HARNESSING FORESTS FOR RESILIENCE: NATURE-BASED SOLUTIONS FOR DISASTER RISK REDUCTION AND DEVELOPMENT

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- Title

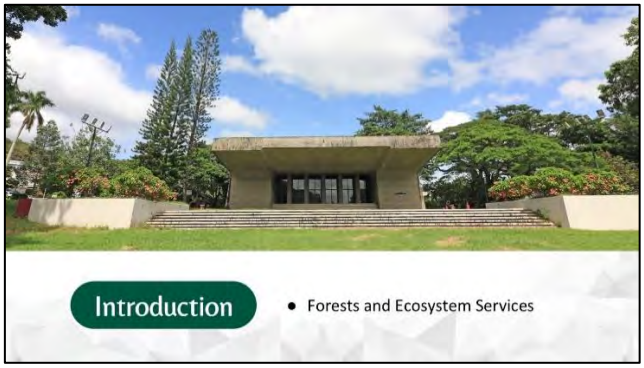
Good afternoon. First, let me sincerely thank the organizers for inviting me to this very important international seminar. The title of my presentation is: "Harnessing Forests for Resilience: Nature-Based Solutions for Disaster Risk Reduction and Development."

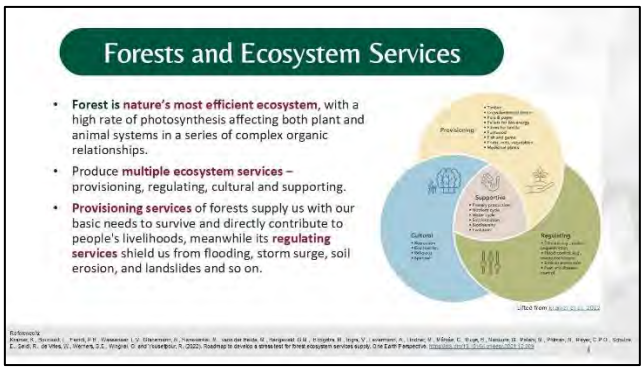
- Contents

I wish to cover the following five sections for my presentation.

1. Introduction
2. The Multifaceted Role of Forests in Regional Development and Disaster Risk Reduction (DRR)
3. The Philippines Context
4. Recommendations and Opportunities
5. Conclusion

- Introduction: Forests and Ecosystem Services

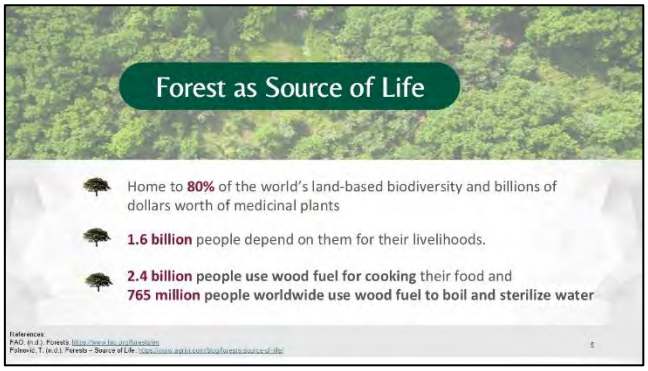




A forest is a complex ecological system in which trees are the dominant life-form. A forest is nature's most efficient ecosystem, with a high rate of photosynthesis affecting both plant and animal systems in a series of complex organic relationships.

Provisioning services of forests supply us with our basic needs to survive and directly contribute to people's livelihoods, meanwhile its regulating services shield us from flooding, storm surge, soil erosion, and landslides, among others.

- Forests are a source of life



- Forests are home to 80% of the world's land-based biodiversity and billions of dollars worth of medicinal plants are harvested from tropical forests every year.

- 1.6 billion people depend on them to some extent for their livelihoods.
- 2.4 billion people use wood fuel for cooking their food and
- approximately　765 million people worldwide use wood fuel to boil and sterilize water

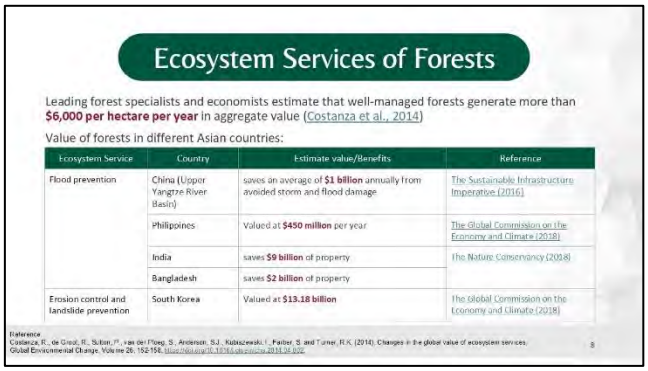
The forests literally provide our basic needs to survive

"Our natural assets – forests, rivers, oceans, soils –　provide over $125 trillion in ecosystem services annually" (CIFOR, 2015), yet they remain underutilized in disaster risk reduction.
I would like to present to you here how we can maximize these natural resources not just for our economic growth and development but as well as our survival in the face of climate change and climate-disasters and other hazards, but focusing on forests.

- Forests for resilience

The FAO cannot emphasize it more by saying that forests and even trees outside forests play important roles in protecting and supporting livelihoods and serving as vital safety nets during disasters and crises
In this slide we show the different functions of forests, or even just a number of trees, in times of shocks or disturbances.

- Ecosystem Services of Forests



In this slide, I want to show you how forest ecosystem services are valued although many of its services cannot be fully accounted for.

Leading forest specialists and economists estimate that well-managed forests generate more than $6,000 per hectare per year in aggregate value, with large values mainly coming from its non-remunerated ecosystem services.

Across countries in Asia, forests that are regenerated and/or well-managed are able to contribute to flood mitigation, erosion and landslide control, and act as biological shields for communities.

- The Multifaceted Role of Forests in Regional Development and DRR

Title Slide: The Multifaceted Role of Forests in Regional Development and Disaster Risk Reduction (DRR)

1. Global Trends in Forests and DRR
2. Nature-based Solutions Framework
3. Recognition of NbS in International Agreements

- Forests for regional development

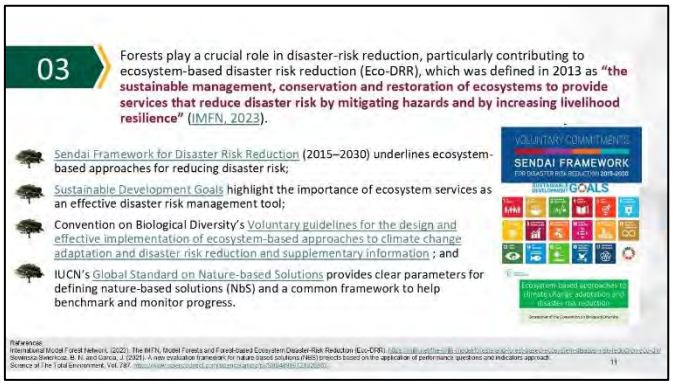
Forests for regional development

Forested watersheds and wetlands supply 75 percent of the world's accessible fresh water for domestic, agricultural, industrial and ecological needs. If sustainably managed, forests are also a source of renewable raw materials, helping to build an economy which allows nature to regenerate.

Forest and forest related initiatives as Nature-based Solutions, which I will delve on later, can be used to participate in carbon markets. Carbon markets are used by companies to offset their emissions by purchasing carbon credits generated from NbS projects.

More than ever, forests have been recognized in many regional and global fora highlighting the importance of international policy coordination and cooperation:

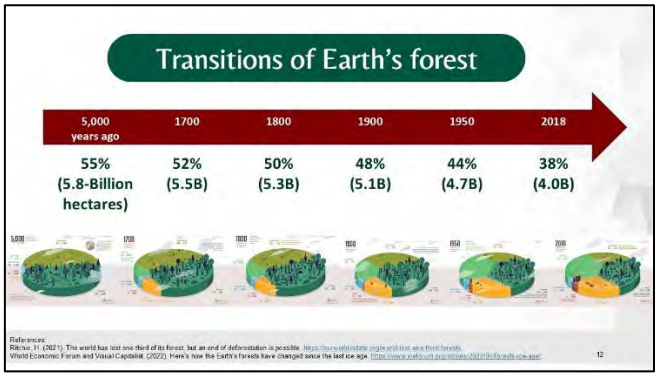
1. 2030 Agenda for Sustainable Development / SDG Goals (2015): Goal No. 15 aims to "protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss".
2. Durban Declaration (2015) called for new partnerships among forest, agriculture, finance, energy, water and other sectors, as well the engagement with indigenous people and local community.
3. Future We Want from the Rio+20 Conference (2012): highlighted the need for sustainable forest management to support livelihoods
4. Agenda 21 (1992): called for efforts to sustain the multiple roles and functions of all types of forests, forest lands and woodlands



Forests play a crucial role in disaster-risk reduction, particularly contributing to ecosystem-based disaster risk reduction (Eco-DRR), which was defined in 2013 as "the sustainable management, conservation and restoration of ecosystems to provide services that reduce disaster risk by mitigating hazards and by increasing livelihood resilience" (IMFN, 2023).
Several mechanisms, frameworks and other tools increasingly integrate nature as a key component to accelerate action on DRR, including the ff:

1. Sendai Framework for Disaster Risk Reduction (2015–2030) underlines ecosystem-based approaches for reducing disaster risk;
2. Sustainable Development Goals highlight the importance of ecosystem services as an effective disaster risk management tool;
3. Convention on Biological Diversity's Voluntary guidelines for the design and effective implementation of ecosystem-based approaches to climate change adaptation and disaster risk reduction and supplementary information ; and
4. IUCN's Global Standard on Nature-based Solutions provides clear parameters for defining nature-based solutions (NbS) and a common framework to help benchmark and monitor progress.

- Transitions of Earth's forest

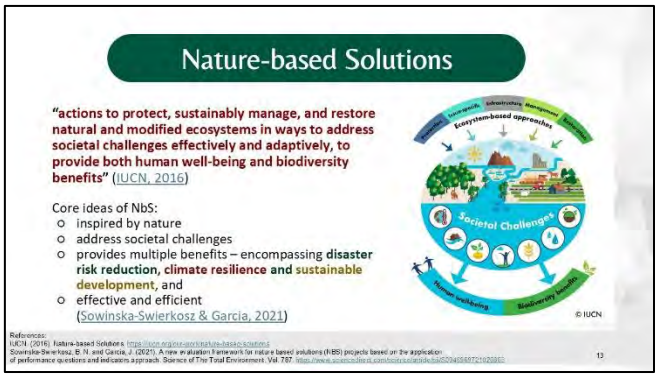


However, even if even from our younger years, we were informed that trees and forests sustain our lives, we see our forests continue to be threatened. This has been the trend since the last ice age.

The slide shows how the world's forests have been shrinking at an increasingly rapid rate since the last ice age.

10,000 years ago, forests accounted for 6 billion hectares (57%) of the Earth's habitable land. However, by 2018, the world's forests will have gone down to just 4 billion or hectares (38%).

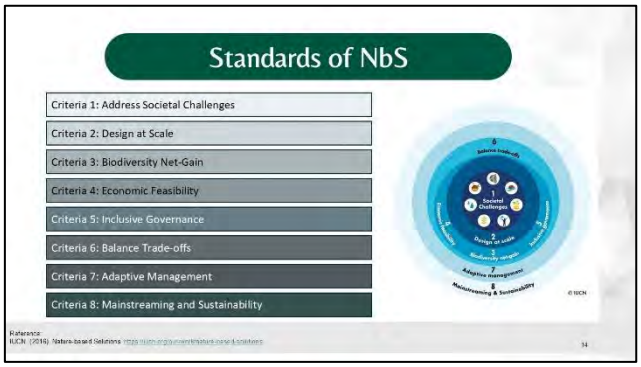
- Nature-based Solutions



What are Nature-based Solutions or NbS

- An umbrella term coined by the IUCN to refer to all "actions to protect, sustainably manage, and restore natural and modified ecosystems in ways to address societal challenges effectively and adaptively, to provide both human well-being and biodiversity benefits" (IUCN, 2016)
- Core ideas of NbS:
    - inspired by nature
    - address societal challenges
    - provides multiple benefits, and
    - effective and efficient (Sowinska-Swierkosz & Garcia, 2021)
- NbS is now considered as essential for achieving sustainable development

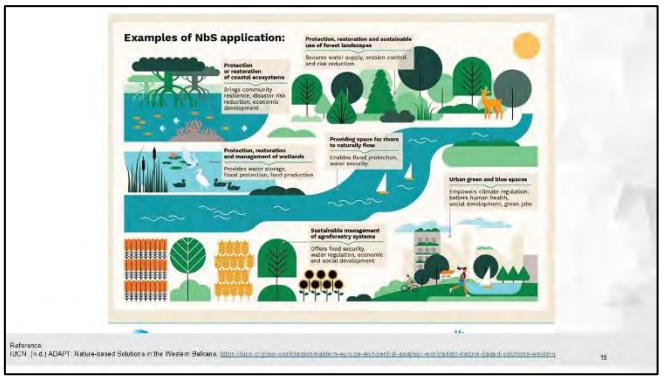
- Standards of NbS



IUCN established standards for NbS

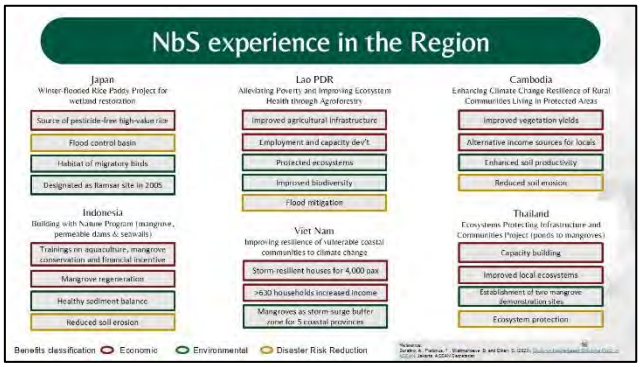
1. NbS should address societal challenges
2. Design at scale
3. Biodiversity Net-Gain
4. Economic Feasibility
5. Inclusive Governance
6. Balance Trade-offs
7. Adaptive Management
8. Mainstreaming and Sustainability

- Example of NbS application



In the following slides, I just want to briefly show you the different NbS initiatives in the Region and each one's multiple benefits – socio economically or development-wise and ecologically, including disaster risk reduction and climate change adaptation and mitigation.

- NbS experience in the Region



In this slide I just want to demonstrate how NbS in the region, for instance in Japan, Lao PDR, Cambodia, Indonesia, Vietnam and Thailand, are able to target multiple outcomes in terms of socio-economic development, environmental protection as well as boosting disaster risk reduction.

The Winter-flooded Rice Paddy Project was able to improve rice production and at the same time sustain migrating birds, and act as a flood basin.

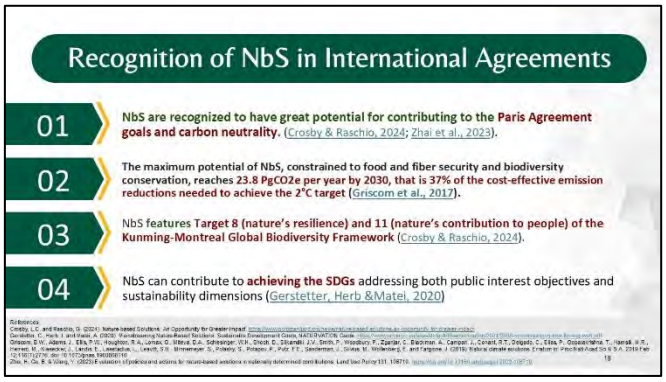
In Lao PDR, the restoration of degraded lands has a direct impact on social and economic development by creating sustainable livelihoods and other development benefits while mitigating flood incidences. Not far from Lao, in Cambodia, a similar initiative has restored the degraded community protected area forests contributing to community livelihoods and at the same time addressing soil erosion.

Meanwhile, mangrove establishment and rehabilitation efforts, separately, have helped Indonesia, Vietnam and Thailand communities achieve their triple bottom lines.

- NbS experience in the Region: Great Green Wall in Africa - an 11-nation state initiative

Here's an NbS in Africa spanning 11 countries, and will surely benefit millions of people for generations to come. This program will result in compounding benefits.

- Recognition of NbS in International Agreements



NbS are recognized in international agreements

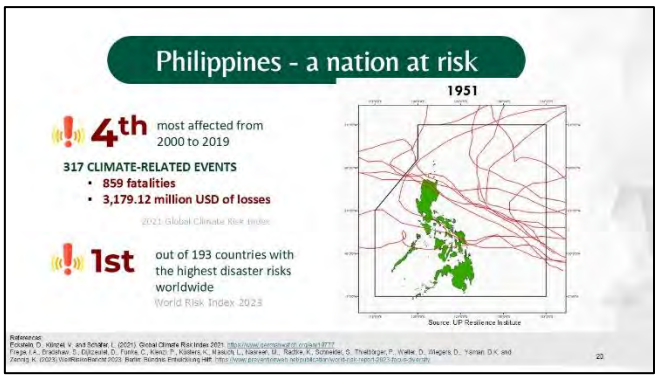
- NbS are recognized to have great potential for contributing to the Paris Agreement goals and carbon neutrality. 66% of Paris Agreement signatories include nature-based solutions as a method to achieve climate mitigation and adaptation (Crosby & Raschio, 2024).
- According to relevant studies, the maximum potential of NbS, when constrained by food and fiber security and biodiversity conservation, reaches 23.8 PgCO2e per year by 2030. NbS can deliver up to 37% of the cost-effective emission reductions needed by 2030 to achieve the 2° C target, 29% at year 2030, 20% through year 2050, and 9% through year 2100 (Griscom et al., 2017).
- NbS actions play a significant role in supporting the response to climate change and have been listed as one of the nine key tracks by the 2019 United Nations Climate Action Summit (Zhai et al., 2023); and features Target 8 (nature's resilience) and 11 (nature's contribution to people) of the Kunming-Montreal Global Biodiversity Framework (Crosby & Raschio, 2024).
- NbS can contribute to achieving the SDGs because they often address public interest objectives and sustainability dimensions at the same time. (Gerstetter, Herb &Matei, 2020)

- The Philippines Context

The Philippines Context

1. Philippines NbS - National Greening Program (NGP)
2. Integration of Traditional and Modern Bioproduction System for Sustainable and Resilient Future under Climate and Ecosystem Changes
3. Philippine-Canada Partnership on NbS for Climate Adaptation and the Vulnerability and Risk Assessment Project
4. Lessons and Challenges

- Philippines - a nation at risk



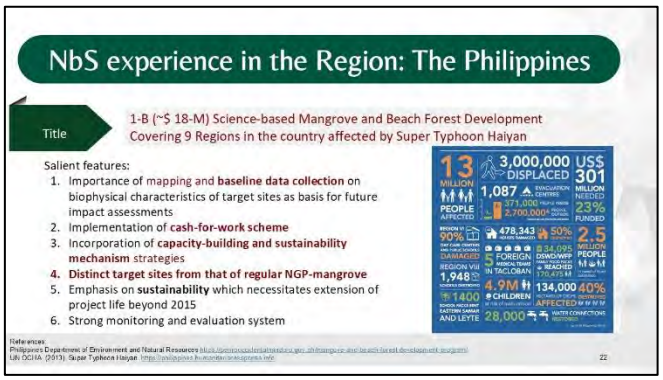
Now let's go to the Philippines, my home country
Philippines is a nation at risk
We are one of the top climate-risk countries all over the globe.

- NbS experience in the Region: The Philippines

One of the NbS that we are implementing in the Philippines is the National Greening Program

We are currently in the second phase of carrying out reforestation and rehabilitation of unproductive, denuded and degraded forestlands while simultaneously reducing poverty, creating alternative livelihoods, securing food, conserving biodiversity and enhancing climate change mitigation and adaptation.

- Since 2011, the NGP has reforested more than 2 million hectares with 1.7 billion seedlings planted on different types of degraded lands, including denuded forestlands and coastal areas (DENR, 2020).
- The project has generated a total of more than 5.6 million jobs in seedling production, plantation establishment and maintenance and protection.
- In some areas, the program has provided employment for former rebels as forest guards to protect forests and natural resources, as part of the peace process with the government.
- In addition to reforestation, the NGP has indirectly contributed to the improvement of water quality in rivers and irrigation used for farmlands, reduced the threat of flooding, and has potentially increased carbon sequestration.
- The NGP has encouraged strong coordination among national government agencies, civil society, private sectors and local communities.



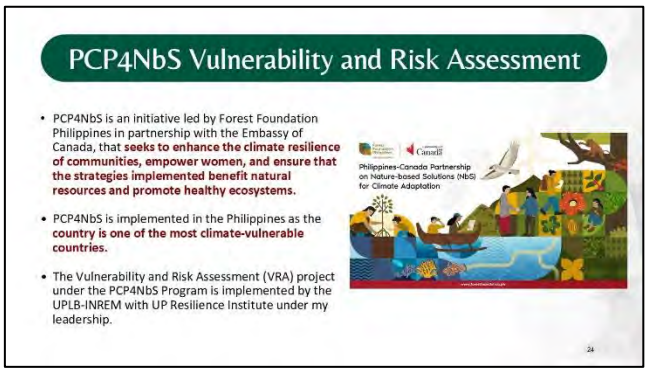
Mangrove and Beach Forest Development was also our post-recovery program after the Super Typhoon Haiyan, touted as the most powerful tropical cyclone ever to hit land, caused massive devastation and loss of life in central Philippines in November 2013.

The project highlighted the:

1. Importance of mapping and baseline data collection on biophysical characteristics of target sites as basis for future impact assessments
2. Implementation of cash-for-work scheme in the different stages of plantation development including nursery establishment
3. Incorporation of capacity-building and sustainability mechanism strategies
4. And the need for a strong monitoring and evaluation system, among others

From the National Greening Program and even the Mangrove and Beach Forest Development we were able to underscore the importance of trees for climate mitigation, disaster risk reduction, and poverty alleviation, as summarized by researchers in this infographic.

- PCP4NbS Vulnerability and Risk Assessment

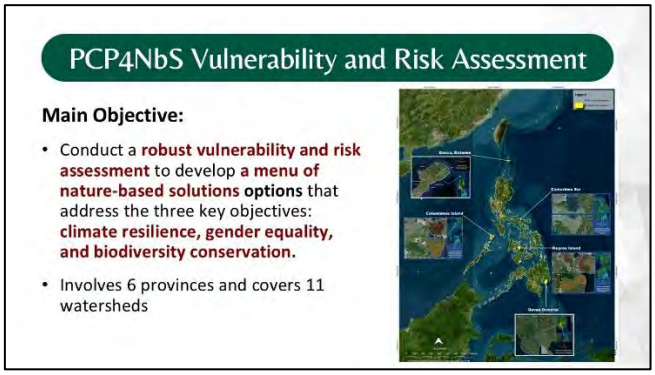


Another ongoing initiative that I want to share with you is the Philippine-Canada Partnership on Nature-based Solutions for Climate Adaptation or PCP4NbS, where I am currently involved.

PCP4NbS is an initiative led by Forest Foundation Philippines in partnership with the Embassy of Canada, that seeks to enhance the climate resilience of communities, empower women, and ensure that the strategies implemented benefit natural resources and promote healthy ecosystems.

PCP4NbS is implemented in the Philippines as the Ph is one of the most climate-vulnerable countries.

The Vulnerability and Risk Assessment (VRA) project under the PCP4NbS Program is implemented by the UPLB-INREM with UP Resilience Institute under my leadership.



Main Objective:

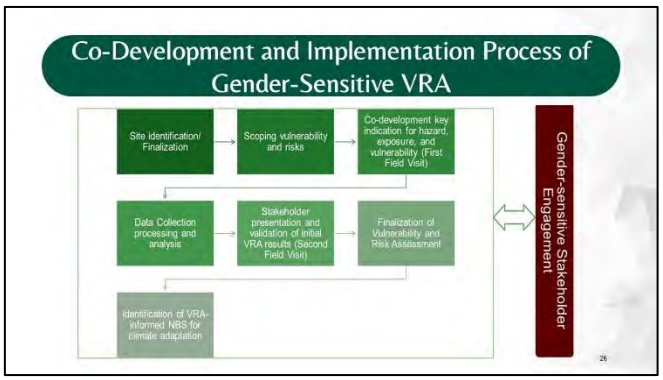
To conduct a robust vulnerability and risk assessment as a basis for providing a menu of options for nature-based solutions that address the three wins of climate resilience, gender equality, and biodiversity conservation.

Specifically:

1. To identify climate-related hazards for baseline and selected climate scenarios for the project areas (in 6 provinces covering 11 watersheds);
2. To co-develop a database for exposure, sensitivity, and adaptive capacity of the project sites;
3. To assess the climate vulnerabilities and risks of the project sites;
4. To provide a menu of options for nature-based solutions that address the three wins.

The idea is the PCP4NbS program will provide funding for the implementation of selected NbS in the different project sites.

- Co-Development and Implementation Process of Gender-Sensitive VRA



This is our methodological framework for the project.

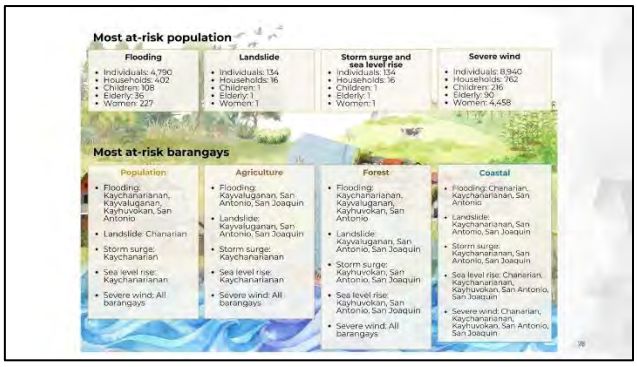
From the selected provinces (Batanes, Camarines Sur, Negros Oriental, Negros Occidental, Davao Oriental, and Calamianes Islands) of the PCP4NBS project, the VRA team identified specific watershed sites. The project developed multiple hazard models for each site, covering the following hazards: flood, rain-induced landslide, storm surge, sea level rise, and strong winds – in four exposure areas including forests, agriculture, coastal areas and communities.

The co-development approach was our principle from the start to integrate gender equality and social inclusion recognizing the multifaceted characteristics of various groups and communities in the project sites.

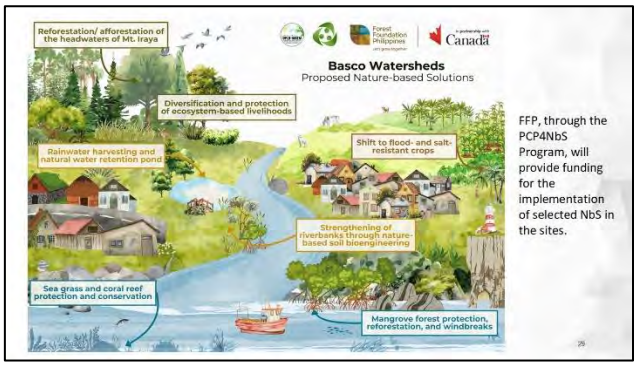
All project outputs are presented and discussed with them, including the presentation of risk maps and hazards assessments, and the finalization of list of possible NbS that can possibly be implemented to contribute to climate adaptation and disaster risk reduction, and as well as socio-economic development.

- an example of our project results for Batanes in the northernmost part of the Philippines

Here's an example of our project results for Batanes in the northernmost part of the Philippines.
The risk assessment for the four exposure areas specify the communities that are susceptible to different hazards.



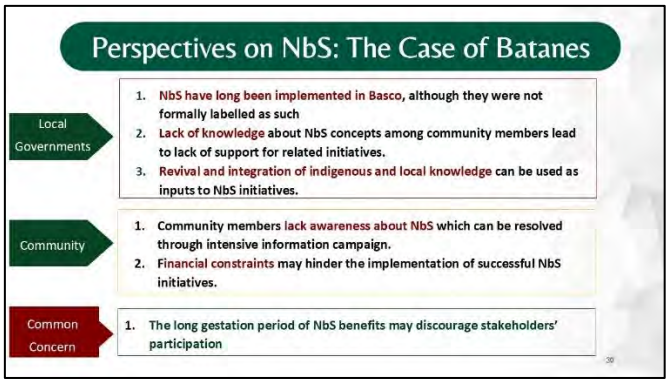
Here's the results in actual numbers.



Based on these results we are recommending the following Nature-based Solutions to the LGU and community partners there.

You will see here that part of the NbS that we are proposing is reforestation and mangrove forest protection. We find that among many NbS, forests provide more benefits in terms of flood prevention, strong winds and even erosion and landslides. Mangroves on the other hand are a top biological shield from storm surge, sea level rise, and strong winds in coastal areas.

- Perspectives on NbS: The Case of Batanes



Here's the Insights of our Batanes partners on NbS:

Government

1. NbS have long been implemented in Basco, but without any formal label as existing initiatives fit the IUCN standards on NbS.
2. Revival and integration of indigenous and local knowledge can be used as inputs to future NbS Initiatives.
3. Lack of awareness of NbS concepts among community members lead to lack of appreciation of existing initiatives and its failure to connect them to the NbS framework.

Communities

1. Community members may not have sufficient knowledge or information on NbS as a concept which can be addressed by an extensive and intensive information campaign.
2. At the community level, financial constraints may hinder the implementation of successful NbS initiatives.

A common concern for both groups however is the long gestation period of outcomes of NbS initiatives.

- Lessons from Ph Initiatives

But then again there is no silver bullet to our societal problems as you know.

For NbS, in the case of the Philippines, we find the following lessons and challenges.

Lessons:

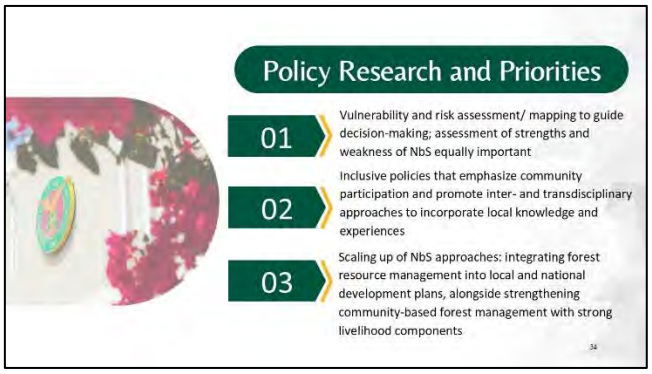
1. Community participation in NbS is a cornerstone for sustainability; sustainable livelihoods of paramount importance
2. Integrated approach of central importance: spatial, temporal, sectoral, inter/ transdisciplinary, governance, policy and institutional, financial, socio-cultural, technological, ecosystem-based integration
3. Measuring achievements necessitates baseline data and an efficient M&E system

- Challenges from Ph Initiatives

Challenges:

1. The sustainability of the initiatives and their outcomes is dependent on:
    a. Access to funding
    b. Good governance
    c. Capacity development of involved sectors, including beneficiaries
    d. Sustainable livelihoods of local communities
2. Putting a monetary value to the benefits from NbS makes it challenging to prove the significant benefits and ecosystem services that it contributes to society.

- Policy Research and Priorities



Moving forward, I would like to propose and pose these recommendations to you. I hope we can continue the conversation on these later.

In terms of policy research and priorities:

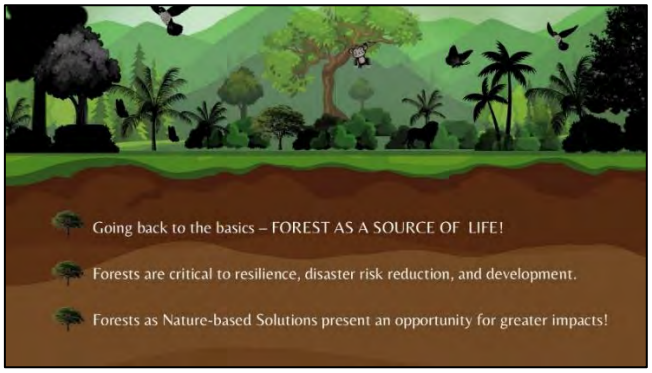
1. Vulnerability and risk assessment/ mapping to guide decision-making; assessment of strengths and weakness of NbS
2. Inclusive policies that emphasize community participation and promote inter- and transdisciplinary approaches
3. Scaling up of NbS Approaches: Integrating forest resource management into local and national development plans, alongside strengthening community-based forest management with strong livelihood components

- Call to Action

Call to action

1. Let's be strategic in harnessing forests' potential to safeguard and sustain communities via NbS initiatives.
2. Forge partnerships, coordination, and cooperation among different stakeholders.
3. Synergize, harmonize, and coordinate efforts towards advancing development while building resilience.

- Conclusion



The UN Forum on Forests 14th session held in New York in 2019, had 3 thematic priorities:

1. Forests and climate change;
2. Forests, inclusive and sustainable economic growth and employment; and

3. Forests, peaceful and inclusive societies, reduced inequality, education, and inclusive institutions at all levels,

recognizing that 1.6 billion people, or 25% of the human population, depend on forests for subsistence, livelihood, employment and income generation.

To conclude, I encourage us to relearn what we have known from our younger years and go back to basics, trees and forests, they sustain our lives. One way or another, even if we're from the city, we benefit from forests. And we cannot discount how forests – terrestrial and coastal – are critical to resilience, disaster risk reduction, and development.

Meanwhile, in relation to actions and solutions, NbS is a practical and sustainable approach for climate adaptation and mitigation. NbS, not just for forests, provides an opportunity for greater social, economic, and cultural impacts!

Forests are not just resources; they are our partners in development and in building a resilient future.

Together, let's act now - tomorrow may be too late!

Thank you.

References

Reference list