

The Challenges in Implementing Vietnam’s Nationally-Determined Contribution (NDC) in the Agriculture Sector under the Current Supporting Laws, Regulations, and Policies

Working Paper No. 217

CGIAR Research Program on Climate Change,
Agriculture and Food Security (CCAFS)

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RESEARCH PROGRAM ON
**Climate Change,
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Abstract

This study reviews the current supporting laws, regulations, and policies in Vietnam and their applicability in the effective implementation of Nationally Determined Contributions (NDC) agriculture activities in Vietnam. The Ministry of Agriculture and Rural Development (MARD) is responsible for the development of NDC activities for the agricultural sector. It can be noted that there is a strong supporting legal framework in Vietnam. There are, however, some challenges and gaps that could potentially affect the effective implementation of NDC activities in agriculture. The study considered the following five areas as critical to NDC implementation: 1) awareness and technical capacity; 2) implementation coordination; 3) downscaling to the provinces; 4) engagement of private sector and NGOs; and 5) regulatory framework. Some recommendations are proposed on how to address the challenges in the five areas identified.

Keywords

NDC; Paris Agreement; greenhouse gas mitigation; climate change adaptation; agriculture

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Contents

A. Introduction.....	9
Background/Rationale.....	9
Objectives of the study.....	9
Methodology.....	9
B. The formulation of NDC for agriculture.....	10
Timeline of NDC for agriculture.....	10
Key features of the Agricultural NDC.....	11
C. National climate change adaptation and mitigation regulations and goals.....	14
National Strategy on Climate change.....	15
National Green Growth Strategy.....	18
Law on Environmental Protection.....	21
D. Implementation challenges and knowledge gaps.....	23
NDC awareness, knowledge, and technical gaps.....	24
Coordination and resource allocation.....	26
Downscaling the NDC to scale-up implementation.....	26
Engaging the Private Sector and Development Partners.....	29
Regulatory gaps and challenges.....	30
E. Conclusions and recommendations.....	31
References.....	35

Acronyms

1P5G	1 Must-do, 5 Reductions
3G3T	3 Reductions 3 Gains
ADB	Asian Development Bank
AWD	Alternate Wetting and Drying
BAU	Business As Usual
COP	Conference of Parties
DCP	Department of Crop Production
DOSTE	Department of Science, Technology, and Environment
EBA	Ecosystem-Based Adaptation
GHG	Greenhouse Gas
IAE	Institute for Agricultural Environment
ICM	Integrated Crop Management
IFES	Integrated Food and Energy System
INDC	Intended Nationally Determined Contributions
INGO	International Non-Governmental Organization
IPM	Integrated Pest Management
LULUCF	Land Use, Land Use Change, and Forestry
MARD	Ministry of Agriculture and Rural Development
MONRE	Ministry of Natural Resource and Environment
MRV	Measuring, Reporting, and Verification
NAMA	Nationally Appropriate Mitigation Actions
NAPCCA	National Action Plan on Climate Change Adaptation
NAPGG	National Action Plan on Green Growth
NDC	Nationally Determined Contributions
NGGS	National Green Growth Strategy
NGO	Non-Governmental Organization
REDD	Reducing Emissions from Deforestation and Forest Degradation
SRI	System of Rice Intensification
UN	United Nations
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
VAC	Vuon – Ao – Chuong (Garden – Pond – Shelter)
VND	Vietnam Dong
WB	World Bank

A. Introduction

Background/Rationale

The Paris Agreement, adopted at the 21st session of the Conference of Parties to the United Nations Framework Convention on Climate Change, is the first legally binding document for all Parties to address climate change. This is reflected in the intended nationally determined contributions (INDCs) of Parties.

The adoption of the Paris Agreement opened up a new era of development in the world characterized by low carbon development, environment-friendly production and consumption models, reduced reliance on fossil fuels, and promotion of renewable energy.

Vietnam joined the international community in ratifying the Paris Agreement and its Action Plan. In the INDC technical report and later in the Nationally Determined Contribution (NDC) plan, Vietnam committed to reduce 8% of its GHG emission by 2030 relative to the business as usual (BAU) levels and aims to reduce it by 25% with adequate international support.

Agriculture is one of the biggest contributors to greenhouse gas emission in Vietnam. The Government and development partners of Vietnam expressed interest and commitment in the implementation of NDC in the agricultural sector. Starting in 2020, the implementation of the NDC will go full blast and, prior to that, Vietnam is expected to do the needed preparatory measures. Considering that Vietnam has issued several laws, regulations, and action plans in response climate change, it would be worthwhile to look into these legal documents and analyze their significance in the implementation of the NDC. Notable among these regulations are the National Strategy on Climate Change and the National Strategy on Green Growth. It is important to know if the current legal and institutional frameworks are sufficient to support the effective implementation of the NDC.

Objectives of the study

This study is carried out to analyze the current legal and institutional framework under which the Agricultural NDC (Ag NDC) in Vietnam will be implemented, identify the barriers and gaps to effective implementation, and recommend possible actions. Specifically, the objectives are:

- 1) Analyze the existing legal framework for supporting the implementation of the Agricultural NDC;
 - 2) Identify the barriers and gaps to effectively implement the agricultural NDC in Vietnam;
- and

- 3) Propose recommendation for tackling the gaps and barriers.

Methodology

This study collected and analyzed relevant laws, policies, strategies, national action plans, and other legal documents. The contents of these legal documents were analyzed on how they complement the implementation of the Ag NDC. Specifically, how the existing legal documents can support the implementation requirements for NDC awareness, knowledge and technical support, local and national coordination and resource allocation, downscaling of the NDC targets to scale-up implementation, engagement of private sector and development partners, and regulations for implementation.

During the development of this study, some the key experts and government officials involved in the development of the Ag NDC options or familiar with the NDC were consulted/interviewed to provide more specific information about the legal gaps and barriers for NDC implementation in the agricultural sector. The list of experts and governmental officials are found in Annex A.

B. The formulation of NDC for agriculture

Timeline of NDC for agriculture

Vietnam started formulating its INDC in 2014 including the agriculture component of the INDC. During the formulation of the INDC, several studies and stakeholder consultations were made. In August 2015, a multi-stakeholder consultation on the Ag INDC was organized by MARD and CCAFS. Thereafter, the Ag INDC was finalized and integrated into the INDC of Vietnam. The timeline on the INDC to NDC formulation is shown in Figure 1.

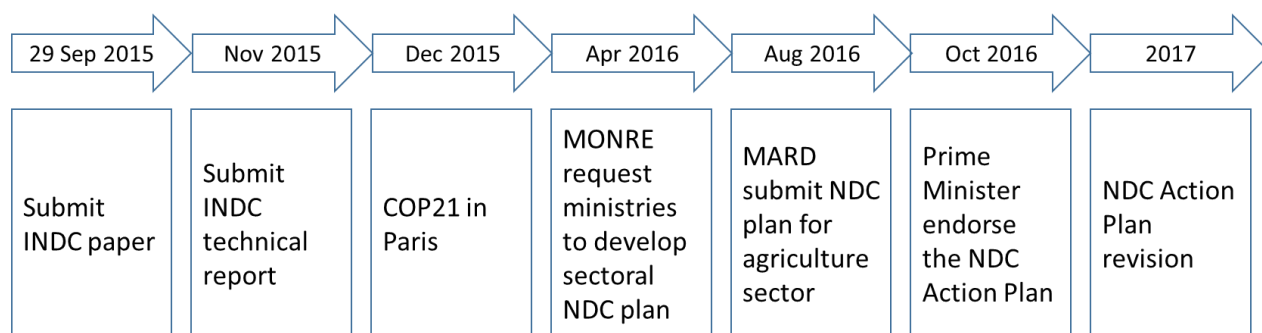


Figure 1. Timeline of the formulation of NDC plan for agriculture sector

On September 29, 2015, Vietnam submitted its new climate action plan to the UN Framework Convention on Climate Change (UNFCCC). This INDC was drafted ahead of the new universal climate change agreement reached at the UN climate conference in Paris, in December 2015. This INDC and all others submitted by countries are available in the UNFCCC website. Vietnam was among the 101 parties to the UNFCCC that have formally submitted their INDCs.

Vietnam submitted the INDC technical report in November 2015. The Report contains the intended contribution of Vietnam in GHG emission reduction and climate change adaptation. The activities in the GHG emission reduction component mostly focused on energy, agriculture, land use, land use change and forestry, and waste management. The contribution of the adaptation component focused mostly on agriculture, water resource management, and forestry to increase resilience, which could enable higher contribution to the mitigation component. During the preparation of this technical report, MARD organized a team of experts to develop the content on agriculture sector under the coordination of the Department of Science, Technology, and Environment (DOSTE). In this technical report, there were 15 activities for GHGs reduction in agriculture (including crop production, livestock, and aquaculture) and nine activities for Land Use, Land Use Change, and Forestry (LULUCF).

The 2015 Paris Climate Conference (COP21) that was held from November 30 to December 11, 2015 came up with a legally binding and universal agreement on climate, the first time in over 20 years of UN negotiations. As a result of the agreement by a majority of the parties, COP21 agreed to set the goal of keeping global warming level below 2°C.

In April 2016, the Ministry of Natural Resource and Environment (MONRE) issued Official Dispatch no.1157/BTNMT-KTTVBDKH providing instructions and requesting ministries to revise and develop their respective sectoral action plans for implementing INDC. Responding to this issuance, MARD designated DOSTE as the coordinating agency that led the development of Ag NDC plan. A study, supported by CCAFS, was conducted by DOSTE to develop the Ag NDC plan.

On August 25, 2016, MARD submitted to MONRE the Official Dispatch No.7208/BNN-KHCN on the Development of INDC implementation plan for the agriculture sector. The plan covered all sub-sectors (agriculture, livestock, forestry, and aquaculture) with both national effort and international support options. The total estimated budget was 138,210 billion VND for GHGs emission reduction component, and 13,115 billion VND for adaptation component. The number of mitigation options for agriculture was 18 and 10 for LULUCF.

After consolidating all NDC implementation plans from different sectors, MONRE sent the NDC implementation plan to the Prime Minister's office. On October 28, 2016, the Prime Minister issued the Decision No.2053/QĐ-TTg to endorse the Action Plan to Realize the Paris Agreement on climate change.

Three days later, on October 31, 2016, Prime Minister Nguyen Xuan Phuc signed Resolution No. 93/NQ-CP, on behalf of the Government of Vietnam, to ratify the Paris Agreement. As stated in the resolution, Vietnam committed to reduce 8% of its GHG pollution by 2030, and set a target of 25% reduction if adequate support from the international community is provided.

Key features of the Agricultural NDC

Based on the Official Dispatch No.7208/BNN-KHCN sent by MARD to MONRE, the NDC implementation plan for agricultural sector has mitigation and adaptation components. The details are as follows:

The first component is the Action Plan for Implementing Greenhouse Gas Emission Reduction in Agriculture Sector under Intended Nationally Determined Contribution (INDC) of Vietnam. It covers four sub-sectors such as crop production, livestock, fishery, and LULUCF. The option of national self-realization included 10 activities, with the total budget of 50,740 billion VND (equivalent to USD 2.28 billion) from the national budget, and contributions from the private sector and the community. The option with international support included 13 activities with the total budget of 76,960 billion VND (equivalent to USD 3.46 billion).

The activities of this component are as follows:

- A3, A9: Applying alternate wetting and drying (AWD) irrigation and system of rice intensification (SRI)
- A15: Improving irrigation technology in planting coffee
- A16: Mid-season water drainage
- A8: Reusing waste products of crop production
- A14: Improving agricultural processing technologies and waste treatment and biogas development in the livestock sector
- A1: Biogas development in the livestock sector
- A11: Improving livestock feeding portion
- A17: Improving livestock waste treatment technologies and reusing it for organic fertilizer

- A12: Improving technologies and techniques in aquaculture and waste treatment
- A18: Adjusting the proportion of low capacity vessels unsuitable for fishing grounds and planning routes and zones for seafood exploitation
- F1, F6: Natural forest protection
- F2, F9: Coastal forest protection
- F3, F7: Coastal reforestation
- F4, F8: Zoning for promoting regeneration of natural forest regeneration
- F5, F10: Large timber reforestation

Table 1. Key components of Vietnam Agricultural NDC

Components	Technologies and Practices	Gender and social inclusion sensitivity
Agricultural mitigation measures	Applying alternate wetting and drying (AWD) irrigation and system of rice intensification (SRI)	xx
	Improving irrigation technology in planting coffee	xx
	Mid-season drainage of rice	xx
	Reusing waste products of upland crops annually	xx
	Improving livestock feeding portion	xxx
	Improving technologies and techniques in aquaculture production	x
Land Use, Land Use Change, and Forestry (LULUCF)	Natural forest protection	x
	Coastal forest protection	x
	Coastal reforestation	x
	Large timber reforestation	
	Zoning for promoting natural forest regeneration	x
Bioenergy and waste treatment measure	Biogas development in livestock sector	xxx
	Improving agricultural processing technologies and waste treatment	xxx
	Improving livestock waste treatment technologies for producing organic fertilizer	xxx
	Improving technologies and techniques in aquaculture waste treatment	xx
Agricultural adaptation measures	Researching on the effective land use management for rice production	xxx
	Researching and transferring knowledge on new agricultural production models and systems (ICM, VAC, IFES, etc.), new crop, forest tree varieties, and new animal breeds which are more adaptive to climate change	xxx
	Researching and transferring knowledge on new technologies and techniques in agriculture, livestock, and fishery (i.e. VietGAP, GlobalGAP, Climate Smart Agriculture)	xxx
	Researching the solutions for adapting to riverbank and	xxx

coastal erosion, drought, and salinity intrusion in vulnerable ecological zones	
Reviewing and assessing the dams and reservoir safety	-
Improving and upgrading the communication infrastructure and equipment for offshore fishing vessels	-
Reviewing and planning the activities in the forestry sector in the context of climate change	xx
Researching the solutions to enhance the protection capacity of coastal mangrove forests	xx
Researching on biodiversity and biodiversity conservation	xxx
Enhancing and upgrading the hydrological and meteorological forecasting infrastructure and facilities	xxx
Constructing, renovating, and upgrading the dike systems, dams, reservoirs, drainage canals, and other irrigation infrastructure	-
Developing flood risk maps for vulnerable downstream areas	xxx
Strengthening the community-based disaster risk management	xxx
Developing models of ecological villages and climate-smart villages	xxx

Source: Summarized by authors

The second component in the Agriculture NDC is the Action Plan for Implementing Climate Change Adaptation Measures of Agriculture Sector under Intended Nationally Determined Contribution (INDC) of Vietnam with the total budget of 13,115 billion VND (equivalent to USD 590 million). This included eight sub-sectors (crop production; livestock; fishery; forestry; water resource; salt production; rural development; and natural disaster response, prevention and control). The major activities are: research in breeding to produce new varieties which tolerate to climate change risks (rice, food crops, cash crops, forestry, cattle, and poultry); research to improve, enhance agricultural production system (ICM, VAC, IFES, EBA); research to develop and scale up climate smart agriculture techniques; strengthen the weather and natural disaster forecasting; enhance the management and conservation capacity of natural resource (water, forest, land, etc.); and improve and renovate the infrastructure to respond to climate change and natural disasters (dykes system, canals, sluices, reservoirs, etc.). The perceived gender and social inclusion sensitivity were rated in this study (Table 1).

C. National climate change adaptation and mitigation regulations and goals

As climate change is considered as one of the most important issues affecting the sustainable development of the country, all political and governmental agencies have made great efforts to resolve this issue. Many policies, strategies, regulations, and plans have been developed

with the involvement of all levels of the authorities, of which the Vietnam Communist Party is at the highest.

Resolution No. 24/NQ-TW of June 6, 2013, of the 7th Plenum of the Party Central Committee, 11th Tenure on actively responding to climate change, strengthening resource management, and environmental protection. This resolution is intended to further enhance the mainstreaming of climate change and sustainable development in Vietnam, in response to what the government sees as an insufficiently rapid and serious response to previous action plans and legislation amongst Vietnam's ministries. It also promotes the shift towards a model of green growth (see Green Growth Strategy below) by identifying the opportunities to transform the economic growth model towards sustainable development (Ha, 2017). In order to do that, the resolution seeks to create favorable conditions for businesses to invest in green growth, with the government mandated to establish the legal framework and build specific policies to support business. Based on analysis of opportunities and challenges, the resolution set the direction and delegates responsibilities to realize immediate and long-term key tasks in response to climate change, resource management, and environment protection.

On January 23, 2014, the Government issued the Resolution No.08/NQ-CP to realize Resolution No. 24/NQ-TW through the approval of an action plan. The action plan's overall target is supporting the development and implementation of strategies, policies, and projects responding effectively to negative effects of climate change in Vietnam. It also aims to support the implementation of tasks set out in the National Strategy on Climate Change, the Strategy on Green Growth and other strategies related to climate change while aiding activities related to policies, science, technology and finance of the government, development partners, and private organizations, in order to ensure the effective utility of resources for responding to climate change in Vietnam.

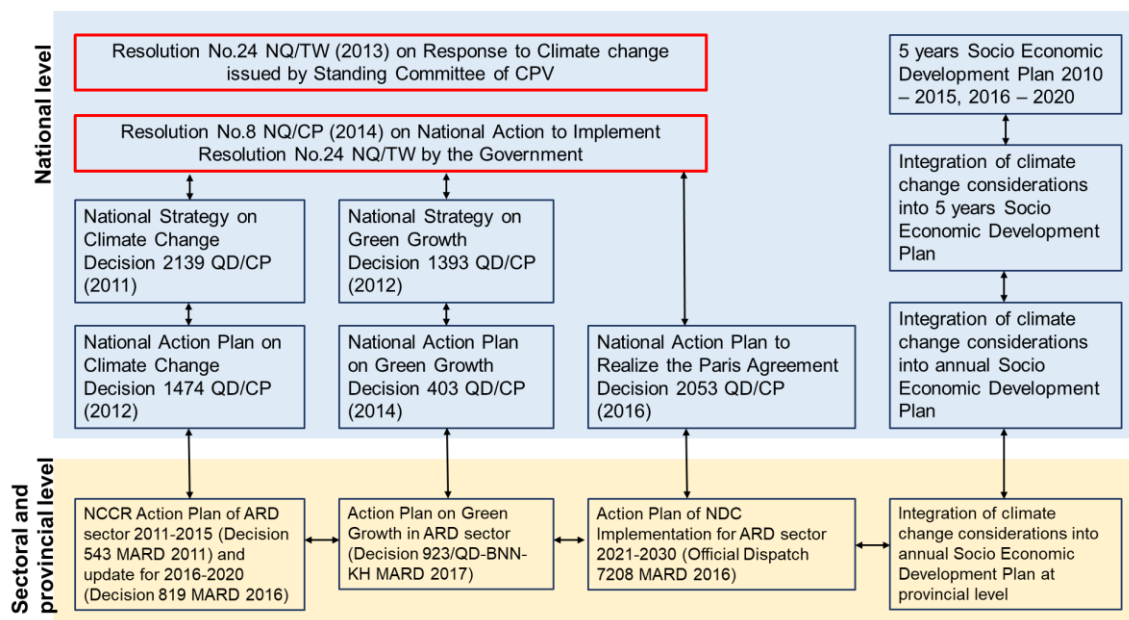


Figure 2. Legal framework for Agricultural NDC in Vietnam (adapted from Tran Dai Nghia, 2016; Rebugio et al, 2017)

National Strategy on Climate change

The National Strategy on Climate Change was issued by Prime Minister Nguyen Tan Dung in Decision No.2139/QD-TTg on December 5, 2011. The strategy's first general target is to bring into play the whole country's capacity in simultaneously taking measures of adapting to the impacts of climate change and cutting down greenhouse gas emission in order to secure people's safety and property as well as for the sake of sustainable development. The specific objective related to GHG emission reduction is to turn the low-carbon economy and green growth into main orientations for sustainable development; and lower emission and higher absorption of greenhouse gases to become compulsory indicators of socio-economic development.

MARD issued Decision No. 543/QĐ-BNN-KHCN on March 23, 2011 to promulgate the Action Plan on Climate Change response of the agriculture and rural development sectors from 2011–2015 and vision to 2050. This plan included 54 tasks, requiring a total funding amounting to 402 billion VND. However, only 21 tasks have been implemented with a total funding of 47,180 billion VND.

To revise and update the action plan, MARD Minister issued Decision No.819/QĐ-BNN-KHCN on March 14, 2016 to promulgate the Action Plan on Climate Change response of agriculture and rural development sector from 2016–2020 and 2050 vision. The updated Action Plan indicated 73 tasks, including the activities for all sectors in general and specific activities for sub-sectors (crop production, livestock, forestry, and aquaculture) in particular,

and 27 investment projects. The total budget estimated for this updated Action Plan was 48,150 billion VND (equivalent to USD 2.16 billion), in which the budget for responsive activities is 6,950 billion VND (equivalent to USD 311.7 million), and the budget for investment projects is 41,200 billion VND (equivalent to USD 1.85 billion).

The Action plan was developed with the following objectives:

- 1) Strengthen capacity for institution and policy, science and technology to respond to climate change in agriculture and rural development in 2016–2020, with a 2050 vision towards sustainable agricultural and rural development, improving value-added, enhancing livelihoods, protecting the environment and population against the negative impacts of climate change;
- 2) Mobilize resources and participation of organizations and individuals, both domestically and internationally, to implement activities to adapt to climate change and reduce greenhouse gas emissions in the fields of cultivation, husbandry and aquaculture, forestry, irrigation, salt production, and rural development in the agricultural and rural development sectors for the 2016–2020 period, with a vision up to 2050 aimed at maintaining a sector growth rate of 20%, reduce poverty incidence by 20%, and GHG emission reduction by 20% in each 10-year period;
- 3) Proactively prevent and combat natural disasters, prevent floods, saltwater intrusion, consolidate river and sea dykes, and ensure the safety of reservoirs, civil works, and technical infrastructure in order to meet the needs for natural disaster prevention and mitigation in agriculture and rural development against the backdrop of climate change in 2016-2020, vision to 2050; and
- 4) Develop human resources, facilitating international cooperation and efficient use of support finance, actively participating in international negotiation to raise the position of agriculture and rural development on activities to respond to climate change in the 2016–2020 period, vision to 2050.

The main tasks include:

- 1) Develop directives and guidelines to integrate climate change response into specific programs, projects, and work plans of the sector;
- 2) Review and complement policies providing financial and land incentives to encourage investments under private-public partnerships (PPP) in adaptation and mitigation activities of agriculture and rural development; and
- 3) “Revise and continue completing the policies.” The plan pointed out the need to develop a guideline to instruct the integration and implementation of NDC. The plan also dedicated a budget of 230 billion VND for communication and capacity building.

Besides the main tasks, the Action Plan's tasks on GHG emission reduction:

Crop production

- Continuing to replicate models, advanced farming methods such as good agricultural practices (VietGAP), Integrated Crop Management (ICM), 3 Reductions 3 Gains (3G3T), 1 Must-do, 5 Reductions (1P5G), Integrated Pest Management (IPM), System of Rice Intensification (SRI), minimum tillage, vegetation cover (only mentioned SRI, but not yet the application of alternate wetting and drying (AWD) irrigation, while activity A9 is Applying alternate wetting and drying (AWD) irrigation and system of rice intensification (SRI).
- Pilot and disseminate socialization models of the collection, treatment, and reuse of crop residue in cultivation (straw, maize, corn cobs, bagasse, cassava leaves, coffee husks, produce organic fertilizer, biochar, animal feed, materials, fillers, etc. to reduce environmental pollution and reduce GHG emissions. (A8: Reusing waste and bi-products of crop production)

Livestock

- Research new fodders, shift to high quality and nutrient rich fodders, especially for dairy cows and big cattle. (A11: Improving livestock feeding portion)
- Enhance the application of new technology (biogas, living bed) in processing livestock residues to produce organic fertilizers (A17: Improving livestock waste treatment technologies and reusing for organic fertilizer production).
- Continue to implement the biogas program, research to innovate the processing technology, diversify the uses of biogas (A1: Biogas development in livestock sector, extend the scale of biogas utilization in livestock production).

Fishery and aquaculture

- Research to innovate the ship designing and construction in order to enhance energy efficiency (A18: Adjusting the proportion of low capacity vessels unsuitable for fishing grounds; planning routes and zones for aquaculture exploitation).
- Develop and apply waste treatment and processing technology for aquaculture production (cat fish) (A12: Improving technologies and techniques in aquaculture and waste treatment).

Forestry

- Manage, protect, and increase forest coverage, increase biomass and improve forest quality to increase the carbon trap (F1, F2, F3, F5: Natural forest protection, coastal forest protection, coastal reforestation, large timber reforestation)

Irrigation

- Replicate, strengthen saving irrigation models, drainage of rice fields in rice cultivation, drip, and sprinkler irrigation methods for coffee, fruit, upland crops, and vegetable production zones with high economic value in specialized areas; (A15: Improving irrigation technology in planting coffee).

It can be seen that the mitigation task under the Action Plan on Climate change response of agriculture and rural development sector in the period 2016–2020 covers almost all the task indicated in the Agriculture NDC plan. There are only 4 tasks missing, including A3: Applying alternate wetting and drying AWD, A16: Mid-season drainage, A14: Improving agricultural processing technologies and waste treatment, and F4: Zoning for promoting natural forest regeneration.

National Green Growth Strategy

On September 25, 2012, the Prime Minister issued Decision No.1393/QĐ-TTg on the Approval of the National Green Growth Strategy. The strategy aimed to reduce the intensity of greenhouse gas emissions and to promote the use of clean and renewable energy according to the following essential targets:

Targets for 2011–2020: Reduce the intensity of greenhouse gas emissions by 8–10% as compared to the 2010 level; reduce energy consumption per unit of GDP by 1–1.5% per year; and reduce greenhouse gas emissions from energy activities by 10% – 20% as compared to the business as usual case. These commitments include a voluntary reduction of approximately 10%, and an additional 10% reduction with an additional international support.

Target from 2020–2030: Reduce annual greenhouse gas emissions by at least 1.5–2% per year; and reduce greenhouse gas emissions in energy activities by 20–30% compared to business as usual. Of this commitment, the voluntary reduction will be approximately 20%, and another 10% target, dependent upon additional international support.

Target from 2030–2050: Reduce greenhouse gas emission by 1.5–2% per year.

The strategy also stipulates that the People's Committees of the different provinces and cities shall be responsible for formulating their respective programs and action plans that provide guidance in the implementation of green growth strategies; specify tasks; integrate into annual and 5-year economic-social development plans; and ensure funds for implementation at local levels.

The NGGS identified in the major objective of MARD is to reduce the greenhouse gas emission from the agricultural sector while maintaining agricultural growth rate, and ensuring poverty reduction. In order to achieve that goal, the NGGS envisions to reduce greenhouse gas emissions in agriculture through different actions:

- 1) Review and adjust the sector development master plans of all sub-sectors under agriculture;
- 2) Research and apply new technologies in agricultural production in order to efficiently use natural resources and reduce GHG;
- 3) Promote the treatment and reuse of agricultural by-products for other purposes (e.g. animal feed, biogas, organic fertilizer, mushroom production, etc.);
- 4) Improve the implementation of afforestation and reforestation projects at the same time encourage investment from the private sector; and
- 5) Develop Reducing Emissions from Deforestation and Forest Degradation (REDD), sustainable forest management, and farmer livelihoods diversification projects.

In particular, the NGGS appointed MARD to plan and project 16.24 million ha of forest area for sustainable management; raise the forest coverage to 45%; sustainably and effectively manage 8.132 million ha of production forests, 5.842 million ha of preventive forests, and 2.271 million ha of special-use forests by the end of 2020.

Two years later, on March 20, 2014, the Prime Minister issued Decision No.403/QĐ-TTg on the Approval of the National Action Plan on Green Growth in the period 2014–2020. This action plan includes 47 activities with some specific ones directly related to agriculture and rural development. MARD is assigned to implement those activities.

Activity 20: Apply organic agricultural techniques and improve the management capacity in order to reduce the GHG emission.

Activity 21: Reuse and recycle the by-products and wastes from agricultural production.

Activity 22: Research and promote the application of nutrient-rich fodders for livestock with high level of absorption to reduce GHG emission

Activity 23: Reforestation and improvement of forest management capacity promotion of sustainable forest management.

Activity 24: Innovate technology in aquaculture, fisheries exploitation, production, and processing.

Activity 25: Enhance the efficiency in using energy and reduce the emission/pollution in the craft-industry production in rural areas.

Activity 31: Revise and provide suggestions on amending the development plan of agriculture, forestry, livestock, and fisheries from the viewpoint of sustainable development; and develop the policy framework and agricultural sector green growth action plan for 2020.

Activity 39: Prevent land degradation and promote the sustainable and effective land resource exploitation and management.

Activity 40: Promote sustainable and effective water resource exploitation and management.

Three of these activities are similar to what was proposed in Agricultural NDC. These are:

Activity 21 – similar to A8 and A17 in NDC; Activity 22 – similar to A11 in NDC; Activity 23: Reforestation and improved forest management capacity, and promote sustainable forest management similar to all activities in LULUCF sub-sector; and Activity 23– similar to A12 and A18 in NDC.

The National Action Plan on Green Growth (NAPGG) listed the sources of the budget for each activity, including the state budget, socialized budget (from the private sector), community contribution, and international financial support. However, there is no breakdown of the budget for each activity, and no mechanism to allocate the state budget or attract the participation of private sector and international partners to implement the plan.

At the sectoral level, MARD issued Decision No. 923/QD-BNN-KH on “Appointing the Responsibility to Implement Green Growth Action Plan of Agriculture and Rural Develop Sector to 2020” on March 24, 2017. The decision specified the tasks for agricultural sector regulated in the NAPGG covering 39 activities.

Thus, to date, there are three action plans containing activities related to greenhouse gas reduction and climate change adaptation (Figure 3).

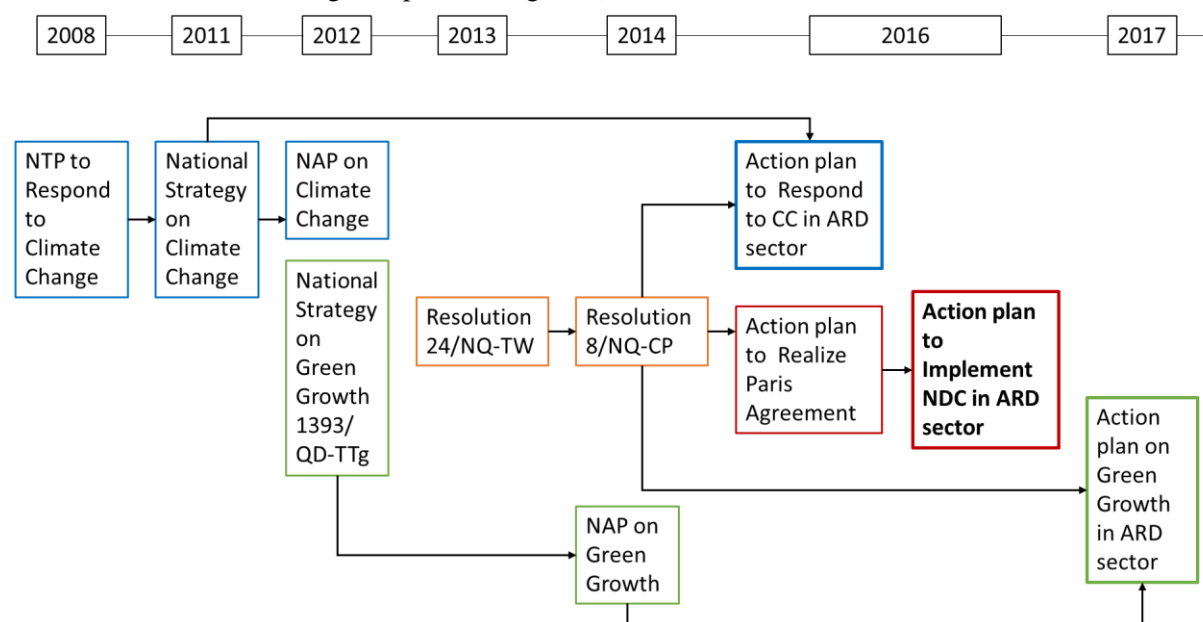


Figure 3. Formulation of climate change-related action plans in ARD sector

As shown in Figure 3, there is no clear linkage between the three action plans in agriculture and rural development sector. Even though many activities indicated in the Agricultural NDC plan were also mentioned in the other two plans, there has been no harmonization of the NDC plan with climate change response plan and green growth plan to optimize funding and human resources in implementing these different activities.

Law on Environmental Protection

In order to better protect the environment from the negative impacts of human activities, the Law on Environmental Protection was developed by the National Assembly and took effect on June 23, 2014. This Law provides statutory provisions on environmental protection activities; measures and resources used for the purpose of environmental protection, rights, powers, duties, and obligations of regulatory bodies, agencies, organizations, households, and individuals who are tasked with protecting the environment. This Law applies to regulatory bodies, public agencies, organizations, family households and individuals within the territory of the Socialist Republic of Vietnam, including mainland, islands, territorial waters, and airspace.

The Law on Environmental Protection defines response to climate change as the actions that human beings may take to adapt to and mitigate the climate change and dedicates a chapter on this issue (Chapter IV)¹.

There are 10 articles from 39 to 48 for regulating the response to climate change. The coverage of the articles ranges from general provisions on the response to climate change to specific tasks regarding the different topics, such as GHG emissions management, renewable energy, and waste-to-energy process. The last two articles also identified the rights and responsibilities of human community, science and technology development and application, and international cooperation. According to the Law, the government shall regulate the roadmap and modality for their participation in reducing global greenhouse gases in conformity with the socio-economic conditions and commitments made in the international agreements to which the Socialist Republic of Vietnam is a signatory (i.e. Paris Agreement).

The law mandates the Ministry of Natural Resources and Environment to assist the Government in designing, implementing, and providing guidelines for the responses to climate change. Thus, MONRE is responsible for coordinating the formulation and coordination of NDC implementation at the national level. The relevant provisions of the law relevant to the implementation of Agricultural NDC are the following:

Article 40 mandates the integration of main contents of responses to climate change with the strategy, planning and proposal for socio-economic development as well as planning for industrial and sectoral development. This integration must rely on the assessment of correlation of activities described in the strategy, plan, and proposal on the environment,

¹ <https://thuvienphapluat.vn/van-ban/Tai-nguyen-Moi-truong/Luat-bao-ve-moi-truong-2014-238636.aspx>

climate change, and a range of measures to be taken for the environmental protection and response to climate change.

Article 41 prescribes the greenhouse gas emission management to mandate MONRE to direct and cooperate with the concerned Ministries and industries in carrying out the inventory of greenhouse gases, and to compile a national report on the management of greenhouse gas emissions that meet the rigorous standards set out in the international agreements to which the Socialist Republic of Vietnam is a signatory.

Article 43 promotes the production of renewable energy development including bio-fuel (e.g. biogas).

Article 47 prioritizes all activities relating to the study, transfer and application of technological and scientific advances for the response to climate change, including (a) management, assessment, supervision, and prediction of impacts caused by climate change on the socio-economic growth, environmental issues, and community health; and (b) technological advances in reducing greenhouse gases and coping with climate change.

The Law on Environmental Protection is the only overarching legal document which covers the response to climate change in Vietnam. The final article regulates the international cooperation in response to climate change, which built the firm ground for the implementation of NDC. The contents developed in Chapter IV cover a wide range of provisions, from management, activities, rights, and responsibilities, and incentives. There is a need for implementing rules and regulation to guide the implementation of environmental protection activities. There is a need for guidance in providing priority or incentive for climate change responsive efforts. For example, according to Article 47, priority will be given to all activities relating to the study, transfer, and application of technological and scientific advances to respond to climate change. However, the prioritization that shall be done is not stipulated (priority for budget allocation, or priority for human resource allocation, or priority in terms of timeframe).

D. Implementation challenges and knowledge gaps

Based on the foregoing review of the different legal documents, some implementation challenges and knowledge gaps have been identified in the areas of (1) awareness, knowledge, and technical capacity; (2) coordination; (3) downscaling; (4) engagement; and (5) regulatory. These are summarized in Table 2.

Table 2. Major challenges for NDC implementation in agricultural sector

Awareness and technical	Coordination	Downscaling	Engagement	Regulatory
<ul style="list-style-type: none"> • Low awareness and knowledge of government officials • Low awareness of farmers and agricultural producers • Low capacity (technical, infrastructure, human resource) for MRV 	<ul style="list-style-type: none"> • Lack or inadequate institutional arrangements • Funds raising and allocation • Collaboration across sub-sectors in agriculture 	<ul style="list-style-type: none"> • Lack of guidance and mechanism to translate the National and/or Sector NDC plan to provincial and sub-sectoral plan • Lack of instruction for provincial and sub-sectoral planning for NDC implementation or integration 	<ul style="list-style-type: none"> • Lack of policy to support or attract the participation of private sector • The development sector lacks an effective entry point for a coordinated response to climate change 	<ul style="list-style-type: none"> • Climate change policies are mainly for orientation at national level • Current policies on climate change are very strong in mandates but weak in inducements

1. NDC awareness, knowledge, and technical gaps

Climate change, its impacts, and the mitigation and adaptation measures taken to address them are not new to the governmental officers of Vietnam. There are many national plans, strategies, and policies formulated for responding to climate change. Government officials and communities have relatively good knowledge and understanding about climate change and its impacts.

Their awareness of climate change mitigation measures, the Paris Agreement, and the NDC are very limited (UNDP, 2016). This limited awareness and knowledge on these three topics create a significant challenge to implement NDC plan successfully in many developing countries like Vietnam. Based on the interviews with respondents, technical officials (i.e. crop production, livestock production, fishery, etc.) and their offices are still focused only on their technical mandate that excludes the implementation of climate change adaptation and mitigation measures.

Hence, the integration of climate change adaptation and mitigation measures have to be mainstreamed in the relevant office's mandate and programs. Capacity building on climate change issues and measures for concerned government officials should be tailored to their line of work. For example, build on what the officials of the Department of Livestock Production are currently doing, and enhance their awareness, knowledge, and capacity on GHG emission from livestock and relevant mitigation measures.

The limited awareness and knowledge of farmers and agricultural producers on climate change issues and measures have to be addressed for an effective NDC implementation. Farmers and agricultural producers need enhanced awareness and knowledge on climate change; climate change impacts on their crops; coping measures to such impacts; the contribution of agriculture to climate change; and the measures to reduce those agriculture's contributions to worsening the climate change situation. During discussions, the need to enhance the knowledge awareness of farmers and agricultural businesses were emphasized in order to create a good foundation for introducing and applying greenhouse gas emission mitigation technologies. It was suggested to adopt a "pull policy" as a prerequisite to entice farmers and agricultural businesses to implement the different NDC measures.

Another constraint to the effective implementation of greenhouse gases inventory is insufficient technical infrastructure. Currently, there are only a few institutions capable of implementing the GHG inventory. Hence, although many researchers have studied the methodology to conduct a GHG inventory in agriculture (i.e. rice production, livestock production, etc.), there have been many challenges in developing a standardized methodology appropriate for the different agro-ecological zones.

Measuring, Reporting, and Verification (MRV) is a very important component in the NDC implementation. MRV system is comprised of three major components:

- 1) Measuring greenhouse gas emissions (GHG inventories), greenhouse gas reduction through mitigation actions, and support (type, amount, impacts);
- 2) Reporting the inventories and mitigation results through standardized formats to disclose it to the public; and
- 3) Verification by periodically submitting reports for review to ensure compliance, conformity, transparency, and for receiving feedback to improve implementation (United Nations Climate Change Secretariat, 2014; Singh, N., J. Finnegan, and K. Levin, 2016). In Vietnam, the MRV system has not yet been developed at the national level and for the different sectors. This could be explained by the fact that the capacity to implement MRV at the national level in general, and in the different agriculture sectors, especially in the measurement component, is weak. Respondents from the

Institute for Agricultural Environment (IAE) noted that current MRV capacity is not enough to implement the NDC plan at the national level. IAE has been working as the leading agency in MRV for the agricultural sector, but the institute’s facilities, equipment, and human resources do not satisfy the requirements of MRV tasks, especially in ensuring transparency and compliance to the UNFCCC MRV Framework.

2. Coordination and resource allocation

Another key challenge identified was in creating a robust institutional structure to manage and coordinate the NDC implementation process. As Vietnam is currently revising the NDC plan, clarifying institutional arrangement is critical for a successful implementation. In many countries, these are built on institutional arrangements already in place for climate change policy implementation. For Vietnam, considering the current setup in implementing the different climate change action plans (Figure 3) and MARD’s current organizational setup (Figure 4), a review and harmonization of roles are needed to improve coordination. United Nations Development Programme (UNDP) suggested that this should include strengthening the capacity of lead institutions to develop and implement NDC-related policies and programs, coordinating with sectorial line ministries, and engaging stakeholders in the NDC implementation process (UNDP, 2016).

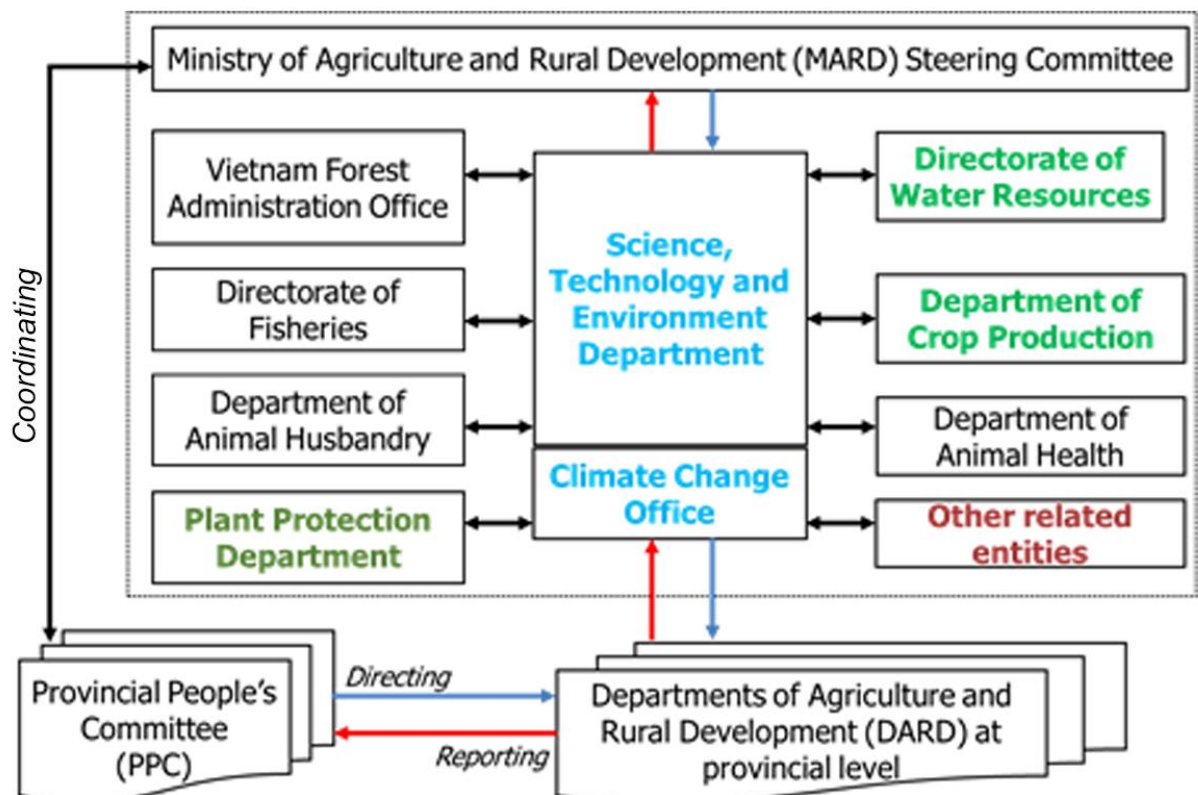


Figure 4. Organizational structure for implementation of climate change policy in MARD (Rebugio L., Iao, S., 2016)

According to the Decision No. 2053/QĐ-TTg issued by the Prime Minister on October 28, 2016, the government assigned MARD to preside and collaborate with other ministries and agencies to implement the NDC plan for the agricultural sector. DOSTE was assigned as the coordinating agency to work with departments under MARD in developing the NDC plan activities in different sub-sectors, including crop production (Department of Crop Production), irrigation (Directorate of Water Resources), LULUCF (Vietnam Forest Administration Office), livestock (Department of Animal Husbandry), and fishery (Directorate of Fisheries). The figure above illustrates the organizational structure for implementing the Action Plan for the agriculture and rural development sectors in response to climate change.

However, there has been no such structure and/or a specialized institution for implementing the NDC. In the Official Dispatch No.7208/BNN-KHCN sent to MONRE on the Development of INDC Action Plan for Agricultural Sector, MARD assigned different tasks to its departments, but lacked directing, cooperating, monitoring, reporting, and verification mechanism. Moreover, the roles and responsibilities of the Steering Committee for Climate Change Mitigation and Adaptation and its Standing Office (OCCA) have not been clearly regulated. Because of this, MARD should consider appointing its Steering Committee for Climate Change Mitigation and Adaptation to be the coordinating agency for the NDC implementation, and should develop in detail its mandates and responsibilities. In the mid-term and annual MARD plan, OCCA needs to synthesize the NDC activities from all sub-sectors, and develop a plan at ministerial level for allocating budget from state or external sources.

The NDC Action Plan needs a clearly defined source of funding both from the state budget and external sources for its implementation to be effective. The ongoing review of the NDC Action Plan should come up with an estimated budget for each activity and expected sources of funding. The amount of estimated budget has also identified the proportion of contribution from the private and the business sector. However, the form that the contribution from this sector will take and the stage in which this contribution will be added to were not yet specified. Furthermore, it still lacks an instruction on the budget allocation mechanism. For example, the application of AWD irrigation for 200,000 hectares is assigned to the Department of Crop Production (DCP), and this department has to collaborate with other related agencies of the Ministry for implementation. There is an estimated budget of VND 2 trillion for this activity, but how and where DCP can get this money is not clear.

3. Downscaling the NDC to scale-up implementation

Another major challenge to the Agricultural NDC implementation is the operationalization of the action plan from the national level to provincial level, and from sectoral to sub-sectoral level. In the Agricultural NDC plan, MARD tasked its departments and directorate to coordinate with the province in implementing the assigned activities. There was a specific instruction on how to go about the implementation process with the concerned provinces for some activities. For example, activity A11 – Improve livestock feeding portion was assigned to the Department of Livestock Production to implement in provinces with large scale livestock farming such as Dong Nai, Thanh Hoa, Tien Giang, and Long An. However, almost all other activities were not clearly identified the targeted provinces, the approach for setting objective and implementation at provincial level.

Similarly, the downscaling of NDC plan by sector also faces many difficulties in implementing the sub-sector activities. Taking the example from crop production sub-sector, DCP can prioritize the researches and pilot projects on climate change mitigation and adaptation such as new climate-smart varieties, and new cropping system suitable to new climatic conditions. However, implementing other activities (e.g. water-saving irrigation, alternate wet and dry, and rice straw processing) or integrating them into their regular working agenda will be a challenge for DCP, considering its existing capacity. In this case, DCP has to collaborate with other departments and offices to develop a work plan for these activities for submission to the Department of Planning for budget allocation. The Department of Planning may disapprove or downscale the proposed activities depending on the government's sectoral priorities reflected by the amount allocated for these activities in the central budget.

The implementation of NDC activities even becomes more challenging with the absence of a planning mechanism at the provincial level. In this case, the instructions to the Provincial People's Committee to develop an implementation plan for the NDC activities has not been issued yet, neither is the guideline for the integration of the NDC activities into the provincial socio-economic development plan. The agricultural NDC plan has indicated some target provinces or regions for different activities. For example, the improvement of irrigation techniques for coffee plantation activity is recommended by DCP for the Central Highland with proposed 60% funding coming from central government and 40% from local and private sources. However, the detailed implementation protocol still has to be developed. Details on the specific irrigation technology for the Central Highland; the cost, benefits, and trade-offs when applying the new techniques; the investment required from the provinces; and the approaches appropriate when introducing, piloting, and upscaling are still unspecified.

Hence, at sectoral level, MARD can consider developing the thematic projects (crop, livestock, forestry, aquaculture, etc.), and this lead to a need to clearly define the roles of the provinces and the national Project Management Unit (Agriculture Project Management Unit, Forestry Project Management Unit, Irrigation Central Project Office) for NDC implementation. It should also be clarified how the NDC activities can be integrated into the provincial socio-economic development plan and provincial green growth plan. A new regulation may be needed to delineate these roles and responsibilities and harmonize process.

4. Engaging the Private Sector and Development Partners

Almost all the legal documents emphasize the importance of the private sector and promote the participation of businesses and entrepreneurs in addressing climate change impacts. However, government still lacks support in encouraging participation of the private sector. In the implementation of all action plans, including the NDC plan, the government has not highlighted the incentives for the private sector to encourage them to participate in the implementation of climate change response activities. The current existing mechanisms regulated by the Decree 210/2013/ND-CP on Incentive Policies for Enterprises Investing in Agriculture and Rural Areas only provides a number of incentives and additional investment support of the State for enterprises which invest in agriculture and rural areas. It does not specify incentives for climate-smart agriculture or application of agricultural techniques that reduce GHG emission and enhance the response to climate change. Currently, there are some companies applying climate-smart agriculture (i.e. Loc Troi Group) for their production. However, they implement the technique only to meet the needs of strategic project shareholders such as the IFC, the World Bank, international investment funds, and export markets, rather than to comply with the government's roadmap. A private company that tried working with the government for support/incentive to implement climate-smart agriculture model has to undergo a long procedure and bear with bureaucratic red tape. Hence, the company withdrew its proposal and decided to invest in the model, without government support.

The government can also take measures to oblige businesses to change their way of operating toward applying climate-smart technologies and practices, and contributing to GHG mitigation, by giving sanctions (Trinh, 2016). It can penalize non-compliance to certain emission standard in agriculture activities, require the adoption of climate-smart technologies for a specific time, and ban certain procedures or process detrimental to the environment. Some of these rules may have been covered by existing rules, and could be reviewed for their applicability in supporting the Agricultural NDC implementation.

Despite several regulations regarding international cooperation on climate change adaptation, green growth, and environmental protection, the development sector lacks an effective entry point for a coordinated response to climate change. Many development organizations within Vietnam (both International Non-Governmental Organizations and local Non-Governmental Organizations) currently working on climate change have expressed their support of the State in implementing the NDC plan, especially the National Adaptation Plan (NAP) within the agricultural sector. There are already several projects being implemented by NGOs across Vietnam in line with the proposed NDC plan. These initiatives can integrate into the Government implementation through improved information sharing between the NDC, implementing government agencies at the national level, and the NGO community. Furthermore, a working cooperation mechanism should be defined to identify the role of NGOs in implementing the NDC plan in the agricultural sector.

5. Regulatory Gaps and Challenges

In general, all the laws, strategies, and action plans provided solutions for MRV raised the capacity and undertook several activities for GHG mitigation and climate change adaptation in agriculture, similar to what was proposed in the Agricultural NDC plan. However, these laws, strategies, and action plans are mainly for orientation at the national level, and not for orienting local and sub-sector levels.

The current policies on climate change have very strong mandates but still lack implementing rules and regulations. The GHG emission reduction has been generally mentioned in all national strategies and action plans, but not yet comprehensively regulated in any law or under-law legal document to identify the responsibilities and roles of GHG emitters. Although the Law on Environmental Protection indicated that the government and local authorities should create a favorable condition to support individuals, institutions, and companies to mitigate GHG, the mechanism for incentives and /support for farmers, agricultural producers, and entrepreneurs to reduce the GHG emission has not been developed. The legal framework defining the limitation/quota of GHG emission for each company, province, and sub-sector also needs to be developed.

Moreover, there are also many overlaps among the different legal documents which could confuse the implementing agencies. The NDC Action Plan is the newest among the climate change responsive agenda at the national level, thus the need to align and synchronize it with NAPCCA and NAPGG.

E. Conclusions and Recommendations

The Agricultural NDC plan was developed under the coordination of DOSTE, with the participation of many experts in different sub-sectors of agriculture, including crop production, livestock production, forestry, fishery, and irrigation. It is comprised of two major components – one for mitigation and another for adaptation. These two components cover all sub-sectors of agriculture including LULUCF. The plan has been circulated among sub-departments under MARD for comments and recommendations.

In general, Vietnam has a suitable legal framework to support the implementation of NDC. With many laws, national strategies, national action plans, and other legal documents which are currently regulating and/or conducting similar activities for climate change mitigation and adaptation, the NDC plan has a strong legislative foundation to be developed and implemented.

There are three related programs working on climate change issues namely, the National Action Plan to Respond to Climate Change, the National Action Plan for Green Growth, and the National Action Plan to Implement NDC (Paris Agreement). At the sectoral level, MARD has also developed the action plan for the agriculture and rural development sectors. All those plans support Resolution No. 24/NQ-TW in actively responding to climate change and strengthening resource management and environmental protection. The overarching law that sets the basis for the implementation of NDC in the agricultural sector is the updated Law on Environment Protection issued by the National Assembly on June 23, 2014.

However, despite the above mentioned favorable conditions, the implementation of agricultural NDC in Vietnam still faces many challenges in terms of awareness and technical capacity, institutional coordination, planning and downscaling, stakeholder engagement, and regulatory issues (Table 2).

There is an urgent need to raise the awareness of government officials and communities, especially those who are directly involved in production and production management as stipulated in the Paris Agreement and Vietnam NDC. Mainstreaming NDC targets and activities as integral part of agriculture sectoral plans and programs should be taken into consideration as a solution to provide the knowledge and information on the roles and responsibilities of each agency under MARD in implementing the NDC plan to ensure success.

Under MARD, DOSTE or OCCA should act as the coordinating agency in disseminating the information related to NDC to other departments, directorates, and agencies. Raising awareness could be implemented through campaigns, mobilizing the media by integrating

these information into training courses, communication activities, and scientific seminars organized by DOSTE. Awareness-raising activities for farmers could be implemented through various projects currently being managed and operated by MARD (i.e. VNSAT, World Bank project on Irrigated Agriculture Improvement), and other projects/programs in the field of natural disaster risk management and climate change response, or through mass media (i.e. Vietnam Television and Voice of Vietnam Radio).

The content for awareness and information dissemination campaign for farmers, producers, and local officials should focus on the GHG mitigation and adaptation measures indicated in the Agricultural NDC Action Plan, and should be tailored to the specific needs of the target audiences. It should contain, among other things, suitable measures for their area, as well as details on when and where they can apply the measures. In this case, there is a need to identify the different recommended measures for different agro-ecological zones, provinces, and communes. For example, when drip irrigation for coffee plantation is identified as a measure in Central Highland, the awareness-raising activities should focus on climate change impacts on water resources, the importance of water saving, and the benefits of drip irrigation for coffee cultivation. The target audience should include coffee farmers, extension workers, and crop production management officials at the local level.

As MONRE will preside over the development of a national MRV system, MARD should consider designating MARD's DOSTE to coordinate the development of a sectoral MRV system for agriculture, which is in-line with the national system. At the same time, capacity building on MRV is needed to enhance the technical capabilities of the Department of Crop Production, Department of Livestock Production, Directorate of Fisheries, Directorate of Forestry, and other concerned agencies (e.g. Directorate of Natural Disaster Prevention and Control, Directorate of Water Resource). The officials from these departments and agencies should be equipped with knowledge on NDC, GHG inventories, GHG measuring techniques, and reporting, in compliance with international procedures and requirements. An investment for improving and modernizing the infrastructure of the MRV, especially for measurement is needed to monitor the GHG emission and mitigation more accurately and to ensure the reliability of reported information. When an MRV system is set up, it can be used by MARD to measure the progress in GHG mitigation of the other programs like Green Growth, Climate Change Adaptation, and Sustainable Production in Agriculture.

A feasibility study for Agricultural NDC should be conducted for each activity to identify the appropriate intervention for each agro-ecological zone and/or each province accordingly. The feasibility study should be conducted comprehensively to cover all issues from natural condition, political context, investment requirements, financial policy, applicability and

potential benefits of NDC activities. The result of the feasibility study then should be used to convince local authorities to integrate NDC activities into their development agenda, or to develop project proposals and call for international support. For the provinces which have fully developed their provincial climate change adaptation and/or green growth action plans, they need to apply the MRV system to measure the mitigation efforts to realize the NDC plan at the local level.

The results of the feasibility studies can be used to develop a clear and comprehensive set of guidelines to translate contents of the NDC plan into specific activities/projects assigned to sectoral and provincial levels. The guidelines should also specify the different approaches for implementing different activities (e.g. integration with the socio-economic development plan; integration with climate change adaptation plan/green growth plan; development of provincial component under the national project). Apart from this, the institutional arrangement for NDC implementation should be clearly developed together with the guidelines, and this should specify the tasks and functions of involved stakeholders and the mechanism on how they cooperate with each other.

Having a clearly defined institutional arrangement for NDC implementation will provide a strong foundation in developing and implementing the plan at both national and provincial levels. The Agricultural NDC plan should identify which activities will be implemented by the departments under MARD, which will be implemented by the provinces. An investment plan for the different components of the Agricultural NDC should be developed under the supervision of MARD. Moreover, MARD's departments should develop a project proposal and submit it to potential donors (i.e. WB, ADB, GCF, NAMA facility), or integrate NDC activities into their own agenda to request funding from the national budget.

Under the Paris Agreement, countries will conduct a facilitative dialogue in 2018 to take stock of collective efforts. This would be a good opportunity for all stakeholders to share their efforts in realizing the NDC plan, and in discussing further cooperation mechanism among stakeholders such as state agencies, the private sector, and NGO community. Meanwhile, government agencies should develop a sharing hub for the private sector and NGO community to join forces in implementing the general NDC and Agricultural NDC. The role of the private sector is very important in this endeavor as Vietnam opens its market for export market-oriented products. Hence, one of the main goals is the integration of NDC targets in the whole value chain as part of the good products standard and/or sustainability goals.

Finally, there is a need to review the current regulations to provide a better regulatory framework and incentive mechanisms for investments. This could encourage the participation

of farmers, the private sector, and other stakeholders in the NDC implementation of GHG mitigation. An improved and a more detailed regulatory framework could create a favorable condition for research, development, and investment to enable the uptake of recommended technologies and practices.

The summary of recommendations is given in Table 3.

Table 3. Summary of recommendations

Awareness and technical	Coordination	Downscaling	Engagement	Regulatory
<ul style="list-style-type: none"> • Mainstream NDC targets and activities as integral part of agriculture sector plans and program • Mobilize the media for an awareness campaign • Build capacity to implement a national MRV system and a sectoral MRV system for agriculture 	<ul style="list-style-type: none"> • Implement an effective institutional arrangement within MARD for NDC implementation • Mobilize national and international support for funding the agricultural NDC implementation (e.g. GEF, GCF, NAMA facilities, etc.) 	<ul style="list-style-type: none"> • Conduct feasibility studies and develop a suitability mapping for each NDC activity • Provide guidelines for planning NDC activities at provincial and sub-sectoral level 	<ul style="list-style-type: none"> • Enhance cooperation mechanism between the government and other stakeholders • Develop investment plan for different components. • Mobilize private sector to integrate NDC targets in the whole value chain. 	<ul style="list-style-type: none"> • Review the current regulations to provide better regulatory framework and incentive mechanisms for investments and uptake of recommended technologies and practices.

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Annex A. List of key informants

No.	Name	Organization	Position
1	Dr. Tran Van The	IAE (MARD)	Vice Director
2	Ms. Bui Phuong Loan	IAE (MARD)	
3	Mr. Tran Van Vuong	DCP (MARD)	Deputy Head of Food Crop Department
4	Dr. Tran Dai Nghia	IPSARD (MARD)	Head of Environment Department
5	Ms. Le Hoang Anh	DOSTE (MARD)	Senior Official
6	Ms. Nguyen Dieu Trinh	MPI	Senior Official
7	Dr. Nguyen Trung Thang	ISPONRE (MONRE)	Vice Director
8	Ms. Vu Minh Hai	Climate Change Working Group (CCWG)	Chairperson

Annex B. List of reviewed legal documents in chronological order

No.	Document number	Content	Issued by/year
1	2139/QĐ-TTg	National Strategy on Climate Change	Prime Minister 2011
2	543/QĐ-BNN-KHCN	Action Plan on Climate Change Response of Agriculture and Rural Development 2011-2015	MARD 2011
3	1474/QĐ-CP	National Action Plan on Climate Change	Government 2012
4	1393/QĐ-TTg	National Green Growth Strategy	Prime Minister 2012
5	210/2013/ND-CP	Incentive Policies for Enterprises Investing in Agriculture and Rural Areas	Government 2013
6	24/NQ-TW	Actively Respond to Climate Change in Vietnam	Vietnam Communist Party 2013
7	403/QĐ-CP	National Action Plan of Green Growth	Government 2014
8	08/NQ-CP	Guideline to Implement the Party's Resolution No.24 on Actively Responding to Climate Change in Vietnam	Government 2014
9	55/2014/QH13	Law on Environmental Protection	National Assembly 2014
10	819/QĐ-BNN-KHCN	Action Plan on Climate Change Response of Agriculture and Rural Development 2016-2020	MARD 2016
11	1157/BTNMT-KTTVBĐKH	Instruct and Request Ministries to Revise and Develop Action Plans for Implementing INDC	MONRE 2016
12	7208/BNN-KHCN	INDC Implementation Plan for the Agriculture Sector	MARD 2016
13	2053/QĐ-TTg	Action Plan to Realize the Paris Agreement on Climate Change	Prime Minister 2016



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