

DROUGHT, FLOOD ANOMALY AND IMPACTS ON MIGRATION IN HAU RIVERSIDE AREA OF VIETNAM TODAY

Le Thi Hoa, Lecturer of People's Security Academy

ABSTRACT

From the perspective of environmental security, environmental hazards have caused Hau riverside area to face certain difficulties and risks in daily life and production. Drought and flood anomaly are two noticeable environmental hazards because they have had strong impacts on the three main livelihoods of people, namely rice cultivation, fruit tree cultivation and aquaculture. A large number of people have to give up their livelihoods, abandon their homeland and choose to migrate to other areas to do business and live. Thence, there are certain challenges in ensuring human resources for local production, and higher challenges for ensuring food security, social security and order and sustainable development goals in the Hau riverside area. The above practice poses an urgent need to identify and research to build and replicate sustainable livelihoods models contributing to social stability, economic development, and adaption to climate change and natural disasters in the Hau riverside area in particular and in the Mekong Delta of Vietnam in general in the coming time.

Keywords: Drought, Flood Anomaly, Migration, Hau Riverside area, Mekong Delta, Vietnam.

INTRODUCTION

Nowadays, environmental hazard has been identified as one of the seven most concerning non-traditional security fronts (Pham, 2016). Environmental hazards have been causing great concern to all countries in the world, seriously threatening human existence and development. In particular, Vietnam has been identified as one of the vulnerable countries from objective, force majeure and unpredictable environmental hazards such as storms, floods, thunderstorms, whirlwinds, earthquakes, landslides, saline intrusion, sea level rise, drought, etc.

For Vietnam, the Hau riverside area in particular and the Mekong Delta in general, in recent years, have been greatly affected by prolonged droughts and absence of floods, in other words, flood anomaly (Minkman, 2022).

The Hau riverside area with an area of about 664,284 hectares, extending from the border area of An Giang Province to the coastal area of Tra Vinh and Soc Trang Provinces, is an important component of the Mekong Delta, identified as district-level administrative units bordering with Hau River, with a total of 326 communes of 28 districts and cities of 7 provinces and municipalities, including: An Giang, Can Tho, Hau Giang, Vinh Long, Soc Trang, Tra Vinh and Dong Thap (Pham, 2016).

The Mekong Delta in general and the Hau riverside area in particular have an important position and role in all aspects of economy, politics, culture and society of Vietnam today. However, in recent years, climate change, natural disasters and many human activities have created both positively and negatively multi-dimensional impacts on the overall development and sustainable development of the Hau riverside area in particular and the Mekong Delta area in

general. On November 17th, 2017, the Vietnamese Government issued Resolution No. 120 on sustainable development of the Mekong Delta to adapt to climate change, which identified: “Sustainable development of the Mekong Delta for the benefit of the common interest of the country, the Mekong sub-region and the world is the cause of the whole people, encouraging and mobilizing all classes, social sectors, international partners and businesses to participate in the development process” Government, 2017. However, in the face of complicated and unpredictable developments of environmental hazards, the Mekong Delta region in general and the Hau riverside area in particular have been facing challenges in all aspects of economy, politics and society. Particularly, there has been an irregular and massive migration in recent years in this area (Nguyen, 2021).

The concept of Migration (used in the census in Vietnam) is construed as the change in the place of residence of people, from one territorial unit to another in a certain period of time. Migration can involve an individual moving to study, find better jobs and try to improve his / her future. The migrants can make personal choices for economic reasons and personal aspirations.

In accordance with the results of many studies, migration is one of the issues of great concern in the Mekong Delta. The Intergovernmental Panel on Climate Change also rates the Mekong Delta as a global hotspot for migration risks as a result of sea level rise (IPCC 2007). In the period of 2008 – 2018, about 1.7 million people migrated out of the Mekong Delta, but only about 700,000 people moved to this area. The migration rate in this region is more than double the national average migration rate Phuc Long, 2018. Many rural areas in the Mekong Delta have been experiencing a very alarming paradox, that is, a densely populated area with more than 17 million people (19% of population of the country) has been experience a local shortage of labor in the farming season. In this place, many houses are derelict or only have the elderly and children. The localities with the highest migration rates are An Giang, Ca Mau and Soc Trang Provinces. The above migration situation has been posing great challenges to the stable, sustainable and normal development of the Hau riverside area in particular and the Mekong Delta in general, such as labor shortage, living standard disparity, children lacking parental care, the elderly becoming breadwinners of family, low rate of children attending school in comparison with that of the whole country, etc.

So what is the cause of the current migration in the Hau riverside area?

In order to contribute to finding out the reasons for the above phenomenon, within the framework of this study, the author focuses on discussing the impacts / influences of the two current major environmental hazards that the Hau riverside area has been facing, inclusive of drought and flood anomaly to the livelihood of people. In other words, it is to analyze and assess the relationship of drought and flood anomaly to migration that the Hau riverside area has been facing for 5 years (2014 – 2019) and the next 5 years, thereby contributing to expanding the understanding of the relationship between drought and flood anomaly in the Hau River Delta in particular and the Mekong Delta in general and migration. On that basis, a number of recommendations are proposed to respond to climate change and environmental hazard, along with their challenges, contributing to the sustainable development of the Hau riverside area in the coming time.

Database and Research Methods

Database

The article is based on the analysis of secondary data, mainly aggregated figures officially published in published documents of relevant State management agencies and international organizations. Some other figures are illustrative in nature, quoted from the official websites of relevant ministries / departments.

In particular, the article uses the results of quantitative and qualitative data analysis from the sociological survey of the State-level project: *“Research and assessment of impacts of climate change, natural disasters and human activities to propose solutions and models for sustainable development in the Hau riverside area”* from 2018 to 2020. From the study including 6 provinces along the Hau River, the author selects and analyzes 3 provinces representing 3 regions, inclusive of the upper, middle and lower courses of Hau River (including An Giang, Can Tho and Tra Vinh).

Research Methods

The article uses research methods of sociology and interdisciplinary science, namely methods of sociological survey, observation, in-depth interview, data analysis and summarization through multi-dimensional perspectives (economic, environmental, social), etc.

From the basis of analyzing natural characteristics and socio-economic conditions for the study including 6 provinces along the Hau River, the author selects and analyzes 3 provinces representing 3 regions inclusive of the upper, middle and lower courses of Hau River (733/1213 questionnaires compared with that of the 6 original provinces in the State-level project: *“Research and assessment of impacts of climate change, natural disasters and human activities to propose solutions and models for sustainable development in the Hau riverside area”*). Specifically, the author has selected a number of localities for research; namely Ham Tan Commune (Tra Cu District, Tra Vinh Province); Long Phu Commune (Long Phu District, Soc Trang Province); Thoi An Ward (O Mon District, Can Tho Province); Tan Hoa Commune (Lai Vung District, Dong Thap Province); Long Kien Commune (Cho Moi District, An Giang Province); Khanh An Commune (An Phu District, An Giang Province).

In addition, the author also uses the results from many sociological field trips for the thesis: *“Environmental security in the Hau riverside area”* that the author has been doing (since 2019). The author has used a system of observation and in-depth interview (52 people) methods about the economy and society in the Hau riverside area, focusing on interviewing households with rice cultivation, fruit tree cultivation and aquaculture, and some local leaders, related to the research problem from August, 2019 to June, 2023.

RESEARCH AND DISCUSSION RESULTS

Overview of the Study Area

The Hau riverside area (along Hau River) with an area of about 644,284 hectares / 40,816.3 km² is a geo-strategic area of the Mekong Delta, extending from the border area in An Giang province to the coastal area in Tra Vinh Province and Soc Trang Province with about 4.4 million/17.4 million people (in 2022). The left bank is the North Bank including the following districts: An Phu, Phu Tan, Tan Chau and Chau Thanh of An Giang Province; Lap Vo and Lai Vung of Dong Thap Province; Tra On, Tam Binh and Binh Minh of Vinh Long Province; Tra Cu, Cau Ke, Duyen Hai and Tieu Can of Tra Vinh Province. The right bank is the South Bank,

including the following cities, townships, districts: Chau Phu, Long Xuyen, Cho Moi and Chau Doc of An Giang Province; O Mon, Thot Not, Ninh Kieu, Cai Rang and Binh Thuy of Can Tho City; Chau Thanh of Hau Giang Province; Ke Sach, Vinh Chau, Long Phu, Tran De and Cu Lao Dung of Soc Trang Province.

The Hau riverside area is considered a strategically important area of the Mekong Delta, Vietnam, especially in ensuring food security in the region (the food output of the Hau riverside area accounts for 50% of the total food output of the Mekong Delta) and the country. In addition, the region also has an important political position due to its location adjacent to many important economic regions and bordering with other countries.

Migration Situation in the Hau Riverside Area

The Hau riverside area – a geo-strategic area of the Mekong Delta – extends from the border area of An Giang Province to the coastal area of Tra Vinh and Soc Trang Provinces with a population of about 4.4 million/17.4 million people (of the Mekong Delta in 2022). However, in the decade from 2008 to 2018 alone, about 1.7 million people migrated out of the Mekong Delta. The migration rate in this region is more than double the national average migration rate Phuc Long 2018. From 2018 to 2021, the flow of residents moving from the Mekong Delta to big cities has been gradually becoming a trend and increasing. In accordance with the results of many studies on migration in the Mekong Delta in the period of 2018 – 2021, it is shown that: The immigration rate in this period slightly increased from 1% in 2018 to 1.3% in 2021 only, while the emigration rate in 2021 (at 13.8%) doubled that in 2018 (at 6.8%). The net migration rate in 2021 of 12.5% was very high (Nhan, 2022). The above results show that there is a huge difference between the immigration rate and the emigration rate for the flow of residents in this region.

Regarding migration in the Hau riverside area, a sociological survey carried out in this region by the author shows the results in the chart below.

Microeconomics: Microeconomics focuses on the behavior of individual economic agents, such as households and firms. It explores concepts such as supply and demand, market equilibrium, consumer behavior, production and costs, and market structures like perfect competition and monopoly.

Macroeconomics: Macroeconomics examines the economy as a whole, studying topics such as aggregate measures of economic activity (Gross Domestic Product - GDP, inflation, and unemployment), fiscal and monetary policy, economic growth, and the role of government in the economy.

Economic Systems: Introductory economics classes often provide an overview of different economic systems, such as capitalism, socialism, and mixed economies. Students learn about the allocation of resources, the role of markets, and government intervention in various economic systems.

International Trade: The principles of international trade are introduced, including concepts like comparative advantage, tariffs, quotas, and exchange rates. Students explore the benefits and challenges associated with international trade and globalization.

Economic Policy: These classes may cover basic economic policy issues, including the role of government in promoting economic stability and growth, income distribution, and the impact of taxes and government spending.

The specific content and depth of introductory economics classes may vary depending on the institution and the level of the course (e.g., undergraduate or high school level). These classes typically combine lectures, readings, problem-solving exercises, and sometimes group discussions or case studies to reinforce the concepts and principles being taught. **Interactive Learning Opportunities:** Encouraging student participation and interaction in the classroom fosters a deeper understanding of economics. This can be achieved through discussions, debates, group projects, and student presentations. These activities promote critical thinking, collaboration, and communication skills. **Regular Assessment and Feedback:** Regular assessments, such as quizzes, exams, or assignments, allow students to gauge their understanding of the material and identify areas where they need improvement. Providing timely and constructive feedback on their performance helps students understand their strengths and weaknesses and guides them towards further learning.

Supplemental Resources: Offering additional resources, such as textbooks, online materials, articles, videos, or tutorials, can provide students with alternative explanations and perspectives on economic concepts. These resources can cater to different learning styles and preferences, enhancing comprehension and retention.

Office Hours and Support: Availability of office hours or dedicated support sessions gives students the opportunity to seek clarification, ask questions, and receive individualized assistance. This personalized interaction can address specific challenges and help students overcome difficulties they may encounter

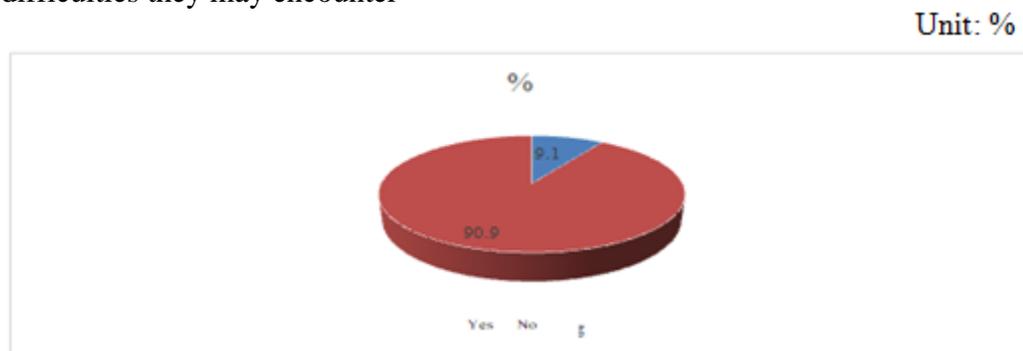


FIGURE 1
PROPORTION OF FAMILY MEMBERS MIGRATING IN 5 YEARS (2014 – 2019)¹

The above data shows that, in 5 years (2014 – 2019), among surveyed households in the Hau riverside area, nearly 10% of households had their members migrating to other places. That is, 1 out of 10 people migrated to another locality to study, work and live. Also in accordance with the results of the quantitative survey, the proportion of people migrating in localities in the Hau riverside area is not uniform. This proportion was 2.7% in Can Tho, 11.3% in An Giang and 16.9% in Tra Vinh.² The above proportions are not too large at one time of survey, but they also partly reflects the very concerning migration situation in this area. Particularly, a very interesting indicator here is that the migrants are mainly young people, students, people in working age from 15 to 60 years old. In addition, in accordance with reports from authorities and many studies, they show that the immigrants from other places to the region account for a negligible proportion.

Thus, migration is not only a huge problem in the Hau riverside area, but also a general problem in the whole Mekong Delta region of Vietnam.

Impact of Drought and Flood Anomaly on Migration

Besides saltwater intrusion, drought is also one of the natural environmental hazards with a great negative impact on livelihoods of the people in the Hau riverside area. Drought has strong impacts on labor, employment and income of the people, specifically, drought makes it difficult for the people to find and develop the jobs, and labor costs has increased many times compared to before. Simultaneously, drought contributes directly and indirectly to reducing the income of the people carrying out their livelihoods such as rice cultivation, aquaculture, fruit tree cultivation (Nguyen, 2021). Regarding this issue, the results of sociological survey conducted in many provinces and cities in the Hau riverside area show that a large number of people in the region have migrated to study and find the jobs in other regions. For example, the actual survey results in Ham Tan Commune, Tra Cu District, Tra Vinh Province show that a part of people who previously worked in farming and aquaculture have migrated to Cambodia for trade or migrated to Binh Duong, Dong Nai and Ho Chi Minh City to find the jobs³. Migration for job search is also common in many other localities, particularly in Thoi An Ward, O Mon District, Can Tho City, with many households formerly engaged in farming and mango, longan and pomelo cultivation. However, due to hot weather as well as erratic rains and floods, it is difficult for plants to grow well, affecting productivity and reducing income. Therefore, in non-peak periods, people are forced to take advantage of hired jobs. Hire more freelance jobs for extra income. Specifically, some people go to Da Lat to do tourism, some go to work as workers for factories and brick kilns, others go to other provinces to look for work when they have the opportunity. Contributing to a better understanding of the relationship between drought and migration, a survey on the impact / effect of drought on migration through families that grow rice, grow fruit trees, and raise aquaculture (these three main livelihoods of people in this area) was conducted by the author are shown in the chart below (Smith et al., 2009).

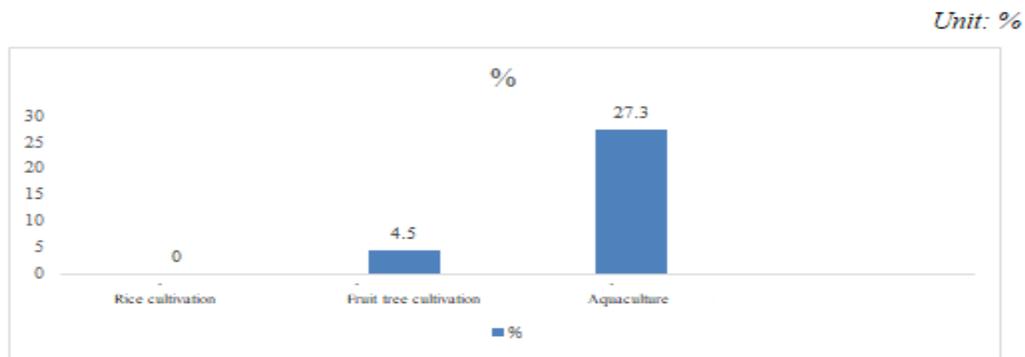


FIGURE 2
MIGRATION DUE TO DROUGHT IMPACTS ON FAMILIES WITH RICE CULTIVATION, FRUIT TREE CULTIVATION AND AQUACULTURE IN 5 YEARS (2014 - 2019)⁴

The information from the chart above shows that, in the past 5 years, drought has not had a significant impact on rice cultivation, but has had certain impacts on other livelihoods such as fruit tree cultivation and aquaculture of the people in the area. Strictly speaking, drought is one of the causes leading to the migration of fruit tree cultivation and aquaculture households in the Hau riverside area in 5 years (2014 – 2019). Specifically, drought has had a great negative impact on aquaculture families (households) and is the reason why nearly one-third (27.3%) of people and households in the survey have to migrate to other places to live and work.

In addition, drought also has a certain impact on people who grow fruit trees, causing them to migrate (with 4.5% of survey respondents for this statement). The proof for this statement is shown by the results of field survey in Thoi An Ward, O Mon District, Can Tho City: some families growing fruit trees here are no longer interested in the profession because erratic heat and prolonged drought (the time when the heat of 38, 39 degrees is prolonged and it is not seasonal as it was in the past) cause longan trees suffer a lot with low productivity; people have left the land vacant or leased it cheaply, or they just let 1 or 2 people continue to work, the rest of the family members migrate to other places to look for jobs with higher incomes.⁵

In addition to drought, flood anomaly is also one of the reasons why people in Hau Riverside Area choose to migrate to other places for residing and working. This is evidenced by qualitative data collected through field surveys and reports from local authorities. An example is Mr. Thang's household in Thoi Hoa C Hamlet, Thoi An Ward, O Mon District, Can Tho City: *"...my son works as a mason, my daughter marries a foreign husband, and my wife goes to Da Lat to do tourism. My family has 4 people, but now only half of us live in our hometown and do farming⁶."* According to the Statistics Office, An Giang Province has the largest number of out-migrants out of the 63 provinces and cities of Vietnam. Accordingly, the average population growth rate of An Giang in the period 1999 - 2009 was an increase of 0.47%/year; in the period 2009 - 2019, it was a decrease of 1.16%/year; compared with 10 years ago, the population has decreased by nearly 229,000 people, most of them are people in rural areas, people working outside the province and students studying away from home (Nguyen, 2021).

According to the results of a sociological survey of many households in Khanh An Commune, An Phu District, An Giang Province, flood anomaly in recent years has caused the livelihoods of aquaculture, rice and fruit trees are more difficult for the people. In particular, silt is less so the soil is less fertile, many areas along Hau River can only be available for 2/3 crops in a year, many farming areas are completely lost. This situation has the effect of reducing the area of food cultivation in this area. Rainfall is less and erratic, causing natural water to be less. Thus, there is less natural food for fish and fish in rafts on the river get sick a lot, forcing the majority of people to migrate to work as workers in industrial parks in the Southeast provinces, Ho Chi Minh City and major cities in the region. They also apply to work abroad in a number of countries such as Korea, Japan, and Malaysia... And, there is an obvious fact that, when children reach the age of 15 -17, they find job without finishing high school, university nor obtaining a vocational degree. They find a job, get married, have children, and then send the children back to the hometown so that the children may be taken care of by the children's grandparents. In particular, in some areas, there are families of which all members migrate. According to population research data in Vinh Truong Commune, An Phu District, An Giang Province, the migration situation here is very alarming, that is, in LaMa Hamlet in recent years, there has been very large number of labor migrants, nearly 400 households, accounting for nearly 70% of the households in the hamlet. Currently, the number of houses in the hamlet remains the same, but

many of the houses are uninhabited, or only inhabited by the elderly and children (Nguyen, 2021).

Contribution to a better understanding of the relationship between flood anomaly and migration which is carried out by the author through the survey on impacts/effects of flood anomaly on migration through household with rice cultivation, fruit tree cultivation and aquaculture is shown in the chart below (Smith et al., 2009).

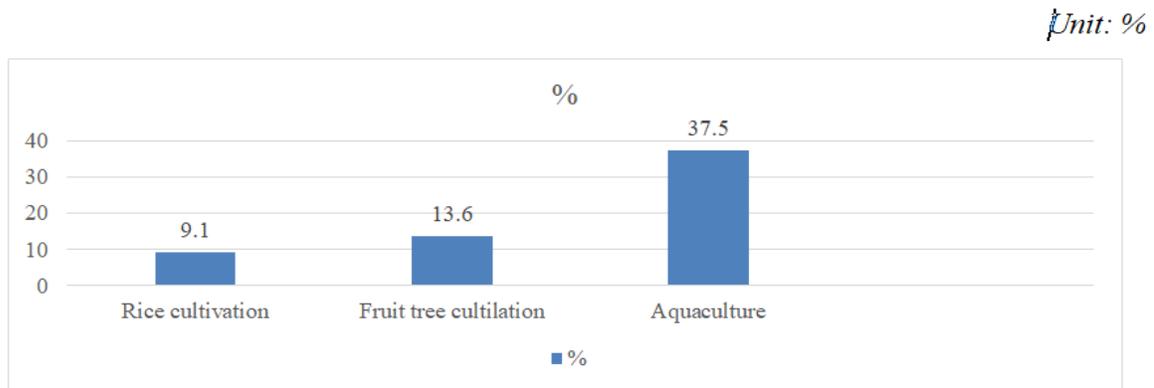


FIGURE 3
MIGRATION DUE TO FLOOD ANOMALY AFFECTING HOUSEHOLDS WITH RICE CULTIVATION, FRUIT TREE CULTIVATION AND AQUACULTURE IN 5 YEARS (2014 -2019)⁷

The chart above shows that flood anomaly has had very significant impacts on three main livelihoods of people in the Hau riverside area in the period 2014-2019. Or to be precise, flood anomaly is a very noticeable cause that leads people in Hau riverside area to migrate to other localities to study, live and work. According to total survey results on the impact of flood anomaly on the above three livelihoods leading to migration, it accounted for more than 1/2, i.e. up to 60.2% of the people in the survey made comments that, from their experience, flood anomaly has caused their households and family members to migrate. It is worth noting that flood anomaly has had a great impact or is an important reason for households with aquaculture to migrate (with 37.5% of survey respondents stating that). In addition, flood anomaly is also a significant cause for households with fruit cultivation and rice cultivation to migrate, with the result of 13.6% and 9.1%, respectively. The proof is once again shown in the results of a direct qualitative survey of households with aquaculture in Hau riverside area:

“Fish farming in river depends on the water level; where the water rises, the raft floats. Experience is that if the fish are kept far from the bank in the middle of a large river, the new fish will grow faster. When there is no water or the flood water is erratic, the dirty water is stagnant, causing the fish to grow slowly, get sick, and die a lot”⁸.

At the time of the survey (September 2019 and August 2022), according to local people's experience, the water level of Hau River was lower than that of the same period in previous years, specifically 80 cm to 100 cm lower. Due to the small amount of water, the quantity of natural fish in the river decreased, making the amount of natural food to raise fish in rafts

decreased, so they had to feed fish in rafts with frozen fish (herring, mackerel, fish intestine,...), leading to high costs and low productivity (Nhan, 2022).

“Fish farming is hard. We feed the fish properly and give the fish medicine and they still get sick and die a lot. To have money to buy food for fish, every day I go to work as a domestic servant or a hired worker. This year, due to low water, it is stagnant, making fish more susceptible to disease. For more than a month now the fish have been sick (red fish is sick fish) so we have to buy medicine and mix with the fish’s food but there is still dead fish (epidemic). For dead fish (reed fish, snakehead fish), we pick up and sell them (40-50k/kg). Because of epidemic, there are 10 dead fish (1.5kg) a day. The current price of fresh fish is 70k/kg. Many times, fish rafts are even swept away, making us lose our capital. There was a year when I lost 50 -70 -100 million, but fortunately I didn’t lose all of my rafts...”⁹

For another household with raft-based fish farming,

“...12000 fish have died, there are only more than 200 fish left (it’s so miserable, it’s a great loss). When starting fish farming, the new fish were only as big as chopsticks. When the fish got big, they all died (due to disease). We took the fish to the vet for a checkup but they couldn’t cure it. The doctor diagnosed the fish with liver disease and dengue fever just like humans. The reason was that the water is not rising, the water is polluted. Nearly 20 years of fish farming, I have never had a loss, fish have never died as much as this year. In the past, there were nearly a hundred fish farming households, now there are only a few dozen of them.”¹⁰

Thus, flood anomaly has created certain difficulties for households with aquaculture on Hau River and forced them to give up their current livelihoods or switch to other jobs to maintain former livelihoods. Flood anomaly also has certain similar effects on households with fruit tree cultivation and rice cultivation, although the impact is to a lesser extent.

In addition to drought and flood anomaly, people in Hau riverside area also face many other environmental hazards such as saltwater intrusion, erosion of Hau riverbanks, coastal erosion, changes in flow and silt of Hau River, etc. For example, the results of a qualitative survey conducted in Thoi Loi Hamlet, Thoi An Ward, O Mon District, Can Tho City show that, after two major landslides here in 2018 and 2019, many people have had to migrate to other places in search of work because their family’s property such as hair salon, pottery shop, restaurant, house... was no longer there because part or the whole house had fallen into the river and was completely submerged. Thus, the impact of environmental hazards not only causes difficulties for the livelihoods of rice cultivation, fruit tree cultivation or aquaculture, but also causes difficulties in labor and employment of households living along Hau River and households trading on the river, thereby forcing them to migrate to other places to live and look for work.

The effects are not only during 5 years of the survey (2019). According to assessment of people in the area along Hau River, in the next 5 years, migration will continue to be widespread and the above natural disaster factors will still be the causes leading to the migration of local people. Specifically, the results of a quantitative survey conducted in Hau riverside area show that, in the next 5 years (2020 - 2025), there will be more than one-tenth (10.5%)¹¹ of households with members migrating to other places to do business and live, increasing 1.4% compared to 5 previous years (Wissing et al., 2020).

Thus, migration is one of the huge problems in Mekong Delta in general and Hau riverside area in particular, in which migration due to environmental hazards and climate change as mentioned above are aspects that are worth paying attention to. Migration in Hau riverside

area is not only a problem of the present but also a problem of the future when competent authorities and local people assess that this situation will develop even more strongly in the future. Consequences of the migration situation pose great challenges to the region in terms of production laborer shortage, posing difficulties in ensuring regional economic and social security in the near future.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

Overall, the results of sociological research in Hau riverside area as presented above show that: two natural environmental hazards, namely drought and flood anomaly, have had certain impacts on the three main livelihoods of local people, including rice cultivation, fruit cultivation and aquaculture. These impacts have caused people to abandon their arable land or switch to other crops and livestock, or have made it impossible for a number of people to continue to deploy their livelihoods. Since then, it causes a large number of people to migrate to other localities to do business and live, posing a significant challenge in ensuring high-quality human resources for the area.

At the same time, the above situation also creates certain difficulties in ensuring cultivation area and food productivity in this area. Thereby, certain challenges in ensuring food security in the future in the Hau riverside area, the Mekong Delta as well as the whole country are posed. And more broadly, related issues arise, such as ensuring economic security, social order and security, social welfare and national security as well as sustainable development of the Hau riverside area.

Recommendations

In order to contribute to solving the problems that drought, flood anomaly and other natural disasters bring to the Hau riverside area in the context of increasingly strong climate change, contributing to the sustainable development of the region in the coming time, the author proposes some recommendations below:

Firstly, relevant agencies and local people need to effectively implement the Government's resolutions on proactively responding to climate change, strengthening natural resource management and environment protection for the area and development of food crop production;

Secondly, propaganda need to be carried out well to create a strong change from awareness to action for leaders and people in the area. In which, natural disaster prevention and control and response to climate change must be identified as necessary requirements and important tasks for sustainable socio-economic development of localities in the region and the whole country;

Thirdly, it is required to focus on improving the capacity of disaster forecasting and warning, ensuring timeliness and accuracy, contributing to proactively preventing, combating and mitigating damage caused by natural disasters and climate change, especially the impacts of climate change and natural disasters on the livelihoods of people in the region.

Fourthly, build a number of models of sustainable food crop production and sustainable economic development to actively adapt to climate change in the coming time; Strengthening environmental protection and natural disaster consequence prevention, response and overcoming;

Fifthly, proactively cooperate between localities in the Hau riverside area, the Mekong Delta and international areas in response to climate change, natural disasters, resource management and environmental protection.

Sixthly, migration issue should be solved, in which it must be focused on removing difficulties for migrant workers, and at the same time persuading and having preferential policies for migrants who study in other localities to return to their hometowns. In which, it is necessary to focus on:

Investing in building infrastructure and improving social service quality in rural areas along Hau River to improve quality of life.

Improving health and education services, strengthening agricultural development policies, taking care of rural life, supporting farmers to return to the countryside to live, contributing to reducing migration from rural areas to urban areas, ensuring social stability, hunger eradication and poverty alleviation.

Encouraging foreign investors, potential investors inside and outside the region to invest in the Mekong Delta to create opportunities and jobs for people.

Expanding university and vocational training institutions in the Mekong Delta in order to promote linkages with domestic, international and regional educational institutions, encouraging active cooperation to improve teaching quality meeting practical requirements and develop high-quality human resources meeting the needs of global digital economy.

Strengthening attraction of a young workforce with qualifications and professional skills to live and work in the Hau riverside area in particular, and the Mekong Delta in general.

END NOTES

1. Survey data from the topic “*Research and assessment of impacts of climate change, natural disasters and human activities to propose solutions and models for sustainable development in the Hau riverside area*”
2. Survey data from the topic “*Research and assessment of impacts of climate change, natural disasters and human activities to propose solutions and models for sustainable development in the Hau riverside area*”
3. Information from in-depth interviews with cadres in Ham Tan Commune, Tra Cu District, Tra Vinh Province.
4. Survey data from the topic “*Research and assessment of impacts of climate change, natural disasters and human activities to propose solutions and models for sustainable development in the Hau riverside area.*”
5. Information from in-depth interviews with officials of Thoi An Ward, O Mon District, Can Tho City
6. Information from interviewing Mr. Thang's family in Thoi Hoa C Hamlet, Thoi An Ward, O Mon District, Can Tho City
7. Survey data from the topic “*Research and assessment of impacts of climate change, natural disasters and human activities to propose solutions and models for sustainable development in the Hau riverside area*”
8. Information from an in-depth interview with Hinh Van Tung, 42 years old, Khanh An Commune, An Phu District, An Giang Province.
9. Information from interview with Hinh Van Tinh, 31 years old, Khanh An Commune, An Phu District, An Giang Province
10. Information from in-depth interview Luong Thi Tam, 46 years old, Khanh An Commune, An Phu District, An Giang Province
11. Survey data from the topic “*Research and assessment of impacts of climate change, natural disasters and human activities to propose solutions and models for sustainable development in the Hau riverside area.*”

REFERENCES

- Minkman, E., Nguyen, H. Q., Luu, T., Dang, K. K., Nguyen, S. L., Du, H., ... & Rijke, J. (2022). From national vision to implementation: governance challenges in sustainable agriculture transitions in the Vietnamese Mekong Delta region. *Regional Environmental Change*, 22(2), 35.
- Nguyen D. (2021). <https://nhandan.vn/bai-toan-di-cu-o-vung-chau-tho-cuu-long-post651903.html>
- Nhan, N.S. (2022). <https://alumni.ueh.edu.vn/di-cu-van-de-can-duoc-giai-quyet-de-khu-vuc-dong-bang-song-cuu-long-tro-thanh-noi-dang-song-for-people-dan>
- Pham N.L. (2016). "Environmental catastrophe - A hot non-traditional security front", *Communist Magazine*, No. 886/2016.
- Smith, J.B., Schneider, S.H., Oppenheimer, M., Yohe, G.W., Hare, W., Mastrandrea, M.D., ... & van Ypersele, J. P. (2009). Assessing dangerous climate change through an update of the intergovernmental panel on climate change (ipcc) "reasons for concern". *Proceedings of the national Academy of Sciences*, 106(11), 4133-4137.
- Wissing, V., Bui, T. S., Nguyen, M. V., Hildner, G., Nguyen, H. S., Westarp, L. G., ... & Nguyen, T. L. (2020). Welcome words from delegates attending the Vietnam and Germany conference on Sustainable Development in the context of global change. *Edition commemorating 45 years of diplomatic relations between Vietnam and Germany (1975-2020)*.

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