CLIMATE CHANGE
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Appendix

Case Studies of Sustainable Adaptation Pathways

Appendix to the Paper „Towards Sustainable Adaptation Pathways: A concept for integrative actions to achieve the 2030 Agenda, Paris Agreement and Sendai Framework"

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On behalf of the German Environment Agency

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Abstract: Case Studies of Sustainable Adaptation Pathways

This publication contains 20 case studies that have been compiled to illustrate the novel concept of Sustainable Adaptation Pathways (SAPs) presented in a conceptual and analytical paper by Bueb et al. (2021).[1] SAPs describe a coherent set of alternative adaptation strategies and procedures composed of measures and policies to strengthen the capacities of populations, institutions and ecosystems to adapt to climate-related risks over time while enhancing the social justice, environmental integrity and economic sustainability of socio-ecological systems. The developed framework for SAPs is used to structure the case study analysis: For each case study, the socio-ecological context, the characteristics of the specific SAP and its dynamic elements (institutional; socio-political and cultural; financial) are illustrated. Additionally, key findings including barriers, success factors as well as the main interlinkages to the sustainable development goals (SDGs) and the Sendai Priority Areas are summarized per case study. The case studies were identified and selected based on a review of scientific and grey literature based on six criteria. First, only case studies whose objectives were congruent with the SAP definition provided in the UBA report (Bueb et al., 2021) were selected in this paper. Second, as one objective of the case studies is to illustrate the practical implementation of different SAPs dynamic elements and their combinations, case studies were sampled to ensure that specific dynamic elements across all three categories (institutional, socio-political and cultural and financial) of the SAP concept are illustrated. Third, they were selected to ensure geographical diversity. Thus, the selected case studies span across different continents and countries and include, fourth, a broad range of socio-ecological challenges. Fifth, they relate to different scales (transnational, national, subnational, local) and have been designed and implemented under the lead of different actors. Sixth, they cover cross-cutting themes, such as agriculture, nature conservation, urban planning and coastal management. Short summaries of selected case studies are also included in the report by Bueb et al. (2021).

Kurzbeschreibung: Fallstudien zu nachhaltigen Anpassungspfaden

Dieser Anhangsband enthält 20 Fallstudien, die der Veranschaulichung des im UBA-Bericht von Bueb et al. (2021) vorgestellten Konzepts der Sustainable Adaptation Pathways (SAPs) dienen. SAPs beschreiben ein kohärentes Set von alternativen Anpassungsstrategien und -verfahren, die aus Maßnahmen und Politiken bestehen, um Kapazitäten der lokalen Bevölkerung, Institutionen und Ökosysteme stärken, um sich im Zeitverlauf an klimabedingte Risiken anzupassen. Gleichzeitig zielen SAPs darauf ab, die soziale Gerechtigkeit, die ökologische Integrität und die wirtschaftliche Nachhaltigkeit sozio-ökologischer Systeme zu verbessern. Das entwickelte Konzept der SAPs wird zur Strukturierung der Fallstudienanalyse verwendet: Für jede Fallstudie werden der sozio-ökologische Kontext, die Charakteristika des spezifischen SAP und seine dynamischen Elemente (institutionell; sozio-politisch und kulturell; finanziell) dargestellt. Zusätzlich werden die wichtigsten Erkenntnisse, einschließlich der Barrieren, Erfolgsfaktoren sowie der zentralen Verknüpfungen zu den SDGs und den Sendai-Prioritäten zusammengefasst. Die Fallstudien wurden auf der Grundlage einer Recherche wissenschaftlicher und grauer Literatur anhand von sechs Kriterien identifiziert und ausgewählt. Erstens wurden in dieser Arbeit nur Fallstudien ausgewählt, deren Ziele mit der SAP-Definition im UBA-Bericht übereinstimmen. Zweitens: Da ein Ziel der Fallstudien darin besteht, die praktische Umsetzung verschiedener dynamischer Elemente von SAPs und deren Kombinationen zu illustrieren, wurden die Fallstudien so ausgewählt, dass spezifische dynamische Elemente in allen drei Kategorien (institutionell, sozio-politisch und kulturell sowie finanziell) des SAP-Konzepts veranschaulicht werden. Drittens stand die Auswahl vor dem Hintergrund der geografischen

[1] Bueb, B., Tröltzsch, J., Reichwein, D., Oldenburg, C., & Favero, F. (2021). Towards Sustainable Adaptation Pathways: A concept for integrative actions to achieve the 2030 Agenda, Paris Agreement and Sendai Framework. Conceptual and analytical paper. (No. 48/2021; Reihe 'Climate Change'). Umweltbundesamt.

Vielfalt. So erstrecken sich die ausgewählten Fallstudien über verschiedene Kontinente und umfassen, viertens, ein breites Spektrum an sozio-ökologischen Herausforderungen. Fünftens fokussieren sie sich auf unterschiedliche Skalen (transnational, national, subnational, lokal) und wurden unter der Leitung verschiedener Akteure konzipiert und umgesetzt. Sechstens decken sie Querschnittsthemen, wie z. B. Landwirtschaft, Naturschutz, Stadtentwicklung sowie Küstenmanagement ab. Kurzzusammenfassungen ausgewählter Fallstudien sind auch im Bericht von Bueb et al. (2021) zu finden.

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List of case studies

List of abbreviations

AFSA	Alliance for Food Sovereignty in Africa
BDP 2100	Bangladesh Delta Plan 2100
CCA	Climate change adaptation
PCM	Council of Ministers (Peru)
DRR	Disaster risk reduction
EbA	Ecosystem-based Adaptation
EU	European Union
EWS	Early Warning System
FAO	Food and Agriculture Organization of the United Nations
GEF	Global Environment Facility
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GVces	Center for Sustainability Studies at Escola de Administração de Empresas de São Paulo da Fundação Getulio Vargas
GEAG	Gorakhpur Environmental Action Group
IIED	International Institute for Environment and Development
MINAM	Peruvian Ministry of the Environment
MRS	Metropolitan Region of Santiago de Chile
NbS	Nature-based Solutions
NAP	National Adaptation Plan
NAPA	National Adaptation Programmes of Action
NDC	Nationally Determined Contributions (in Paris-Agreement)
NGO	Non-governmental organisation
OECD	Organisation for Economic Cooperation and Development
PNACC	National Climate Change Adaptation Plan
RCP	Rotterdam Climate Proof program
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SDG	Sustainable Development Goal
SFHC	Soils, Food and Healthy Communities Project
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

1 Case Studies

Case Study 1 Bhutan | Addressing water scarcity through NbS in Tsirang Toed

NAPA project addressing water scarcity holistically through NbS in Tsirang Toed, Bhutan

In response to emerging concerns for water scarcity, the central government of Bhutan implemented adaptation intervention measures in the community of Tsirang Toed under the NAPA II. The objective of the project was to strengthen adaptive capacities to climate change induced risks and develop climate-resilient solutions for water collection, storage and distribution to ultimately reduce poverty and underlying root causes of vulnerabilities.

COUNTRIES AND ACTORS Government of Bhutan, United Nations Development Programme (UNDP), Global Environment Facility (GEF)

PROJECT TITLE Climate-resilient water harvesting for rural areas

SOCIO-ECOLOGICAL CONTEXT

Tsirang Toed is a remote community of 2,200 people in the district of Tsirang in Bhutan. Most households depend on subsistence farming with some limited other activities like weaving, high-value fruit sales, and timber products. Due to the high elevation of the community, the local community has been traditionally relying on small streams, ponds, and, in general, on regular cycles of annual rainfall for its water supply. In the last decades, increasing temperatures, irregular precipitation and unsustainable land management techniques have been causing the deterioration of historical water sources, while population growth and unsustainable resource use have increased local water demands. These developments have forced locals to travel increasingly long distances to access drinking water supplies or, in some cases, to migrate to urban areas.

SUSTAINABLE ADAPTATION PATHWAY

The goal to strengthen adaptive capacities to ultimately reduce poverty and underlying root causes of vulnerabilities has been addressed through a transformative approach of adaptation aimed at tackling root causes of vulnerability. The implementation of systemic implementations and holistic interventions was based on a comprehensive baseline assessment of the vulnerability context and focused on the use of nature-based solutions (NbS). The project's main outcomes included the regeneration of water sources, the construction of easily accessible water points, increased human health and a decrease in outmigration.

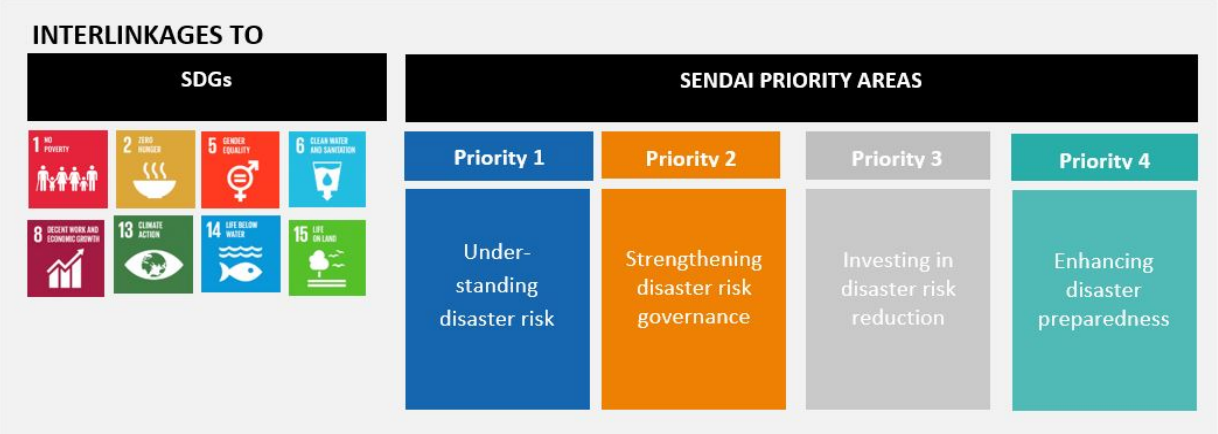
DYNAMIC ELEMENTS OF SAPS

Fostered institutional capacities: The resilience of the Tsirang Toed community was strengthened through technical training on water filtration and awareness training on issues related to climate change. As part of the project, water user associations were created to manage a newly constructed water reservoir, water harvesting tanks and a system of pipes for water distribution

Consideration of multiple benefits, e.g. ecosystem-based approaches: Efforts to stop harmful ecological trends were made via NbS, for example by eradicating invasive plant species through the reintroduction of native varieties of trees.

Coordination across scales and levels: Strategies for adaptive water management and identification of relevant climate impacts has been integrated from the local to national level across coordinating institutions

Stakeholder participation: Different stakeholder groups, including marginalized populations and women, were integrated into the community's governance structure. This included the creation of a water management association and women's savings group for water infrastructure maintenance. Ferdinand et al. (2020) see these changes in participatory governance as a major reason for decreased outmigration.



Sources: (Ferdinand et al., 2020; NEC & UNDP, 2019)

Case Study 2 Netherlands | Rotterdam's transformative climate governance

Transformative climate governance in Rotterdam, Netherlands

The case study of the city of Rotterdam is an example of how the challenge of climate change resilience can become an opportunity to implement integrated strategies for more sustainable and lively urban environments.

COUNTRIES AND ACTORS Government of the Netherlands, City of Rotterdam (Office for Sustainability and Climate Adaptation)

PROJECT TITLE Rotterdam Climate Proof (RCP) program

SOCIO-ECOLOGICAL CONTEXT

Rotterdam has a population of over 600.000 and hosts the largest harbor in Europe. The city developed through the centuries under the threat of both coastal inundations and river floods which led to highly efficient systems of flood and storm surge defense. Nevertheless, climate change is expected to bring additional challenges, with more severe storms, sea-level rise as well as rise of river and groundwater levels threatening the city's inhabitants and infrastructure.

SUSTAINABLE ADAPTATION PATHWAY

The city of Rotterdam is one of the pioneers in integrated and transformative strategies for climate change adaptation (CCA), disaster risk reduction (DRR) and sustainability. In the recent past, the city's political agenda had been shaped by the perception of water as a potential threat due to sea-level rise, river and groundwater levels as well an increase in storm surges and downpours. In 2009-2010, this perception was reframed through the Rotterdam Climate Proof (RCP) program, which considers climate change adaptation not only as a preventive and security action, but also as an opportunity to improve the city's social and economic conditions and lay the ground for more systemic sustainability transformations in the city. Various projects have been designed to

minimize risks while creating co-benefits of CCA with greening of urban spaces, community building, and overall economic development. The RCP program is based on three mutually reinforcing pillars: action, knowledge and marketing communication.

While the city's government (through the Office for Sustainability and Climate Adaptation) is the main responsible for the development and the implementation of the cross-cutting projects under the RCP, numerous networks and partnerships allow the active involvement of stakeholders and other actors to enable cross-boundary and cross-sectoral implementation. The office is also responsible for the coordination of actions related to climate, resilience and sustainability, connecting with other departments, levels of government and water boards. To this end, knowledge schemes for information sharing are a fundamental platform to bring together actors from different areas and government levels.

DYNAMIC ELEMENTS OF SAPS

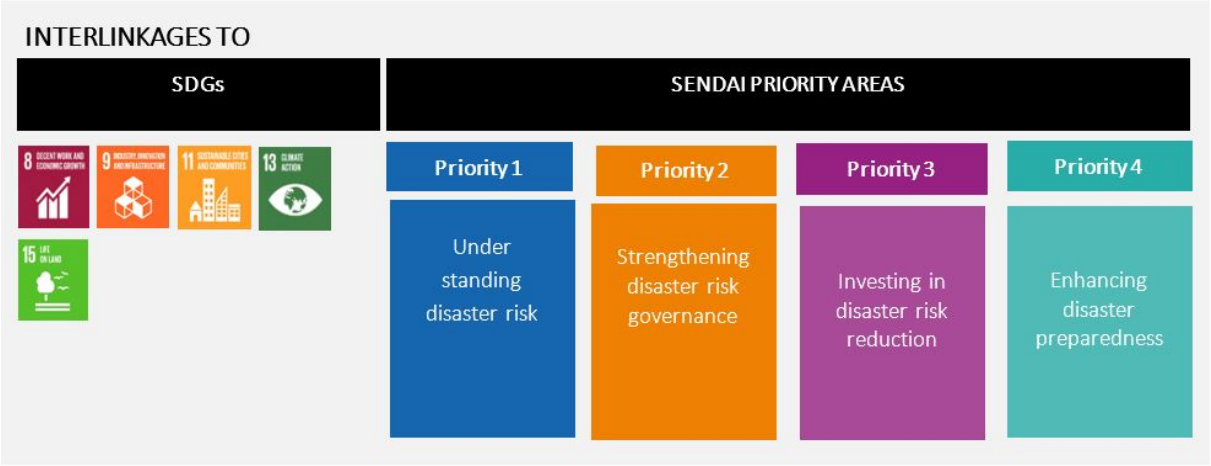
Intersectoral coordination and exchange: The Office for Sustainability and Climate Adaptation is responsible for the involvement and coordination of stakeholders and other actors to ensure cross-sectoral and cross-scale implementations.

Coordination across scales and levels: In the Netherlands, responsibilities for water and flood safety are shared between national, regional and local governmental levels, leading to close interaction and coordination. In the case of Rotterdam's climate governance, the city government has a key role in coordinating climate action across-sectors and scales and in line with overarching strategic visions.

Flexible governance structures: Rotterdam seeks to achieve co-benefits for climate mitigation, community-enhancement, economic development through a high profile proof-of-concept experimental approach based on network interactions, public-private partnerships and marketing communication.

KEY FINDINGS

Using a transformative climate governance approach, the RCP program identifies which type of innovative actions are taken and how these can be embedded into existing institutions, infrastructures and social practices. In applying this transformative strategy, decisional processes and governance structures themselves become objects of innovation that are more open, decentralized and collaborative than traditional governance structures. In Rotterdam, the necessity of new models of governance to steer transformation led to the establishment of informal spaces in which different actors equipped with different transformative capacities (governmental bodies, water boards, companies, non-governmental organizations (NGO), etc.) interact and complement each other to develop solutions and mediate manifold interests.



Sources: Hölscher (2019), Hölscher et al. (2019), Institution of Civil Engineers (2015)

Case Study 3 Sahel region | The Great Green Wall

The Great Green Wall of the Sahel

The Great Green Wall is an ambitious initiative, started in 2008, that aims to create an 8,000km long wall of trees spanning across the Sahel Region from the Red Sea to the Atlantic Ocean to halt land degradation and combat desertification.

COUNTRIES AND ACTORS African Union, Pan-African Agency of the Great Green Wall, United Nations Convention to Combat Desertification (UNCCD), Algeria, Burkina Faso, Chad, Djibouti, Egypt, Ethiopia, the Gambia, Mali, Mauritania, Niger, Nigeria, Senegal and Sudan, among others. Funding by GEF, African Development Bank, the World Bank, EU, among others

PROJECT TITLE The Great Green Wall

SOCIO-ECOLOGICAL CONTEXT

The Sahel region stretches across the southern edge of the Sahara like a belt. In the region, prolonged droughts and desertification contribute to food insecurity, conflicts over scarce resources and mass emigration. The region is afflicted by one of the highest levels of multi-dimensional poverty in the world, with alarming scores for education, health and standard of living. Despite high outmigration, population growth is expected to continue throughout the rest of the century.

SUSTAINABLE ADAPTATION PATHWAY

The Great Green Wall initiative is an ambitious example of applying ecosystem-based measures to decrease vulnerabilities to climate change impacts and enhance adaptive capacities at a large scale. The project addresses adverse socio-ecological developments triggered by climate change in the Sahel region by restoring the degraded landscapes. Through this, the initiative aims to ensure food and water security, empower local populations and create climate-resilient economic opportunities. The continental geographic scope of the Great Green Wall Project means that large-scale and diffuse benefits are possible, thus creating the opportunity for a contribution in 15 of the 17 SDGs. In practice, however, implementation has been hampered.

DYNAMIC ELEMENTS OF SAPS

Intersectoral coordination and exchange: The project foresees networking platforms for mutual learning, sharing of knowledge and best practices, the transfer of technology and the monitoring of activities. Enhanced inter-agency coordination is among the expected positive impacts of the project.

Consideration of multiple benefits: Due to their resilience to climate change and their provision of essential services, ecosystems and their management are at the very core of the project

Local context. politics, inequalities and cultural norms: Initially envisioned as a one-size-fits-all kind of initiative, the vision of a Great Green Wall has eventually changed into that of a mosaic of different, integrated local interventions addressing multiple challenges through good local practices in environmental management and sustainable development.

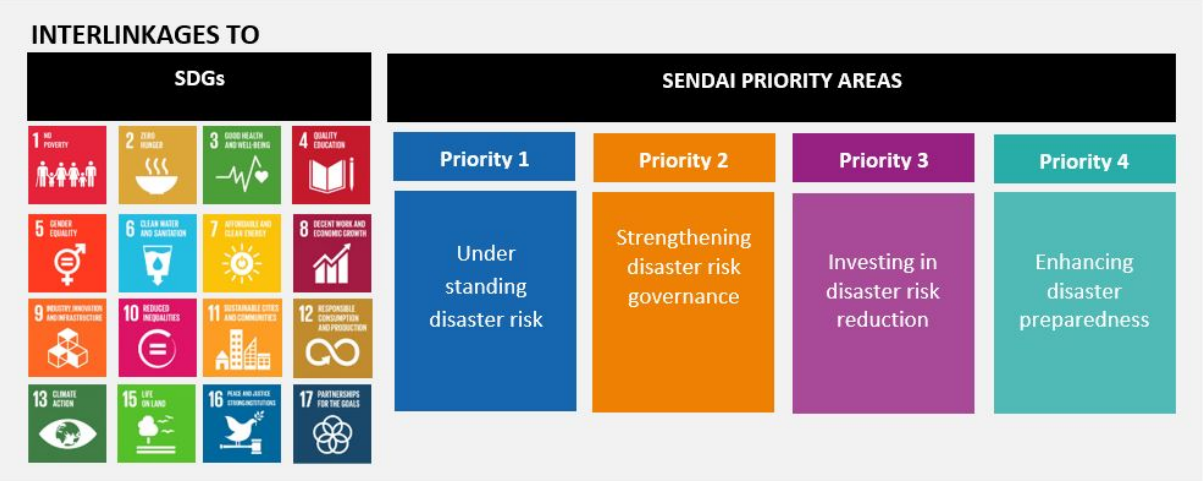
Consideration of local knowledge: the project combines existing scientific and local knowledge of how actions could help increase climate change resilience.

Stakeholder participation: The various initiatives are strengthened through the involvement of local communities in the planning, implementation and post-investment stages; their extensive participation is one of the guiding principles of the project. The mastering of all operations (funding, monitoring, evaluation, selection procedures, support, etc.) by local stakeholders and their long-term partnership commitment is essential to guarantee the sustainability of adopted responses. However, proponents of agroforestry advocate for more grassroots-driven and science-based approaches taking into account local needs and ecosystems.

Provision of funds by international donors: The Initiative has been attracting funding from many sources. Financial resources have been mobilized at the level of the involved countries, the Commission of the African Union, and through several partners of the initiative, such as the European Union (EU), the Global Mechanism of the UNCCD, the Food and Agriculture Organization of the United Nations (FAO), the Global Environment Facility (GEF) and the World Bank.

KEY FINDINGS

The Great Green Wall in the Sahel is an example of an ambitious continental-scale project aiming at sustainable adaptation. The commitment of participating countries to jointly combat climate change impacts is a potential catalyst for closer cross-border collaboration in other areas. The recognition of the primary significance of community ownership of both the identification process for initiatives and their management allows minimizing potential conflicts between the sustainable development goals and CCA efforts. While the initiative has been showing promising results, criticism has been voiced about a gap between ambition and actions on the ground. Also, securing funding remains a challenge due to the high implementation costs. Strengthening and promoting grassroots-driven and science-based agroforestry taking into account local needs and ecosystems can make efforts to include local communities more sustainable.



Sources: African Union (2012), Goffner et al. (2019), Morrison (2016).

Case Study 4 Bangladesh | The Delta Plan 2100

Managing water and disaster risk in the world's largest delta. The Bangladesh Delta Plan 2100

In 2018, Bangladesh launched an integrated, long-term plan, the Bangladesh Delta Plan 2100 (BDP 2100), that combines water resource management, DRR and CCA in the Ganges–Brahmaputra–Meghna Delta to enhance sustainable development.

COUNTRIES AND ACTORS Consortium of companies and governmental institutions from the Netherlands and Bangladesh, led by Dutch consultancy firm Twynstra Gudde

PROJECT TITLE Bangladesh Delta Plan 2100 (BDP 2100)

SOCIO-ECOLOGICAL CONTEXT

The Ganges–Brahmaputra–Meghna Delta area covers most of the territory of Bangladesh and is one of the most densely populated deltas in the world. The region is particularly exposed to climate change impacts and water-related natural disasters, such as recurring floods and tropical cyclones. Vulnerabilities are further exacerbated by deep social inequalities among the population. In addition to climate change, several human activities that exert pressure on the delta ecosystem – irrigation, fisheries, transport, construction of industrial infrastructure, etc. – are rapidly expanding due to economic development and demographic change.

SUSTAINABLE ADAPTATION PATHWAY

The program seeks to implement numerous medium-small scale "no-regret" interventions, phased over time, instead of a large-scale and irreversible single project. This strategy intends to maximize the efficiency of the timing of investments through adapting solutions to changing ecosystem and socioeconomic settings over time and in coherence with previously implemented projects. For each intervention, opportunities to align implementations and to reap social and environmental benefits are considered. The BDP 2100 program integrates existing development policies and sectoral strategies into a multi-sectoral effort that mainstreams CCA, biodiversity and sustainable land and water management.

DYNAMIC ELEMENTS OF SAPS

Coordination across scales and levels: The program coordinates actions and strategies at different scales. The national level identifies the strategies for general challenges, like flood risk and

freshwater supply, while at district level, plans are developed to tackle specific issues. Moreover, cross-cutting issues are dealt with using multi-sectoral strategies that see the participation of multiple districts. Mechanisms for cross-border regional cooperation are part of the program as most of the renewable water resources of Bangladesh originate in India, China or Nepal.

Fostered institutional capacities: The project comprises the strengthening of governance through policy reforms and institutional capacity building. New institutions have been established to create an enabling institutional environment: the Delta Governance Council for strategic directives comprising eight ministries; the Project Selection Committee for the selection of programs to be implemented and the Delta Commission for the management of annual spending plans.

Consideration of multiple benefits: To decrease vulnerabilities and foster sustainable water management, activities to control floods and land erosion prioritize nature-based and ecosystem-based solutions.

Intersectoral coordination and exchange: An intersectoral character is at the core of the program, with a specific focus on coordination and interaction among different areas of intervention such as flood risk management, fresh water, sustainable spatial planning and land use, food security, agriculture, sustainable livelihoods, water resource management, land and water transport, renewable energy.

Involvement of the private sector: The program is financed by multiple funding sources. A major source of funding lays in the private sector. Cost-effectiveness assessments and the creation of opportunities for profitable investments in multiple sectors – e.g. improvements to the navigability of rivers or the reduction of flood risk – proved to be effective means to attract private investors.

Provision of funds by international donors: International development partners such as the World Bank are involved, providing both planning and financing assistance.

KEY FINDINGS

Climate pressures coupled with uncoordinated human activities produce changes in the river delta ecosystem which negatively affect multiple economic sectors as well as local livelihoods. The BDP 2100 is an attempt to implement policies and investments formulated in the short to medium term in a consistent way with long-term commitments of development that will unfold in an inherently uncertain future setting. The inter-sectoral nature of the impacts expected provide the opportunity to pool financial resources from different investment channels. They further allow integrating previously autonomous sectoral plans into a coherent strategy to strengthen institutional capacities, foster economic development and DRR while reducing the vulnerability of populations, ecosystems and institutions. The long life span of the strategy, as well as the size of the aggregate investment, pose a number of challenges to its successful outcome. Sustained commitment to management and alignment of interconnected projects and financing activities is essential and represents a challenge given the unpredictability of long-term climate changes and socioeconomic trends.

Sources: Global center on Adaptation (2021, p. 26ff), Government of Bangladesh (2020)

Case Study 5 Colombia and Ecuador | Building local adaptive capacity through food security measures

Building adaptive capacity through food and nutrition security measures and peacebuilding actions in the border region of Ecuador and Colombia

In 2018, Columbia and Ecuador started a binational participatory food security project in the Mira river basin to develop local village adaptation plans in a comprehensive participatory process to find local adaptation solutions.

COUNTRIES AND ACTORS Governments of Colombia and Ecuador, World Food Programme, local communities, Adaptation Fund

PROJECT TITLE Building adaptive capacity to climate change through food security and nutrition actions in vulnerable Afro and indigenous communities in the Colombia-Ecuador border area.

SOCIO-ECOLOGICAL CONTEXT

The Mira river basin is primarily inhabited by historically marginalized Afro-Colombian communities as well as indigenous communities of the Awá. The region is impacted by several violent conflicts and by problematic social conditions such as chronic malnutrition and a high children mortality rate. The Mira river basin is one of the most climate-sensitive and food-insecure regions in Latin America. The main environmental and climate-related risks are extreme precipitation events leading to landslides and infrastructure damages. Drought events have resulted in forest fires, reduced water access and lower crop yields, reducing local incomes.

SUSTAINABLE ADAPTATION PATHWAY

Within the project, “village adaptation plans” are developed that, through a bottom-up approach, contribute to the development of regional mitigation and adaptation plans. The village adaptation plan contains a list of traditional and innovative adaptation solutions to reduce vulnerabilities of the local populations, e.g. using forest species that retain soil on riverbanks prone to erosion and landslides. Traditional food-preservation techniques have been promoted as well. Furthermore, technical support has been provided to enable the local processing of cacao and the preparation of chocolate to enhance the economic sustainability of the project. Additionally, communities have been equipped with basic instruments to collect precipitation and temperature data in their

villages and trained in their usage. A wide range of local partners was integrated and coordination mechanisms with the local population are incorporated across the project structure.

DYNAMIC ELEMENTS OF SAPS

Coordination across scales and levels: Village adaptation plans are developed that contribute to the development of regional mitigation and adaptation plans.

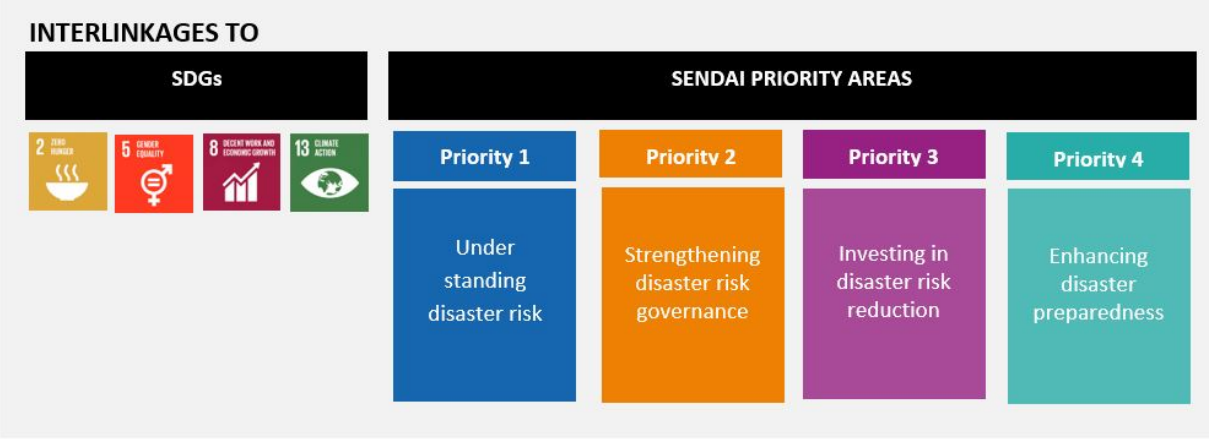
Stakeholder participation: The project uses a community-based participatory planning approach to promote community ownership. It uses a co-development approach, e.g. establishing a participatory early-warning system. The project aims to empower women. These efforts are embedded in constitutional provisions on citizen participation and multiculturalism, including ethnic minorities' right to self-governance present in both Ecuador and Colombia.

Consideration of local knowledge: The project focuses on local knowledge, abilities and opportunities. It uses a community-based participatory planning approach to promotes community ownership.

Provision of funds by international donors: The project was funded by the Adaptation Fund.

KEY FINDINGS

The project's sustainability is rooted in an appropriate governance structure that coordinates between administrative levels and scales in a way that does justice to the complexity of the situation. The participation of local communities at all levels of decision-making was evaluated as leading to more sustainable project outcomes. All stakeholders valued the participatory process as beneficial. Due to the enhanced involvement of stakeholders throughout the project, the project progressed slower, but in a more robust way. The project demonstrates that finding ways to combine local knowledge and scientific findings can lead to innovative and effective sustainable adaptation activities. A key factor for the community participation was seen in effective trust-building.



Sources: Adaptation Fund (2021), Global Center on Adaptation (2021, p. 35ff)

Case Study 6 Haiti | Pro-poor catastrophe insurance

Pro-poor catastrophe insurance in Haiti

Fonkoze is an NGO and the largest micro finance provider in Haiti, committed to decreasing poverty by empowering Haitians through financial inclusion and development services. Recently,

the institution began offering disaster insurance loans to clients in order to decrease the impacts of natural disaster events.

COUNTRIES AND ACTORS Haiti, Fonkoze

PROJECT TITLE Kore W**SOCIO-ECOLOGICAL CONTEXT**

Haiti is among the countries most vulnerable to multiple natural disasters, suffering regularly from floods and landslides, droughts, earthquakes and hurricanes. Due to widespread poverty, survivors of natural catastrophes are often confronted with serious problems of food insecurity, access to drinking water and sanitation.

SUSTAINABLE ADAPTATION PATHWAY

Fonkoze is a microfinance institution that provides financial services in Haiti to lift Haitians out of poverty. Since a series of hurricanes struck the island in 2008, Fonkoze committed to the creation of affordable insurance against natural disasters for its microfinance clients. The result was Kore W, a program for natural catastrophe coverage whose affordability is granted by the institution and international donors' subsidies to the premiums paid by participants. The program covers small entrepreneurs from earthquakes, storm and hurricane events, and is mandatory for every loan client. By regularly paying a small fee, participants are covered for most of the losses; furthermore, they have the right of cancellation of their loan, with the possibility to take a new loan as soon as they deem it necessary. This affordable insurance addresses food insecurity caused by natural disasters and allows for a swift recovery. Under such conditions, small entrepreneurs are more confident when making investment decisions without having to worry about climate-induced losses.

Fonkoze included an educational initiative as part of Kore W, in order to raise awareness over the benefits of the product among clients.

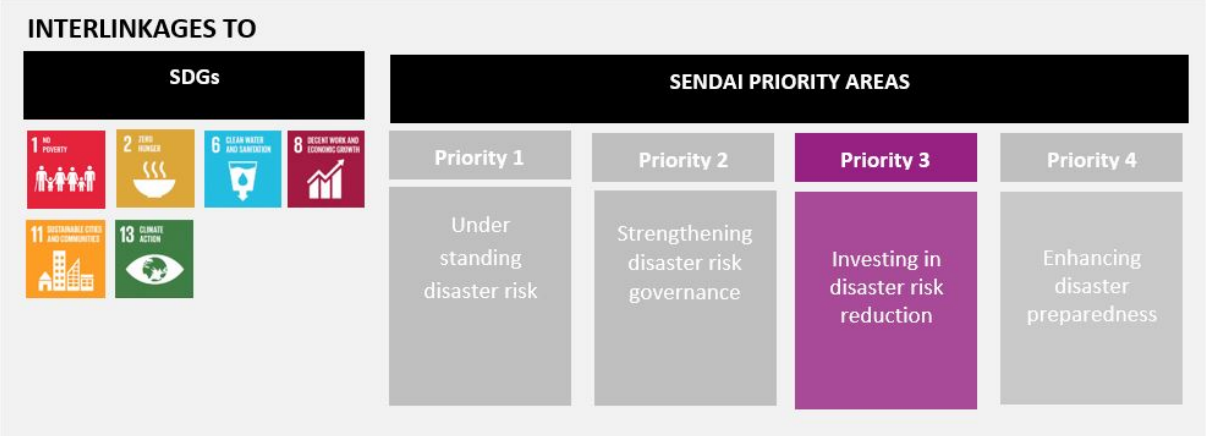
DYNAMIC ELEMENTS OF SAPS

Provision of funds by international donors: The involvement of international donors allowed Fonkoze to subsidize the premium paid by clients, lowering it from 8% of the loan to just 3%. Affordable rates are fundamental to guarantee diffused insurance coverage across communities.

KEY FINDINGS

The existence of a single premium contrasts with the great variability of risks across the different regions of the island. Differentiated pricing could be an opportunity to improve acceptance and participation in the program for those businesses operating in areas at lower risk.

One of the main challenges to the sustainability of micro-insurance in Haiti is the capacity to maintain substantial capital in order to afford to fulfill clients' claims for particularly destructive or recurring natural disasters. A complicating variable is the management of thousands of claims that accumulate in the wake of a large-scale disaster. Visiting claimants, verifying damages, filling out, submitting and approving forms are processes that end up extending payout times if these processes are not carried out efficiently. Corrective measures include the adaptation of the team capacities according to seasonal increased risks or the use of technologic solutions such as smartphone apps to support damage assessments.



Source: Cubas et al. (2020) Impact Insurance (2014), Kolbe et al. (2012)

Case Study 7 Sri Lanka | Inclusive Flood Protection

Inclusive Flood Protection and EWSs in Sri Lanka

The objectives of the project are to improve the capacity of the Government to forecast weather and climate hazards and to decrease the vulnerability of people and infrastructures to flood risks in the Kelani river basin.

COUNTRIES AND ACTORS Sri Lanka

PROJECT TITLE Climate Resilience Multi-Phase Programmatic Approach Project

SOCIO-ECOLOGICAL CONTEXT

The country of Sri Lanka is particularly vulnerable to different types of large-scale natural disasters. In recent history, the most dramatic example is surely the 2004 Tsunami, which caused more than 30,000 casualties in the country. Increased flood risk due to climate change threatens to directly affect a large portion of the population, but to differing degrees due to different sensitivity and exposure to climate impacts. The history of natural disasters in Sri Lanka led to the development of policy frameworks for disaster risk management. During this process, one of the priorities of policy-making was to incorporate provisions for vulnerable group inclusion in disaster risk management plans; yet, one gap that emerged was that policies were addressing these concerns in a rather generalized fashion, grouping all the vulnerable into a single category.

SUSTAINABLE ADAPTATION PATHWAY

The Climate Resilience Multi-Phase Programmatic Approach Project aims to close this gap by detailing specific groups' needs in the design of an inclusive early warning system (EWS) and flood risk mitigation infrastructures.

Issues of exclusion concerning the EWS emerge as different groups have different means to receive early warning messages and to consequently take action. In order to increase the outreach of the EWS to socially excluded groups/individuals, warning messages are delivered through a range of communication means (television, radio, social media, SMS etc.) with appropriate measures to address different visual and hearing needs. In addition, community early warning committees are established with such a composition as to represent the variety of components of each community. The capacity of local communities to understand and use EWS is enhanced through dedicated capacity-building training programs.

Social inclusion is also pursued with regards to investments in flood risk mitigation. Local communities are engaged in the designing, construction and maintenance of flood risk-mitigating infrastructure in order to avoid imbalances of impacts on infrastructure development across households. One important intervention in this direction was the establishment of citizen monitoring committees. Other initiatives include the creation of a multilingual hotline for access to information and public inquiries registries at local government offices.

Among the most challenging socio-economic issues, concerning flood management infrastructure development is that often most vulnerable households tend to reside in areas most exposed to natural disasters. The project made these areas priority areas for intervention and constructed embankments to mitigate flood risks. The project further established a resettlement assistance plan, cash transfer schemes and awareness-raising campaigns, among several safeguards to minimize the negative impacts to project-affected groups and individuals.

DYNAMIC ELEMENTS OF SAPS

Fostered institutional capacities The project enhances the capacities of the disaster management center, irrigation department, national building research organization and the department of meteorology in order to widen and qualitatively improve the hydrological and meteorological observation networks.

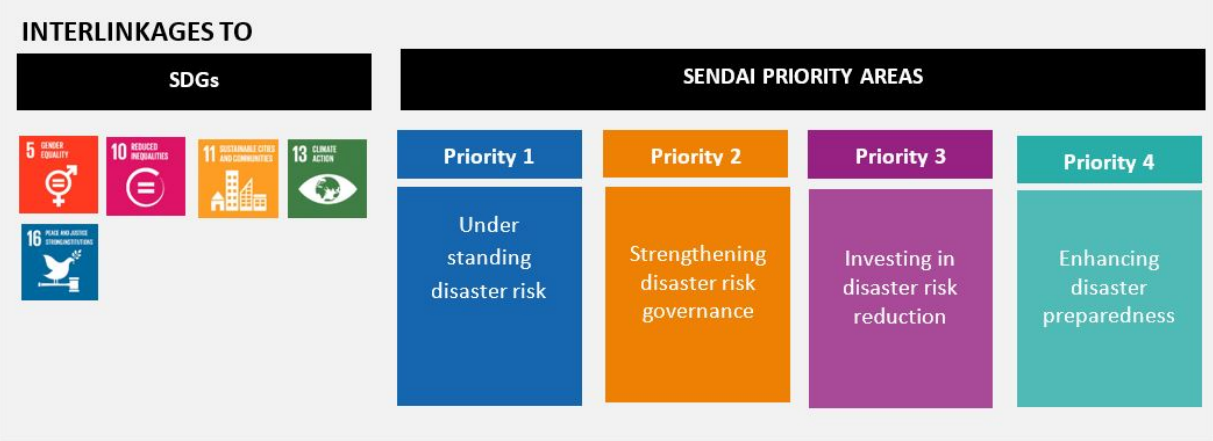
Intersectoral coordination and exchange: Intersectoral coordination and exchange is among the expected positive impacts of the project.

Local context. Politics, inequalities and cultural norms: The project develops an EWS taking into careful consideration the social dimension of disaster risk management. Social inequalities and marginalization are included in the project design and tackled with a wide range of measures.

Consideration of local knowledge: Improved decision-making at different scales (from national to the household level) before and during disasters through the creation of sustainable, regular two-way communication between communities and the government. Measures included setting up a citizen monitoring committee, a hotline for project-related information and reporting, an inquiry register as well as the appointment of volunteers to support monitoring activities etc.

KEY FINDINGS

Large-scale natural disasters affect different people in different ways. Socially marginalized groups, such as people with disabilities, pregnant women, the elderly, and the poor, are especially exposed to environmental risks and have specific needs regarding CCA. The Climate Resilience Multi-Phase Programmatic Approach Project in Sri Lanka commits to an inclusive approach to disaster risk management by deploying multiple communicative and participative measures to ensure the inclusion of marginalized and vulnerable groups in the EWS. One of the fundamental challenges of an inclusive approach is the identification of vulnerable categories or individuals and the definition of related indicators. The vulnerability assessment strategy pursued in this study case was based on community empowerment, with the establishment of citizens committees that are representative of local diversities.



Sources: World Bank (2019, 2021)

Case Study 8 Brazil | National Platform for data-sharing on adaptation

AdaptaClima - A National Platform for data-sharing on adaptation

Launched in 2017 with the support of European partners, AdaptaClima is a Brazilian platform for sharing data on adaptation to climate change.

COUNTRIES AND ACTORS Brazil, Brazil's Ministry of Environment, Center for Sustainability Studies (GVces) and the International Institute for Environment and Development (IIED), The Newton Fund

PROJECT TITLE AdaptaClima

SOCIO-ECOLOGICAL CONTEXT

The impacts of climate change on the Brazilian economy and people are increasingly evident. Rises in temperature and prolonged droughts have been putting the Amazon forest under immense strain which adds to already existing pressures like illegal logging. Nowadays, the establishment of effective adaptation strategies at all levels is a priority to halt harmful socio-ecological trends. Free access to quality, reliable information and data on the latest developments and findings in adaptation is an important precondition for any adaptation action on the ground.

SUSTAINABLE ADAPTATION PATHWAY

Knowledge is an essential resource for people and organizations that take decisions on adaptation strategies and actions. The quality and reliability of available information directly affects the outcomes of implemented projects. AdaptaClima was developed to enable free access to practical information on adaptation and to avoid knowledge gaps, thus achieving the first objective of the Brazilian National Adaptation Plan (NAP), which required the "Development and delivery to society of an online platform for management of knowledge on adaptation". The platform provides information through multiple services, including scientific publications, interactive data interfaces, systematic guidance tools for the development of strategies and networking tools.

Acknowledging the involvement of a diverse range of stakeholders in the adaptation agenda, the platform was developed through an inclusive and participatory process, which saw contributions from more than 60 Brazilian organizations and several experienced foreign partners. Since its publication, the AdaptaClima platform has been coordinated and operated by the Ministry of Environment, which holds responsibilities for its maintenance, the updating of content, and, in general, to keep the portal relevant and effective.

AdaptaClima is also part of the KE4CAP network for knowledge exchange between CCA platforms, an international forum where developers and operators of similar projects compare their approaches and learn from each other on how to address common and emerging challenges.

DYNAMIC ELEMENTS OF SAPS

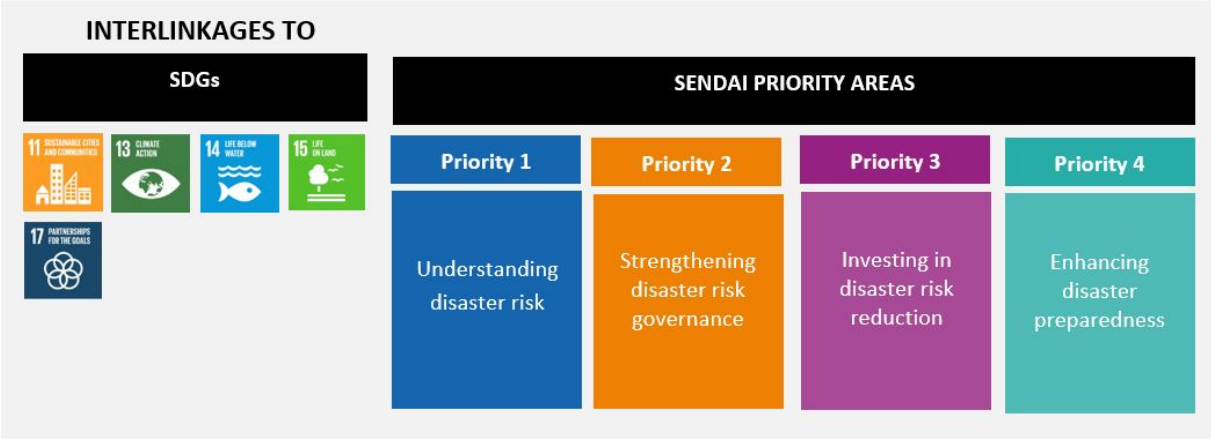
Intersectoral coordination and exchange: The platform was implemented based on close coordination between different sectors and institutions. The Ministry of Environment held a leading role in steering the overall coordination.

Social learning and cognitive aspects: The development process was based on a design thinking framework, and supported the stakeholders' interactions through workshops, webinars, meetings and interviews. In order to understand the platform design process as a whole, a comprehensive theoretical and practical approach was created and social learning was researched, discussed and applied to support group cohesion and maintain constant engagement.

Stakeholder participation: Stakeholders have been directly involved in a two-year participatory process for the development of the platform. The active involvement of the diverse stakeholders in the adaptation agenda was a crucial requirement for the platform to be structured in a way that best fit their needs.

KEY FINDINGS

AdaptaClima connects actors that make decisions on adaptation across Brazil, bridging both regional and sectoral differences and enabling common understanding over mutual challenges and emerging ones. The participatory development process underlines the importance of stakeholder inclusion to ensure that the design of the platform matches the needs and expectations of potential users and is actually being used in policy practice.



Sources: Barrott (2018, 2019), Ministry of Environment (BRA) (2016)

Case Study 9 India | Grassroot flood resilience building

Grassroot flood resilience building in Gorakhpur, India

In 2009, the civil society organization Gorakhpur Environmental Action Group (GEAG) developed a climate resilience strategy for the City of Gorakhpur in India based on several citizen-led resilience-building interventions to address long-term flood risks.

COUNTRIES AND ACTORS India, GEAG

PROJECT TITLE Gorakhpur City Climate Resilience Strategy

SOCIO-ECOLOGICAL CONTEXT

High population growth in the city of Gorakhpur, India has been posing enormous challenges to urban planning. This fact coupled with a diminished capacity of the local government to provide water supply, sanitation and drainage, as well as endemic issues of flooding and waterlogging is likely to increase local climate change impacts.

SUSTAINABLE ADAPTATION PATHWAY

Confronted with recurring episodes of waterlogging and inefficiencies of governmental action, the civil society organization GEAG decided to become active by planning ecosystem-based adaptation (EbA) measures that could address multiple goals through community efforts. The group, in collaboration with local stakeholders, identified opportunities for interventions that could pursue one or more of these overarching objectives:

1. The development of climate-resilient models for integrated agriculture;

2. The improvement of income and food security for poor and vulnerable households;

3. The establishment of regulatory mechanisms that could enhance the sustainability of peri-urban agricultural lands;

4. The improvement of the city flood resilience through the sustainable management of agricultural ecosystems.

Aside from the objective to reduce weather-related hurdles and improve the city's most basic services, the resilience strategy pursued by GEAG was essentially meant to protect the city from flood risks by maintaining the cultivated areas surrounding it, which act as natural barriers. In fact, the NGO collaborated with farmers at the city's periphery and introduced them to EbA in order to improve their agricultural productivity and livelihoods, ultimately avoiding their eventual displacement and the consequent unmanaged expansion of the urban area.

DYNAMIC ELEMENTS OF SAPS

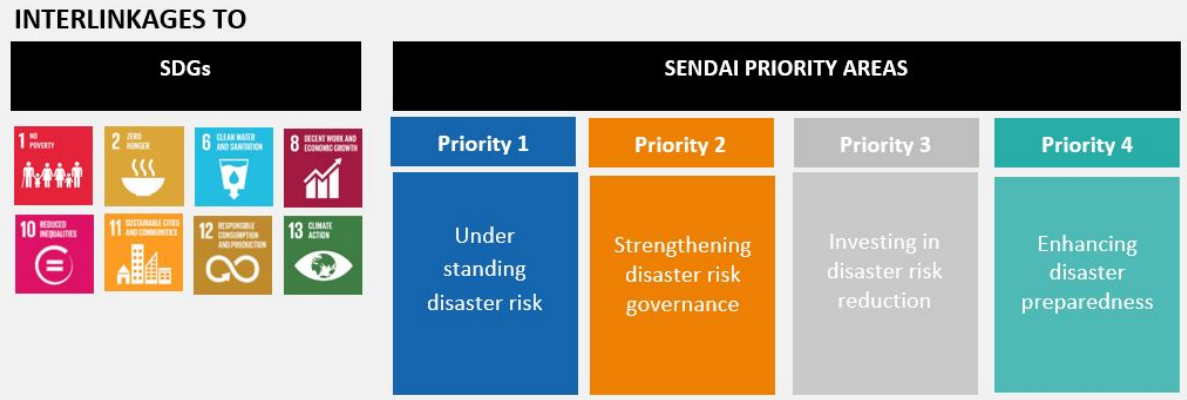
Consideration of multiple benefits: The project was entirely focused on EbA actions that could yield multiple benefits and deliver essential services

Consideration of path-dependencies and lock-ins: While the activation of bottom-up initiatives brought incremental improvements to the agricultural income of farmers, local public authorities lacked the operational and financial capacity to make and implement decisions regarding basic services. Acknowledging these facts, GEAG collaborated with the city's agencies in order to establish regulatory and incentive frameworks for a managed expansion of the urban area.

Stakeholder participation: Shared learning meetings with relevant stakeholders such as the Municipal Corporation of Gorakhpur, the Fisheries Department, Gorakhpur Development Authority, informed citizens, academics of the city (and many others) were organized to discuss approaches and future scenarios of urban growth in the future

KEY FINDINGS

The governance structures and demographics of the city of Gorakhpur are typical of many fast-growing cities in the Global South where climate change poses particularly dire threats, especially for the most socially marginalized. The grassroots-led flood resilience strategy adopted by GEAG managed to increase the city's capacity to deal with climate change hazards, while at the same time increasing the agricultural income of local farmers and avoiding their displacement. These encouraging results are likely transferable to other similar urban contexts, and have the potential to be scaled up. Tapping the potential of ecosystem-based measures to enhance adaptive capacities of vulnerable communities in the light of climate change as well as socio-economic risks is a crucial element of realizing SAPs in cities.



Sources: Du (2019), Global Center on Adaptation (2019, p. 29), Gorakhpur Environmental Action Group (2013).

Case Study 10 Chile | Participatory CCA planning in Santiago de Chile

Participatory CCA planning in Santiago de Chile

In the Metropolitan Region of Santiago de Chile (MRS), urban planning and governance schemes have been typically sectoral and non-participatory. The cross-boundary nature of climate change impacts and the need for adaptation forced policy-makers to consider new models of governance and experiment with more collaborative and participatory approaches.

COUNTRIES AND ACTORS Chile, Ministry of Environment, Gobierno Regional de Santiago de Chile

PROJECT TITLE Regional Climate Change Adaptation Plan for the MRS

SOCIO-ECOLOGICAL CONTEXT

In Chile, governance is often characterized by low degrees of public participation, low interaction between sectoral planning and the absence of elaborated mechanisms to connect public action with the private sphere, the civil society and the scientific community.

In the coming decades, the MRS is expecting multiple impacts of climate change on its territory. The combination of rising temperatures and more intense heatwaves on the one hand, and a reduction in precipitation volumes on the other hand will decrease the availability of water resources, while at the same time stronger increase the demand from different sectors. Conflicts over the use of water supply, therefore, represent a future challenge for the MRS. A lack of awareness of topics of climate change and associated impacts has been observed among key decision-makers and civil society actors.

SUSTAINABLE ADAPTATION PATHWAY

Due to the cross-sectoral reach of climate change impacts, the MRS designed a participatory process for the development of its Regional Climate Change Adaptation Plan. Availability of sound scientific data on expected regional impacts and the existence of a public debate on adaptation were two preconditions that were met before the process itself was established. The participatory process was structured as a series of ten roundtables where a range of relevant stakeholders confronted their specific interests and anticipated possible conflicts. Involved key stakeholders included institutional partners, regional public authorities, members from civil society, multilateral institutions, climate and social scientists as well as public and private organizations with sectoral competence (e.g. in water management or land-use planning). The participatory process provided sufficient political and social legitimacy to the Regional Climate Change Adaptation Plan for the MRS, as demonstrated by its approval by the Council of Regional Authorities and its public acceptance.

DYNAMIC ELEMENTS OF SAPS

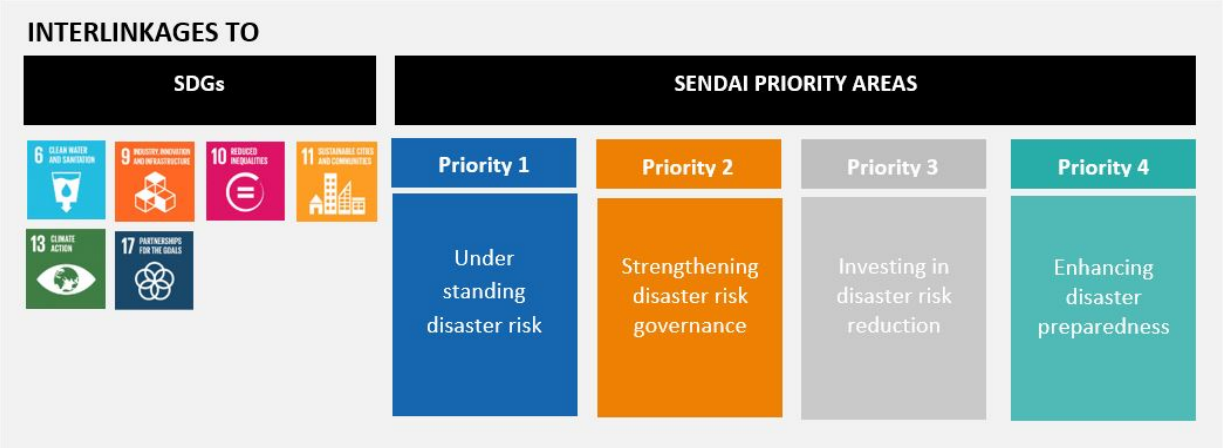
Consideration of local knowledge: Local stakeholders' knowledge was a critical component of the process of identification of priority areas for action, barriers and opportunities for the implementation of adaptation measures.

Stakeholder participation: Different types of stakeholders were included in the series of roundtables. Some of these took part in all roundtables, while some only participated when specific issues were on the agenda. Through this, continuity and coherence of the process were maintained, while the flexibility in the composition allowed specialized expertise to be incorporated. Each meeting was dedicated to one or more scientific themes, with stakeholders sharing their experiences and knowledge on related adaptation issues. The process enhanced the collaboration between a wide range of actors and decision-makers from the regional government, social and climate scientists, national ministries, civil society, the private sector and multilateral institutions with the overall objective of identifying socially-suitable measures of adaptation.

Openness to alternative framings and narratives: The participatory approach for the design of the Regional Climate Change Adaptation Plan of MRS deviates from the traditional way of policy formation in Chile. Typically decisions were made by the sole public authorities without taking into account different stakeholders and their varying preferences and framings.

KEY FINDINGS

The newly introduced participatory governance for the definition of a Regional Climate Change Adaptation Plan requires logistic and organizational efforts and is certainly time-consuming when compared to traditional top-down policy making. Nevertheless, this reorientation is, first of all, a necessity to address an entrenched sectoral planning for CCA. Secondly, additional costs have been compensated with high levels of political and social acceptance of the plan, as the participation and the mutual interaction of stakeholders could avoid conflicts by design and increase the overall legitimacy of the process. Interactions between the stakeholders on thematic issues proved to be an effective means to build social capital for adaptation and climate change across sectors. The construction of a common knowledge base was the factor that mostly attracted the interest of stakeholders in participating in the project. By involving a large number of social groups and interests, the process managed to promote climate change and adaptation issues as major topics in public debates.



Sources: Barton et al. (2015), Krellenberg et al. (2014).

Case Study 11 Colombia | Integrating CCA with 2030 Agenda and Sendai Framework in the NDC

Integrating CCA with 2030 Agenda and Sendai Framework in Colombia's updated NDC

In early 2021, Colombia published its updated Nationally Determined Contribution (NDC) under the United Nations Framework Convention on Climate Change (UNFCCC) for the period of 2020-2030 and used an integrated approach aiming at synergies between the 2030 Agenda, the Paris Agreement and the Sendai Framework.

COUNTRIES AND ACTORS Government of Colombia, Green Climate Fund

SOCIO-ECOLOGICAL CONTEXT

In Colombia, climate change poses threats in the form of heavy rainfalls, heat waves and persistent droughts. Increases in temperature and changes in precipitation patterns will likely lead to water shortages in Colombia affecting irrigated agriculture, human health and sectors such as hydropower that rely on a consistent water supply. Sea level rise is likely to have localized impacts, with significant effects on coastal cities and key ecosystems such as coral reefs and fisheries, affecting key livelihoods (USAID 2017). In addition, major socioeconomic inequalities cause stark differences in vulnerabilities and adaptive capacities across the population.

SUSTAINABLE ADAPTATION PATHWAY

As a response to these threats, the Colombian government has been active in promoting climate change policies and aligning them with overall development strategies. Their recently updated NDC for the period of 2020-2030 is based on an integrated approach aiming at synergies between the 2030 Agenda, the Paris Agreement and the Sendai Framework. It describes actions to mainstream climate change considerations into national and local development plans. The NDC identifies water resources, protection of terrestrial and coastal marine ecosystems, restoration of protected areas, infrastructure and agriculture as target areas for adaptation actions. The adaptation priorities are aligned with areas of risk and vulnerability identified as priorities for the country, to be congruent with the SDGs and the Sendai Framework. While the Colombian NDC is primarily an example of intersectoral coordination and exchange across scales, it also contains socio-political and financial elements which are described in the following.

DYNAMIC ELEMENTS OF SAPS

Intersectoral coordination and exchange: The Government of Colombia's 2010-2014 National Development Plan listed CCA as a priority and established a National Climate Change System to improve coordination among the institutions. Colombia approved the National Climate Change Policy in 2017 and the Climate Change Law in 2018, which establish the guidelines for climate change management in the country. Climate change considerations have been integrated into formal sectoral and territorial planning instruments, through the formulation of Integrated Climate Change Management Plans at sectoral and territorial levels. For every adaptation goal specified in the NDC, related SDGs and Sendai targets are listed. The National Climate Change Adaptation Plan (PNACC) is the mechanism that guides management and organizes national planning processes of these adaptation objectives. It also articulates the implementation of policies, plans, actions and projects to reduce vulnerability and increase adaptive capacity to the possible impacts of climate events in the country.

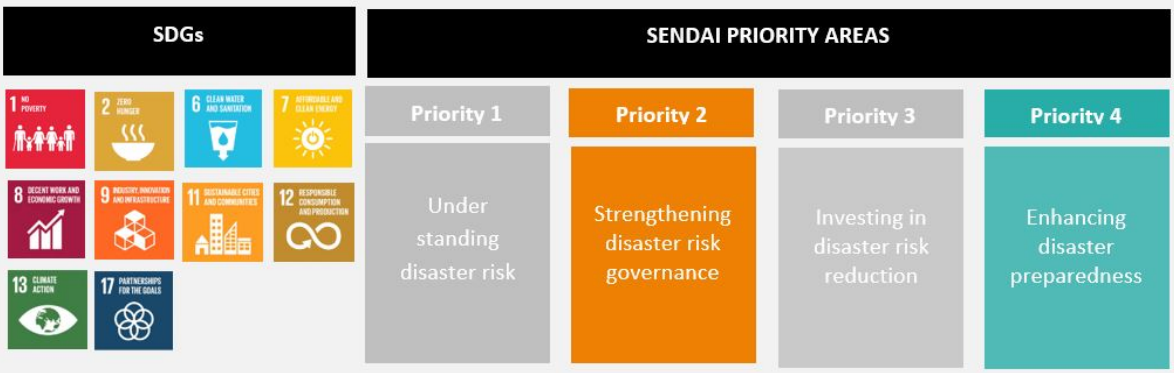
Stakeholder participation: The NDC was updated in a participatory manner including socialization and awareness-raising exercises on the importance of climate change, dialogues with diverse groups, technical working groups and workshops with sectoral and territorial actors.

Provision of funds by international donors: Colombia is currently in the process of formulating the Action Plan to bring the PNACC into practice financed with resources from the Green Climate Fund.

KEY FINDINGS

Colombia's updated NDC takes important steps towards coherence between national policies and long-term commitments to the Paris Agreement, 2030 Agenda and Sendai Framework. Through more robust technical modelling and stakeholder engagement, Colombia has stepped up its NDC's CCA components by better aligning its 30 sector-specific NDC goals with the Sendai Framework and the SDGs. With its NDC, Colombia sets out to address climate and economic challenges in a coherent way and thus to work towards sustainable development in its three dimensions, as promised in the NDC. As countries continue to submit enhanced NDCs, Colombia's NDC can provide an example for an integrated strategy for other nations. A key challenge remains the implementation of this ambitious framework. This will largely depend on an adequate political environment that continues to prioritize holistic development and adaptation policies also in the light of the COVID-19 pandemic.

INTERLINKAGES TO



Sources: Government of Colombia (2020), Vergara et al. (2021).

Case Study 12 Sri Lanka| Integrated approach to CCA in the NAP

Integrated approach to CCA in the Sri Lankan NAP

In Sri Lanka, adapting to climate change has become an essential requirement of sectoral planning at all levels. In 2016, the government established a NAP in order to organize efforts of adaptation and resilience in a coherent way.

COUNTRIES AND ACTORS Sri Lanka

PROJECT TITLE National Adaptation Plan on Climate Change of Sri Lanka

SOCIO-ECOLOGICAL CONTEXT

Sri Lanka is a developing country highly vulnerable to climate change and recurring extreme events are already posing threats to the country's population, infrastructure, ecosystems and economy. As a small island nation, projections of rising sea levels, temperature increases and unpredictable rainfall patterns are likely to aggravate negative climate impacts.

SUSTAINABLE ADAPTATION PATHWAY

The ministry of environment and wildlife of Sri Lanka launched the country's NAP in 2016, as part of the UNFCCC's NAP process. The plan is a country-driven, gender-sensitive and transparent approach to tackle climate change impacts in the decade 2016-2026. Sri Lanka's NAP covers the need to adapt to changes that are already taking place (a gradual increase in ambient and ocean temperatures, changes in the distribution of precipitation patterns, increasing violence and recurrence of extreme weather events) in nine critical sectors that are identified as the most vulnerable. These are food security, water resources, coastal and marine sector, health, human settlements and infrastructure, ecosystem and biodiversity, tourism and recreation, export agriculture sector, energy & transportation. In each identified sector, a set of priority actions is proposed. In addition, cross-cutting national needs of adaptation - i.e. issues that stretch across multiple sectors such as resource mobilization and governance - are taken into consideration, anticipating an active involvement of stakeholders for the development of policies and priorities.

Integrating its adaptation planning into international processes, the NAP is aligned with the UN 2030 Agenda, and dedicated to pursuing the SDGs. Eight out of the seventeen goals are identified as potentially synergetic with the country's adaptation strategy. Policy targets, as well as practical adaptation measures to approach them, are detailed in the document.

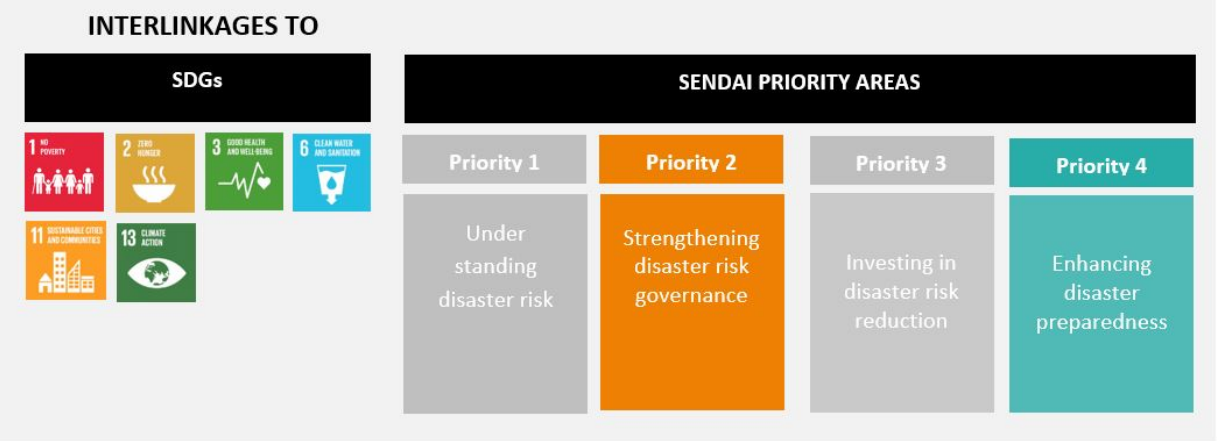
DYNAMIC ELEMENTS OF SAPS

Intersectoral coordination and exchange: Special attention was given to maintain coherence with previous national policies and international commitments. The national Climate Change Policy of 2012 and the National Climate Change Adaptation Strategy already provided a framework for the themes discussed in the NAP. Other policy documents that were considered for a coherent design of the NAP were action plans and programmes to combat land degradation, and enhance water management and DRR, among others.

In addition to the alignment with the SDGs, the NAP also identifies co-benefits with climate change mitigation in accordance with the Paris Agreement.

KEY FINDINGS

The NAP of Sri Lanka is an example of an integrated approach to CCA as it recognizes how adaptation efforts potentially contribute to sustainable development. The method chosen here was to identify critical sectors based on existing vulnerabilities - as well as the main ongoing climatic changes - and then select a range of concrete measures that could simultaneously support both the adaptation and development agendas. The integrated approach of policy-making builds on the existing national policy framework in order to ensure cross-sectoral coherence and continuity.



Sources: Ministry of Mahaweli Development and Environment Sri Lanka (2016), UNFCCC (2017).

Case Study 13 Gambia| Developing a climate-resilient economy

Developing a climate-resilient, natural resource-based economy in Gambia

The government of Gambia, in collaboration with the United Nations Environment Programme (UNEP), launched its most comprehensive project for CCA, with the aim of developing a natural and ecosystem-based economy.

COUNTRIES AND ACTORS Gambia; Government of Gambia, UNEP, Green Climate Fund

PROJECT TITLE Large-scale EbA in the Gambia: developing a climate-resilient, natural resource-based economy

SOCIO-ECOLOGICAL CONTEXT

Gambia is a small country in mainland Africa with one-third of its total surface situated less than 10 meters above sea level. As a consequence, the Gambian population is particularly vulnerable to climate change impacts related to rising sea levels. The vast majority of the country's household income relies on agricultural production, which is constantly threatened by both floods and irregular precipitations. Reduced crop yields pushed rural farmers to seek resources within the forest ecosystems, but unsustainable extraction practices have been contributing to the degradation of its main ecosystem services.

SUSTAINABLE ADAPTATION PATHWAY

The program for adaptation launched by the government in 2017 is centered on ecosystem-based solutions. These provide a cost-effective and low-risk approach to adaptation that reduces adverse impacts of climate change while improving and safeguarding ecosystem services and nature. More than one hundred natural resource-based businesses have been established, thus stimulating economic activities and decent work opportunities for poor communities. The project strategy is to anchor adaptation culture by focusing on mainstreaming its principles and practices in four strategic sectoral policies: transhumance, migration, agriculture and energy. In these areas, adaptation actions are integrated into the respective annual plans with dedicated budget and monitoring systems. The implementation of the proposed EbA measures is facilitated by the government policy that promotes the decentralization of natural resource management to dedicated community-based committees.

DYNAMIC ELEMENTS OF SAPS

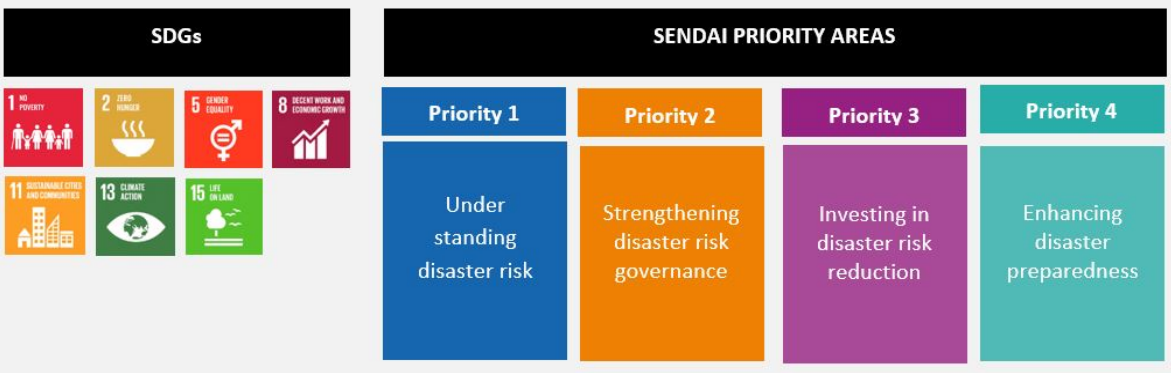
Consideration of multiple benefits: Extensive restoration of forests and other landscapes is carried out by planting species that can provide multiple resources (wood, fruits, medicine, fiber, fuel, etc.) and can also endure climate stress. Particular attention was given to mangrove trees, which provide villages with natural barriers against floods and storm surges. The reforestation effort takes into consideration the risks of bushfires in the dry season, with fire breaks around restored landscapes. Within farms, enrichment-planting practices have been introduced to reduce soil.erosion.

Local context, politics, inequalities and cultural norms: In Gambia 60% of the population lives below the poverty threshold. The project's objective is to increase the cash income of 11,500 households by at least 330 US$ per year through its activities, while projections indicate further 46,200 households to benefit indirectly from the initiatives. Beneficiaries are spread across four different regions (out of the seven regions in Gambia) and over half of them will be women.

KEY FINDINGS

Climate change impacts are exacerbating the effects of poverty in the Gambia. EbA is a strategic approach to strengthen vulnerabilities in this context, as its implementation will restore and safeguard key ecosystems while at the same time supporting a shift towards a sustainable nature-based economy to improve the living conditions of local communities.

INTERLINKAGES TO



Sources: UNEP (2016, 2019).

Case Study 14 Ecuador| The Socio Bosque Program

Ecuador: The Socio Bosque Program to protect forest ecosystems and decrease poverty through monetary incentives

In 2008, the Ecuadorian government launched the Socio Bosque Program. The Program provides financial incentives to landowners in native forest areas to guarantee the protection of ecosystems and their services and to halt deforestation.

COUNTRIES AND ACTORS Government of Ecuador, German Development Bank (KfW), Global Conservation Fund, local communities

PROJECT TITLE Programa Socio Bosque

SOCIO-ECOLOGICAL CONTEXT

The deforestation rate in Ecuador is one of the highest in South America, with territories covered by forests steadily decreasing since the 1990s due to the expansion of human activities such as agriculture, oil exploration, logging and mining. Deforestation and environmental degradation have severe effects on many ecosystem services and resources essential to the country's biodiversity and economy and which are especially important for the livelihood of rural communities, which are often closely intertwined with forest ecosystems. The removal of forests and their ecosystem services – carbon storage, regulation of the water cycle, provision of habitat for the biodiversity etc. – furthermore increases vulnerabilities of populations, ecosystems and institutions to climate change.

SUSTAINABLE ADAPTATION PATHWAY

The government of Ecuador launched the Socio Bosque Program in 2008, a national conservation agreement scheme based on incentive-driven voluntary actions that aims to protect vast forest areas from deforestation. The environmental target of forest conservation is integrated with socioeconomic ones, specifically poverty alleviation, as the scheme was designed to support the poorest rural landowners and indigenous communities in the country.

Socio Bosque offers economic incentives to individuals or communities who own land in native forest areas to guarantee the protection of ecosystems and their services. The amount of monetary incentive received by individual landowners is calculated through a regressive formula that guarantees higher relative remuneration to smallholders. For the first 50 hectares, participant contractors receive $30 for each hectare covered, and the following categories guarantees lower remuneration per each hectare protected. The Program is particularly targeting low-income regions with high rates of indigenous population to tackle poverty challenges using a spatially-differentiated approach.

By restoring and maintaining fundamental services of the forest ecosystem, the program contributes to climate change mitigation thanks to the forests' function of carbon sequestration and storage, develops CCA as well as improved disaster risk management and resilience by containing run-offs, limiting flood risks and increasing infiltration and water storage.

DYNAMIC ELEMENTS OF SAPS

Conditional on compliance In order to guarantee direct and verifiable benefits for local development and poverty alleviation, each applicant is required to issue a social investment plan containing detailed information about the management of funds. These are especially important

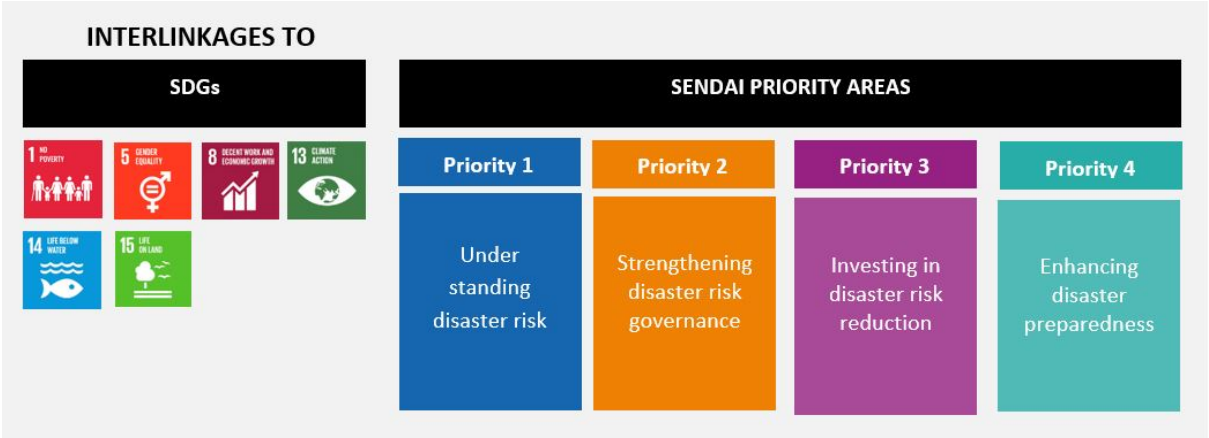
for those cases where entire communities apply to the program, as the transparency of decision-making processes related to the management of the incentives is essential to ensure that nobody is excluded from the benefits offered by the scheme. The compliance with the conservation modalities detailed in the action plan, as well as the achievement of minimum standards and goals is conditional to the transfer of the monetary compensation.

Diversified financing: The Socio Bosque Program was launched as an initiative fully funded by the Government of Ecuador. As the project developed, the government sought to diversify the source of its financing through new green taxes, international cooperation funds, voluntary international contributions and compensatory payments by industry in exchange for licenses for natural resource extraction or other high-impact activities. Currently, the Ecuadorian Government is receiving support from the German Development Bank KFW to expand and consolidate forest conservation activities in Ecuador and align them with the national REDD+ strategy under the UN-REDD Programme.

KEY FINDINGS

The combination of environmental protection and poverty alleviation goals is the distinctive feature of the Socio Bosque program. This requires balancing efforts between environmental and economic efficiency as well as social equity, as trade-offs might arise concerning with issues such as access to the program and the inclusive distribution of incentives. One of the major barriers that have been identified within the program was the issue of land distribution. Direct involvement of the poorest is often undermined by informal or missing land rights, which are a precondition to project participation. The Government of Ecuador is committed to regularize land ownership and is currently planning an ambitious land titling program to improve the land tenure situation.

Socio-ecological research has mainly depicted Socio Bosque as a positive incentive program for forest conservation that complementarily supports other policy efforts of reforestation, control of illegal logging.



Sources: De Konig et al. (2011), Fehse (2012)

Case Study 15 Ghana| Approaches to increased coherence between CCA and DRR

Institutional approaches to increased coherence between CCA and DRR in Ghana

Due to the likely severe impacts of climate change on Ghana, the country has focused on coherent CCA and DRR besides its mitigation efforts.

COUNTRIES AND ACTORS Ghana, Ministry of Environment, Science, Technology and Innovation; Environmental Protection Agency; National Development Planning Commission; National Disaster Management Organisation

SOCIO-ECOLOGICAL CONTEXT

Ghana is a country highly affected by climate change. The average temperature is projected to increase between 1.7 up to 3.7°C by 2080. Risks from climate change affect all regions. With regard to the occurrence of disasters in Ghana, over 80% are climate-related. High-level risks include too much, too little or erratic rainfall, dry spells and crop failures.

Ghana has a decentralized governance system. At the national level, different ministries are responsible for the policy development of CCA. The Ministry of Environment, Science, Technology and Innovation and the Environmental Protection Agency as well as the National Development Planning Commission are mainly responsible to integrate CCA and to some extent DRR into the country's development agenda. The National Disaster Management Organisation that operates under the Ministry of Interior is responsible for the management of disaster risks and similar emergencies, as well as for rehabilitation after disasters. The responsibility for implementing CCA and DRR lies with local authorities.

SUSTAINABLE ADAPTATION PATHWAY

In order to react to these challenges Ghana has made institutional arrangements to enhance policy coherence between CCA and DRR. One of these examples is the close coordination between the Environmental Protection Agency and the National Disaster Management Organisation. The coordination between the Environment Protection Agency and the National Disaster Management Organisation led to the Ghana Plan of Action on Disaster Risk Reduction and Climate Change Adaptation and Ghana's National Climate Change policy. The latter is the main policy document concerning climate change in Ghana and includes program areas that are explicitly linked to disaster risk management. One of the key elements is the development of integrated priority policy responses including EWSs.

DYNAMIC ELEMENTS OF SAPS

Intersectoral coordination and exchange: Governance arrangements in Ghana facilitate integrated policy-making and coherence between CCA and DRR across ministries and agencies.

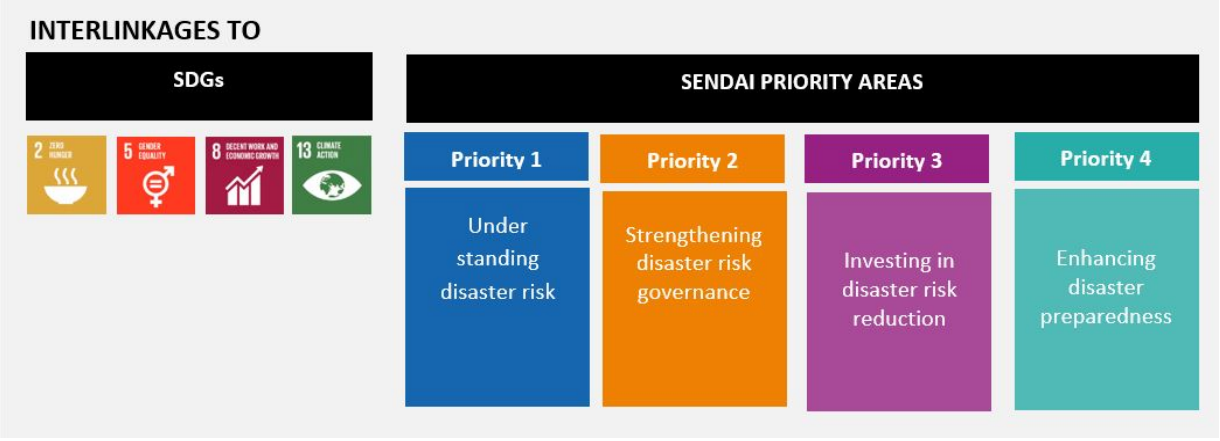
While policy development for CCA and DRR at the national level is governed by different ministries and agencies, Ghana has put in place institutional arrangements that contribute to processes of integrated policy making. This includes inter alia the coordination between the Environment Protection Agency that is responsible for the development and implementation of policies and programs on climate change, together with the Ministry of Environment and the National Disaster Management Organisation.

Coordination between the Environmental Protection Agency and the National Disaster Management Organisation contributed to the development of the Ghana Plan of Action on

Disaster Risk Reduction and Climate Change Adaptation and Ghana's National Climate Change policy.

KEY FINDINGS

The authors of the OECD (2020) report presenting the case concluded that strengthening institutional capacities at the sector and sub-national levels to better understand the climate and disaster risks is an important next step as well as planning through to implementation. According to the authors, this includes to identifying and prioritizing CCA and DRR options, conducting budget estimates to mobilize funding, and learning from implementation, guided by data and information. The authors acknowledge that budget limitations still constrain the implementation of CCA and DRR. Furthermore, the implementation of these policies on the ground remains challenging due to gaps in data, information and awareness. Next steps to further improve coherence between CCA and DRR include enforcing existing legal standards and regulations as the basis for CCA and DRR, ensuring that they are incorporated into local development plans, and establishing review mechanisms to monitor and evaluate CCA and DRR.



Sources: OECD (2020, p. 77ff).

Case Study 16 Denmark| Supporting adaptation planning and action at municipal level

Strengthen governance by supporting adaptation planning and action at municipal level through knowledge and consultancy in Denmark

In 2012, Denmark adopted a NAP to ensure the country's resilience towards climate change in the future. Since then, accompanying measures have been implemented across different scales to put a place-based approach to adaptation into practice.

COUNTRIES AND ACTORS Denmark, Ministry of Environment, Ministry of Transport, Ministry of Defense and others

SOCIO-ECOLOGICAL CONTEXT

Denmark's climate is gradually changing, with increasing precipitation in the winter season and warmer summers characterized by longer and more frequent dry spells. In the long term, sea levels are expected to rise, and extreme weather events will manifest with more frequency and intensity. While adaptive capacities in Denmark are relatively high, these future predictions are likely to increase vulnerabilities in specific parts of the country.

SUSTAINABLE ADAPTATION PATHWAY

In light of the uncertainties and spatially different impacts associated with climate change, the Danish Adaptation Plan understands CCA to be locally based and iterative effort. Local authorities, companies and other stakeholders are perceived as being the most familiar with local conditions and as well equipped to make decisions on adaptation. At the same time, strategic responsibilities for adaptation are also allocated at the national level to provide a sound legal and regulatory framework for local initiatives, as well as support through coordination and information sharing. Thus, the NAP required municipalities to create their own strategies for CCA following guidelines provided by the government.

In this context, the Ministry of Environment has established a task force to ensure the availability of updated knowledge and data to municipal governments and other local stakeholders involved in adaptation efforts. In order to facilitate these functions, a web-based platform (Klimatilpasning.dk) was created. The portal provides the most recent information from research and development in the area of CCA worldwide, with the inclusion of databases for case studies and instruments.

DYNAMIC ELEMENTS OF SAPS

Intersectoral coordination and exchange: The NAP promotes initiatives of cross-sector relevance. Efforts in the area of CCA should be coordinated among public authorities, businesses and individuals. One of the main purposes of the information and consultancy service provided by the task force through the Klimatilpasning portal and the mobile unit is to create a common knowledge base to enable dialogue and intersectoral coordination.

Fostered institutional capacity: Information, consultancy, implementation counselling, tools to assess risk from changing climate and to climate-proof infrastructures and buildings are all means provided by the central government to enhance the capacity of local institutions when planning and implementing adaptation strategies. The governance structure entails a high degree of flexibility, which is expressed in the mobile unit supporting the NAP implementation in the communities.

Coordination across levels and scales: One of the responsibilities of the national task force on CCA is to provide guidance to municipal governments and other actors according to the national guidelines. It can also offer initiatives designed by the central government when local conditions allow their effective implementation. The Ministry of Transport visited the municipalities located in areas designated as flood-prone by the EU Floods Directive, in order to provide additional support in the designing of adaptation strategies. The Ministry of Defence published a report directed to local governments with suggestions and best practices to manage and react to violent cloudburst events.

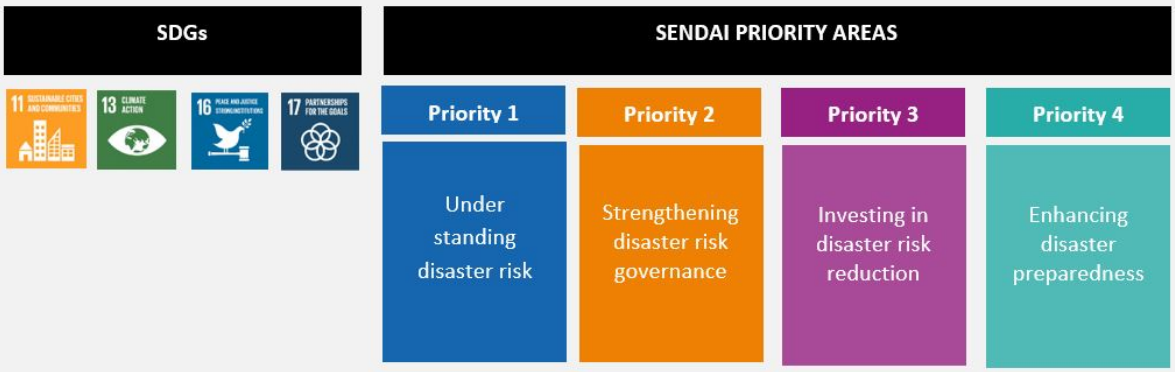
Flexible governance structures: Within the national task force on CCA, a mobile unit was established soon after the adaptation of the NAP. The mobile unit provides direct support to municipalities in the implementation of their plans. The team can be summoned free of charge. It provides guidance, facilitates the involvement of stakeholders and organize workshops and meetings with various actors.

Stakeholder participation: Initiatives for CCA are based on inclusive and open processes of decision-making, which entail network-based stakeholder involvement structures.

KEY FINDINGS

The scale of anticipated climate change challenges requires societies to develop solutions through coordinated effort while limiting fragmented approaches as much as possible. The Danish approach for its 2012 NAP is highly focused on improving the institutional setting for a participative, inter-sectoral and cross-level coordinated action. The case study sheds light on the distribution of responsibilities to match the nature of climate change impacts. While adaptation measures are identified mainly at a local/regional level - as climate change risks and vulnerabilities are often determined by local circumstances - the national level promotes initiatives, develops common guidelines and a framework for collaboration, in order to avoid gaps and a piece-meal type of adaptation. The NAP stresses the importance of knowledge sharing and the empowerment of local institutions as crucial areas where the central government can provide functional frameworks for multilevel coordination.

INTERLINKAGES TO



Sources: EEA (2014), Government of Denmark (2012).

Case Study 17 Peru | Approaches to increased coherence in CCA and DRR

Approaches to increased coherence in CCA and DRR in Peru

Peru is a country highly exposed to climate-related disaster risks. CCA and DRR are a policy priority. While a strong institutional setting exists to address CCA and DRR, implementation on the local level still faces obstacles

COUNTRIES AND ACTORS Peru, Council of Ministers, Ministry of the Environment (MINAM), National Centre for Disaster Risk Estimation, Prevention and Reduction

SOCIO-ECOLOGICAL CONTEXT

Peru is a country highly exposed to disaster risks. It was regarded to be one of the ten most affected countries of disasters in 2017 concerning economic damages. Peru was impacted by 50 000 disasters between 2003 and 2015 according to national statistics leading to more than 2100 deaths and further severe impacts on housing, infrastructure and agriculture, affecting most economic sectors. Hydrometeorological hazards have caused more than half (57%) of these emergencies at the national level. Heavy rains, strong winds, low temperatures and floods have affected all regions. This high proportion demonstrates the importance of climate-related risks in Peru. Another source of risk is geological hazards that may affect this seismically prone country.

This high fragility is amplified by physical and socio-economic vulnerabilities, including inadequate asset protection and construction of buildings, deforestation and land degradation.

SUSTAINABLE ADAPTATION PATHWAY

Peru, therefore, regards DRR and CCA as a policy priority in its strategic orientation concerning the country's sustainable development. Concerning DRR Peru established the National Disaster Risk Management System that aims at strengthening resilience against disaster risks. The National Disaster Risk Management System coordinates DRR efforts on the local, regional and national levels. The Centre of Government, the presidency of the Council of Ministers (PCM) is responsible for the overall coordination through the Deputy Ministry of Territorial Governance and the National Disaster Risk Management Council chaired by the President. The National Disaster Risk Management System is further supported by technical advisors (i.a. the National Centre for Disaster Risk Estimation, Prevention and Reduction). The Ministry of Economy and Finance is responsible for the disaster risk financing strategy. The institutional set-up covers the entire risk management cycle with clear roles and responsibilities. The National Disaster Risk Management System requires regional and local governments to develop DRR plans and to integrate DRR in their local planning and budget processes.

Concerning CCA various regional climate change strategies exist. The Peruvian Ministry of the Environment (MINAM) supports the development of these regional instruments. Peru has adopted the framework law on Climate Change in 2018, making it mandatory for all levels of government to include climate change in development planning. MINAM has also set up a specific participatory process to engage stakeholder participation.

DYNAMIC ELEMENTS OF SAPS

Intersectoral coordination and exchange: The MINAM used the development of Peru's NDC to promote multi-stakeholder engagement and strengthen its coordination role in CCA. Various ministries participated in identifying key thematic areas for adaptation and specific measures. 25% of the measures in the NDC are related to DRR.

Fostered institutional capacity: In the aftermath of the 2017 El Nino coastal event, Peru created an autonomous authority under PCM to implement a resilient reconstruction process to strengthen resilience.

Coordination across levels and scales: The National Disaster Risk Management System foresees clear responsibilities for regional and local governments to develop DRR plans.

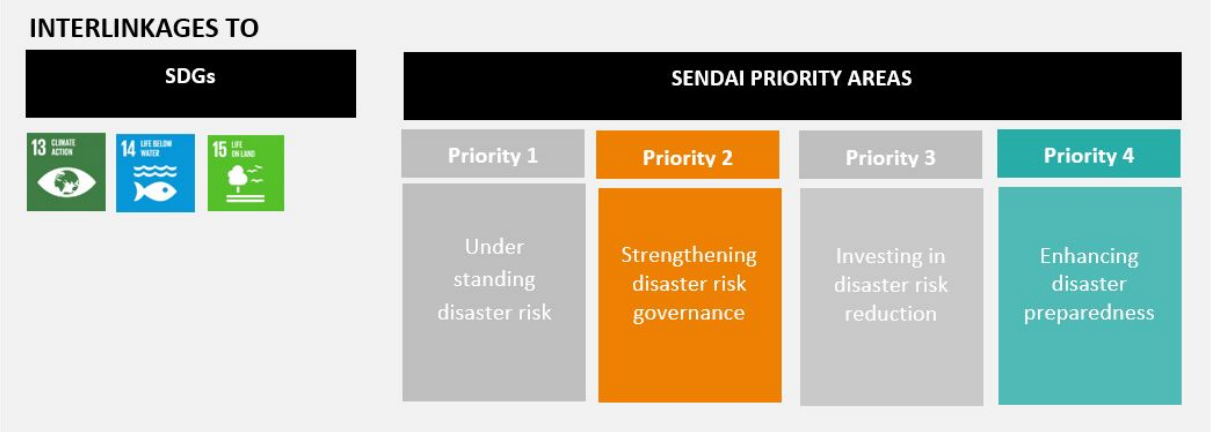
Consideration of multiple benefits: MINAM has paid particular attention to incorporating NBS such as upper watershed reforestation and river flood control through riparian buffer development into CCA and DRR policy tools.

Stakeholder participation To foster multi-stakeholder participation and inclusion in climate change policy-making, the MINAM created a specific participatory process named "Dialoguemos". More than 2000 people from the civil society, indigenous communities, academia, youth organizations and the private sector convened to discuss the development of the Peruvian NDC, the by-laws of the climate change framework law or other topics of interest.

KEY FINDINGS

While efforts are made to align policy approaches, there is a clear margin of progress to further develop synergies between these two agendas, avoid redundancies and benefit from

opportunities. Despite a clear institutional arrangement to increase local DRR implementation, a large number of municipalities in Peru have not yet developed such local plans. Only about 3,7% of the 1869 Peruvian municipalities had disaster prevention and risk reduction plans in place in 2017 and their quality varies.



Sources: OECD (2020, p. 115ff)

Case Study 18 Peru | Public investment policy invierte.pe for investments in DRR and CCA

Public investment policy invierte.pe to favor investments in DRR and CCA in Peru

Peru revised its public investment policy in 2017 to simplify the process of accessing funds and focus on citizen-centered service delivery. Peru's public investment policy nvierte.pe has a series of innovative features i.a. potentially favoring investments in DRR and CCA measures.

COUNTRIES AND ACTORS Peru, Ministry of Health, Ministry of the Environment (MINAM)

PROJECT TITLE Peru's public investment policy invierte.pe

SOCIO-ECOLOGICAL CONTEXT

Peru is a country very exposed to climate-related disaster risks (cf. Case Study 17).

SUSTAINABLE ADAPTATION PATHWAY

The investment policy applies a social discount rate that takes into account the long-term gains from investment projects, such as those from improved climate resilience. It provides incentives for multipurpose investments, so that projects that integrate a DRR or CCA purpose in addition to achieving other social benefits can be evaluated favorably. It makes ex-post evaluation a priority, which may favor resilient projects given the high risk involved. It considers NbS among project types for public investment.

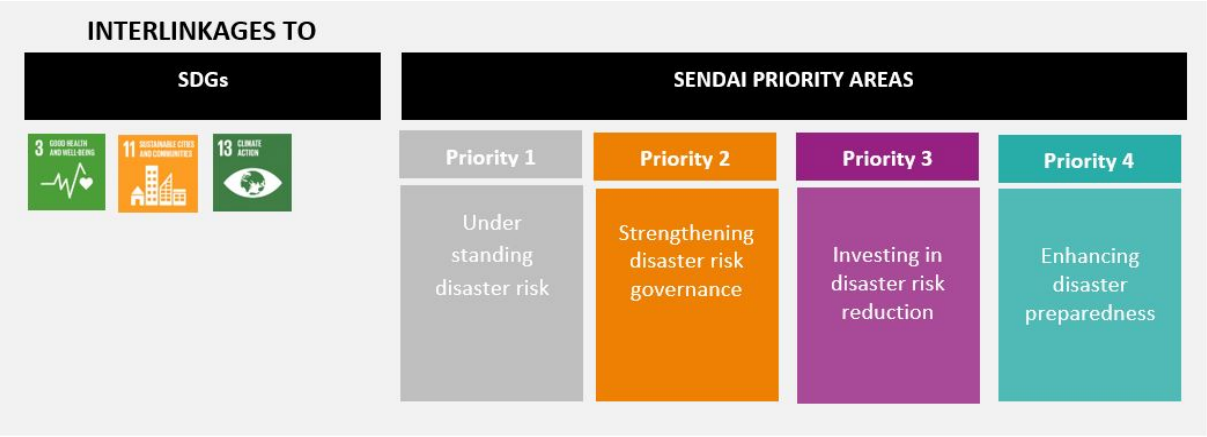
DYNAMIC ELEMENTS OF SAPS

Intersectoral coordination and exchange: The Ministry of Health has collaborated with MINAM, which led to increased coherence between CCA and DRR in the health sector. These guidelines highlight specific issues that enable alignment between DRR and CCA, such as: investment sustainability for DRR in CCA, climate change risks and health, risk analysis for corrective and prospective management

Provision of funds by the government: The government revised its public investment policy through a series of innovative features such as the favouring of projects supporting integrative DRR and CCA measures.

KEY FINDINGS

While the innovations within invierte.pe are a positive step for DRR and CCA, the simplification process has lowered the level of expectations related to pre-investment risk analysis. The previous public investment system included minimum DRR and CCA requirements in its guidelines. Guidelines in this regard for invierte.pe have generally, with the exception of the health sector, not been developed yet, even though clear responsibilities exist.



Sources: OECD (2020, p. 115ff).

Case Study 19 Malawi | Participatory learning for legume diversification adoption

Participatory learning for legume diversification adoption in Ekwendeni, Malawi

COUNTRIES AND ACTORS Malawi; University of Western Ontario and Michigan State University, local communities

PROJECT TITLE Soils, Food and Healthy Communities (SFHC) Project

SOCIO-ECOLOGICAL CONTEXT

Malawi is a small African country where 90% of the workforce is found in the agricultural sector. Maize crops are cultivated by the vast majority of farmers, due to highly caloric products and low requirements of labor inputs. However, more than half of the farming households produce at subsistence level using government-subsidized synthetic fertilizers. The great climate variability in the dry region increased the risks of non-organic fertilizers use, exposing Malawian smallholder farmers to food insecurity and malnutrition.

SUSTAINABLE ADAPTATION PATHWAY

Green manures and legumes have been known as possible strategic solutions for Malawi's food insecurity and low soil fertility situation. Yet, several technical and social barriers (labor requirements, lack of technical education, limited access to seed varieties, uncertain markets) prevented their widespread application. In 2000, the Soils, Food and Healthy Communities (SFHC) Project was launched by the Ekwendeni town Hospital in collaboration with researchers from the University of Western Ontario and the Michigan State University, attempting to remove such

barriers. Several agricultural communities have been involved in educational events and participatory research processes. Participants learned about the multiple positive impacts of legumes products for their specific context: leguminous cover crops enhance soil quality by replenishing nitrogen and recycling crucial nutrients like phosphorous. At the same time, legume crops are an excellent source of protein and iron for human consumption. Management education and notions on marketing opportunities were also included within the educational activities.

More than 10,000 farmers joined the initiative by 2011 with high rates of women participation. The proposed adoption of legumes reached even the most poorly resourced farming households. These activities lead to increased crop diversity and helped to spread crop rotation practices, thus improving the adaptation of local communities to changing climatic conditions.

DYNAMIC ELEMENTS OF SAPS

Social learning and cognitive aspects: The project implemented a "farmer-to-farmer" teaching model, with educational activities stimulating the interactions between farmers with different levels of experience. Inexperienced farmers could also learn about practical techniques for the management of the different legume technologies through direct observation of a "mother plot" located at the center of the village, where all five legume options were grown by the researchers team.

Consideration of pathways and lock-ins: Low speed of seed multiplication and limited market options represent barriers to the uptake of the production of legumes that require long-term investments. The project acknowledges these difficulties and provides continuing support to farmers when obstacles to crop system experimentation arise.

KEY FINDINGS

The challenge for the long-term sustainability of the cropping system in Ekwendeni, Malawi was the dire food insecurity produced by farmers' reliance on cereal-dominated monocultures in a context of soil depletion and more unpredictable climatic conditions. Legumes are plants that can grow in low-fertility soils and have the capacity to replenish soil and recycle nutrients, and produce nutrient-enriched foods. The case study showed how legume-based options should be considered as a priority for the technological improvement of cropping systems in arid-climate developing countries. The preference of informed local farmers for edible legumes and their voluntary adoption of diversified crop systems supports the suitability of integrated education and participatory research approaches in strategies for the enhanced sustainability and adaptation of smallholder farming communities, as opposed to conventional "top-down" technology transfer models.

Sources: Bezner Kerr et al. (2007), Oakland Institute and AFSA (2021).

Case Study 20 Mexico | Insurance policy pilot to restore coral reefs and protect tourism infrastructure

Design of an insurance policy pilot to restore coral reefs and protect tourism infrastructure in Quintana Roo, Mexico

A global reinsurer, the Nature Conservancy and the hotel owner's association of Mexico have teamed up to draft an insurance policy pilot to cover for the potential beach erosion that could result from a severe hurricane.

COUNTRIES AND ACTORS Mexico, private sector (hotel owners), global reinsurer, GIZ, The Nature Conservancy

PROJECT TITLE Design of an insurance policy pilot for coral reefs to protect tourism infrastructure project

SOCIO-ECOLOGICAL CONTEXT

The coast of Quintana Roo in Mexico is highly biodiverse and a main retreat for international tourism on which the local populations are highly dependent. Worsening climate impacts paired with poor land-use planning provide threats to local livelihoods. The main environmental and climate issues are coral bleaching and beach erosion resulting from hurricanes and sea-level rise.

SUSTAINABLE ADAPTATION PATHWAY

The policy insurance includes, inter alia, the allocation of resources for the restoration of coral reefs. This is based on the evidence conducted by the Nature Conservancy that preserved coral reefs can reduce wave energy greatly. Implementation is overseen by a non-profit-organization, a key requirement for the involved global reinsurer to get involved.

DYNAMIC ELEMENTS OF SAPS

Intersectoral coordination and exchange: Mexico has a solid legal framework with regards to climate change and DRR which is however hindered by incoherence in practice (Sandholz et al. 2020). Mexico has included ecosystem-based approaches in their NDC presented to UNFCCC.

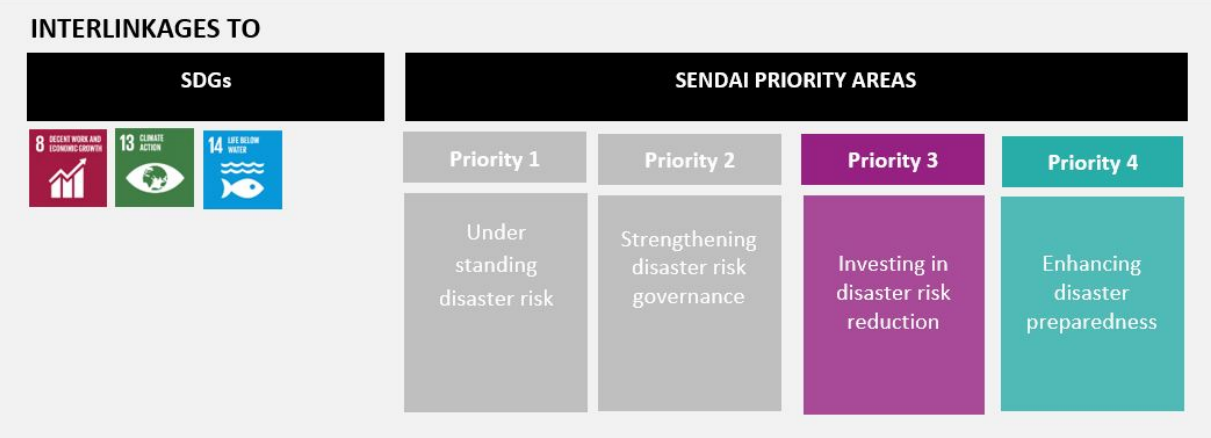
Coordination across scales and levels: There are several governance bodies at the local level to support integrated land management.

Stakeholder participation: There is an advisory Council as part of the Mexican governance framework to advise on the conservation and management of protected areas, consisting of mayors of the municipalities of the protected areas, academics, civil society and land owners.

Involvement of the private sector: The developed insurance policy is an innovative financial instrument for NbS for adaptation. The financial budget generated by the insurance company is used to protect the coastline - using coral reef restoration measures with large social and ecological benefits.

KEY FINDINGS

The success of the insurance policy still has to be determined. Yet the case study shows that ecosystem-based adaptation measures can be initiated by actors from the private sector. Preliminary findings highlight the importance of a robust technical and scientific foundation for the involvement of stakeholders. The measure shows synergies between protecting the local tourism sector and related livelihoods and ecological improvements.



Sources: GIZ (2018), Sandholz and Wannewitz (2020).

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