Ecosystem-based Mitigation and Adaptation (EbMA): Exploring the synergies

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MAINSTREAMING ADAPTATION IN DEVELOPMENT:
STRATEGIES AND ACTIONS IN A CHANGING CLIMATE

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Investing in adaptation technologies with mitigation co-benefits
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Outline

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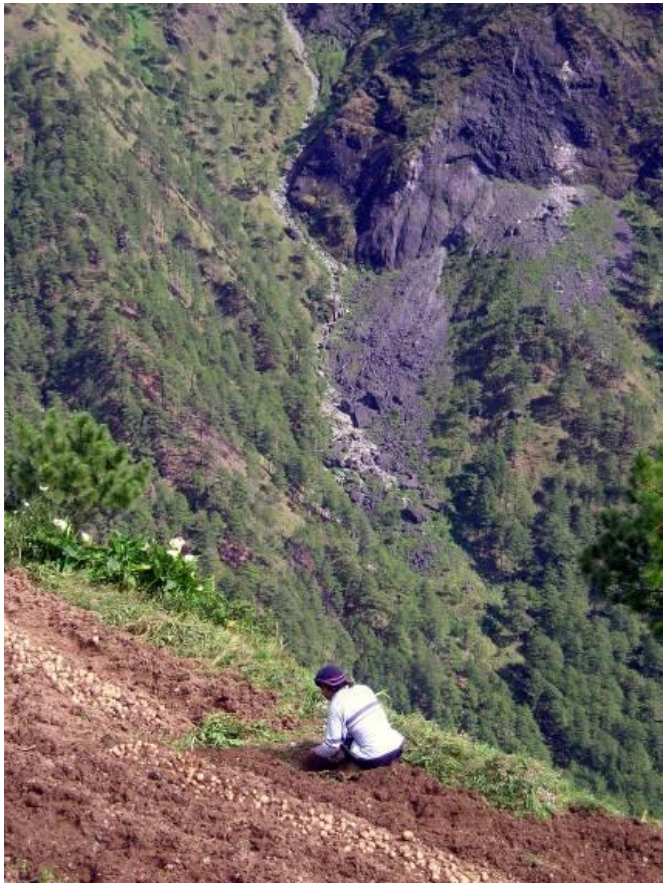
- What's this all about?
- Why the divide?
- Where are the links?
- Why link M&A?
- What's EbMA?
- Examples of EbMA:

  Forest and Agroforestry
- In summary…so what?



What is this all about?

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- Natural-resource dependent communities will be affected most severely as climate change threatens services ecosystems provide such as biodiversity
- However, proper management and sustainable use of natural resources can allow for both ecosystems and people to adapt to climate change.
- Responses to climate change:
  - Mitigation
  - Adaptation
- Recent focus in research and policy on synergies between adaptation and mitigation for win-win solutions (Locatelli&Evans, 2009)

Why the divide?

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Mitigation (reducing GHGs) ⟷ **Causes** ⟷ **Effects** ⟷ **Adaptation** (reducing vulnerability)

Global	**Spatial scale**	Local
Energy, transport, infra, industry	**Sectors**	Water, health, Agri, forest
Long term	**Time scale**	Short term

(Lotacelli and Evans 2009 as cited from Swart, 2007)

Where's the link?

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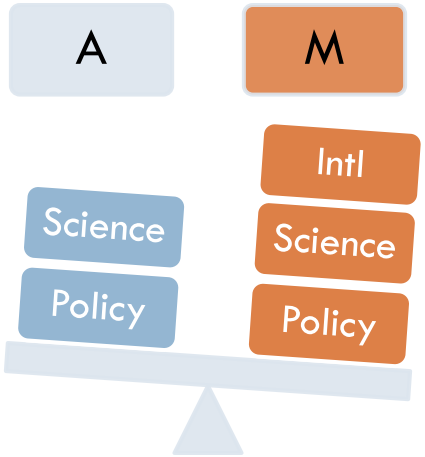
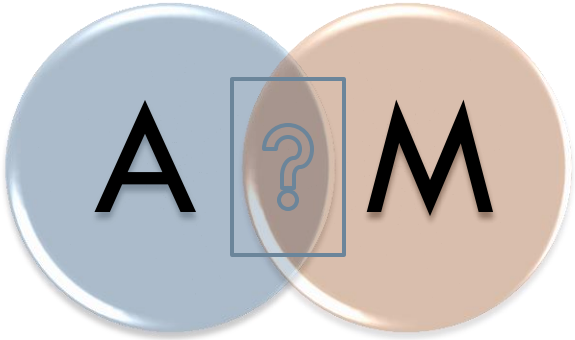
More attention for mitigation than adaptation (at least historically)…

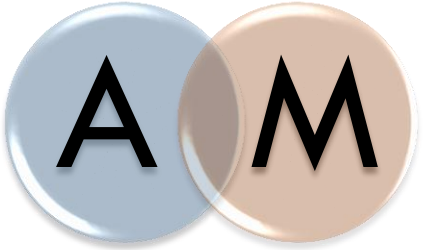


There is a conceptual divide….

Will try to see the synergies and trade-offs…



and illustrate them through the FOREST and AGROFORESTRY…



Where's the link?

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- Purpose: the same ultimate purpose: to reduce the undesirable impacts of climate change;
- Scale: adaptation may also have global benefits (e.g. reduction of threats to biodiversity) and can be long term since addressing current climate risks can enhance future vulnerability;
- Sectors: potential overlaps (e.g. adaptation policies in the LULUCF sector have implications for CO2 sequestration and in agriculture to reduce methane emissions

Why link M&A?

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- Two-fold benefits (Ayers and Huq, 2007)

(1) Short term: channelling of financial and institutional support currently provided for mitigation toward adaptation

(2) Long term: overcome the persistent conceptual divide and empower adaptation agenda within the international climate change frameworks

- Potential for win–win solutions by implementing a single action (Locatelli & Evans, 2009).;

- Critical need to assess the conflicts and synergies, and the interactions with development plans and institutions;

What's EbMA?

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Ecosystem-based Mitigation and Adaptation (EbMA)

- addresses the role of ecosystem services in reducing the vulnerability of natural-resource dependent societies to climate change and taking advantage of the role of natural in greenhouse gas emissions, both as sources and sinks.

Example of EbMA in forest

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- **Maintaining and restoring "natural infrastructure"** like mangroves, coral reefs and watershed vegetation as a cost-effective means for reducing vulnerability to storm surge, rising sea levels and changing precipitation patterns.

- **Enhancing the availability of natural resources** as a source of food and other products important to livelihoods.

- **Maintaining connectivity of ecosystems** including protected areas and corridors in production landscapes involving a full range of stakeholders and governance arrangements that will ensure the continued supply of ecosystem services.

Example of EbMA in forest

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Ikalahan Indigenous People Community

- The Ikalahan Ancestral Domain covers 38,000 hectares in N Luzon
- an ecologically sensitive area that is rich in biodiversity
- the economic and biological diversity are considered to be important for the sustainable development of the IP
- The KEF established a Food Processing Center in 1980 to produce jams, marmalades, preserves and related products using wild fruit from the forests

Example of EbMA in forest

- Kalahan Ancestral Domain

Major Land Use:

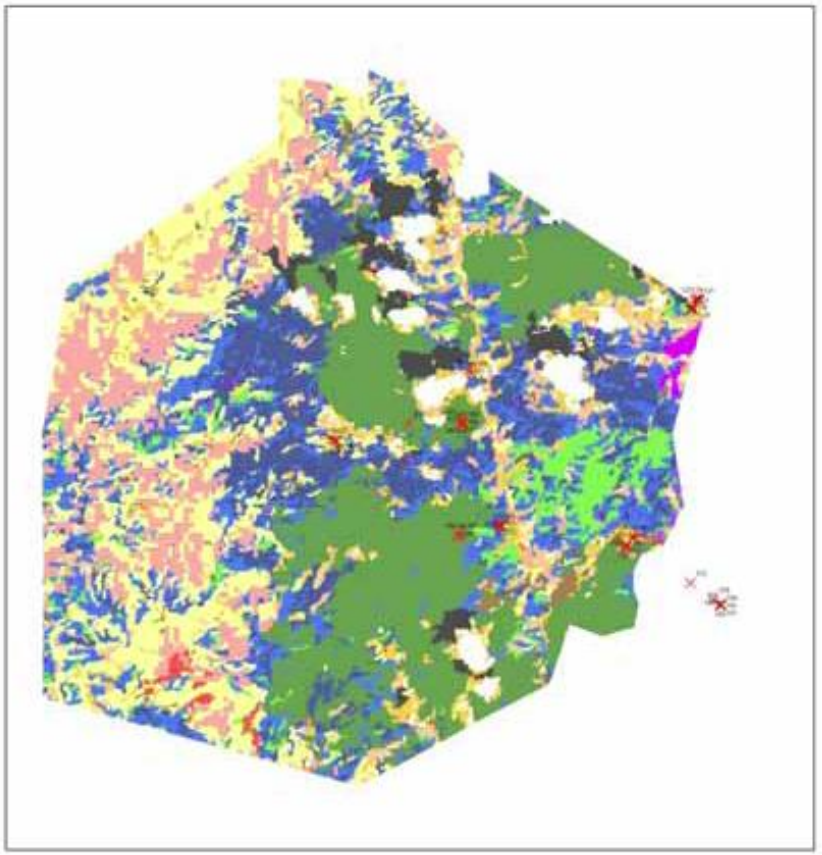
2^0 Forest

Agroforestry

Agriculture

Grassland

Reforestation



Example of EbMA in forest

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- Developed a land-use classification system:
- 3,159 ha as sanctuary area where extraction, hunting and agriculture are not permitted;
- expanded to 4,224 ha to include some primary pine forest and secondary mossy forest;
- protection forest, in steep areas that could not be exploited, and production forest, which is open to regulated exploitation.
- Established and implemented policies and guidelines to control harvesting of resources, use of fire and swidden farming

Example of EbMA in forest

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- Adaptation: Improved management of forests (control, access) and products (commercialisation); and increased income and provide livelihood opportunities; protection of biodiversity

- Mitigation: The estimated total (above- and belowground) carbon stock of different land-use systems in the KFR ranged 54.31–151.13 Mg/ha (Villamor et al 2010)

Table 17. Plot-level mean carbon-stock of each land use

Land use	Tree Mg/ha	Intermediate Mg/ha	Understorey Mg/ha	Litter Mg/ha	Soil & litter Mg/ha	Total Mg/ha
Agriculture	3.60	0.48	0.03	5.15	45.05	**54.31**
Agroforest	17.10	0.32	0.03	6.06	55.05	**78.56**
Grassland	3.52	0.58	0.05	10.06	40.65	**54.87**
Reforestation	55.22	0.20	0.04	17.67	78.00	**151.13**
Secondary forest	28.75	0.16	0.04	20.59	45.02	**94.55**

EbMA through agroforestry

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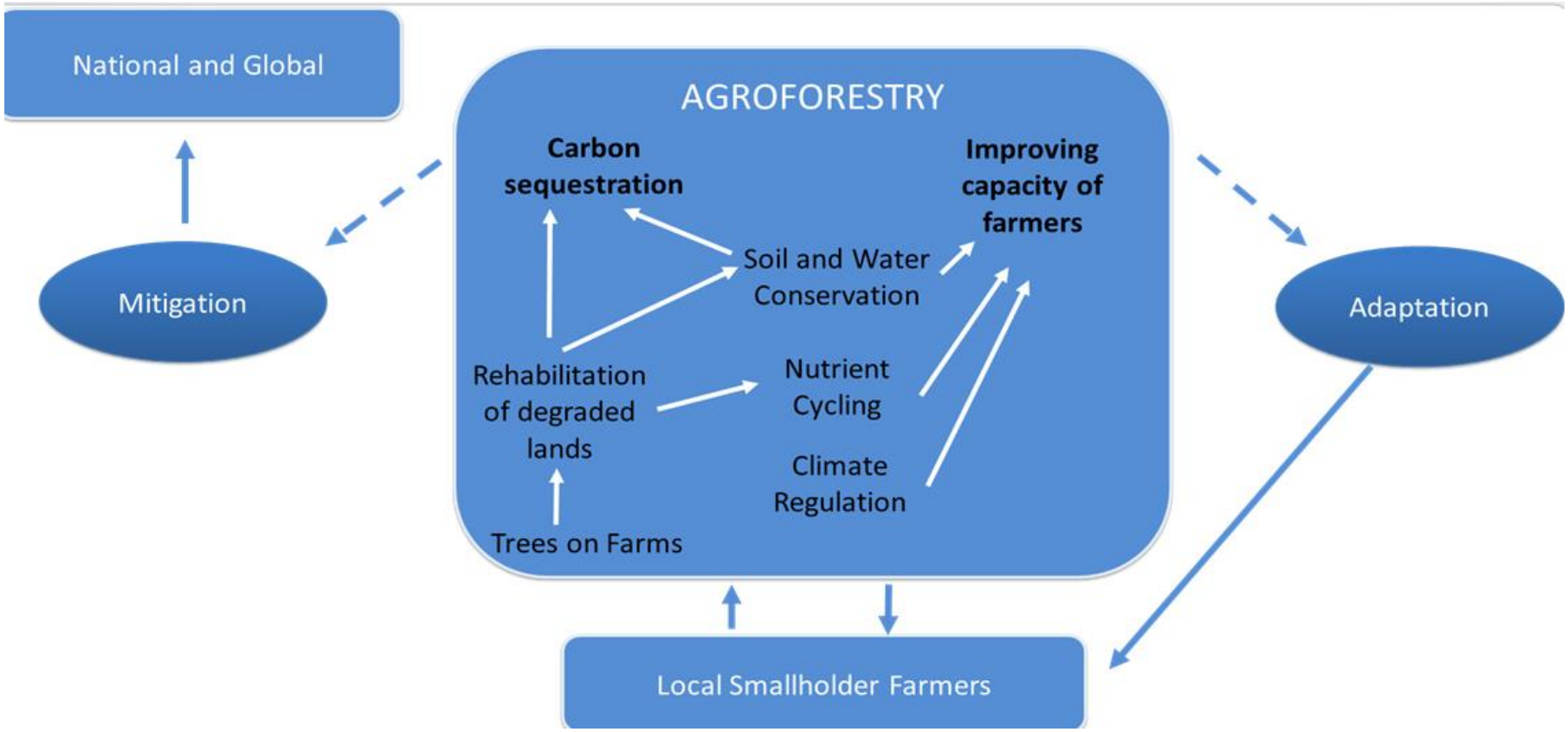

(Modified from Locatelli & Evans, 2009)

Example of EbMA: Agroforestry

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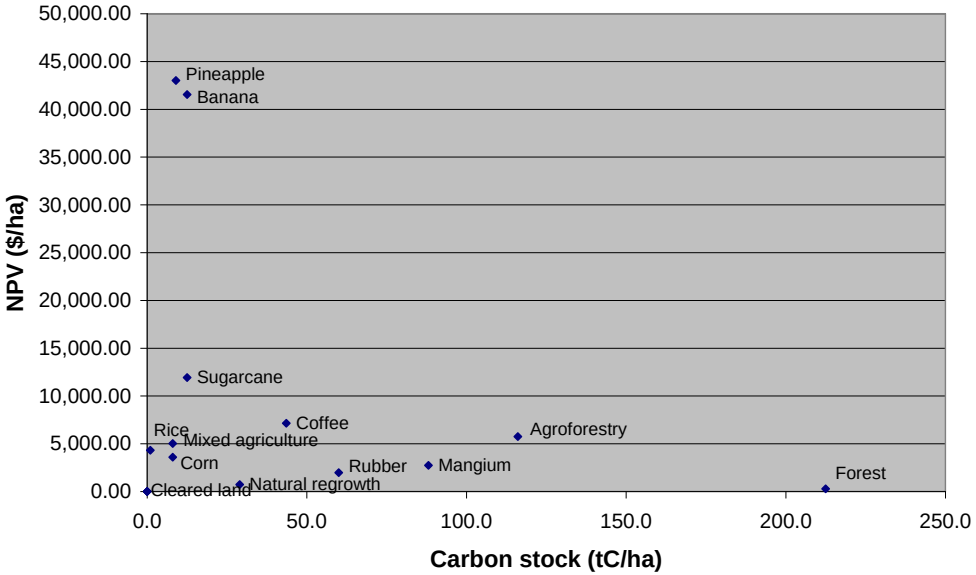
Adaptation: Diversified and sustainable crop production, in addition to providing a wide range of environmental benefits such as erosion control and watershed services. (Verchot et al 2007)



Tradeoffs between carbon stocks and social profitability of land use systems in Lantapan, Bukidnon (ASB Project)

Example of EbMA: Agroforestry

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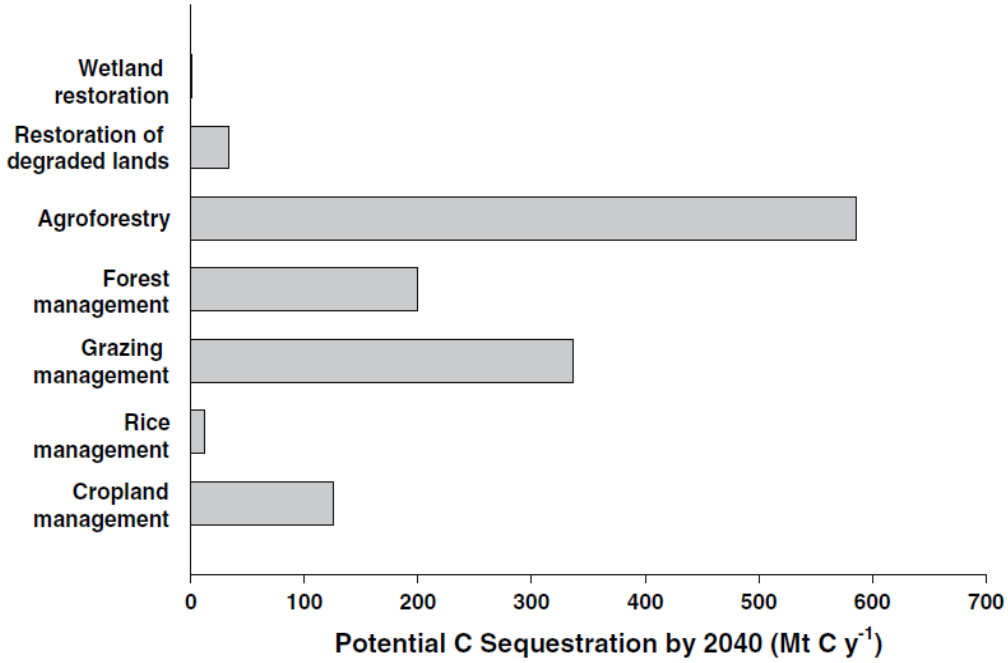
- Mitigation: Agroforestry systems present a good opportunity to increase carbon stocks in degraded and agricultural lands.



Carbon sequestration potential of different land use and management options (adapted from IPCC 2000)

Example of EbMA: Agroforestry

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Agroforestry Systems, Activities or Practices	Biophysical Roles				Economic Roles	Social/Survival Roles	Sources
	Water	Soil	P&D	MC			
Agroforestry (in general)	X	X	X	X	X	X	Verchot et al 2007, Nyong et al 2007, Ravindranath et al 2007
Multi-storey cropping				X	X		Rahman et al 2011
Shade Trees				X	X		
Coffee-based	X			X	X		Lin 2006, Lin et al 2008, Lin 2010
Cacao-based	X			X	X		Schwendenmann 2009
Soil and water conservation							
Alley Cropping/Hedgerows		X			X	X	Kang 1997, Montagnini and Nair 2004, Molua 2005
Improved Fallows	X	X			X	X	Kandji et al 2006
Legume trees	X				X		Sileshi et al 2011

In summary…

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- Through EbMA strategies, people and ecosystems will be better able to cope with risks associated with current climate and future climate change at the same time contributing to the efforts of reducing GHG concentration in the atmosphere.
- EbMA will provide effective strategies to minimize the impacts in the community at the same time protecting the ecosystems from further degradation thus enhancing carbon sinks.
- There are encouraging synergies between mitigation and adaptation at the ecosystem level (e.g. forest and agroforestry);
- Synergies can also contribute to sustainable development goals of climate change and are worth exploring.

So what?

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- EbMA promises for 'win-win' solutions;
- Provides for effectiveness and efficiency;
- Can enhance participation of developing countries in mitigation while preparing for adaptation;
- Worth exploring (knowledge gaps) and needs further explorations (research and policy);
- Not the magic bullet, but it's like hitting two birds in one shot: cost can be reduced, co-benefits increased.

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Thank you very much!

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