

Ecosystem Based Spatial planning As a Guidance of Precautionary Approach to Maintain HCV areas Case in Sumatra & Borneo

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ABSTRACT

Ecosystem-based Spatial Planning is explained and discussed. The main objective in ecosystem spatial planning is to ensure sustainability of the space or area to support and ensure the harmonious coexistence of all living organisms (human being, plant, animal, and microorganism) and the abiotic environment.

Spatial Planning also includes protection of land use. Another imperative aspect in maintaining equilibrium between protected areas and development areas hinges on the population density. For that reason, sustainable development management must balance the natural ecosystems as life holding area and the artificial ecosystem that depends on the population and its activities. In the context of planning, spatial planning can serve as criteria for land use for both protection areas and development areas.

Using this approach, Vision for Sumatran Ecosystem adopts nine criteria, those that derived from thematic spatial data, as its basis: Sumatra regional ecosystem areas; Distribution of Sumatran tigers; Distribution of Sumatran elephants; Distribution of Sumatran rhinos; Distribution of Sumatran orangutans; Distribution of Sumatran peat lands; Important Bird Areas; Key Biodiversity Area; Sumatran forest coverage of year 2007. All data above have been overlapped in considering that each thematic of delineated criteria being used has equally important values. This information will help to give identify sensitive areas for conduct HCV assessment in concession unit level.

CONCEPTION OF ECOSYSTEM-BASED SAPTIAL PLANNING

Definition for spatial is clearly stated in Law 26/2007 that a place that covers land, sea, and air space, including an area in earth as an integrated region where human being and other living creatures are living, doing activities, and maintaining their lives.

Further explained that spatial is materialization of structure space and pattern space. Meanwhile Island Spatial Planning is detailed spatial planning of a nation according to its unit of island or group of many small islands.

As well definition of ecosystem according to *Convention on Bioversity* (CBD) is group of plants, animal and microorganisms interacting one and another and with the a biotic environment (CBD 1993).

Law No. 41/1999 defines forests as an integrated ecosystem of a spreading-out area containing natural bioresources with a domination of trees in a harmony with its nature and inseparable one from another.

Based on the above definition it can be interpreted that Ecosystem-Based Spatial Planning is pattern and structure of space that is arranged by community interaction between living things (human being, plant, animal, and microorganism) and the a biotic environment within a certain island/group of small islands as an integrated region, place for human being and other living creatures surviving, doing activities, and maintaining their lives.

In this approach can be described relations between spatial planning as a desire and expectation in utilizing space sketched as structure and pattern directed to be compatible with the context of ecological environment, and social and cultural condition, and as an integrated unit of ecosystem influenced by economy and technology.

The Diagram 1. illustrates that there is correlation between natural ecosystem and artificial ecosystem that is on how far human being's direct influence, in terms of natural resources utilization, on life and economic development, and technology used to achieve the objective.

In this case that natural ecosystem that performs regulatory functions such as hydrology, climate, floods and erosion control, and habitat for flora and fauna in Spatial Planning is included in protection areas land use. Meanwhile, in line with landscape context, which is an ecosystem entity that has been undertaking process of adaptation with human's culture has traditionally become important sites, including sites with nation's histories and cultures.

Meanwhile, on areas or landscape used for development either in small-scale, middle-scale, or high-scale intensity designated as agricultural or farming lands simultaneously identified as artificial ecosystems.

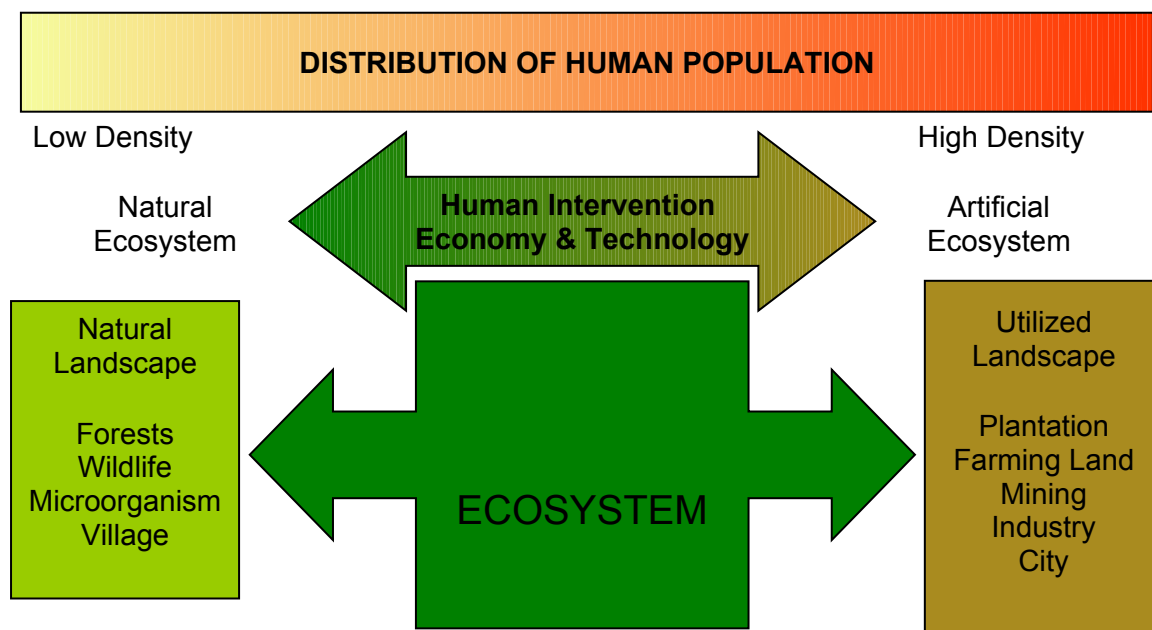


Diagram 1: Relation between natural ecosystem and artificial ecosystem influenced by human being

Another imperative aspect in maintaining equilibrium between protection areas and agricultural areas on certain location particularly depends on population density. For that reason, sustainable development management that puts balance on between natural ecosystem as life holding area and artificial ecosystem has been very significant relating to human population control. Spatial conflict between human and wildlife has led to drastical big wildlife population in Sumatra, for instance decreasing population of Sumatran elephant together with increasing.

In context of planning, spatial planning can serve as control device as well as effective controller if making process of the spatial plan has required strategic criteria and directive on land uses with important ecosystem values for both protection areas and farming areas.

The chart below illustrates correlation between spatial planning and important ecosystem regions.

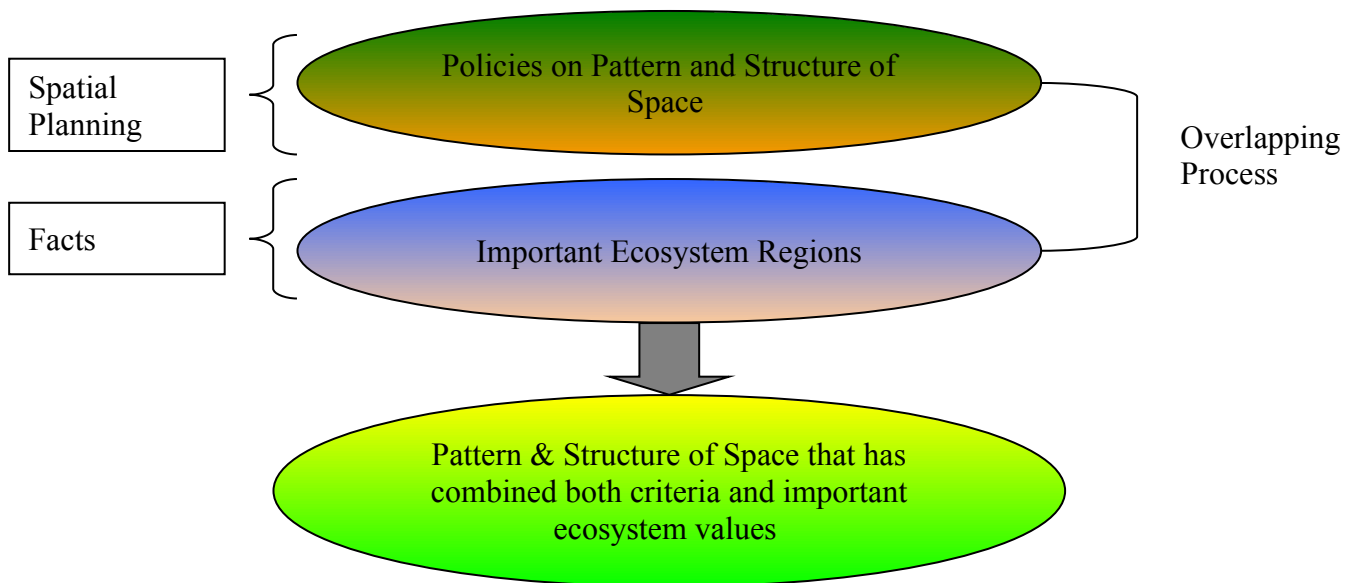


Diagram 2: Analysis Model for Spatial Policies versus Important Ecosystems

VISION FOR SUMATRAN ECOSYSTEM

The vision is developed by Sumatran Spatial Planning Forum or *Forum Tata Ruang Sumatera* (ForTRUST). It consists of varied elements such as NGOs and universities. The main goal of the 'vision' is to serve as consideration and recommendation for pattern and structure of space design for Sumatra Island (Sumatra Island Spatial Planning) in order to develop the Sumatran ecosystem-based Spatial Pattern, which accommodating interests of human being as well as other living creatures in the same areas.

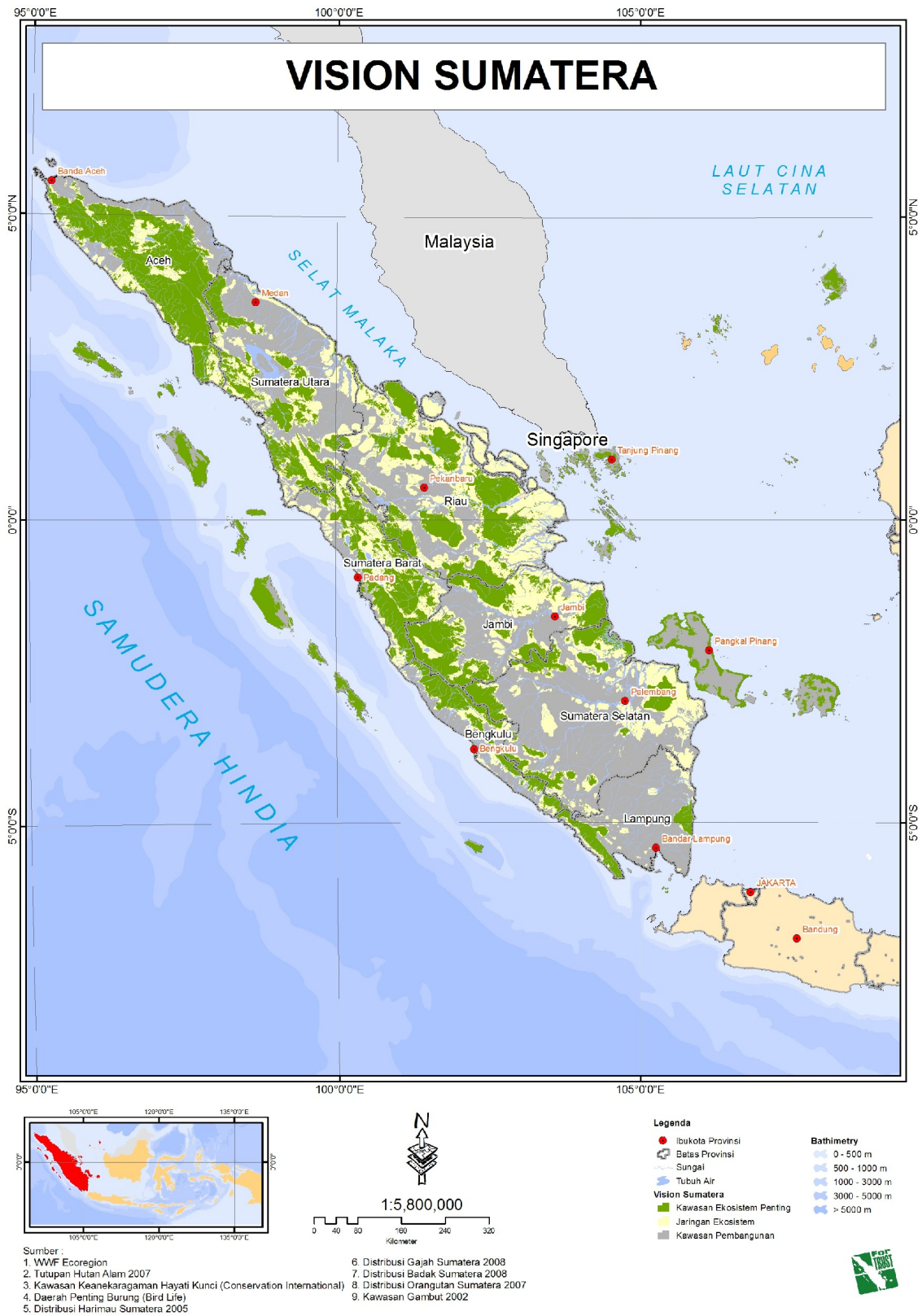
Designing of the vision has been on consideration that the condition of Sumatran ecosystem has been significantly degraded and leading to a threatened stage. For that reason, urgent measures are highly required to prevent further quality decline on Sumatran ecosystem.

HIGHLY IMPORTANT VALUE ECOSYSTEM (HCV LANDSCAPE) IN SUMATRA

Vision for Sumatran Ecosystem adopts nine criteria, those that derived from thematic spatial data, as its basis:




1. Sumatra regional ecosystem areas: it is originated from overlapped data on the types of soil, slope, climate, thereafter classified into 6 ecoregion classifications (WWF)
2. Distribution of Sumatran tigers: it is sourced from research data of conservation institutions (WCS, FFI, YABI, WWF, ZSL, LIF)
3. Distribution of Sumatran elephants: it is sourced from research data of conservation institutions (WCS, FFI, YABI, WWF, ZSL, LIF)
4. Distribution of Sumatran rhinos: it is sourced from research data of conservation institutions
5. Distribution of Sumatran orangutans: it is sourced from research data of conservation institutions
6. Distribution of Sumatran peat lands: it is based on data from wetland conservation institutions (WI)
7. Important Bird Areas: it is sourced from International Bird Life, containing information of the important spreading areas for various bird species in Sumatran island
8. Key Biodiversity Area: it is sourced from International Conservation Institution, containing information on globally significant spreading areas for biodiversity conservation.
9. Sumatran forest coverage of year 2007: it is sourced from Landsat imagery interpretation of year 2007, containing the spreading of natural forest coverage and non-forested areas (WWF, CIFOR).

All data above have been overlapped in considering that each thematic of delineated criteria being used has equally important values. For areas with three or more criteria overlapped are categorized as *important ecosystem areas* (area that its ecosystem functions should be maintained (in green)). The areas with two criteria overlapped are categorized as ecosystem net (in yellow), and areas excludes from criteria above are classified as agricultural areas with sustainable principles (in grey). The analysis results of Sumatran ecosystem can be seen in the following map (picture 1).



Picture 1: Sumatra Map

Table 1. Land-use Directive related to Sumatra Island Ecosystem.

Ecosystem	Directive to Land-use
<p>Important ecosystem areas</p> <p>In green </p>	<p><u>For Ecosystem of natural condition</u> These areas should be designated as conservation areas, protection forests, and limited production forests based on principles of certification, ecotourism sites, and environmental services concessions. Need to do HCV assessment</p> <p><u>For ecosystem of changed condition</u> If there are exploitation practices by forestry, oil palm, mining, etc., it is necessary to isolate impacts, and to restore damaged neighboring areas and basic infrastructures for a better management practices. Need to do HCV assessment</p>
<p>Ecosystem connecting areas</p> <p>In yellow </p>	<p><u>For Ecosystem of natural condition</u> Production forests areas with principles of certification, community forests, and environmental services. Need to do HCV assessment</p> <p><u>For ecosystem of changed condition</u> Industrial forests plantation, oil palm plantation and other plantations, and infrastructure for production. Blocking canal to maintain water level. Need to do HCV assessment</p>
<p>Development areas</p> <p>In grey </p>	<p><u>For ecosystem of changed condition</u> Convertible production forests, agricultural lands, settlement areas, mining areas, intensive infrastructure.</p>