

Land Use System Approach to Sustainable Land Management in Indonesia

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1. Introduction

Sustainable development is a major concern of all nations in view of the need to preserve the global environment. Since the Stockholm Declaration, signed in 1972, there have been many initiatives towards global environment protection. The establishment of the World Environment Year, for example, indicates the world's determination to confront this issue.

In Den Haag, some 24 leading countries have signed a declaration of harness global climatic change. And in 1992 the United Nations World Summit in Rio de Janeiro produced piles of documents pledging to sustain the global environment.

Recently in 1997, the Second World Summit was held in New York to evaluate the implementation of all commitments and of the agenda formulated in Rio de Janeiro and to draw up an action plan to sustain our planet for the next 5 years and the more distant future.

Indonesia, along with other nations, participates in this development. Indonesia considers it a necessity to save the global environment since its natural resources are also an integrate part of the world environment. Indonesia has appointed a Minister for Environment since 1973 and in 1982 The Act on Environment management was passed.

It is well understood that the implementation of sustainable development is not a simple task. It embraces a wide spectrum of ecology, social, economic, politic, and security tasks. Therefore these have to be formalized to enable government policy and the definition of guidelines, goals and strategies for sustainable development.

Indonesian national development, as stated in the Guide Lines for National Development (GLND) 1993, is a continuous program with the goal to attain a prosperous and just society, materially and spiritually based on the five principles of "Pancasila"¹ and the 1945 Constitution in the Republic of Indonesia which is united, free, and democratic.

To achieve this goal, the government policy on the utilization and management of national resources for the Second Long Term Development Period (1993-2018) is directed as follows:

The utilization and management of natural resources, especially land, water, and forest should be based on nine principles of the national development. These are: the Believe in one God Almighty, utility, democracy, equality, sustainability, legality, independent, struggle, and science and technology.

Land, water, and forest are a part of basic inputs and dominant factors for national development to be used and managed within the nation unity to strengthen national defense and security.

¹ Pancasila means: Panca : five, Sila: principle; it is the State ideology, way of life of the Indonesian people and the primary source for all laws/acts, regulations and statutes. Pancasila consists of: (1) Believe in One God the Almighty, (2) Humanity, (3) Nationality, (4) Democracy and (5) Social Justice.

Land is one vital natural resource to be utilized for living and working space, and to support the natural flora and fauna.

Land is also an integral part of the environment, as the case with other resources such as waters is and space. Therefore land resource management in Indonesia should be strategically oriented toward sustainable development which consists of:

- Sustainable land resource management
- Use of land resources for national unity
- Recognition of land resources as national property for national equality

Clearly the land policy in Indonesia should strive for optimal utilization of national land resources to equally distribute and enhance national prosperity.

Based on the above mentioned principals, this paper will introduce the basic concepts and policy on land management in Indonesia

2. Land Use Condition and Problems in Indonesia

Land is a strategic ecosystem component for sustainable development. Its limited availability, however, substantially effects national development activities. Problems related to land conservation are mostly concerned with use, utilization, and tenure aspects.

2.1 Land use and utilization aspects

The Republic of Indonesia is an archipelago country with a territory of approximately 8.4 million square kilometers consisting of about 1.92 million square kilometers of land and 6.48 million square kilometers of sea. Some 72 percent or roughly 1.4 million square kilometers of the total land area are forest, the rest is settlement (housing, industry, and services) and cultivation areas.

Nationally, the total forest area makes up an ideal proportion of land use. By region however, this proportion appears to be very unequally spread:

- Sumatra covers an area of 47.3 million hectares, of which 56 % is forest;
- Java covers an area of 13.2 million hectares, of which 21 % is forest;
- Kalimantan covers an area of 53.9 million hectares, of which 68 % is forest;
- Sulawesi covers an area of 18.9 million hectares, of which 63 % is forest;
- Irian Jaya covers an area of 42.2 million hectares, of which 96 % is forest.

Clearly, these figures indicate that Java has been intensively used, while Kalimantan and Irian Jaya are less intensively used. It appears that the intensity of land use is closely related to the physical characteristics of the land.

The physical characteristics of land differ between locations. Hence, the carrying capacity differs which in turn affects infrastructure that is relatively well-developed in Java, Bali, Sumatra and some parts of Sulawesi. Hence these regions undergo fast economic growth.

Regional differences in land fertility and rate of infrastructure development have led to an unequal distribution of the population. In 1996, for example, 120 million people or about 60 % of the total population of Indonesia of 200 millions were concentrated in Java. By the end of the second 25 year long term development plan (2018) the population of Indonesia is estimated to be about 260 million. Of these, about 140 million (54 %) will live on Java, 55 million on Sumatera and the balance of 75 million on the other islands.

This condition has consequences for the land use distribution. Today, approximately 79 % or 10.4 million hectares of the territory of Java has been used for agriculture and other activities. The remaining 21 % are forest area. Therefore agricultural expansion on this island would be difficult.

The rapid changes in land use, in a response to the growing need for land, results in significant changes in land tenure. Since the establishment of Basic Agrarian Law (BAL) in 1960, a fundamental change in land ownership and land tenure structure has occurred.

Problems related to land use are mostly related to land utilization that exceeds the supporting capacity. This is of course hazardous to the environment.

There have been a growing tendency to convert fertile land near urban areas to accommodate fast urban expansion.

2.2 Land Tenure

Although many efforts are still in progress toward creating equality of land ownership, rapid growth of population and scarcity of land supply have limited this effort. This is why, at present, there are still many farmers who do not have enough land for cultivation, which is less than 0.5 Hectares, some even none.

There is also a tendency that land in urban fringe areas is no longer possessed by local people but by city dwellers . Most of these lands were not being cultivated or used, but for speculation. In other cases, land occupied by affluent people has been released to local people on rental basis. This practice is not fully unlawful either because there is no clear regulation on this practice.

Prior to the BAL enforcement in 1960, land ownership outside Java Island was regulated under the customary law ("adat" law) meaning that all land was controlled by adat communities, known as communal land right or "Hak Ulayat". Under the BAL it was decided that the state is the only authoritative body responsible for controlling the national land. In this context, the communal land rights are appreciated as long as they serve the national interest and are not in conflict with the BAL and other regulations on land matters.

3. Land Policy

The 1945 Constitution has underlined the basic policy on the management of the national territory Article 33 paragraph 3 of this constitution states that the earth and water, including all natural resources contained therein are controlled by the state for the maximum prosperity of the people.

3.1 Basic Land Policy in Indonesia

Act No 5 of the year 1960, i.e. the Basic Regulation on Agrarian Principles which is also popularly called the Basic Agrarian Law (BAL) is an elaboration of what the 1945 constitution (articles 33, paragraph 3) has spelled out. This act is the basic land policy in Indonesia.

The basic land policy set forth in the BAL is as follows:

- The national unity concept is used for the purpose of unity in politics, economics, culture, national defense and security. It defines that national land, water and space and all natural resources are national properties.
- Communal land rights can be acknowledged as long as, in reality, they are conform to the national interests and not in conflict with existing regulations.
- Social functions embedded in the land rights. In this matter, land rights have a social function and any use of land should accord with the characteristics of the land and the land rights so as to maximize the prosperity and the justice to those who possess of the land rights, the community and the state.

- The principle of nationality. Right of ownership ("hak milik") can be granted to Indonesian citizens only. Foreigners may obtain other kinds of land rights which are limited in time and size.
- Equality. All Indonesian citizens, male and female, have equal opportunities to acquire land rights right and the benefits from land.
- Obligations of right holders. Persons, legal bodies, or institutions with a legal relation to the land have to utilize their lands, establish justice, and protect the right of less fortunate people based on the existing regulation.
- Land use planning is a key instrument to give maximum prosperity to the people and the state. This plan, both in general and in more detail, arranges the designations, the use and the supply of land within the territory of the Republic of Indonesia so as to support the various needs for land by the community and the state. Such a plan should also include initiatives to maintain or preserve natural resources.

Some key points mentioned in this Act are as follows:

- The State, as the authoritative organization of the people's power, resumes responsibility for the whole national land to be used for the maximum prosperity of the people. This article authorize the State to:
 - Regulate and implement the designation, utilization, preservation and conservation of the national land
 - Determine and regulate legal rights on land
 - Determine and regulate legal relationships among individuals and legal actions that concern national land.
- The right to use land is only given to those persons or legal bodies who hold land rights. It means that the utilization or cultivation of land by those not in possession of land rights is prohibited.
- The government is entitled to draw up a general plan concerning the preservation, the designation, and the use of the earth, water and space and all natural resources contained therein for various purposes.
- Landowners shall cultivate and maintain their lands.

In relation to sustainable development, it is deemed necessary to set up a comprehensive and integrated plan to be used to achieve the national welfare and security through economic development focusing on industrial development supported by well-established agricultural sector and sound environmentally protected condition.

For the sustainable development to be successful, many principles should be taken into account. These are comparative, competitive, dynamic, accommodative, sustainable and economic growth and equality.

A planned development can only be successful if it is implemented through the arrangement of land use and land tenure as an integrated element of development based on policy at national and local levels and takes into account the existing local conditions.

Likewise, sustainable development will only be possible with the establishment of orderly land utilization, maintenance and environment through land use planning so as to achieve optimal and effective results. Land use planing is therefore expected to abate land utilization that exceeds its carrying capacity, which might have resulted from differences in population, urbanization and economic growth between regions.

As an attempt to control land utilization, the Government has issued a set of policy measures. For example, the State Minister of Agrarian Affairs 's Regulation number 2, 1993 concerns the procedures for location permits for development purposes. Presidential Decree number 53, has also been introduced in 1989 to replace Presidential Decree No. 41 of 1996 concerning Industrial Estate and states the prohibition of land use conversion from irrigated to non-agricultural use. Government Regulation Number 29 established in 1986 and concerned with environmental impact assessment has been replaced by another government regulation in 1993. The important statutory in the regulation is that it is compulsory for every land user to prepare an environmental impact analysis for any project covering a large area and or having a severe impact on the community and environment. The project must prepare a plan for environmental management and a plan for environment monitoring.

4. Concept of Land Use Systems

The concept of the land use system in sustainable land management embraces a set of components. Basically the system contains three parts, representing input, process (black box) and output. The concept of the land use system can be broadly seen as follows.

- The Input: concerns data collection, data processing, paradigm and strategic environment.
- The Process: includes land allocation based on the spatial plan and five year development plan; implementing land allocation through the provision of permits for location, land use change and land use practices; and the monitoring and controlling of land use practices.
- The Output: contains the objective of the land use system, viz a sustainable and optimum land use and the establishment of four orders of land management.

4.1 Objective

The goal of land use system for sustainable land management is to establish sustainable and optimum use of land for maximum prosperity of the people, both for the landowners and the community as a whole.

To obtain this goal, land use management pursues what is called "four orders of land management", they are: legal order, administration order, use order, and order of maintenance and conservation of environment.

Through this strategy, land use management will establish a land use arrangement as follows:

- All types of land use are accommodated according to the plan, and there will be no conflicts among them. Besides, they must be in balance and in harmony both in terms of hectares and location.
- All types of land use must be discerned based on the technical criteria for maximizing benefit and minimizing externalities, and must avoid any activity hazardous to the environment or which diminishes the land's carrying capacity.

4.2 Data Collection and Processing

The planning process of land use consists of data collection, data processing, and formulating the plan. The Reliable land data are fresh, recent, accurate and appropriately detail in conformity with the objective. The unit planning area hierarchically embraces the national, provincial, district and local levels. The land data include: present land use, land capability and other physical land characteristics, land status and social economic condition, and other supporting data.

Data processing produces land database for the planned uses. The huge amount of land data needs very sophisticated tools in terms of both the software and the hardware. With the rapid development of mapping technology, remote sensing and computerization, these data are easily handled and processed through a geographic information system.

4.3 Paradigm and Planning

A multiple land use plan is prepared on the basis of land availability and the land data base with the focus to realize the objective.

Since the land use plan describes essentially the spatial dimensions of development, the land use plan can only be prepared if the development plan has been stated.

A multiple land use plan is the basis to prepare the spatial plan. The end product of land use planning is a spatial plan at all levels. The spatial plan is a legal document issued by the government through regulation.

The paradigm of spatial plan are the State Ideology Pancasila, constitution, Agrarian Law, Spatial Law, other land related laws (such as forestry law, water and irrigation law, environmental law, etc.) and The Guide Lines of the National Development.

Besides, the plan must consider very seriously the strategic environment, both at international, regional and national level. This environment is strongly influenced by the process of globalization, which affects the life of the nation and the state all over the world in many aspects covering economy social, culture and security.

In specific economic globalization ultimately will end with world free trade. Anticipating this possibility The World Trade Organization (WTO) continuously review the GATT, which basically directed in reducing tariff systematically until at a certain stage (about 2020) no tariff at all. The world free trade will only give benefit to all people around the world if the bargaining power of every nation/state are equal.

At the regional level we realize the growth and development of regional trade integration and cooperation namely AFTA, APEC, NAFTA, EEC, etc.

At the national level the government imposes continuously deregulation and de beaurocratization to strengthen the economic base of the country especially in the field of agriculture and industry.

4.4 Land Allocation

On the basis of spatial plan and the five-year development plan which contains sectoral and regional development plan, land allocation for every land use activity is indicated.

4.5 Plan Implementation

The actors of land use plan implementation are government and the community as a whole whether legal body or individual. To execute the plan first of all they must acquire land where the activity is located. For this purpose the government will issue location permit, as the basis for land acquisition and the development approval, which consists either land utilization, land use conversion or land consolidation.

4.6 Land Use Monitoring

The Land use monitoring is carried out by the government. A continuous monitoring is treated to individual project. On the basis of the location permit and land rights, the government monitors and evaluate the progress of land acquisition and land use practices. If the type of uses and the progress of development are not in line with the plan, the government could take action to review and or to cancel the location permit and or the right on land.

The systematic land use monitoring is undertaken through systematic land use mapping by using remote sensing technique or conventional mapping method.

The result of monitoring is used to review the plan by inputting back to the process of data collecting, as shown in the diagram of the land use system.

5. Spatial Planning

The policy on spatial plan is promulgated in the Act No. 24 of the year 1992 concerning Spatial Use management.

This Act defines that "space is the space encompassing the land space, sea space and air space as the territorial entity where human being and other organisms live and perform their activities and maintain their survival. By that definition, the act states that land resources is a component of space. In daily life, land is the most important and dominant component of the space. To manage the use of space is essentially to manage the use of land.

The objectives of the spatial use management are:

- The realization of an environmentally sound spatial utilization based on Archipelago concept and National Resilience.
- The realization of the orderly use of conservation region and productive region.
- Properly use of space in support of:
 - Establishing intelligent nation with wise character and prosperous life.
 - Integrated approach in utilizing natural, and man-made resources.
 - Enhancing effective and efficient use of natural resources to increase the quality of human life.
 - Protecting and preserving the environment as well as avoiding and overcoming externalities.
 - Balancing the prosperity and the security.

Based on the administrative boundary, spatial plan is classified hierarchically into:

- National spatial plan
- Provincial spatial plan
- District spatial plan

The National Spatial Plan provides strategies and general policies on the utilization of the national space. It consists of:

- National objectives in utilizing the national space directed to the prosperity for the people and the national security.
- The structure and the pattern plans for national space.
- Criteria and management procedures applied to conservation region, productive region and specific regions.

As the strategy and the general policy, at the national level, the national spatial plan comprises of:

- The establishment of conservative, productive and specific regions.
- Norms and criteria in utilizing the national space.
- Guidelines of controlling any use of national space.

The Provincial spatial plan translates and elaborates strategies and policies underlined in the National Spatial plan into provincial level. Therefore, Provincial spatial plan also includes:

- Provincial policies and interests in utilizing the provincial space which are directed to the prosperity and the security at provincial level.
- The structure and the pattern plans for provincial space.
- Norms and Guidelines of controlling any use of provincial space.

The District Spatial Plan translates and elaborates the policies and strategy as underlined in the Provincial spatial plan. The plan includes:

- Local purposes in utilizing local space that are to increase the prosperity and the security at local level.
- The structure and pattern plans for the local space
- Norms and Guidelines for controlling any use of local space.

In addition to these three administrative based spatial plans, the government must also establish spatial plans based on the functions of region, which cover the urban and rural areas. These plans are the integrated part of the district spatial plan and include the detail of spatial structure and pattern plan.

6. Land Use Management

6.1 Land Use Planing

As stated in the Act No. 24 of year 1992 concerning Spatial Use Management, land, is an integral part of space. Therefore, spatial plan and land use plan are interrelated and can not be separated. Land use plan is a subsystem of spatial plan. In other words, land use planning is essentially a land space planning. The concept of land use planning as the subsystem of spatial planning are as follows:

- The principles of land use planning. These principles are:
 - Sustainability. Land, as the natural resources, should be utilized for the maximum prosperity of the people at present and future time.
 - Optimization. The use of land should be effective and efficient so as to achieve the maximum prosperity for the people.
 - Equal and harmony. Land use PLAN should be able to accommodate various development activities on the proper location based on their designation and function. By this way, conflict of interest can be avoided. Those three principles are interrelated. Therefore, any use of land should also consider legal aspect of land ownership and social functions of land. It should also provide enough care to less fortunate people.
- The objective. The objective for land use planning is directed:
 - To establish so-called the "four orders of land management", those are legal order, Administration order, Utilization order, and order of maintenance and preservation of land and environment.
 - To direct the designation of land use in accordance with spatial plan and to provide persons and legal body who owns lands with the right to utilize their lands.
 - To direct the supply of land for various development activities as designed in spatial plan. Based on these objectives, the plan directs the use of land for the government, religion, center of public activities, social, culture and other social welfare purposes; and for the development of agriculture, industry, transmigration, mining, tourism, including the use of land in the coastal region, small island, swamp and coast reclamation and emerging land.

6.2 Policy Formulation

As discussed previously, land use planning is essentially land space planning. To enable the government to provide the required space for the implementation of development activities, land use planning is deemed necessary. Viewed in this light land use planning can not be separated from development plan, or it can be said that land use planning is essentially the spatial dimension of development planning. Another point to be clearly understood is that land use planning is prepared in response of the presence of development plans. Therefore, a land use play can only be prepared if the development plan has been established. The third point is land use planning in the framework of spatial planning is one of the basis of land management. A sound land use and spatial plan will not only give maximum benefit in using land, but also provide foundation for the

environment protection and maintenance, so as to support a sustainable development. In relations to the three points mentioned above, a land use planning policy will include:

- The direction of the use of land in general, both in rural and urban. Based on the objectives, it directs the use of land for the government, religion, center of public activities, social, culture and other social welfare purposes; and for the development of agricultural, industry, transmigration, mining, and tourism.
- The direction of the use of air space that would affect and or limit the use of land below it; and the designation of the use of space below the land surface that would affect and or limit the use of land above it
- Land use guidelines based on land capability and its physical and economical functions, natural resources and environment conservation, and technological enhancement. These guidelines are necessary so as to supply land on the basis of its capability for a specific purposes, and at the same time, provide technical guidelines to maintain and conserve land.

6.3 The Preparation and Implementation

The preparation and implementation of land use plan embraces a wide dimension of activity. These activities include data compilation, development of GIS, land use planning program, and Guidance of land use and spatial planning. Besides, given to the fact that land use planning involves various parties, the implementation of it should be coordinated with related departments and institutions both at the national and the local level. Data compilation is directed to obtain information on:

- Land capability
- Generalized present land use
- Social-economics
- Other supporting data

Land capability and present land use data obtained from field survey along with other data such as soil, geology, climate, population, social and economy, are systematically organized, synthesized and analyzed. This information is the primary sources for decision making process for land use planning policy, including its implementation and control. These activities have been taken care for coordination purposes among sectorial development both at the national and local level. Generalized present land use is very much important as the primary source to predetermine existing conditions of the region. Likewise, land capability plays important roles so as the development activities to take place at the proper location based on its capacity. In this matter land capabilities should be analyzed not merely on the basis of physical characteristics of land, but also of its value (rent), which covers:

- ricardian rent
- locations rent
- environment rent
- socio economic rent
- political rent

The availability of information concerning land resources is a pre-requisite for comprehensive development planning as well as the planning for natural resources management of biosphere reserve.

Information on the potentials, levels of development, and available technology, are needed for the expansion of the nation's economic base. Improving the quality of the information supplied to planners, policy and decision-makers will improve the quality of planning and implementation of development oriented activities. The development of GIS includes the activities on: data standardization, establishment of criterion, setting up hard ware and soft ware, personnel training for data analysis. The establishment of land use planning program is carried out by the National Land Agency in coordination with other institutions based on the level of detail of the plan or policy.

In relation to the spatial plan arrangement, land use planning, as the process of setting-up plan for land use, provides guidelines of the suitability of land use plan to regional spatial plan.

6.4 Implementation of the Land Use Plan

The land use plan, which has been integrated into the spatial plan and is legalized by the government regulation (both at the national, provincial as well as district level), became a legal document. Every person or legal body who uses the land, the type and location of which must be in line with the plan.

To those already owned lands, must adjust its use with the plan. To those who have not yet in possession of the lands, must apply first of all a location permit for the purpose of their activities, such as industry, housing, agriculture, etc. Location permit is issued by the Head of the District Land Office on the basis of the Spatial Plan. With the location permit, the firm or person acquires land both by purchasing or other means. In principle location permit will not be issued in the area designated for conservation region. Having acquired lands, they make application for land rights. The type of land right depends on the type of the use and the status of right holder (firm, personal, citizen or foreign). The conditions which must be followed by the landholder in using land are also stated in the statement letter of granting rights, for example the user must carry out land conservation practices, keep the use in line with the spatial plan and avoid land use practices which produce pollution. If the user can not fulfill the conditions, their right on land can be reviewed which in the adverse situation their rights on land can be canceled and the lands are under controlled by the government.

6.5 Controlling on Land Use Practices

For the success of the implementation of land use plan controlling mechanism for land utilization has been formulated. The control of land utilization includes the activities of:

- Monitoring of land use and land tenure for the entire or part of national land and for any land parcel occupied by person or legal body.
- Evaluation on the suitability of particular land for a specific purpose of use. This evaluation is applied for any activities that modify the use of land. Upon approval this evaluation, land rights can be granted.
- Any change of land use that is not included in the process of granting land rights can be controlled through the mechanism of giving location permit for development. The permit is released on the basis of land use aspect consideration and must be in live with the spatial plan.

6.6 Land Consolidation

Land consolidation is the methods of rearrangement of land use and land ownership. With the rapid of development, land consolidation in Indonesia has become a very powerful instrument to implement land use plan.

In Indonesia, Land Consolidation is carried out in rural as well as in urban areas. Land Consolidation is a part of land policy of which the National Land Agency is responsible for. The implementation of Land Consolidation has a very significance role for the rearrangement of land use and land ownership to be in line with the spatial plan. Form and size of parcels are rearranged to be more regular and all parcels must have access to the road, so that the use of land will become more efficient. Besides, Land Consolidation also gives more opportunity to speed up land registration all over the country, where until now it only covered about 17 million parcels or 30 % of the total number of parcels in Indonesia.

Land use practices are usually not in accord with the plan or maybe planning is not available. That is why there should be a proper decision for replanning and rearrangement of the existing land use and land tenure which does not match its potential and the need for development.

During its implementation in Indonesia, Land Consolidation is executed both in urban and rural areas.

Indonesian experience shows that Land Consolidation has a great role to support urban development since its first implementation in Bali (1982).

The Budget for the implementation of Land Consolidation comes from various sources, such as Central Government, Local Government, and self-finance by the landowners or participants. Up to 1995, Land Consolidation has been practiced and amounted to an area of about 8,309 hectares comprising 132 project sites, 56,292 land parcels spread in 70 cities of 25 provinces.

To day rural land consolidation has been widely implemented to support small holder plantation in cooperation with the nucleus estate.

7. Conclusions

- A Sustainable land use management is a system of land use management which covers planning, implementing, and controlling the utilization of land to establish a sustainable development related to land for the maximum prosperity of the people at present and in the future time.
- Land is the integrated part of space. The components of space include: land, sea and air. Therefore spatial planning and land use planning are interrelated and can not be separated. Land use planning is essentially land space planning.
- Land use planning is the process in setting up a wise arrangement of land utilization as the response to the presence of development plans. In other words a land use plan is essentially the spatial dimension of development plan.
- The hierarchy of spatial plan is the national, provincial and district plan, where the lower category translates and elaborates that of the higher level. It is legally allowed to prepare district spatial plan in the absence of the provincial, and that is also do for provincial plan although the national level has not yet been established.
- Prerequisites for land use and spatial planning include data collecting and data processing that produce a land data base in the form of geographic information system. Land data base covers present land use, land capability, other land physical characteristics, social economical data, land tenure, climate and other land related data for the land management.
- The paradigm for land use and spatial planning embraces state ideology, constitution, agrarian law, environmental law, other land related laws and the guidelines of the national development. Besides, the planning must consider the prevailing globalization, which influence almost every aspect of human and nation life. The globalization has resulted a strategic environment which creates opportunities and constraints. The strategic environment must be seen from the scope of international, regional and national. It has been agreed upon among the member countries of WTO that world free trade will have been established in the year 2020.
- The implementation of land use plan is carried out through the issuance of location permit, the granting land rights and the building/construction approval. Whereas land use monitoring is undertaken on project basis or through systematic land use mapping by using remote sensing technique and computerization. The result of land use monitoring is input back to review the plan.
- Land consolidation is a land policy to rearrange the existing land use and land ownership to be in line with the spatial plan. The form and size of parcels of ownership are rearranged to be more regular and each parcel must have access to the road, with the objective to obtain an efficient land use practices. Land consolidation has been widely implemented in Indonesia both in rural and urban areas. Land consolidation is also used as the tools to acquire land by the government for public uses without removing landowners.
- Law and regulation concerning land consolidation need to be established to improve and strengthen the existing provisions. The institutions involved in the implementation of land consolidation need to be specified, which consist of government institutions and community institution.

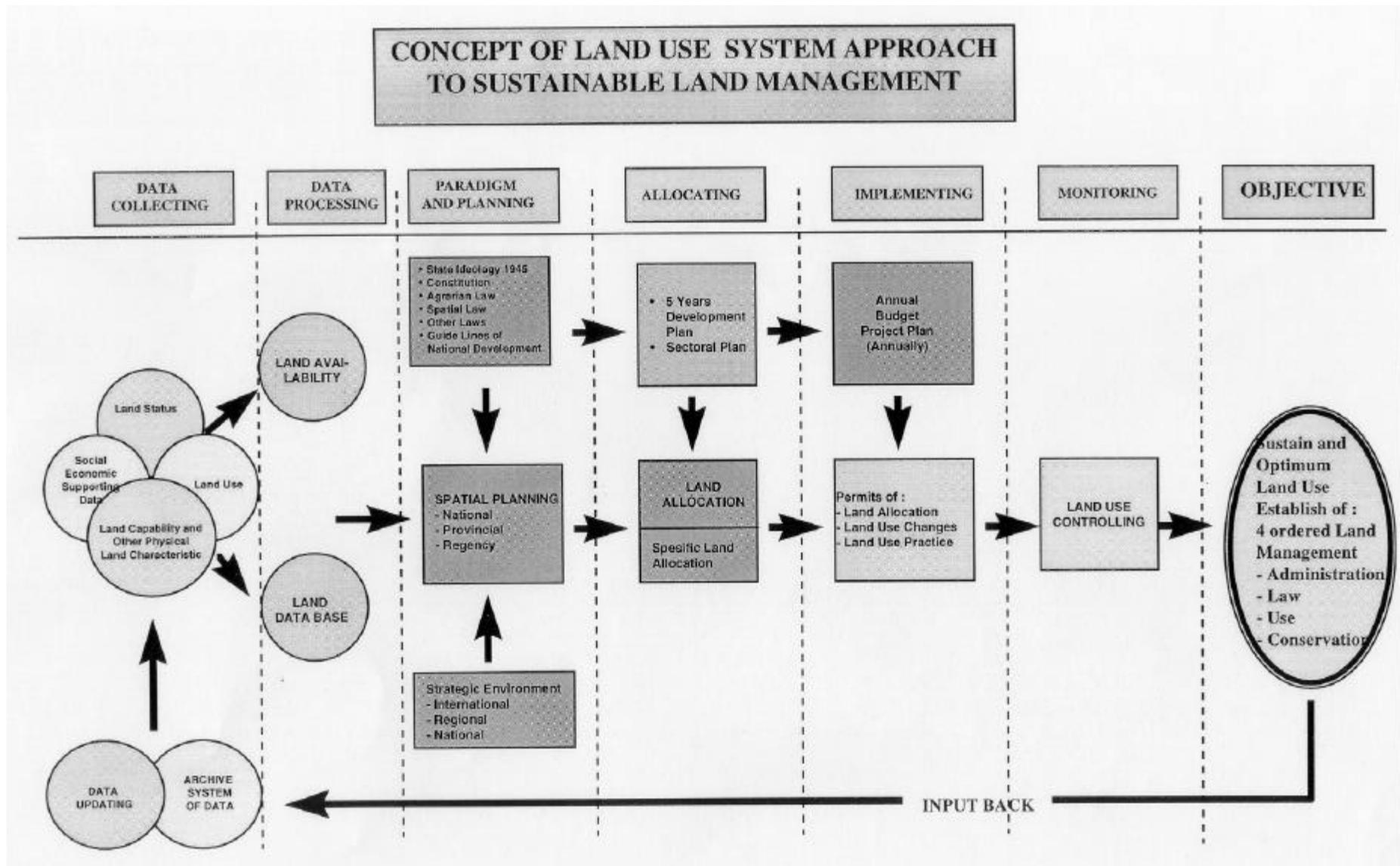


Figure 1. Land use system approach to sustainable land management.

