



EBA POLICY BRIEF

Ecosystem-based adaptation for drought resilience in Vietnam's Central Highlands

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Contents

Introduction

1	Agricultural drought and El Niño in the Central Highlands.....	7
2	Relevance of EbA practices for increased drought resilience	8
3	Framework conditions for mainstreaming EbA	10
4	Recommendations	12

List of Figures

Figure 1: Irrigation reservoir in the Central Highlands	7
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List of Tables

Table 1: Benefits of EbA (Source: Marggraf et al. 2024).....	8
Table 2: Challenges of EbA (Source: Marggraf et al. 2024)	8
Table 3: Key national policies promoting EbA for drought resilience.....	10

Abbreviations

BMBF	German Federal Ministry of Education and Research
EbA	Ecosystem-based Adaptation
ENSO	El Nino Southern Oscillation
GCF	Green Climate Fund
IMHEN	Institute for Meteorology, Hydrology and Environment
MARD	Ministry of Agriculture and Rural Development
MoF	Ministry of Finance
MONRE	Ministry of Natural Resources and Environment
MPI	Ministry of Planning and Investment
NAP	National Adaptation Plan
SDGs	Sustainable Development Goals

Introduction

Vietnam is one of the countries most affected by climate change and its diverse impacts (MONRE 2022). These impacts include sea level rise, flooding and salt water intrusion along the coastlines as well as droughts, water scarcity and forest fires in other regions such as the Central Coast, South-Central Coast, the Northern Delta, the Midlands and the Central Highlands.

Agriculture and the export of agricultural goods play a major role in Vietnam's economy, as the country is the second largest coffee producer in the world. However, **climate change impacts threaten agricultural production**, as crops suffer from heat stress, yields are decreased and climate-related disasters destroy equipment and farmland.

For this reason, adaptation measures need to be considered to ensure a long-term sustainable agricultural production, while also protecting livelihoods. **A promising approach is ecosystem-based adaptation (EbA)**, where synergies between socio-economic development, climate change adaptation, and biodiversity conservation are created. In Vietnam, several national policies already mention EbA and related adaptation measures and some are already being implemented.

This Policy Brief was prepared within the project **"Drought-ADAPT: Adaptation to Drought and El Niño Effects in the Central Highlands of Vietnam"**, financed by the German Federal Ministry of Education and Research (BMBF). The aim of Drought-ADAPT is to develop innovative solutions to support short, medium and long-term planning and adaptation measures to droughts and their effects in the Central Highlands of Vietnam.

Previously, a report on best practices for EbAs in Vietnam has been published (Marggraf et al. 2024) and adelphi conducted an assessment of the legal and institutional framing conditions regarding climate adaptation and EbA for drought adaptation. This work constitutes the basis for the Policy Brief at hand.

1 Agricultural drought and El Niño in the Central Highlands

The agricultural sector is of vital importance for Vietnam's national and international trade. Coffee constitutes a major part of Vietnam's agriculture, contributing to jobs and livelihoods for many. Globally, **Vietnam is the second largest exporter and producer of coffee** (VietnamCredit 2020). Over 95% of the coffee is cultivated in the region of the Central Highlands (IDH 2023), together with other major exporting goods like rubber, pepper, cashew nuts, vegetables, fruits and tea (ADB 2022). However, the agricultural production in the region is facing increasing risks from the **impacts of climate change**.

Vietnam is particularly affected by climate change with risks related to flooding, cyclones, drought as well as sea level rise (World Bank 2021). The El Niño Southern Oscillation (ENSO) majorly impacts Vietnam's climate as it drives monsoons, shifts in rainfall and temperature. **The Central Highlands are particularly affected**, experiencing the most rapid temperature increase in the country over the last decades as well as a shift in rainfall (ADB 2022). Since at least 1993, the Central Highlands have experienced various drought episodes, with Dak Lak and Gia Lai being most affected (Ha, Nguyen et al. 2021). Drought also increases the risk of erosion and forest fires, degrading soils and destroying agricultural production. As a result, the livelihoods of the local population are at risk, with the **loss of crops and livestock, water scarcity as well as reduced food supply** (CGIAR 2016).

While climate change is a strong driver of drought in the region, the growing production itself accelerates it, due to deforestation, land degradation and shrinking water reserves (VietnamCredit 2020). To address these challenges, the Government of Vietnam promotes **water management practices**, implementing water saving measures and increasing the use of water reservoirs. At the same time, first initiatives introduce adaptation measures related to agricultural practices, such as **inter-cropping and agroforestry**. This is taking place within a process of growing awareness and legal framework conditions. **National policies already promote ecosystem-based adaptation**, among climate-smart agriculture and other adaptation measures to increase the resilience of drought-prone regions. Before looking into these policies, the next section will shortly explain the use of EbA in agriculture and highlight its relevance for drought adaptation.



Figure 1: Irrigation reservoir in the Central Highlands

2 Relevance of EbA practices for increased drought resilience

Ecosystem-based adaptation (EbA) can be understood as a strategy that utilizes the capacity of biodiversity and ecosystem services and integrates them into climate change adaptation strategies (CBD 2009). **Ecosystem services** are services and goods provided by nature, divided into provisioning services (e.g., food or timber), regulating services (purification of water, pollination), cultural services (recreational or spiritual benefits) and supporting services (soil formation or nutrient cycling) (UNECE 2007). EbA combines the ideas of **socio-economic development, climate change adaptation, biodiversity and ecosystem conservation** (CBD 2009) and therefore provides a holistic approach for local sustainable development.

Several **types of EbA measures** exist in the realm of agriculture, forestry and water management. Examples for **agriculture** are practices of agroecology, agroforestry, regenerative agriculture, permaculture or organic farming (GIZ 2022). Related to **water management**, EbA practices can include the use of retention ponds and restoring wetland ecosystems. EbA in **forestry** are related to reforestation and management of natural forests. In the context of Vietnam and the Central Highlands, these measures can aid in increasing resilience to drought (and other climate risks).

Certain measures such as **intercropping** (mixing plant species on the same plot) and **agroforestry** (mixing trees, crops and livestock) are already being implemented. In doing so, soil quality (incl. moisture) and the micro-climatic conditions are improved, making crops more resistant to drought periods. These practices also diversify food supply and income opportunities, among other **multiple benefits** to the community and environment.

Besides these benefits, certain **challenges in the mainstreaming of EbA** need to be considered as shown in **Error! Reference source not found.** In summary, changing agricultural and environmental systems is a longer process that requires human and financial resources.

Still, due to their positive and long-term impacts, EbA measures are more and more included into national

and local policies in Vietnam, as highlighted in the next chapter.

Table 1: Benefits of EbA (Source: Marggraf et al. 2024)

BENEFITS

- Making use of ecosystem services for communities to withstand and recover from climate change impacts
- EbA can be more cost-effective compared to traditional engineering approaches
- Improves water quality and increases biodiversity
- Promotes sustainable land and resource management practices, ensuring the long-term health and functionality of ecosystems
- Provides opportunities to involve local communities in decision-making processes, fostering their ownership and empowering them to actively participate in adaptation efforts
- Recognizes the dynamic nature of ecosystems and their ability to adapt to changing conditions, providing flexible and adaptable solutions for future uncertainties

Table 2: Challenges of EbA (Source: Marggraf et al. 2024)

CHALLENGES

- Limitations in awareness and understanding of EbA among stakeholders, including policymakers
- EbA requires specialized knowledge and capacity for ecosystem management, which is not available to all stakeholders
- Integrating EbA into policy frameworks and development planning can be challenging, as it often requires cross-sectoral coordination and collaboration
- Conflicts between different stakeholders or land uses when implementing EbA

- Scaling up EbA initiatives and replicating successful practices across different ecosystems and regions can be complex and resource-intensive
- Challenges in monitoring and evaluating the effectiveness of EbA measures, requiring long-term data collection and assessment of ecological and socio-economic impacts

3 Framework conditions for mainstreaming EbA

Overall, a **broad legal and institutional framework at national level** exists that emphasizes and potentially regulates ecosystem-based adaptation measures. As agriculture is an important part of the Vietnamese economy, various strategies and policies deal with possible adaptation approaches to increase resilience of agricultural crops and practices minimizing negative impacts under climate change. These frameworks operate at various levels, ranging from national plans and laws to regional policies. The four most relevant national policies for the promotion of EbA for drought resilience in agriculture are presented in the following table.

Table 3: Key national policies promoting EbA for drought resilience

NATIONAL ADAPTATION PLAN (NAP) FOR THE PERIOD 2021-2030, WITH A VISION TO 2050
(MONRE 2022)
Promotes “climate-smart” agriculture with various measures such as ecosystem- and community-based adaptation but also technological innovation.

Presents concrete tasks such as the promotion of agroforestry solutions, ecosystem restoration, water management, intercropping and cooperation

FIVE-YEAR SOCIO-ECONOMIC DEVELOPMENT PLAN (SEDP) 2021-2025
(SRV 2021)
Protection of forest cover through conservation and sustainable management of ecosystems
Addressing water security, safety of dams and reservoirs.

Promoting organic, green, clean, smart and high-tech agriculture.

NATURAL DISASTER PREVENTION AND CONTROL ACT
(SRV 2013)
Recognizes several responsive measures to drought such as the adjustments of crops, plant and animal structures based on drought warnings and forecasting

LAW ON ENVIRONMENTAL PROTECTION
(SRV 2020)
State should introduce policies to encourage innovation of agricultural methods and models towards sustainability and resilience (Article 61)
Need for disaster risk reduction, community- and ecosystem-based climate adaptation and impact assessments Article 90

Green Bonds are promoted, a measure to raise capital for environmental protection activities (incl. adaptation measures)

In order for policies to be further developed at different political levels and put into practice, institutions with relevant mandates are required (among other non-governmental stakeholders). In Vietnam, **several institutions govern adaptation and prevention measures**. The Ministries with the strongest mandate to strengthen adaptation measures related to drought (in agriculture), including EbA, are the following: 1) **The Ministry of Agriculture and Rural Development (MARD)**: issues agricultural and rural development plans incl. climate adaptation measures; 2) **The Ministry of Natural Resources and Environment (MONRE)** implements and monitors the NAP and the Law on Environmental Protection and develops climate change policies and action plans (leading the climate change agency); 3) **The Ministry of Planning and Investment (MPI)** is the responsible authority for infrastructure investments, incl. investment projects for the NAP, for the Green Climate Fund (GCF) and for the implementation of the Sustainable Development Goals (SDGs) in Vietnam; and 4) **The Ministry of**

Finance (MoF): reviews and plans climate budgets with the MPI and MONRE and guides the allocation of funds to implement the NAP.

At **sub-national level**, the provincial and district governments are responsible for planning and implementing a broad range of national climate change policies, guided by national policies and the respective Ministries. This includes **plans for disaster and risk reduction and climate change action plans**, but also the **local development plans**. Integrating EbA into these policies at sub-national level is highly relevant to bring the approach into local practice, thereby contributing to drought resilience at a larger scale.

4 Recommendations

The overview above showed that a **variety of policies build the framework for Vietnam's climate adaptation action**, also referring to approaches of ecosystem-based and community-based adaptation for the reduction of drought risks in agriculture (among other sectors). Furthermore, **good practices already exist in Vietnam** of introducing EbA and other adaptation measures, including agroforestry, intercropping and sustainable water management. Based on these policies and practices, implementation can be further upscaled at regional and national level through **the mainstreaming of EbA**. Especially for the Central Highlands that are facing increasing drought risks due to climatic trends and growing agricultural production, a broader application is seen as highly beneficial. The following policy recommendation can facilitate this mainstreaming process.

1. Raising Awareness & Capacities:

Considering the challenges indicated above in Table 2, **awareness-raising and capacity building at various levels** are required to allow the inclusion of EbA into policies and into the actual agricultural practice on the ground. This is also reflected in the NAP, proposing training of government authorities to successfully implement the measures. The NAP furthermore highlights that **investments are still required to experiment with the diversity of EbA approaches** and adapt them to the local context, as well as for advancing technology and innovation.

2. Local investments for change:

At farmer level, the introduction of EbA often requires initial investments and time, allowing them to diversify crops, plant trees and possibly add livestock, as well as to change their farmland structurally (e.g. by building a pond). This requires the necessary knowledge and skills to do so, but also funds as well as (shared) equipment and materials. Practices such as intercropping only show their benefits in terms of higher yields after a few years, so that the question of finance is crucial for a farmer. It requires incentives or initial financing through green bonds, microcredits or other financial support mechanisms to make this decision.

3. Changing markets:

As EbA in agriculture often comes with a diversification in crops, this will lead to a change of products available for local and international markets as well as changing amounts.

Consequently, an EbA approach in agriculture also needs a restructuring of these markets, so that farmers have security over the sale of new products and that the government can meet the regional, national and international demands. Accordingly, structures need to be set-up before changing agricultural production at large scale.

4. Multi-sectoral drought adaptation action:

EbA represents one measure for climate change adaptation and needs to be complemented by a variety of approaches and actions, adapted to the local context. Considering the **multi-sectoral character of adaptation measures and EbA** itself (incl. agriculture, forestry, environment, water resources, infrastructure, community development, finance, etc.) the coordination of multiple government authorities at national and local level is required. **A holistic drought adaptation action programme** at regional level could be a suitable way to achieve a large-scale implementation of measures. Based on national framework policies, this action programme could:

- Include EbA, forestry, irrigation and other drought adaptation action;
- Connect agricultural practices with seasonal forecasts (e.g. by IMHEN);
- Establish inter-sectoral coordination structures (e.g. a working group/ task force);
- Link monitoring, information and training of farmers on water management; and
- Provide a financing framework for farmers and support structures.

Options to develop such an action programme could be the **Target Program to respond to climate change** (currently 2021-2030) as well as local development programmes. Strong multi-level coordination and capacitation under such a programme can also **enable local authorities to become climate adaptation and EbA leaders**.

To summarise, there needs to be a common understanding that **a change to EbA in agriculture**

is not an immediate measure but a process that requires 1) adequate framework conditions of policies and markets; 2) multi-sector coordination to lead the process; 3) know-how about specific EbA practices from institutional to farmer level; and 4) incentives and/ or finance to invest in a change to EbA. Due to the flexible nature of EbA measures, capacities and practices can be built up and adapted over time, responding to changing conditions of policies, markets and, last but not least, the climate.

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