

# Planning sustainable land management at regional level: the Indonesian case

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## ABSTRACT

This paper describes the Indonesian experiences concerning institutional strengthening in the areas of regional spatial planning, and the management and evaluation towards sustainable development of its natural terrestrial and marine resources. Land management aims to secure the legal rights to land, while simultaneously upholding the social and productive functions of land. One of the most distinctive features of Indonesia is its sheer size. The distance from the northernmost islands in Sumatra in the west to the most southern international boundary with Papua New Guinea in the east is 5000 km. Its land and marine territories cover about 7.7 million km<sup>2</sup>; the land area alone covers 1.9 million km<sup>2</sup>. Indonesia is by nature endowed with rich and diverse terrestrial and marine resources to support the economy of its population of 200 million. Notably, 62 percent of the population lives on 7 percent of the land area, on Java and Bali. This uneven population distribution results in complex problems related to the natural resource base. The island of Java also accommodates about 80 percent of all industries in Indonesia. This results in additional stress on land, with competing demands for land for housing, road infrastructure and industrial needs. As a result of the rapid economic growth, conflicts over land use and access to other natural resources are increasing. Accordingly, land evaluation and land management have been the focus of government initiatives during the last decade [11].

Indonesia is a country located along the equator from 95° E to 141° E and from 5° N to 11° S. The sheer size of Indonesia, stretching 5000 km from east to west, makes up the largest archipelago in the world, with a land area of 1.9 million km<sup>2</sup> and a marine area of approximately 5.8 million km<sup>2</sup>. About 2.7 million km<sup>2</sup> of the marine area form the Exclusive Economic Zone, over which Indonesia has some form of jurisdiction and from which it harvests living resources and extracts non-living resources. The national sovereignty of archipelago waters and the territorial sea covers an area of 3.1 million km<sup>2</sup> [9].

## PROBLEMS RELATED TO LAND: KEY ISSUES OF SUSTAINABLE LAND MANAGEMENT

In February 1997, the population of Indonesia passed the 200 million mark; it will reach 233 and 257 million in the years 2010 and 2020, respectively. To date, 62 percent of its population lives on 7 percent of the total available land area, on the islands of Java and Bali.

The uneven population distribution and the increasing number of people living in urban areas results in heavy pressure on land and its resources. As a result of this growing population pressure and changes in the nature and intensity of economic development throughout Indonesia, land use issues have become increasingly important. In Java, for example, the encroachment of landless farmers into upland forests and the conversion

of coastal wetlands to aquacultures have led to increasing soil erosion, flooding in low-lying areas, and the loss of valuable coastal and marine natural resources.

The recent, and frequent floods in Jakarta—even following short periods of heavy rainfall—are due to uncontrolled land use and land cover change in the upper watershed of rivers flowing to Jakarta. The impacts are severe since many landless people in Jakarta live along riverbanks. Floods are of even greater severity when they coincide with high tides or if runoff rainwater cannot be easily drained; this in turn affects the low-lying alluvial plain of Jakarta.

The rapid and uncoordinated expansion of urban areas has rendered the present transport systems inefficient. On the outer islands, encroachment of forest land for planting cash crops is taking place at an alarming rate—that is why a Minister for Transmigration and Resettlement of Forest Encroachers has been appointed to the present Cabinet. The present weak enforcement of the spatial planning law (24/1992) may lead to uncontrolled land use and land cover change in forest land, which would also indirectly affect coastal areas. Currently, the coastal areas in Java, where 60 percent of the population lives and works, account for 80 percent of all marine-related activities of the country.

## URBAN POPULATION

In 1990, the urban population reached 55.4 million (33 percent of the total population), with a growth rate of 5.4 percent per year. The overall growth rate in Indonesia is 1.96 percent. Following this trend, the urban population will reach 102.5 million in the year 2010 (44 percent of the total population) and 127 million in 2020 (50 percent of the total population).

An example of the impact of the population growth can be found in the area surrounding the capital city of Jakarta, where once fertile agriculture land has been transformed into settlement and industrial areas. Jakarta and the three *kabupatens* around Jakarta have acquired the acronym “Jabotabek” (Jakarta, Bogor, Tangerang and Bekasi). During the day, the population of Jakarta is about 11 million; at night it is about nine million. This means that two million people commute every day to and from the surrounding areas. The inadequate road system makes traffic jams a daily feature of Jakarta roads. It was suggested that macro-site planning of Jabotabek should be entrusted to a single authority and that everyone should adhere to its spatial planning arrangements. The macro-site planning should provide an overview of the spatial arrangements related to transport and drainage systems, and to commercial, recre-

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ational, social and public facilities. At present, the three kabupatens Bogor, Bekasi and Tangerang are administered by the governor of West Java Province, while Jakarta, as a special capital area, is administered by another governor. There is a need to have a single authority to control the development of the Jabotabek area.

## TRANSMIGRATION PROGRAMME

Since the first five-year development plan (FYDP) of 1969, the government has embarked on a massive transmigration programme, with people moving from the densely populated islands of Java and Bali to the sparsely populated outer islands such as Sumatra, Kalimantan, Sulawesi and Irian Jaya. This programme needed the support of intensive systematic basic mapping and natural resources inventory, and this has been the main objective of the civilian national mapping agency BAKOSURTANAL. BAKOSURTANAL was established by presidential decree in 1969, its main tasks being:

- to advise the president with regard to basic natural resource surveys and national mapping
- to provide basic data and all kinds of maps
- to establish a depository of all maps and basic data relating to the national territory.

Population density trends are shown in Table 1. As a result of the growing population pressure, changes in nature and the intensity of economic activities throughout Indonesia, land use issues have become increasingly important.

**TABLE 1** Population density trends in Indonesia

Major islands	Population density per km <sup>2</sup> in 1990	Expected population density in 2020
Irian Jaya and Maluku	7	14
Kalimantan	17	31
Sulawesi	66	101
Bali, West and East Nusa Tenggara, and East Timor	115	180
Sumatra	77	128
Java	813	1093
National	93	132

Source: [5]

The first four FYDPs focused on increasing agricultural output as a base for economic growth, targeting food self-sufficiency, especially rice, which is the staple food of the country. The oil boom of the 1970s increased foreign earnings and supported economic development with an annual growth of 6.8 percent. With oil prices declining in the 1980s, Indonesia had to adjust and reform its economic approach by boosting non-oil industries. Since the fifth FYDP, the focus has been towards developing industries, especially labour-intensive industries such as textile industries, in order to increase foreign earnings, with special emphasis on added value domestic products.

By the end of the fifth FYDP (1993/1994), Indonesia had laid a solid foundation for its economic growth by diversifying its economy—moving from dependency on

oil and gas towards export-oriented industries. However, great differences in wealth and affluence remain, and the government is striving to decrease the gap by sharing the benefits of economic growth among its people.

This economic growth explains the increasing change in land use, from agricultural uses to such uses as residential, industrial, transportation, telecommunication, fresh water supply, etc. Agricultural land is being converted to non-agricultural land at a rate of 50,000 ha per year, which means a decrease of Rp 300 billion per year from agricultural products (around US\$ 120 million). For the period 1991 to 1993, land converted on the island of Java can be classified as follows: housing 55 percent, industry 15 percent, office buildings 5 percent and others (shopping malls, golf course, etc) 25 percent.

## LAND USE ALLOCATION POLICY

Problems related to land are very complex. As a result of population increase and development activities, there are competing demands for land, but available land is limited and unevenly distributed among regions/provinces. The economic potentials of the regions/provinces vary, creating imbalances and inequalities in economic growth potentials. Moreover, land scarcity is ever-increasing and conflicts among land users are becoming evermore intense. Land use policy has become the focus of efforts to relieve such conflicts by addressing the following needs:

- to make land available for expanding economic activities to support the increasing population
- to make land available for developments to improve the quality of life (eg, the construction of an adequate transport infrastructure, health and education facilities, parks and other service centers)
- to maintain self-sufficiency in food production and develop other agricultural products such as commercial crops, industrial raw materials and export commodities. This goal can be achieved by protecting agricultural lands from uncontrolled conversion.
- to develop sustainable land resources management [6].

## THE THREE ASPECTS OF LAND

### LAND MANAGEMENT IN INDONESIA

Three aspects of land have to be considered:

- (1) land as a basic legal entity
- (2) land in its spatial context, the necessary space for economic development
- (3) land as one of the three inorganic realms of the geosphere (land, water and air).

Land, water and air provide the non-living substances out of which the living substance of the biosphere is created. In earth system science, the interaction between the geosphere and the biosphere is an international study and research topic. Sustainable development should therefore be pursued between the elements of the organic and inorganic matters of the geosphere.

Article 33 of the 1945 Indonesian Constitution states that "land, water and air and the natural richness therein shall be under the control of the State, and used for the maximum benefit of people." "Control of the State" should be interpreted to mean that although the State

does not own the natural resources bequeathed to the people of Indonesia by the Grace of God, it is responsible for arranging and managing them in a sustainable way for the benefit of present and the future generations. This statement has always been embodied in the general guidelines for state policies implemented in the FYDPs.

Most issues concerning sustainable development, with its multiple roles (economic, ecologic and socio-cultural), are related to land management. There are four basic laws governing land in Indonesia that are of interest here and they cover all aspects of land and its sustainable management:

(1) Basic Agrarian Law (24/1960)

This law covers the legal aspects of land, such as land rights and land registration, and hence the security and certainty of rights to land.

(2) Basic Forestry Law (5/1967)

This law provides basic legislation and regulations regarding the management and control of forest, protected forest, conservation forest, production forest, reforestation and environmentally sensitive areas, as well as regarding the role of the general public in the control and conservation of the nature.

(3) Basic Law on Management of the Living Environment (4/1982)

This law, which is now being revised, provides measures and benchmarks for safeguarding the living environment from degradation and deterioration caused by land, water and air pollution, and for assessing environmental impacts caused by physical development.

(4) Law on Spatial Arrangement (24/1992)

This law, which considers land in its spatial context, governs the allocation of land for human activities, including conservation and preservation. To avoid land use conflicts, and taking into account the sustainability of land from the ecologic point of view, the spatial allocation of land is regulated at national (*RUTR Nasional*), provincial (*RUTR Propinsi*) and regional (*RUTR Kabupaten*) levels by the general spatial plan (*Rencana Umum Tata Ruang (RUTR)*). The kabupaten is the lowest autonomous administrative unit-autonomous, that is, except in foreign/some marine affairs and matters concerning defence and security.

## THE BASIC AGRARIAN LAW

The Basic Agrarian Law of 1960 (BAL-1960) was the first Indonesian law with regard to land management. It replaced the "Agrarische Wet 1870", which was the basis of land administration in the colonial period. After national independence in 1945—and prior to 1960—Indonesia adopted two systems of land rights [7]:

(1) land was categorized as "western land" and was subject to the provisions of the (Dutch) Civil Code and registered at the cadastral offices (land registration offices) or

(2) land was categorized as "Indonesian land" and was subject to the provisions of unwritten customary law and registered at land tax offices.

Hence, there are two cadastral systems in the country, the first is the legal cadastre and the second is the tax cadastre.

BAL-1960 established that Indonesian land law would be based on customary land law (*Hak Ulayat*) and that all land parcels would be cadastrally measured and reg-

istered in a "ground book", a legal record of land titles. The landowner was to be given a certificate of title, with an extract called a "letter of measurement" relating to the measurements of the parcel. However, most laws and regulations prescribed by BAL-1960 have yet to be implemented.

Under BAL-1960, Indonesia recognizes the following land titles:

- ownership rights, the most important land rights for individuals (*Hak Milik*)
- right to build (*Hak Guna Bangunan*)
- right of exploitation (*Hak Guna Usaha*)
- right of use (*Hak Pakai*).

After BAL-1960 came into force, pre-1960 land titles had to be converted to one of the titles stated in the law within a specific period. Three additional types of land title were introduced later:

- management rights (extended to government agencies and state enterprises to develop land for public uses, eg, government offices, industrial estates, agriculture estates, etc)
- strata titles (to deal with the emergence of high-rise apartments and office buildings).

A report by the World Bank in 1994 [10] identified the major issues related to the legal framework that hinder the smooth registration of the land titles mentioned above.

(1) Many land-related laws and regulations make land transactions and registration overly complex. There are approximately 2000 laws and regulations related to the administration and management of land, water and air.

(2) Documentary evidence of land rights dating back to 1960 or earlier (before BAL-1960) is required for land registration. Often, however, such documentary evidence is no longer available, which poses problems. Lands with pre-1960 "western titles" should have been converted to BAL-1960 land titles by the respective title-holders; if this was not done within the time frame stipulated, these lands reverted to the government. In this case, the government may grant land rights to the occupants or to other investors (government or private) who want to develop this government land in accordance with the general spatial plan for a town or region. When investors want to develop land for commercial complexes, illegal occupants receive insufficient compensation (*ie*, less than the market value) to buy new land or rebuild their houses elsewhere. This can create social disturbances.

Although communal land rights are recognized as the basis of BAL-1960, only individually held lands are registered. Converting communal land rights to the BAL-1960 land titles is a complicated time-consuming process. First, the National Land Agency (*Badan Pertanahan Nasional (BPN)*) sets up a special commission—the members coming from the local authorities—to investigate evidence regarding communal lands or "Indonesian land". If the commission approves, the land is cadastrally surveyed and a "letter of measurement" is prepared, showing a planimetric map of the parcel with all the measured boundaries, together with proof of adjudication. With this document, the land will first be transferred to the government, who can then grant ownership rights under BAL-1960. It is compulsory to register land at the local land registration office of the National Land Agency, and a certificate of ownership is then issued.

To increase the efficiency of land allocation, a major effort is required to strengthen market forces, by reducing and simplifying land regulations, expediting land titling and registration, and improving the availability of land information. The National Land Agency is in the process of computerizing land information [8].

In an effort to speed up land registration, the government intends to call on the services of private surveying companies. Only licensed surveyors, who have undergone additional training to reach the required level of professional competence, can carry out cadastral surveys.

The National Land Agency, mandated by presidential decree, has the task of advising the president on the management and development of land affairs administration. It carries out this function in accordance with the Basic Agrarian Law, as well as other legislative regulations covering the utilization, measurement and registration of land, the control and ownership of land, and the settlement of land rights.

### SUSTAINABLE LAND MANAGEMENT AT REGIONAL LEVEL

Sustainable land management was discussed at the second environmental workshop held in Samarinda (east Kalimantan) at the end of 1993. A common and recurrent feature of the discussions was the issue of land use conflicts between different sectors, *eg*, between conservation areas and mining, or between forestry areas and transmigration areas. There is only limited coordination between sectors.

A scale 1:500,000 map, the *Consensus map of forest land use*, was prepared for each province. This map represented a consensus between all concerned sectors and was signed by the governor of each province. It was intended to be used as a guideline for land use development, but a larger-scale map is needed to define the exact boundaries between developed areas and areas designated for protection or conservation.

Under the Regional Physical Planning Programme for Transmigration (RPPProT), scale 1:250,000 maps were produced for transmigration planning purposes by a UK consultant group in cooperation with BAKOSURTANAL [3]. The whole country was covered within four years (1984 to 1989). These maps, which were prepared mainly by compiling multi-stage/multi-sensor remote sensing images and area study reports, show three types of information:

- present status of land and forests
- land system and land suitability
- land status/recommended areas for development.

The question was raised as to whether planning should be on the basis of physical (watershed) or administrative (province, kabupaten) units. In the terms of reference of the land resource evaluation and planning (LREP) project, it was agreed that zonal planning should be carried out at provincial level, but that the evaluation should focus on watershed or other appropriate units (such as land units), particularly regarding environmental issues. The LREP is an ADB- (Asian Development Bank) funded project. One objective of the LREP is to extend the use of geographic information systems (GIS) at national and provincial levels and to improve the physical planning process by the optimal management of

land resources and natural resources. The first phase (1985 to 1990) was to cover the eight provinces of Sumatra, and the second phase (1992 to 1997) to cover the other 18 provinces.

To emphasize their importance, the environmental aspects are presented as a separate overlay in the LREP planning process. This is in addition to three layers prepared for the RePPProT maps. However, most provincial planning agencies had difficulty in fully appreciating the LREP planning concept. This was because many provinces were already in the advanced stages of preparing structural plans-in compliance with the Law on Spatial Planning (4/1992), which stated that each province should produce a strategic plan on a scale 1:250,000 map. Only strategic planning (zoning plan/zoning of land use) can be shown at this scale.

Environmentally sensitive areas (ESAs) were also included in the environmental layer. The ESAs were classified into groups reflecting different types and degrees of sensitivity, including [2]:

(1) *conservation*: nature conservation, tourist and cultural features

(2) *protection*: areas requiring a certain amount of protection, often to prevent environmental damage to other areas. This group includes (upper) watersheds/headwater areas, coastal areas, mangroves, peat areas and lakes

(3) *degraded areas*: areas where development has already resulted in environmental damage to such an extent that serious losses in productivity occur. This group includes: critical land/watersheds, mined areas, areas with special problem soils (problems of salinization, etc), silted areas and areas intruded by salt water. It was suggested that areas potentially at risk to degradation should be included in category (2).

(4) *natural hazards*: areas prone to damage from volcanic or seismic activities, typhoons, floods or landslides, and which, consequently, could not be recommended for certain types of development.

(5) *pollution*: could be industrial, urban or agricultural areas.

### AGENDA 21 INDONESIA

Agenda 21 Indonesia [5] is a document concerning the national strategy for sustainable development, which was prepared by the Office of the Minister of State for Environment to comply with Global Agenda 21 agreed at the 1992 UNCED meeting in Rio de Janeiro (Rio Declaration).

Agenda 21 Indonesia was drawn up to meet the needs and conditions of Indonesia, and after a series of consultations involving the relevant sectors, regional governments, seminars and a public hearing, was agreed by the government, private sectors, non-government organizations and the general public. There are four chapters: (1) Community Service; (2) Waste Management; (3) Land Resources Management; and (4) Natural Resources Management; and 18 programmes. The programmes that are relevant here are dealt with in Chapter 3 (land resources planning, forest management, agricultural and rural development, and water resources management) and Chapter 4 (biodiversity conservation, biotechnology development, and integrated coastal and marine management).

## CONCLUSIONS

Indonesia has pursued sustainable land management since the start of its FYDP in 1969, because of the heavy pressure on land and land resources, resulting from the unequal distribution of its population. As a matter of fact, local people in Kalimantan dan Sumatra have traditionally practiced sustainable land management over the centuries through shifting cultivation.

Sustainable land management has again become a topic of discussion since modern Indonesia embarked on a policy of economic development and land was needed for industries, human settlements (especially for resettling people from heavily populated islands to sparsely populated outer islands) and the development of its rich biodiversity for economic return through industry and tourism.

The four basic laws and other legislation such as the presidential decree on establishing environmental impact assessment agencies (which are not touched on here at any length) show the government's commitment to UNCED Agenda 21. However, implementation and law enforcement still need to be improved; this should start by educating people of all levels and ages, thus increasing public awareness at large.

Although the role of geo-information has not been elaborated on in this paper, GIS has been widely implemented in micro- and macro-planning and in resource evaluation, *eg.* in the LREP and MREP projects of regional planning agencies (BAPPEDA at provincial and kabupaten levels) from as early as 1985 [1, 4]; in environmental monitoring by various agencies and researchers; and also in business circles.

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## RESUME

Dans cet article, on traite des expériences indonésiennes concernant le renforcement institutionnel dans les zones de planification régionales et spatiales, ainsi que la gestion et l'évaluation vers un développement durable de ses ressources naturelles terrestres et marines. Une gestion des terres a pour but d'assurer les droits légaux à celle-ci, tout en maintenant simultanément les fonctions sociales et productives de la terre. Un des traits les plus particuliers de l'Indonésie est sa dimension côtière. La distance à partir des îles les plus septentrionales à Sumatra à l'ouest jusqu'à la frontière la plus méridionale avec la Papouasie Nouvelle Guinée à l'est est de 5000 km. Ses territoires terrestres et maritimes couvrent environ 7.7 millions de km<sup>2</sup>; la partie terrestre seule couvre seulement 1.9 millions de km<sup>2</sup>. L'Indonésie est naturellement dotée de riches ressources diverses sur terre et en mer pour subvenir aux besoins d'une population de 200 millions. Il est à noter que 62 pour cent de la population vit sur 7 pour cent de la partie terrestre, à Java et Bali. De cette répartition inégale de la population, il en résulte des problèmes complexes ayant rapport aux ressources naturelles de base. L'île de Java accueille également, environ 80 pour cent du total des industries en Indonésie. Ce qui a pour résultat une pression supplémentaire sur les terres, avec des demandes compétitives pour le logement et pour des besoins d'infrastructure de routes et d'industries. Des conflits au sujet de l'utilisation des terres et de l'accès aux autres ressources naturelles deviennent toujours plus nombreux avec la rapidité de la croissance économique. En conséquence, l'évaluation et la gestion des terres ont été le centre des initiatives gouvernementales pendant ces dernières décennies [11].

## RESUMEN

Este artículo describe las experiencias indonesias acerca del fortalecimiento institucional en las áreas de la planificación espacial regional, y acerca del manejo y de la evaluación hacia un desarrollo sostenible de sus recursos naturales terrestres y marinos. El manejo de las tierras se dirige a asegurar los derechos legales a las tierras y simultáneamente sostiene las funciones sociales y productivas de las tierras. Uno de los rasgos más distintivos de Indonesia es su forma fragmentada y alargada. La distancia desde las islas más norteñas en Sumatra, en el oeste de Indonesia, hasta la frontera internacional más sureña con Papua Nueva Guinea en el este es 5000 km. Los territorios terrestres y marinos cubren cerca de 7,7 millones de km<sup>2</sup>; el área terrestre sola cubre 1,9 millones de km<sup>2</sup>. Por naturaleza, Indonesia está dotada de recursos ricos y diversos, tanto terrestres como marinos, que apoyan la economía de su población de 200 millones de habitantes. Es notable que 62 por ciento de la población vive en 7 por ciento del área terrestre, en Java y Bali. Esta distribución desproporcionada de la población resulta en complejos problemas relacionados con la base de recursos naturales. La isla de Java también concentra cerca del 80 por ciento de todas las industrias en Indonesia. Esto resulta en una presión adicional sobre las tierras, con demandas competitivas de tierras para viviendas, infraestructura de carreteras y necesidades industriales. Los conflictos de uso de las tierras y de acceso a otros recursos naturales están aumentando como resultado del rápido crecimiento económico. Por tal motivos, la evaluación y el manejo de las tierras han sido el foco de iniciativas gubernamentales durante el último decenio [11].