nam apply to minimize damage, and women are always proactive and insist on doing this.

“Even when the rice was flooded already, my wife still put on a raincoat and went to the field. She said ‘bring it home and it’s ours. So much effort was spent. Just take home, even if people can’t eat, it’s better to feed the chickens and ducks” (IDI, male, 32 years old, TB household, Phuoc Nam commune, 2017).

“The water flooded the garden, but whenever the rain recedes, I pick apples to sell. Any penny will do” (IDI, female, 37 years old, Phuoc Nam commune).

Table 1. Response of male and female farmers after natural disasters (N=368)

Change areas	Gender (%)		Both	
	Male	Female	Percentage	Number
Job change ***	21.0	11.5	16.3	60
Work away from home***	19.9	6.0	13.0	48

Notes: *p<0,1 **p<0,05 ***p<0,01.

Source: Survey data in Phuoc Nam commune, 2017.

Increased natural disasters have left serious damage on agricultural production in Phuoc Nam, and income from agriculture has become more and more unstable. The number of people who quit farming to do other jobs or migrate to other places tends to increase and is mainly focused on men or groups under the age of 40, because old farmers are too

familiar with the fields and attached the land. It is not easy for them to change to a new job or move to a new land because most of them are untrained workers, with no experience in production and business, limited in social network to be able to find a new livelihood.

Women migrate in smaller numbers to nearby areas in short periods of time, especially married women. The female migrant workers tends to earn more than men even though the average wages of female migrants are often lower than men, as most women tend to save:

“Women often work in garment or food processing companies, men can apply for jobs in a wider variety of fields, wages paid to men are usually higher than women, but men often spend a lot of money on drinking and smoking... women are more frugal, especially married women” (FGD, mix gender, Phuoc Nam commune).

Women are actively involved in post-disaster recovery and reconstruction. They not only undertake most of the housework, take care of family members, but also take an active role in taking care of plants and animals, recovering their family’s livelihood after the disaster.

3.3. The decisive role of women in response to natural disasters

To learn about the decisive role of women and the factors influencing this role in transforming agricultural production structure in response to natural disasters, this paper uses logistic regression analysis. The dependent variable used in the logistic regression model is built as a binary variable based on the question: “Do you have a decisive role in the agricultural production restructuring in response to natural disasters?” (hereinafter referred to as the decisive role in response to natural disasters). The data show that the decision to restructure agricultural production to cope with natural disasters is mainly made by men (the husband) is 74.1%; The percentage of women (the wife) who decide is 25.9%.

Model 1 analyzes the factors affecting the decisive role of women in agricultural production restructuring in response to natural disasters: The dependent variable takes two values (1) - Women decide; (0) - Women not decide. Likewise for model 2 (the factors affecting the decisive role of men in restructuring agricultural production in response to natural disasters).

The independent groups of variables include:

- The individual characteristics of the respondents (sex, age, education, ethnicity; is the respondent the head of the household);
- The household characteristics and members (number of generations in the family; standard of living);
- Division of labor: division of housework and division of labor in agricultural production;
- Awareness and opportunities to access sources of information on agricultural production and information related to forecast and prevention of natural disasters;
- Resource access and knowledge development such as: participate in production training classes; has a decisive role in production investment; participate in natural disaster prevention activities in the locality?

The logistic regression model presented below is the final model, including all independent variables in the analysis. The model for women explains 55.3% and the model for men 41.2% of the impact of the independent variables on the dependent variable.

The analysis shows that, there are 5 factors that have a statistically significant impact on the decision-making power of women in agricultural production restructuring in response to natural disasters, while other influencing factors are considered the same (model 1).

The first factor is the age of women. Model 1 shows that the decision-making power of women in the agricultural production restructuring in response to natural disasters increases with their age.

Besides the age factor, the education factor has a significant impact on the decisive role of women. For the female group with education level lower than elementary, their decisive role in agricultural production restructuring in response to natural disasters is 0.02 times lower than that of the female group with upper secondary education. This means that the educational factor has a stronger impact on women's opportunities to have a decisive voice in response to natural disasters in the agricultural sector. Limited education has become a factor preventing women in their livelihood as well as in disaster prevention.

Table 2. Logistic regression model of the decisive role of women and men in agricultural production restructuring in response to natural disasters

Independent variable		Model 1 (Female)		Model 2 (Male)	
		Coefficient B	Odds ratio (OR) ¹	Coefficient B	Odds ratio (OR)
Age	Under 40	-3.891	0.020***	-2.233	0.107***
	40-59	-3.988	0.019***	-1.321	0.267**
	Over 60 (Control group)		1		1
Education	Below elementary	-3.930	0.020***	-2.061	0.127**
	Lower secondary	-2.137	0.118***	-0.749	0.473
	Over upper secondary (Control group)		1		1
Head of household	Yes	0.394	1.484*	1.621	5.059**
	No (Control group)		1		1
Ethnic minority	Kinh	-0.171	0.843	-0.379	0.685
	(Control group)		1		1
Living level	Good	1.961	7.105***	1.463	4.318*
	Average	1.112	3.041**	1.773	5.890***
	Poor/near poor (control group)		1		1

¹ Odd ratios (OR) is the ratio of the difference between a feature (denoted by Odd1) to the difference of the feature used for comparison (Odd0). In which, the difference is the ratio between the probability of making a decision to respond to a disaster (p) and the probability of not (1-p).

		group)			
Follow weather news	Frequent Not frequent (Control group)	1.457	4.292**	-0.688	0.503
		1		1	
Independent variable		Model 1 (Female)		Model 2 (Male)	
		Coefficient B	Odds ratio (OR)	Coefficient B	Odds ratio (OR)
Main person doing agricultural production	Yes No (control group)	-1.072	0.342	-0.416	0.660
		1		1	
The main person doing housework	Yes No (control group)	-2.269	0.103**	0.773	2.166
		1		1	
Participate in trainings on production	Yes No (control group)	2.371	10.709***	0.985	2.676
		1		1	
Join local activities in natural disaster prevention	Yes No (control group)	-0.626	0.535	1.305	3.689
		1		1	
Model 1 (Female): N=182 R2 (Nagelkerke) =55,3 %					
Model 2 (Male): N=186 R2 (Nagelkerke) = 41,2 %					

Notes: *p<0,1 **p<0,05 ***p<0,01

Source: Data collected at Phuoc Nam commune, 2017.

The standard of living shows a strong impact on women's decision-making power in the agricultural production restructuring. The female group with a high standard of living is more likely to have a say in agricultural production restructuring in response to disasters than the female group with the poor and near-poor living standards with the difference ratio of 7.1 (This odds ratio for the male model of decision making is 4.3). If women are head of the households, they are 1.5 times more likely to decide on the agricultural production restructuring in response to natural disasters than women who are not heads of households. For men, it is 5 times more likely that they are the ones who have the power to decide in case they are heads of household, compared to control group. Being the person in charge of housework reduces the ability of women to be the main decision maker. This factor in the male decision-making model shows no statistical significance.

Access to information related to disaster warning and agricultural training has a statistically significant impact on the ability of women to be the main decision-maker of agricultural production restructuring in response to natural disasters. The female group that regularly keep up with weather news are more 4.2 times likely to decide on the restructuring of plants and animals in response to natural disasters than the group that does not regularly follow the news. Participation in production training also has a strong influence on the ability of women to be the main decision-maker of agricultural production restructuring in response to natural disasters. Specifically, the female group participating in production training is 10.7 times more than the control group (with $p < 0.001$).

Thus, the decisive role in restructuring agricultural production is mainly influenced by factors related to human capital such as age, education, living standard ... also influenced by a number of other factors related to gender roles in housework, access to weather information and training opportunities. According to the analysis results of two regression models of men and women in Table 2 above, women are bound more barriers than men in response to natural disasters in agricultural production. Women have an important contribution to responding to natural disasters in daily life as well as in agricultural production, but limited access to resources prevents women from becoming more active in response to natural disasters.

The qualitative research results also show that gender inequality in access to training and agricultural extension has limited women's ability to respond to natural disasters in agricultural production. In many rural communities including Phuoc Nam commune, village meetings are seen as a job for men. Women only attend when men are busy or not at home, except those meetings organized by the Women's Union. Men also have more opportunities to access training courses on disaster response, so they tend to apply science and technology to production more than women.

Women have less opportunities than men to grasp methods, techniques and technologies to apply in production.

“When the village head invited me to a meeting, I asked my husband to go because he had more time. That day the sheep got sick so I stayed home to take care of them and prepared for meals. I learned this water-saving method of irrigation from my husband” (IDI, female, 39 years old, Phuoc Nam commune).

Due to both subjective and objective reasons, the opportunity to participate in training courses is narrower for women who are heads of households, or from single families and poor households.

“I live alone, in a poor household, so I can not afford irrigation system, which costs at least 3-5 million. Moreover, because the area of cultivation is small and I myself often feel ill, I did not pay much attention when receive the notice to participate in the training” (IDI, female, 48 years old, poor household, Phuoc Nam commune).

Traditionally, women play an important role in housework and men are the ones who make products through the production activities. Gender inequality has been improved significantly in recent years, but in reality, women still spend a lot of time doing housework. This limits the opportunities for women to generate income and their ability to respond to disasters.

“The housework is mainly done by the wife, almost every day, there is no free time. In the family, the woman is too busy with her work” (FGD, women, Phuoc Nam commune).

Results of household interviews show that over 90% of care work and house word in the family during a natural disaster is done by women.

“We family has 1 ha of rice cultivation; 1 ha of corn and green beans. We raise 250 goats and 15 cows. My husband and I work together in agriculture. He mainly herds the

goats and the cows, and I grow crops. In the busy season, we both work in the fields, gardens and hire a shepherd to take care of the goats and cows. Whenever there is spare time, I go and cut grass for the cows. After each working day, we return home in the evening. After checking the barn, he has a shower and watches TV, I cook, and shower the baby. After the meal, I wash the dishes and check the kids' homework. I do everything because women have to do housework and take care of the children. It is the most suitable" (IDI, 34 years old, Phuoc Nam commune).

Women are under pressure due to the traditional gender role, which makes family members, the community, society and even themselves, assume that their main role is taking care of families and do all the care work. Participating in socio-economic activities as well as disaster response activities are put at second place.

After the disaster, the workload of both men and women increases significantly. The effects of drought are long-term and on large-scale, so people also need a long time to restore production. For example, after the drought in 2015, a lot of the cultivated area of rice and crops was narrowed or even abandoned if there was no conversion of livestock or crops. On the other hand, on areas that are still arable, with harsher climatic conditions, people had to invest more in terms of manpower to maintain output levels. Women farmers who are already responsible for housework and a large part of production work are much more burdened once natural disasters occur.

Women play a key role together with men in disaster recovery at the family and community level. These are important resources that need to be promoted to improve response to natural disasters in the context that Vietnam is one of the countries most affected by climate change today.

4. Conclusion

Women hold a broad knowledge about production, environment and weather. They play an important role in the performance of family functions, but due to a number of gender-discriminatory barriers, they are considered having a minor, passive and limited role in response to natural disasters.

There are a number of factors that prevent women from responding to disasters. Firstly, women are still bound to perform housework, spending a lot of time taking care of their families, preventing them from improving their knowledge and awareness about disaster prevention. Women have limited access to resources, opportunities to participate in

training courses to improve their knowledge and qualifications. Moreover, women also face many biased social norms and stereotypes associated with gender inequality and gender discrimination. Climate change is more and more complicated. Extreme weather events occur more and more frequently, leaving great and long lasting impacts on all aspects of life. Therefore, it is necessary to have a clearer and more objective view on the roles of both women and men as active actors for effective and sustainable disaster response and climate change adaptation.

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