

Knowledge and Innovation for Impact



“Assessing the roles of forests in reducing poverty and enhancing climate resilience in the Philippines”

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Study Background

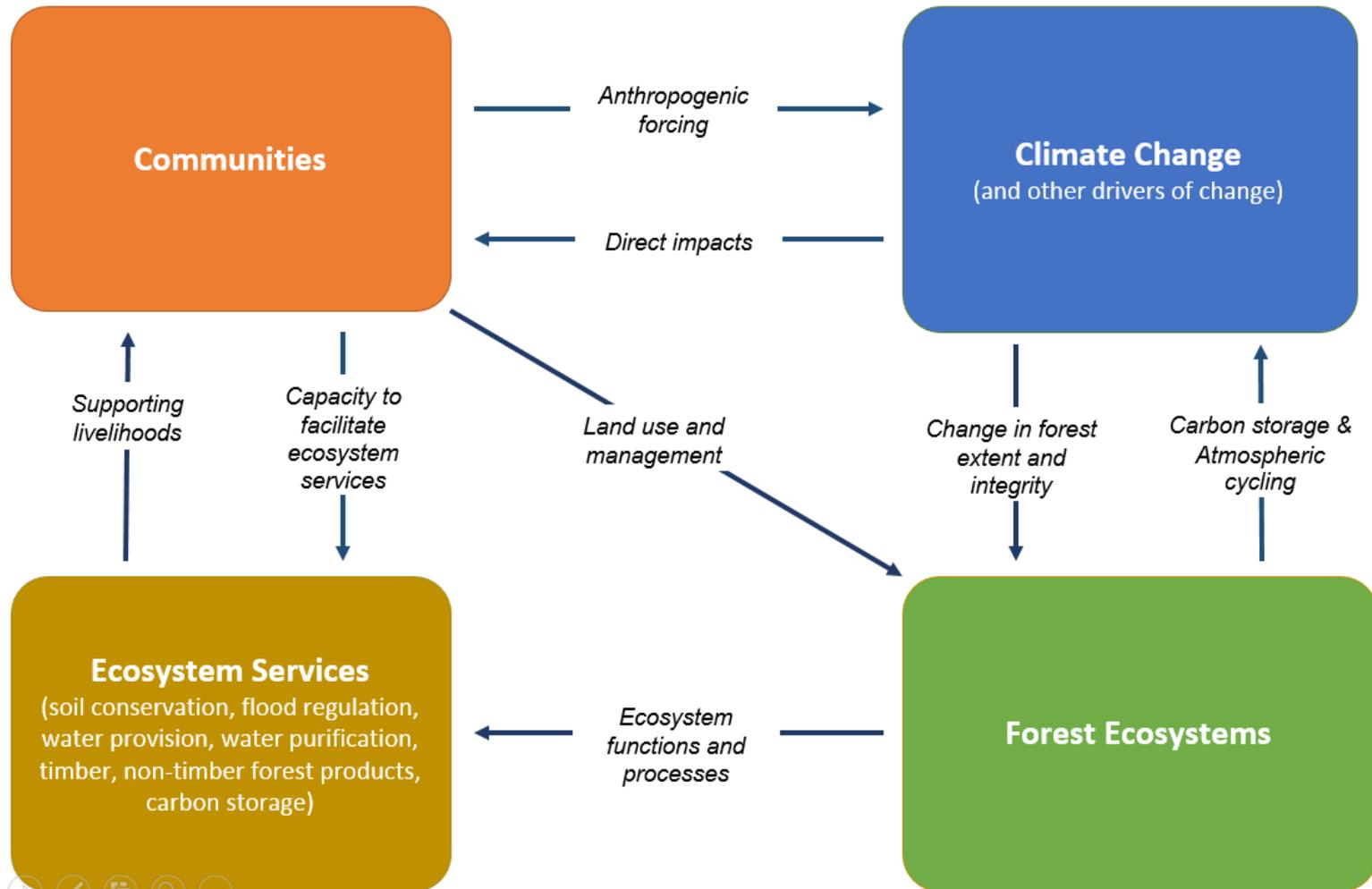
- Climate change and persistent poverty are challenges to Philippine's development progress.
- Climate change is a threat multiplier affecting natural resources, people's livelihoods, and the economy; poorest and vulnerable being affected most.
- Increasing knowledge base on how provisioning ecosystem services support income of the poor.
- Limited understanding of how regulating ecosystem services can help enhance the income and climate resilience of the poor.

Study Objectives

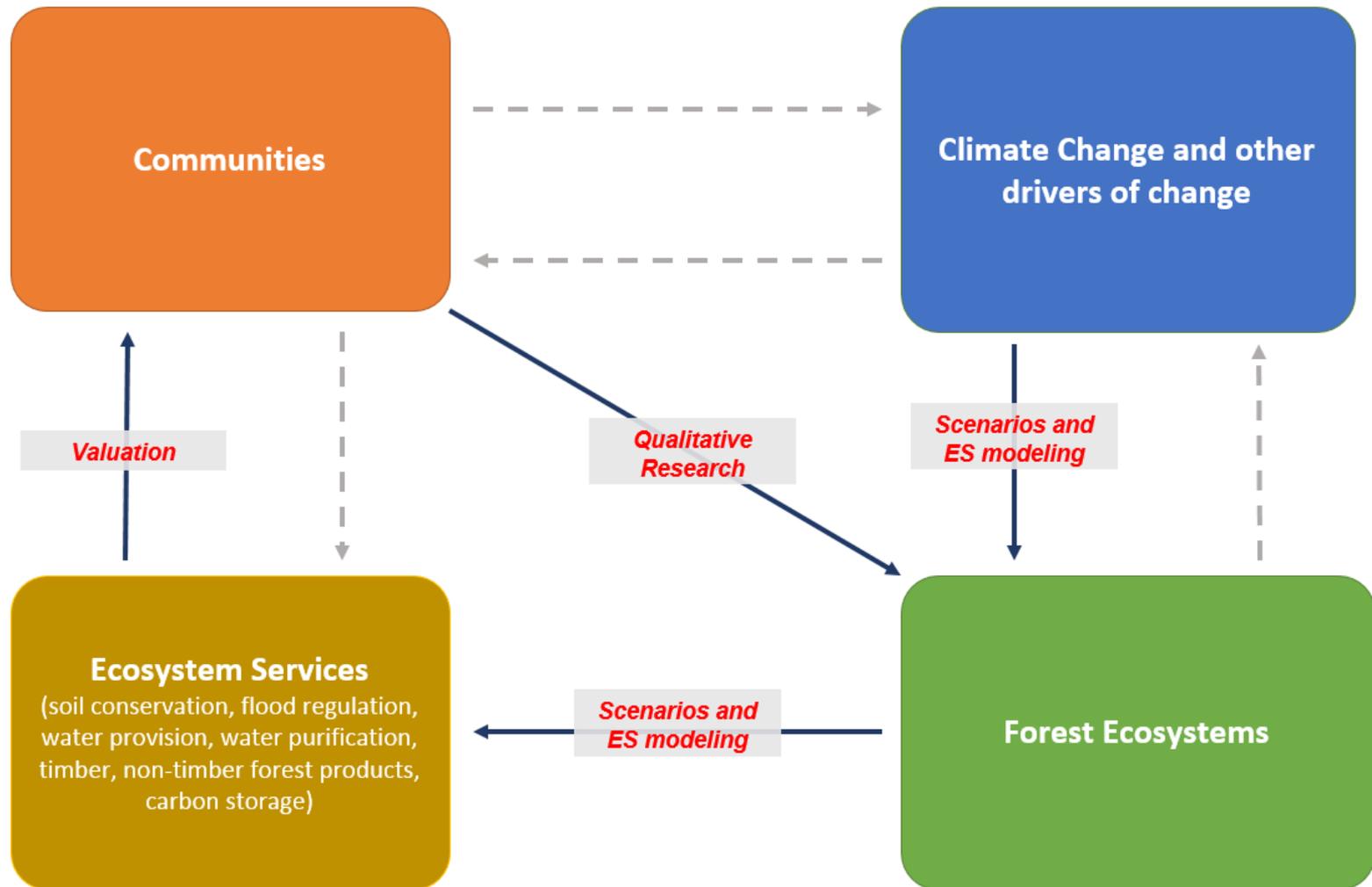
“to build on existing analysis of forest-poverty-climate change resilience linkages and enhance understanding of how forests and the ecosystem services they provide can contribute to and mutually reinforce both poverty reduction and resilience in the Philippines”



Conceptual Framework for Study



Conceptual Framework for Study



Forest-Poverty Linkages

- Subsistence, income and safety nets are common channels through which the poor access forest resources
- This study investigates the forest poverty linkages in the PH through:
 - Valuation of ecosystem services
 - Forest use analysis in study sites to understand how the poor within forest communities use forest resources
 - Scenarios – to understand how forest development (in the future) could potentially impact the poor through changes in forest ecosystem services

Forest-CC Resilience Linkages

- Healthy forest systems can buffer the impacts of change/ stressors e.g. disease, weather and climate changes.
- The ability to buffer the impacts of change characterizes the resilience of forests.
- Healthy forest systems in a watershed
 - increase the resilience of the watershed to stresses such as climate change
 - help to increase the resilience of people in that watershed, particularly those that depend on forest ecosystem services

Major Study Activities

How does the capacity of forests to deliver services change under weather & climate changes

Ecosystem Service Modeling

How do forest communities, particularly the poor, use forest resources for livelihood and subsistence?

Forest Use Analysis

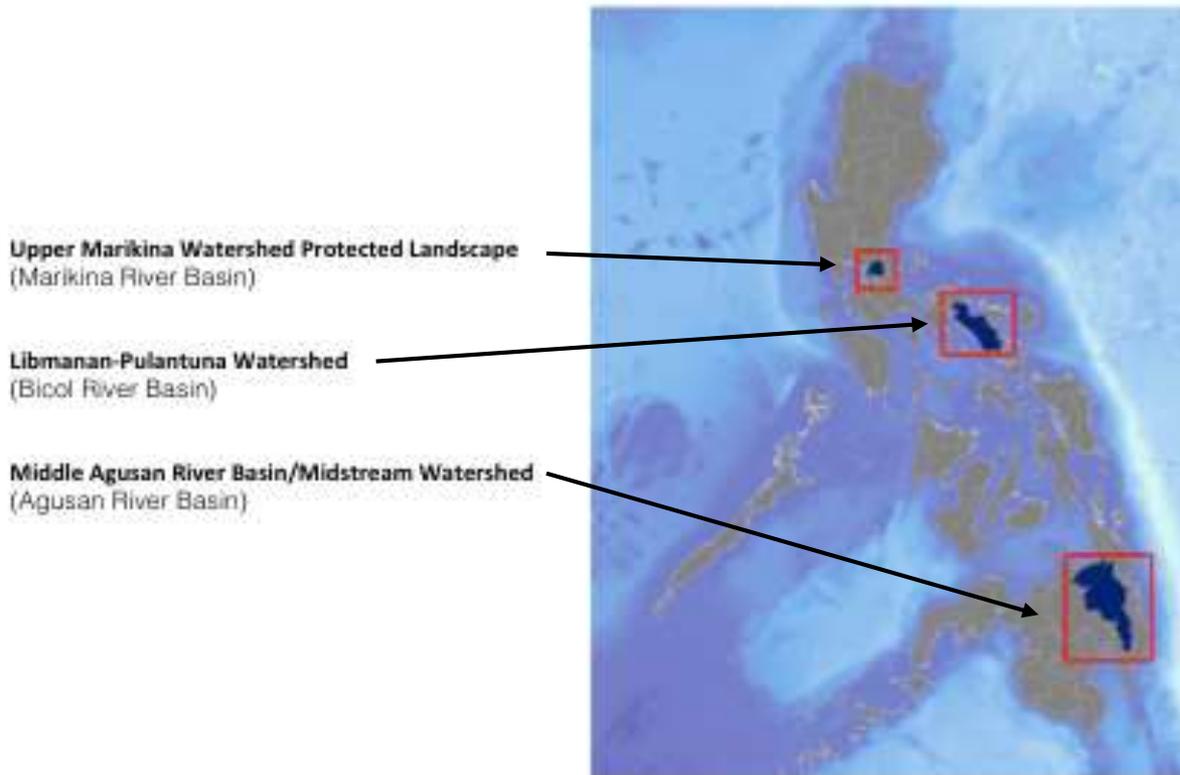
What are the values of forest services to forest communities especially to the poor?

Valuation of Ecosystem Services

What is the vision for forest development that is pro-poor and enhances resilience to climate change?

Scenario Development

Study sites



Study sites selected using criteria including poverty incidence, climate change risk, forest cover, & availability of information

Key Issues

- Declining biodiversity
- Declining fish resources
- Declining water availability
- Declining water quality
- Frequent flooding
- Reduced storage capacity of lakes and rivers
- Saline water intrusion
- Sedimentation in waterways
- Soil erosion

Forest Use Analysis

- Focus group discussions & key informant interviews at study sites
- Surveys guided by forestry module developed for the Living Standards Measurement Survey
- Information collected on:
 - use of forest goods and services by communities;
 - the seasonal use of these goods;
 - community livelihoods associated with forest services;
 - use of forest resources during climate and economic shocks;
 - forest changes and clearance;
 - forest institutions.

Preliminary Results of Forest Use Analysis

	Upper Marikina Watershed	Libmanan-Pulantuna Watershed
Most important forest-associated products (MIP) for Cash/ Sales	Bamboo, cassava, fruits, banana, charcoal, pineapple, rice	Rice, coconut, pineapples, vegetables, tiger grass, abacá (species of banana), wood, fish, nipa (a species of palm)
MIP for Subsistence	Water, rice, vegetables, fuelwood and rootcrops	Rice, root crops, fruits and vegetables, water
Priority forest services accessed by the communities	<ol style="list-style-type: none"> 1) Food 2) Freshwater provision 3) Water purification 	<ol style="list-style-type: none"> 1) Freshwater 2) Storm protection 3) Climate regulation 4) Food
Livelihoods/ income earning opportunities associated with forests	Reforestation and forest management programs such as National Greening Program (NGP); watershed protection; ecotourism and landscape beautification, and stream bank protection.	Watershed protection activities, ecotourism (birdwatching and hiking).
Use of forest resources during climate or economic shocks	Increased dependence on forest resources mainly for food during climate/ economic shocks	Increased dependence on forest resources mainly for food during climate/ economic shocks – particularly charcoal/ fuelwood and root crops (sweet potato and cassava) which are not destroyed by strong winds and rains.
Forest Changes	Mixed response – increase in forest extent in some areas as a result of NGP; decrease of forest cover in other areas due to forest clearing for cultivation and charcoal (both illegal activities)	Mixed response – increase in forest extent in some areas as a result of reforestation; decrease of forest cover in other areas due to forest clearing for charcoal, timber, and forest destruction by typhoons,

Ecosystem Service Modeling

- Ecosystem services: water yield, timber, NTFPs, water purification, water flow regulation, erosion regulation, sediment control, carbon sequestration and storage
 - NTFPs and Timber provision assessed using secondary data
 - Carbon sequestration and storage assessed using allometric equations
 - ArcSWAT and SEDNET used for modeling water purification, water flow regulation, erosion regulation, and sediment control.

Ecosystem Service Modeling

- Land cover scenarios integrated with ArcSWAT and SEDNET
 - “**Forested Scenario**” – complete forest cover across watershed
 - “**Conservation Scenario**” – all conservation measures in legislation implemented e.g. riparian forest, forest cover on steep slopes
 - “**Agriculture Scenario**” – all forest converted to perennial and annual crops
 - “**Bare-Urban Scenario**” – all forest removed from the watershed

Ecosystem Service Modeling

- Weather and Climate scenarios integrated with ArcSWAT and SEDNET
 - ‘Dry and wet’ seasons – using historical data
 - Storm events – using historical data
 - Future climate change - climate change projections were generated by Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) using the PRECIS model for the timeframe to 2020 and 2050



Ecosystem Service Modeling

- A watershed with a greater proportion of forest, and forests situated in critical areas such as on steep slopes and within riparian zones:
 - For a given storm event, will have a lower peak discharge, a longer lag time, and lower sediment generation and sediment flow;
 - will have higher levels of stream flow, and less variability in stream-flow levels over the period of a dry season;
 - will have smaller annual variation in water discharge, and lower sediment generation and sediment flow;
 - is more resilient to climate changes as assessed by its ability to regulate water flows throughout the year

Ecosystem Service Valuation

- Focus on 'exchange values'
- Similar to SNA 2008 and SEEA 2012 valuation approach used for Philippines Wealth and the Valuation of Ecosystem Services project

Ecosystem Service Valuation

Ecosystem Service	Valuation Method	Valuation Output
Water Provision	Replacement cost (based on cost of the cost of replacing the water provision ES with delivered water or other sources)	Value of the water provision service in \$/year
Water Regulation	Replacement cost (based on cost of the cost of replacing the water provision ES water from other sources); Cost of damage avoided	Value of the water regulation service in \$/year
Water Purification	Cost of treatment (cost of removing sediments and nutrients from water)	Value of the water purification service in \$/year
Erosion Control	Replacement cost (cost of replacing the service through the use of erosion mats)	Value of the erosion control service in \$/year
Sediment Control	Replacement cost (cost of replacing the service based on the price of constructing check dams and the cost of removing the sediments/silt once these are filled up)	Value of the sediment control service w in \$/year
Carbon Sequestration	Social cost of carbon	Value of the carbon sequestration service in \$/year
Timber Provision	Stumpage value	Value of the timber provision service in \$/year
NTFP Provision	Resource rent	Value of the NTFP provision service in \$/year

Scenario Development

- Scenarios are:
 - descriptive storylines about the consequences of various plausible changes in drivers, ecosystems, and services they provide on human well-being
- Process adapted from Millennium Ecosystem Assessment Process
- Scenario themes:
 - (i) halting forest loss by protecting and conserving remaining forests;
 - (ii) reversing trends in forest loss through reforestation and afforestation;
 - (iii) no action on activities that result in forest loss and degradation, current trends continue.

Discussion: Why Relevant for the Philippines?

- Contribute valuable data and information to help the GoP better understand how flagship programs - National Greening Program and the Risk Resiliency and Sustainability Program - can help reduce poverty and enhance resilience.
- Study will provide the evidence to support the joint strategic focus on building resilience of the poor through sustainable management of natural capital – therefore informing future design of forest investment programs.
- Integration of scientific evidence (#, \$) to inform planning decisions

Discussion: Why Relevant for the Philippines?

- Potential for scenario-based planning at the sub-national/ LGU level
- Laying the groundwork for other types of forest management/ conservation schemes e.g. payment for ecosystem services
- Approach puts people at the centre of focus, for better pro-poor development planning



Thank You

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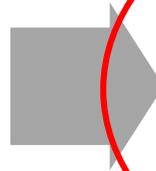
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Scenario Development Process

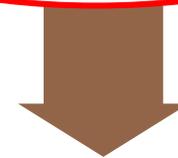
Set up scenario exercise

- Identify and agree upon main purpose of scenario exercise
- Agree on expected outcome of scenario exercise
- Define the scope for the scenario exercise



Develop Scenarios

- Identify focal issue
- Establish scenario development procedure
- Select main driving forces and scenario logic
- Describe scenario assumptions and storylines



Use and Communicate scenarios

- Map target audience and context conditions
- Map purpose to context
- Develop outreach and communication strategy
- Present scenarios to target audience



Analyze Scenarios

- Establish whether, what and how to quantify
- Analyze implications of individual scenarios
- Analyze across the set of scenarios