

PAPER IAIA- EMBEDDING SOCIO-ECONOMIC BENEFITS AND ECOSYSTEM SERVICES IN ENR MANAGEMENT

How to integrate socio-economic benefits and ecosystem services in land use plans to inform decision-makers using policy instruments on the sustainable management of the environment and natural resources

Outline

1. As we continue to exploit our environment and natural resources (ENR) like there is no tomorrow, our global society is now in a race against time to address intense risks and impacts that could possibly be the greatest threat to our very existence. Understanding our dependency on ecosystem services and its resulting socio-economic and ecological benefits is key to our survival. Deeply realizing that ENR provides the natural capital as material basis for our socio-economic development and well-being could potentially elevate the conservation and protection of the environment to higher levels of decision-making both at local and global levels. The challenge for us Impact Assessment practitioners is how to make individuals, communities, government and civil society make ENR management more meaningful and enjoyable.
2. Unknown to many of us, the big and little things in life which comprise our natural capital like air, water, soil, biodiversity, oceans, mountains as well as the bio-chemical processes that function in our ecosystems. They provide for our food, good health, shelter, mobility, recreation, cultural practices, among others, which are supplied and supported by ecosystem services that strengthen our well-being. A universal set of goals that embodies a good quality of life were set in the 17 Sustainable Development Goals (SDGs) which were unilaterally agreed upon by all nations during the UN Conference on Sustainable Development in Rio de Janeiro in 1992.
3. Natural Capital is our naturally occurring stockpile of renewable and non-renewable resources, which can be distinguished as stocks (assets) and flows. It is called natural because compared to the human capital (man) or manufactured capital (man-made), social capital (norms), natural capital feeds the fundamental necessities of human life, without which no human being can survive. It also provides the material basis for our economy, as it heavily relies on ecosystem services to produce the benefits and values that accrue to our society. Emanating from ecosystems are ecosystem functions where physico-chemical and biological processes naturally occur like clockwork such as soil formation and nutrient cycling.
4. According to the UN System of Environmental Economic Accounting (UN SEEA) Ecosystem Accounting framework, ecosystem services are categorized into three services: 1) provisioning, 2) regulating, and 3) cultural. Provisioning services are the material benefits people obtain such as food and fuel. Regulating services are benefits that occur as part of the regulation of ecosystem processes such as carbon sequestration and flood control. Cultural services are those benefits that are non-material such as cultural identity and aesthetic inspiration. Ecosystem services flow accounts (physical and monetary) record the supply of ecosystem services by ecosystem assets and the use of those services by economic units, including households.
5. Land can be considered as the single most valuable natural capital asset that aside from being the host to many terrestrial and aquatic ecosystems, it has immense socio-economic value to

commerce. Thus, it makes sense that public land and natural resources belong to the State, while the use of private properties are state regulated as well. This makes land use management a requisite economic and administrative functions of the State. These functions carry fiscal responsibilities that includes the accounting of the costs and benefits of the extraction and use of natural resources and the valuation of ecosystem services.

6. According to land administration and disposition, land use types can be categorized as follows: 1) residential, commercial, industrial and other productive purposes, 2) agricultural, 3) tourism, and 4) services. In the Philippines, there are four land classification, 1) agricultural, 2) forest, 3) mineral, and 4) national parks. Only public agricultural lands are alienable and disposable, allowing for private ownership which paves the way for land use conversion and modification.
7. Land as a natural capital can be described according to several fundamental factors:
 - a. Physical Factors – it is finite, immobile, site-specific physical characteristics, multiple uses and suitability – slope, elevation, soil characteristics
 - b. Social Factors – subject to personal aspirations, biases, prejudices, political motivations
 - c. Economic Factors - microeconomic – set market prices, macroeconomic - excludes environmental values, ex-situ shifting of environmental impacts
8. Urban land use is the most economically active use of land that follows a natural historical process due to the human activities that evolved through space and time, brought about migration and economic development. It has also been the direct driving force of local and global economic transformation as well as environmental change. There are intense flows of materials, energy, information happening simultaneously within and adjacent to urban areas as well as outside them as resources and manpower are naturally magnetized as inputs to its growing prosperity. This results in shifts of regional ecosystem services to support highly concentrated human activities. Thus, significant risks and impacts on the structure, function, spatial evolution of regional ecosystems and ecosystem services arise which are needed to be adequately addressed to avoid irreversible damage that may significantly affect man and the environment.
9. Among the positive effects of urbanization are: 1) it can accommodate high concentrations of urban population and economic industries, 2) it apportions the expansion on the structure, function & spatial evolution of local and regional ecosystems, 3) it provides plentiful economic opportunities such as an active exchange of goods and services, 4) easier access to financing for development and investments. However, its negative effects on ecosystem services may include: 1) conversion of pristine land into cultivated and developed land, 2) absence of open spaces as buffer zones due to intense human activities, dense population, built up areas, 3) increase in impervious surfaces, heat island effects due to concrete structures, 4) increase in pollution, waste discharge, nutrient loading, soil erosion, GHGs, and 5) unbalanced land use allocation
10. Meanwhile, the positive effects of agricultural development to ecosystem services are 1) provides habitats to wildlife and aesthetic landscapes, 2) help maintain healthy ecosystems and clean source of water, 3) animal excreta provides good source of nutrients while seed dispersal can enhance soil fertility, 4) sustainable and integrated aquaculture can conserve mangrove functionality for flood control. On the other hand, its negative effects are 1) use of pesticides and land clearing and homogenization decrease natural pollination, 2) deforestation and poor

land management lead to severe erosion, landslides and flooding, 3) excess excreta can cause water pollution and eutrophication, 4) overfishing and over-development of coastal and marine resources can upset food chains and destruction of aquatic habitats can upset food chains.

11. Below is a summary of an ecosystem-based approach to ENR management:

**An ecosystem-based approach to ENR mgt.
(structure, function, process)**

Ecosystem Services (means) R-Regulating, P-Provisioning C- Cultural, S- Supporting	Socio- Economic Benefits (end)
<ul style="list-style-type: none"> • R-climate regulation, P-trees, S-habitat • R-bio-decomposition, P-decomposers, S-habitat • R-flood control, P-watershed, S-catchment basin • P-natural parks, C-aesthetic value, S- living spaces • P-natural pathways, C-social relations • R-climate regulation, P-sun, wind, geothermal • R-air quality regulation, P-unlimited air 	<ul style="list-style-type: none"> • Urban heat island mitigation • Integrated waste management • Stormwater, drainage & flood management • Recreational areas • Sustainable transportation • Renewable energy • Fresh air

12. Market driven land use patterns if sustainably managed may lead to an increase in good governance, socio-economic benefits, equity and environmental protection. Likewise, it promotes sustainable economic health and improves the standard of living for a designated area, benefiting both businesses and the government and stimulates the local economy by utilizing existing resources and fostering community-driven processes. On its flipside, poor land use planning can lead to unstable growth and production, poverty and insecure livelihoods, rampant degradation, wasted resources and diminished ecosystem services. Lopsided land use allocation may yield higher returns in the short run but may pose several unmanageable problems for future generations due to overexploitation of land, water and other natural resources. Poorly planned land use, particularly in urban and agriculture areas may reduce the benefits of socio-economic growth, and result in food insecurity, dwindling agricultural production, permanent land degradation.

13. The following are socioeconomic impacts of land use change:

- i. Conversion of farmland and forests to urban development reduces the amount of land available for food and timber production
- ii. Soil erosion, salinization, desertification, and other soil degradations associated with agricultural production and deforestation reduce land quality and agricultural productivity
- iii. Conversions of farmland and forests to urban development reduce the amount of open space and environmental amenities for local residents
- iv. Urban development reduces the “critical mass” of farmland necessary for the economic survival of local agricultural economies
- v. Urban development patterns not only affect the lives of individuals, but also the ways in which society is organized

- vi. Urban development has encroached upon some rural communities to such an extent that the community's identity has been lost
- vii. Suburbanization intensifies income segregation and economic disparities among communities
- viii. Excessive land use control, however, may hinder the function of market
- ix. Land use regulations that aim at curbing land development will raise housing prices, making housing less affordable to middle- and low-income households
- x. Land use regulation must strike a balance between private property rights and the public interest

14. It is therefore important to remember the following considerations in land use planning:

- a. Balance efficient, adaptive land use/acquisition/disposition for its highest & best use (HABU) to derive ecosystem services, socio-economic & ENR benefits
- b. Reconcile land use conflicts among parties to meet existing/ future needs
- c. Reduce costs of public services, infrastructure & regulate wasteful development
- d. Conserve natural capital, protect & restore historical, aesthetic, sensitive ecosystems & preserve ecosystem services
- e. Direct, harmonize, influence discussions bet. private, public sectors relative to land use & management

15. A conceptual framework on Land-based ENR plan shall incorporate the following:

- a. Policies for land development & redevelopment
- b. Improvement of transportation network
- c. Framework for various transect zones
- d. Plan primary development locations in different contexts & scenarios
- e. Retrofitting plans for suburban areas
- f. Design for downtown areas & surrounding neighborhoods
- g. Environment protection & sustainable development
- h. Preservation of history & culture of the area
- i. Strategies on affordable housing

16. Measuring non-market values of ecosystem services eg., clean water and climate regulation and market prices of agricultural commodities eg., fruits and vegetables are subjected to wide swings in market values due to preferences and environmental conditions such as weather patterns. In conclusion to answer the question on what the full costs and benefits of land management decisions are, the following approaches may be necessary to embed socio-economic benefits in ENR management:

- a. Promote innovation & entrepreneurship
- b. Enhance productivity, competitiveness of existing & potential businesses
- c. Attract investment, strengthen regional integration & cooperation
- d. Conserve & regenerate the environment
- e. Empower talent & focus on social inclusion