DOI: 10.24411/2618-9453-2020-10023

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CLIMATE CHANGE ADAPTATION POLICIES OF VIETNAM IN THE MEKONG DELTA[1]

Abstract. If the alarming climate change and sea-level rise scenario occurs without coping solutions, it will greatly affect the socio-economic development and the environment of the the Mekong River Delta region. Recognizing this, the Government has soon developed both policies and action plans to adapt to climate change for the region. However, the policies and programs to cope with climate change are still inadequate and limited. In order to complete the climate change adaptation policies in the Mekong Delta in the current context, the Government and localities in the region need to implement more comprehensive and practical solutions for it.

Keywords: governmental policy, climate change adaptation, the Mekong Delta, sea-level rise.

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ПОЛИТИКА ВЬЕТНАМА ПО АДАПТАЦИИ К ИЗМЕНЕНИЮ КЛИМАТА В ДЕЛЬТЕ МЕКОНГА

Аннотация. Если не будут приняты решения по предотвращению тревожного сценария изменения климата и повышения уровня моря, урон социально-экономическому развитию и окружающей среде в районе дельты реки Меконг будет очень большим. Осознавая это, правительство Вьетнама разработало планы действий по адаптации к изменению климата в регионе. Однако эти программы все еще носят ограниченный характер. Для эффективной реализации политики адаптации к изменению климата в дельте Меконга в настоящее время правительству и местным властям необходимо выработать более комплексные и практические решения.

Ключевые слова: государственная политика, адаптация к изменению климата, дельта Меконга, повышение уровня моря.

Introduction

The Mekong Delta region consists of 13 provinces/cities directly under the Central Government, with a population of 17.5 million and a natural area of about 40,604.6 sq km. The region is one of the largest and most fertile plains in Southeast Asia and in the world, and its role in the country's economy is of increasing importance. It is one of the largest and most fertile plains in

[1] The grant "Studying and Proposing Policy Framework to Proactively Adapt to Climate Change in Mekong Delta by Socio-ecological Approaches", code 507.01-2019.301, sponsored by National Foundation for Science and Technology Development.

Southeast Asia and the world, and it is increasingly playing an important role in the country's economy. However, at present, the region is facing many great internal and external challenges and impacts of international integration. In particular, climate change has affected all industries, fields and economic components, especially the livelihood of rural population communities due to vast territories under inundation (fig. 1). According to climate change and sea-level rise scenarios 2016, if the sea level rises by 1m, the Mekong Delta is most at risk of flooding (38.9% of the area), in which, Hau Giang province is the largest flooded area (80.6%) [Ministry of Natural Resources and Environment 2016]. In response to negative impacts of climate change, the Government and localities have developed and reformed a series of institutions, policies, programs and projects to cope with climate change. Good coping actions will lead to efficiency and positive impacts, while the wrong solution will result in a waste of resources due to reverse effects, causing expensive measures. Therefore, building a system of solutions to create a long-term, sustainable and suitable vision for the region is extremely important in the current development context.

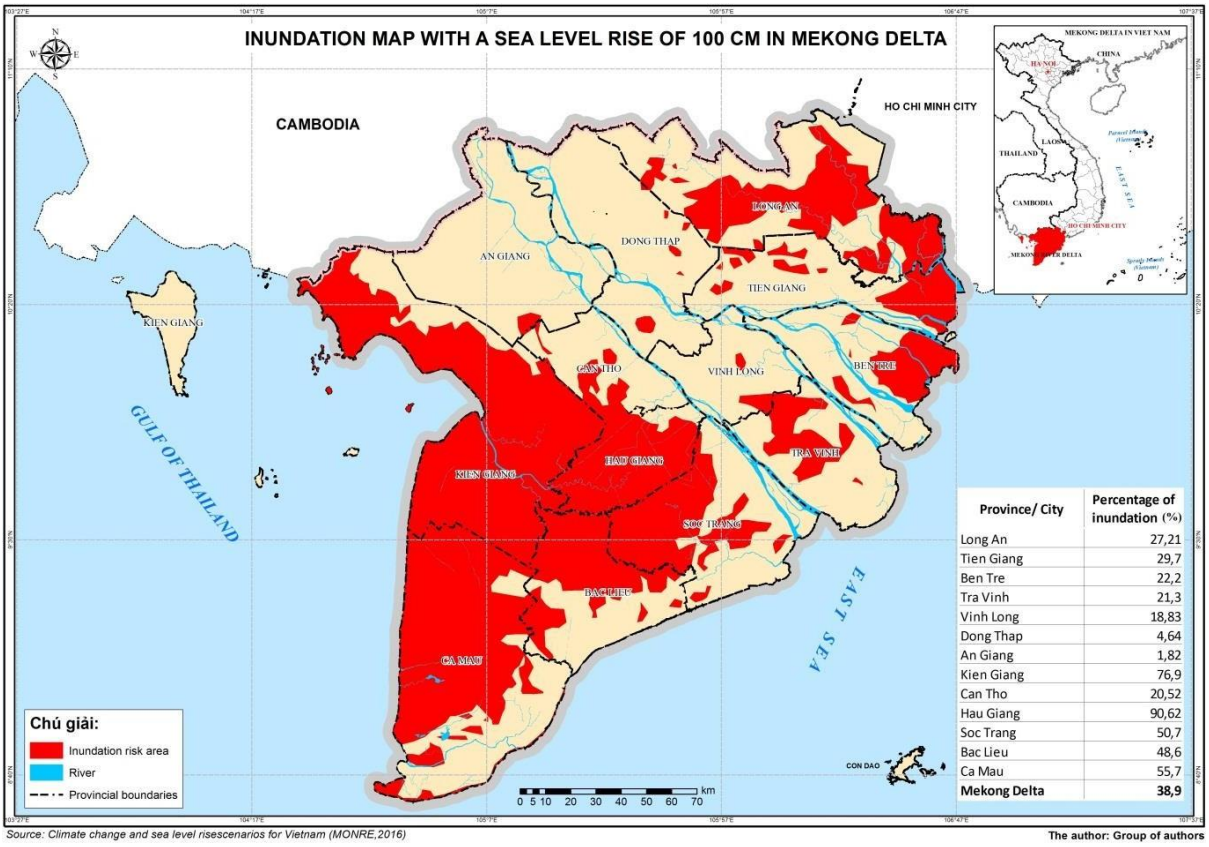

Fig.1. Inundation map with a sea level rise of 100 cm in the Mekong Delta.
Source: [Ministry of Natural Resources and Environment 2016]

Literature review

In recent years, the adaptation to climate change in the Mekong Delta has been studied by many researchers, organizations at home and abroad, mainly focusing on the following directions:

First of all, the research on scenarios and impacts of climate change on the East Asian plains [Dasgupta et al. 2007] shows that Vietnam is among the top five countries most affected by climate change, especially the two plains, namely the Red River Delta and that of the Mekong. Next research [Le Anh Tuan, Suppakorn Chinvanno 2011] also shows potential impacts and effects of climate change on land and water resources causing food insecurity in the Mekong Delta. The Russian scholars' research underlined that the intensity of climate changes is determined by the geographical

situation; island states or the region with long shoreline as Vietnam suffer from many natural calamities; such as, the Mekong Delta is threatened by opposite natural disasters at the same time, part of it suffers from drought, another is inundated due to a rising sea level; according to the forecast, it will be about 40% inundated area and 43% of influenced population, in which, about 35% of the population in the Mekong Delta will have to be moved [Ryazantsev et al. 2017: 131]. In the face of new developments and increasingly severe impacts of climate change on the Mekong Delta, there have been many international studies on this issue with the different aspects, such as: water security, subsidence etc. Among them the works by P. W. Thorne et al. (2011), Simon Benedikter (2014) and other Western authors [i.e. Minderhoud et al. 2019] are especially important. The aforementioned studies have warned that climate change will increase a vulnerability to floods and rising sea level by storms, and the Mekong Delta may face the risk of full inundation.

Besides, there are interesting studies on mechanisms and policies to cope with climate change in the Mekong Delta. These studies focus on the following aspects: regional planning, regional integration; public investments for the climate change adaptation at local level; building social security system; support community livelihoods to cope with climate change etc.

A research by the Government of Vietnam and the Kingdom of the Netherlands [The Government of Vietnam, the Kingdom of the Netherlands 2013] has emphasized that the development of an appropriate strategy to minimize and adapt to these changes is necessary for this locality in the future. The same idea with the aspects of the aforementioned plan was carried through by the authors [Tran Huu Hiep et al. 2015], who have also emphasized that survival, safe development, prosperity and sustenance in the future require urgent actions on the basis of the orientation, long-term vision, and the multi-sectoral, regional, inter-regional and national approaches. Expressing the same views in their works, the other authors [Bui Quang Tuan, Ha Huy Ngoc 2018; Nguyen Quang Thuan et al. 2019] mentioned the issue of policies on coping with climate change at the national, regional and local levels. At the same time, their studies emphasize the role of implementing regional integration policies; the importance of carrying out the inter-regional programs and projects being integrated in response to climate change in the Mekong Delta.

Besides, many researchers [Nguyen Tuan Anh 2018; Vu Thi Mai 2016] study the policies for sustainable livelihood models suitable for ecological sub-regions. They have focused on proposing solutions to meet sustainable livelihood initiatives for the Hau River sub-region and the floodplain sub-region of Dong Thap Muoi.

The review of a number of works shows that the studies having been carried out on the climate change adaptation policies in the Mekong Delta relatively vary in terms of both content and scope of the research, and are useful reference for research-workers. However, some other aspects should be mentioned, such as the overall policies, the impacts and shortcomings of the current policies, and the orientations for the policy change to create a sustainable development of the Mekong Delta in the nearest future.

Methodology

This article uses the data of research works along with descriptive analysis methods.

In addition, data sources related to the climate change manifestations and scenarios; impacts of natural disasters on the Mekong Delta socioeconomics; data on public investment in climate change in the region and so on are also collected by the authors from Ministry of Natural Resources and Environment (MONRE), the Department of Climate Change, the General Department of

Irrigation, the General Department of Disaster Prevention, the General Statistics Office of Vietnam and the Mekong Delta localities, in the course of 2011–2019.

Results

Effects of climate change on the Mekong Delta

From the end of 2015 to June 2016, the provinces in the Mekong Delta had suffered periods of natural disasters, such as severe drought and salt-water intrusion. By June 2016, 13/13 provinces and cities in the region had issued decisions to disclose natural disasters, droughts and salt-water intrusion in the area. Drought and salt-water intrusion damaged nearly 139,000 ha of rice in the region, of which more than 50% of the area was destroyed completely, causing losses of about 9.3 million USD. Ca Mau, Kien Giang, Ben Tre, and Bac Lieu are provinces with the largest areas of rice damaged. At the same time, about 400,000 households (1.5 million people) are short of freshwater. Estimated total loss during the drought-saline intrusion season of 2015–2016 in the entire Mekong Delta was about 326.2 million, of which Kien Giang, Ca Mau and Bac Lieu were the worst affected provinces: their damage amounted to about 188.7 million (fig.2). On the other hand, in the period of 2016–2020, the Mekong Delta region continues to suffer the erosion of river and coastal banks with unprecedented frequency and scale in over 300 years of its development.

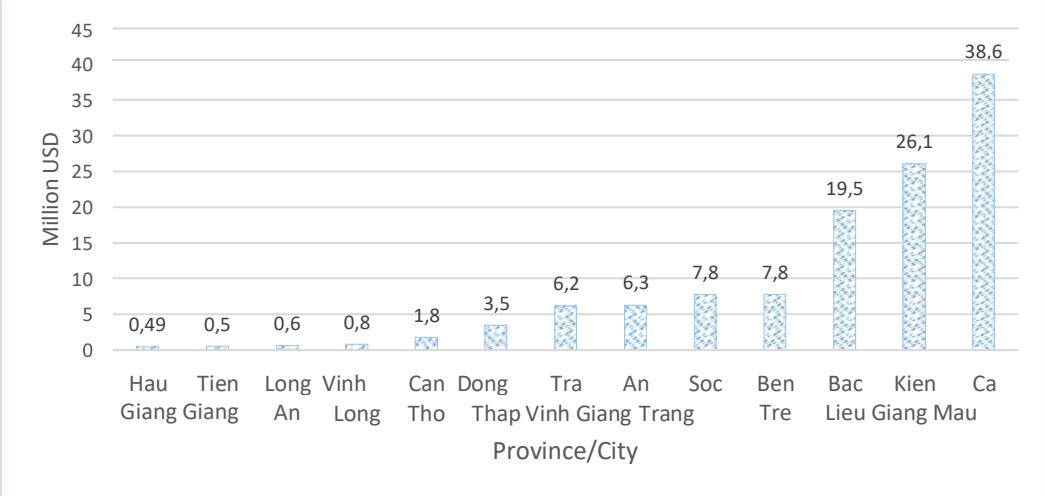

Fig. 2. Total damage due to the riverbank and coastal erosion in the Mekong Delta period of 2010–2020.

Source: Authors' calculations based on the report on riverbank and coastal erosion by the General Department of Water Resources and the report on river erosion in 13 provinces of the Mekong Delta (2020)

Salt-water intrusion in 2019–2020 is equivalent to that in 2015–2016, and drought in 2019–2020 is even more severe than the record drought in 2015–2016. Drought and salt-water intrusion in the Mekong Delta in 2019 occurred earlier than usual, from the end of November, compared to January 2020. As of January 2020, there are areas where salt-water intrusion enters up to 70 km inland, such as those in Ben Tre, Tien Giang, parts of Soc Trang and Bac Lieu, Ca Mau, Kien Giang, Tra Vinh and others in the drought-saline intrusion season of 2019–2020, affecting nearly 100,000 ha of rice, 130,000 ha of fruit trees in the Mekong Delta. Besides, there are about 100,000 households at risk of tap water shortage, estimated economic losses will be greater than the drought-salinity period of 2015–2016, with the damage of about 346.3 million [Ministry of Agriculture and Rural Development 2020].

Erosion directly threatens people's lives and property, seriously affects the safety of coastal natural disaster prevention and infrastructure and degrades coastal mangroves. The total damage caused by bank erosion of the Mekong Delta in March 2020 has been amounted to more than 130 million[2].

The level of damage caused by natural disasters and climate change increased in the period of 2010 – March 2020, with total damage of up to 1.26 billion, the most severe damage in 2019 accounted for 38.1% (fig. 3).

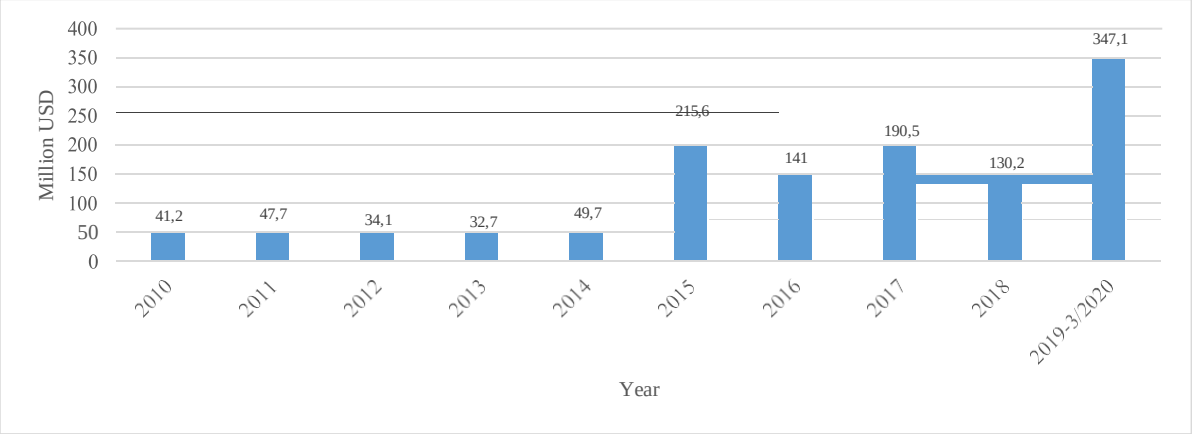

Fig. 3. Estimation of damages caused by natural disasters and climate change in the Mekong Delta, period of 2010-March 2020 (million USD).

Source: Authors' calculations from the General Statistics Office of Disaster Prevention's Disaster Statistics, Annual Damage Reports of 13 provinces/ cities, period of 2010–2020

Policy for climate change adaptation in the Mekong Delta

Policies for climate change adaptation

a. Group of policies related to infrastructure adaptation to climate change

Decision No.1397/QD-TTg dated September 25, 2012 of the Prime Minister approving the Mekong Delta Irrigation Plan for period of 2012–2020 and orientation towards 2050 in the context of climate change (CC) and sea-level rise (SLR). The decision emphasized that irrigation planning aims to contribute to the effective exploitation, use, protection and development of water resources in the upstream and surrounding areas.

Besides, the Prime Minister issued Decision No. 2623/QD-TTg, dated December 31, 2013 on Approving Urban Development Project to cope with climate change period of 2013–2020. Accordingly, the Mekong Delta has 12 municipalities supported by the Government to develop scenarios to assess the impact of SLR, improve the capacity to cope with climate change, and develop urban planning to respond to climate change and SLR.

b. Group of policies related to regional integration in the formation of local key products to adapt to climate change

In order to concretize the legal mechanism for regional integration in the Mekong Delta, the Prime Minister issued Decision No. 593/QD-TTg, dated April 6, 2016, promulgating the Regulation on piloting joint socioeconomic development of the Mekong Delta in the period of 2016–2020, in particular, focusing on regional linkages in response to climate change. To further the implementation of Decision 593 in localities, the Prime Minister issued Decision No.64/QD-TTg, dated January 18,

[2] Authors' calculations from reports on damage caused by river erosion in localities of the Mekong Delta, 2019.

2017 on the Establishment of interdisciplinary steering group in the Mekong Delta linkage period of 2016–2020.

c. Group of policies that are integrated, interdisciplinary and multi-objective related to climate change adaptation

The Government issued Resolution 120/NQ-CP, dated November 17, 2017 on Sustainable development of the Mekong Delta to adapt to climate change, creating a long-term and sustainable development vision of the Mekong Delta, based on the principle of respecting the natural ecological values and the population of the region. At the same time, in order to realize Resolution 120, some ministries, namely, the Ministry of Natural Resources and Environment and the Ministry of Agriculture and Rural Development (MARD), also issued action plans to implement the Resolution.

Implementation of climate change adaptation policies

In the period of 2011–2018, the National Target Program (NTP) on climate change response had 18 central-led projects implemented in the Mekong Delta region with the corresponding budget of more than 150.8 million; and 37 local-led projects with a total implementation cost of 111 million.

In addition, the Support Program to Respond to Climate Change (SP-RCC) had 7/16 projects implemented in the Mekong Delta with a budget of more than 99.8 million. In which, the budget for projects focusing mainly on the field of climate change adaptation is about 96.3 million, most of which are infrastructure constructions to respond to climate change. Meanwhile, the financial resources for the project related to climate change mitigation are very limited, only about 3.5 million (mainly focusing on policy development, scientific research, communication for energy saving, renewable energy model at household level etc.). In total, during the period of 2011–2018, the Mekong Delta has mobilized about 558.7 million for programs, projects and tasks to cope with climate change. In particular, the capital source for climate change response activities is 517.2 million, while the financial resources for climate change mitigation activities are around 41.5 million.

Besides, in the period of 2011–2018, the ODA capital from international organizations, such as: the World Bank (WB), the United Nations Development Program (UNDP), the Asian Development Bank (ADB), supporting for projects related to climate change adaptation in the Mekong Delta are more than 764 million.[3]

There have been invested 12 automatic meteorological observation stations and 89 automatic hydrographic observation stations, 13 intermediary transmitting stations to ensure full collection of instant and continuous transmission data in order to timely serve the hydro-meteorological forecasting, disaster prevention and mitigation in the Mekong Delta. There has been built a monitoring system for forecasting water sources, warning drought and salinization in the Mekong Delta region under the project of investigation and overall issessment of water sources, forecasts, warnings against drought and salinization adapting to climate change in the Mekong Delta.

Eighty-four livelihood models (in the fields of agriculture, aquaculture and forestry) have been implemented which have brought the benefit to about 57,000 people. Typically, livelihood models such as climate smart rice production or shrimp farming under mangrove forest have reduced environmental stress and increased income by 20–80% per household. On the other hand, a coastal forest policy is developed, including the reforestation of 46,000 ha of coastal forests by 2020, which

[3] Data calculated by the authors (2018), adapted from sources, including the Ministry of Agriculture and Rural Development, the Ministry of Natural Resources and Environment, the Ministry of Construction, the Ministry of Planning and Investment, and other ministries/sectors.

will provide ecosystem services worth about 102 million per year, as well as absorpsion of about 13.2 million tons of CO_2.

Some inadequacies and limitations of climate change adaptation policies in the Mekong Delta

Since the aforementioned policies, programs and projects have been implemented in the Mekong Delta region, people's lives have improved, incomes have increased and livelihood has been sustained and well adapted to climate change. However, recent policies to adapt to climate change in the Mekong Delta still have shortcomings.

– Climate change has impacts on a large scale, both inter-provincial and inter-regional ones. However, in recent years programs and projects to adapt to climate change have been mainly developed and implemented locally, scattered according to administrative boundaries, mechanisms to solve inter-sectoral and inter-regional issues remained insufficient. Therefore, resources have been scattered, spread and low in implementation efficiency. There has been a lack of continuity, connection and sharing of information among localities in the process of formulating public investment projects. Not to mention, that projects on constructing infrastructure and irrigation in adapting to climate change will have negative impacts on the province or surrounding area, if not implemented in a comprehensive manner and shared information between localities.

– Most programs and projects on climate change adaptation have been designed in the field of construction solutions, accounting for about 89 % of the investment capital for climate change in the Mekong Delta in the period of 2011–2019[4]. In particular, focusing on construction: sea dikes, river dikes, reservoirs, dams, canals for flood drainage, sewers to prevent salinity etc.; attention has not been paid to non-structural, semi-structural and technological solutions, such as natural disaster monitoring and early warning systems; renewable energy; climate change adaptation based on ecosystems, protection of mangroves; sustainable livelihood model for the community and so on.

– The budget demand for climate change adaptation in localities of the Mekong Delta is very large, while 12/13 provinces and cities have not yet been able to balance budget revenues and expenditures and have to apply from the central budget. In the context of tightening and cutting public investment budget as currently, budget spending only meets about 25% of local demand, while it is difficult to attract funding for climate change investment from the private sector or the community [Bui Quang Tuan, Ha Huy Ngoc 2018].

Recommendations and conclusion

Policy recommendations

Implementing science and technology research programs and tasks in support of climate change adaptation in the Mekong Delta, focusing on the following areas: research, breeding, and development of plant varieties and aquatic varieties production adapted to climate change.

Investing in scaling up organic, sustainable and environmentally friendly farming techniques in systems of farming, intercropping and ecological farming in rural households. Building models of "Smart villages" in Dong Thap, rice farming models using smart technology 4.0 in An Giang and Kien Giang, reducing emissions in rural communities.

[4] Authors' calculations, based on the data on the implementation of projects under the National Target Program on Climate Change, the Department of Climate Change, 2019.

Investing and building irrigation systems to prevent drought and freshwater reservoirs to adapt to salinization in the Mekong Delta, reservoirs to create multi-purpose fresh water sources in heavy salty drought areas.

Focussing on planting trees and afforestation, especially coastal mangroves to preserve land and protect dykes; study and build socio-economic development infrastructure in coastal areas in combination with sea encroachment and erosion prevention.

It is necessary to have policies to strongly encourage private investment in renewable energy in the Mekong Delta, such as wind energy, solar energy, biomass energy in the Mekong Delta.

It is necessary to consider and establish a Sustainable Development and Climate Change Adaptation Fund in the Mekong Delta, with a clear operational management mechanism, in order to mobilize urgent funds, intended for specific purposes, in accordance with the general principles of sustainable management, regional adaptation.

It is necessary to invest in the system of observation, early warning of natural disasters and climate change in the Mekong Delta.

Conclusion

Through the above analysis, it is shown that the Mekong Delta is suffering from negative impacts of natural calamities and climate change. To date, many policies and programs related to climate change have been implemented in the region. However, the content of the policies remains overlapping and spreads across many fields. Thus, there is a lack of resources for implementation. On the other hand, the current process of planning and allocating public investment for climate change has to go through many procedures, which leads to low adaptive efficiency. Therefore, in the upcoming period, the Government and localities in the Mekong Delta need to focus on completing policies towards proactively adapting to climate change in the spirit of Resolution 120 / NQ-CP.

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For citation: *Nguyen Chien Thang, Ha Huy Ngoc, Tran Thi Tuyet* (2020). Climate change adaptation policies of Vietnam in the Mekong Delta. Russian Journal of Vietnamese Studies, Series 2, No. 3. P. 36–45.

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Article history:
Received: April 21, 2020
Received in revised form: September 10, 2020
Accepted: September 17, 2020

Для цитирования: *Нгуен Тиен Тханг, Ха Хюи Нгок, Чан Тхи Тует*. Политика Вьетнама по адаптации к изменению климата в дельте Меконга (англ. яз.) // Вьетнамские исследования, сер. 2, 2020, № 3. С. 36–45 (на англ. яз.).

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Продвижение статьи:

Дата поступления: 21.04.2020

Дата поступления в переработанном виде: 10.09.2020

Принята к печати: 17.09.2020