

POLICY ON HILL SLOPES DEVELOPMENT

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Policy on Hill Slopes Development

1. Vision

To maintain as well as to conserve important and sensitive hill areas in Sabah to support sustainable development of the State.

2. Policy Statement

To plan and implement prudently all development activities on hill slopes in order to minimise adverse impacts, and to conserve the physical, biological and cultural values of these areas as well as to maintain the natural landscapes.

3. Principles

Development on hill slopes shall be based on the following principles:

- Hills constitute an important part of the physical, biological and cultural landscapes of Sabah and as such, form an integral part of the State heritage.
- Hills are sensitive ecosystems and are prone to environmental hazards such as soil erosion and landslides occurring naturally or when the landform is disturbed.
- Development on hill slopes must be among others, must be guided by the natural environmental setting - let the site influence the plan.
- It is the responsibility of all sectors which include the public and private sector, business community, civil society, and the general public to conserve and protect the landscapes of hill areas of the State.

4. Objectives

- To incorporate environmental dimension into the planning of development activities on hilly areas;
- To regulate development activities on hill slopes in order to minimise unnecessary adverse impacts on the natural landscapes, surrounding areas and the environment;

- To strengthen networking and cooperation among all stakeholders in the management of development activities on hill slopes; and
- To enhance awareness among all stakeholders on the importance of proper planning and management of development on hill slopes.

5. Strategies and Action Plans

To achieve the policy objectives, effective management and control of development activities on hill slopes shall be guided by the following strategies and action plans:

Strategy (1): Strengthen the planning of development activities on all important hill areas

Action Plans:

- Review and revise existing land use planning schemes and local plans covering critical hill areas.
- Prepare new land use planning schemes and local plans for hill areas involving all relevant stakeholders with priority given to hills which have potential to be developed taking into account conservation issues vis-à-vis development needs.
- Ensure approved land use planning schemes and local plans are fully enforced and implemented.
- Apply a holistic planning approach to ensure that the necessary infrastructure and measures to minimise environmental degradation are put in place before construction activities are allowed to proceed.
- Take action to gazette hill areas which have been identified to be conserved.

Strategy (2): Strengthen the institutional framework for management and control of development on hill slopes.

Action Plans:

- Enforce strict compliance to existing manuals, guidelines and regulations governing development activities on hill slopes, including the submission of an integrated geological, geotechnical and hydrological report for any proposed hill slope development.
- Strengthen the existing Town and Country Planning Ordinance by making it mandatory for land developers to adhere to guidelines for development on hilly areas when planning and implementing development activities on hill slopes.

- Strengthen the Conservation of Environment (Prescribed Activities) Order and the guidelines for development on hill slopes to ensure that an environmental impact assessment is undertaken prior to project implementation.
- Establish inter-agency working group at district and state levels to co-ordinate the management of development activities on hill slopes and the enforcement of regulations.
- Require developers to put up a performance (good behaviour) bond to ensure that they comply with all the conditions stipulated in the approvals issued by the relevant approving authorities.

Strategy (3): Improve the knowledge database

Action Plans:

- Conduct studies on existing development activities on hill slopes to document the impacts on the environment, including impacts on slope stability, soil erosion and landscape.
- Identify catchment areas or hills with high ecological and landscape values where development activities are taking or had taken place, and take immediate action to conserve these areas.
- Determine the development capacities of hills which are currently being developed and take appropriate action to restrict or control new development activities.
- Promote local, national and international collaboration efforts in order to enhance management of development activities on hill slopes.

Strategy (4): Enhance awareness among all stakeholders on existing guidelines, procedures and regulations pertaining to development on hill slopes.

Action Plans:

- Conduct periodic seminars and road shows to inform relevant stakeholders on the procedures, requirements and regulations governing development activities on hill slopes.
- Prepare pamphlets or booklets on the procedures, requirements or regulations pertaining to the planning and submission of development plan proposals, and disseminate to the developers and the general public.
- Create awareness among land developers of their duties and responsibilities in minimising negative impacts downstream and on adjacent land users.

6. Rationale

Overview

The terrain of Sabah is generally hilly and mountainous. The western part of Sabah is dominated by the 50 km wide, 1,200 to 1,800 m high Crocker Range, which stretches from the Sarawak border in the southwestern corner to the Kinabalu massif at its northern end in Mount Kinabalu (4,093.37 m). Between the Crocker Range and the sea on the west coast is an extensive, heavily populated coastal plain with hills reaching down to the sea in many places.

East of the Crocker Range are several less prominent ranges. In the south central and part of east Sabah, the topography is dominated by a series of circular to sub-circular basins ranging from 16 to 50 km across and are defined by curved ridges, up to 1,800 m high, and valleys.

The Lokan Peneplain, 65 km wide and 180 to 300 m high occurs between Telupid and Sandakan. The southern part of the Sandakan Peninsula is hilly and terminates in a number of spectacular escarpments facing Sandakan harbour. The Semporna Peninsula is dominated by steep volcanic hills stretching parallel to the south coast. Inland from Tawau and Lahad Datu, the terrain is mountainous, with hills of more than 900 m high.

Five inter-montane plains are located along the west coast and interior.

Flat, non-swampy land available for development in Sabah is thus limited in extent compared to the hilly terrain, which constitutes most of Sabah. As pressures from population growth, economic activities and land use activities grow; it is inevitable that the hilly areas will be developed.

Development on hill slopes is becoming increasingly evident in urban centres and hilly areas with tourism potential such as Kundasang and Gunung Emas in Penampang. The types of structures erected on such slopes range from residential houses to commercial condominiums/apartments and chalets; other structures include temples, water storage reservoirs and telecommunication/transmission towers.

It is anticipated that development on hills will increase in the near future as pressures from population growth, economic activities and land use continue to increase.

Needs

Hills can have considerable development potential because of the views and attractive setting they provide. Historically, development on hills had been conceived on short-term benefits with the rights of the individual prevailing. However, there are rising community expectations concerning the maintenance of visual values, natural habitat and biodiversity around urban and growth centres. Hill slopes are prone to environmental hazards such as soil erosion and landslide as is evident from past incidences, resulting in loss of lives and property. Development in these areas can compound such hazards and render them highly visible and costly to deal with. There is, therefore, a need to better manage and control develop-

ment activities on hills to reduce environmental impacts and to reduce loss of lives and property.

Future management decisions on hill slopes development should also be based on the principle of sustainable development because of the unique values associated with hillslopes, which makes them a natural resource in their own right. In this context, sustainable development means that resources should be used in ways that do not jeopardise future use of the resource. Strategic planning, which recognises visual, conservation and recreational values, can provide clearer directions for future uses and management.

The Policy on hill slopes development will help to ensure that such management decisions are implemented on a statewide basis.

Legislation

The need for controlling development on hill slopes has been recognised for many years. It is reflected in a number of legislative controls administered by various government agencies, for example:

- The Central Town and Country Planning Board - for **approval to rezone** the land on which development will be carried out under Part I, Section 3 of the Town and Country Planning Ordinance 1950
- Environmental Conservation Department (ECD), Sabah – **EIA Approval** to carry out development activities on hills with slopes having gradient of 20 degrees or more from the Director of Environmental Conservation Department under the *Conservation of Environment (Prescribed Activities) Order 1999*. Construction of buildings for commercial purposes or buildings exceeding 4 storeys high for residential purposes on hills with slopes having gradient of 20 degrees or more, and construction of parks, resorts or other recreational facilities or major roads on hills with slopes having gradient of 20 degrees are Prescribed Activities require an EIA approval prior to project commencement.

Most of the approvals for hill slopes development are issued on a piecemeal basis and little attention has been given to the cumulative effects, which a number of existing or future operations may have on the hill environment as a whole.

Environmental Impacts

The major adverse environmental impacts of hill slopes development are:

(a) *Slope erosion*. Site clearing during earthworks result in the removal of vegetation and the creation of cleared surfaces, which become vulnerable to the erosive action of rain and surface runoff. Erosion on exposed slopes starts with rain splash leading to sheet, rill and gully erosion creating badlands if the site is left exposed for too long or abandoned altogether. Cuts and fills change the slope angle, often creating steeper slopes. The steeper the slope, the faster the surface runoff flows and the more force it will have to remove material downslope.

(b) Slope stability. Landforms are the product of the local balance between weathering, erosion and deposition and are continuously evolving. Natural slopes that have been stable for years may suddenly fail because of development activities on hills.

Changes to the terrain and hydrology through construction or earthworks may cause erosion, which create conditions conducive to mass movement if exposed surfaces are not protected within a short period. Exposed rocks will be weathered at a faster rate and the weathered material is susceptible to movement especially when saturated with water.

Over cutting the toe or over steepening of the slope gradient can induce instability. Slope cutting changes the slope topography and releases residual horizontal stresses and cause expansion of the slope. Joints or weak zones may be exposed along which sliding may occur. Placement of fill will also lead to increase in shear stresses acting on slopes and may lead to slope failure.

Drainage patterns of an existing terrain may be altered as a result of construction. The change in groundwater flow patterns may cause changes detrimental to the stability of the newly constructed slopes of the existing *in-situ* slopes that were stable prior to construction.

(c) Landscape impacts. The impact on landscape is the direct physical change to existing landscape features such as vegetation, topographical, geomorphological features and recreational facilities as well as buildings and structures. Visual impact is a change to the appearance of the landscape and the subsequent effect on the views of groups of people at particularly sensitive viewpoints. Visual impact can vary from overall improvement to degradation. Construction on hills will bring about a change in the landscape and will thus have a visual impact on landscape quality.

Other adverse environmental impacts of hill slopes development include:

- Loss of ecological habitat
- Objectable noise levels from construction and transportation activities
- Vibration associated with piling, vehicular movement and blasting
- Dust and atmospheric pollutants from machinery and transport vehicles
- Wastewater and solid waste disposal.