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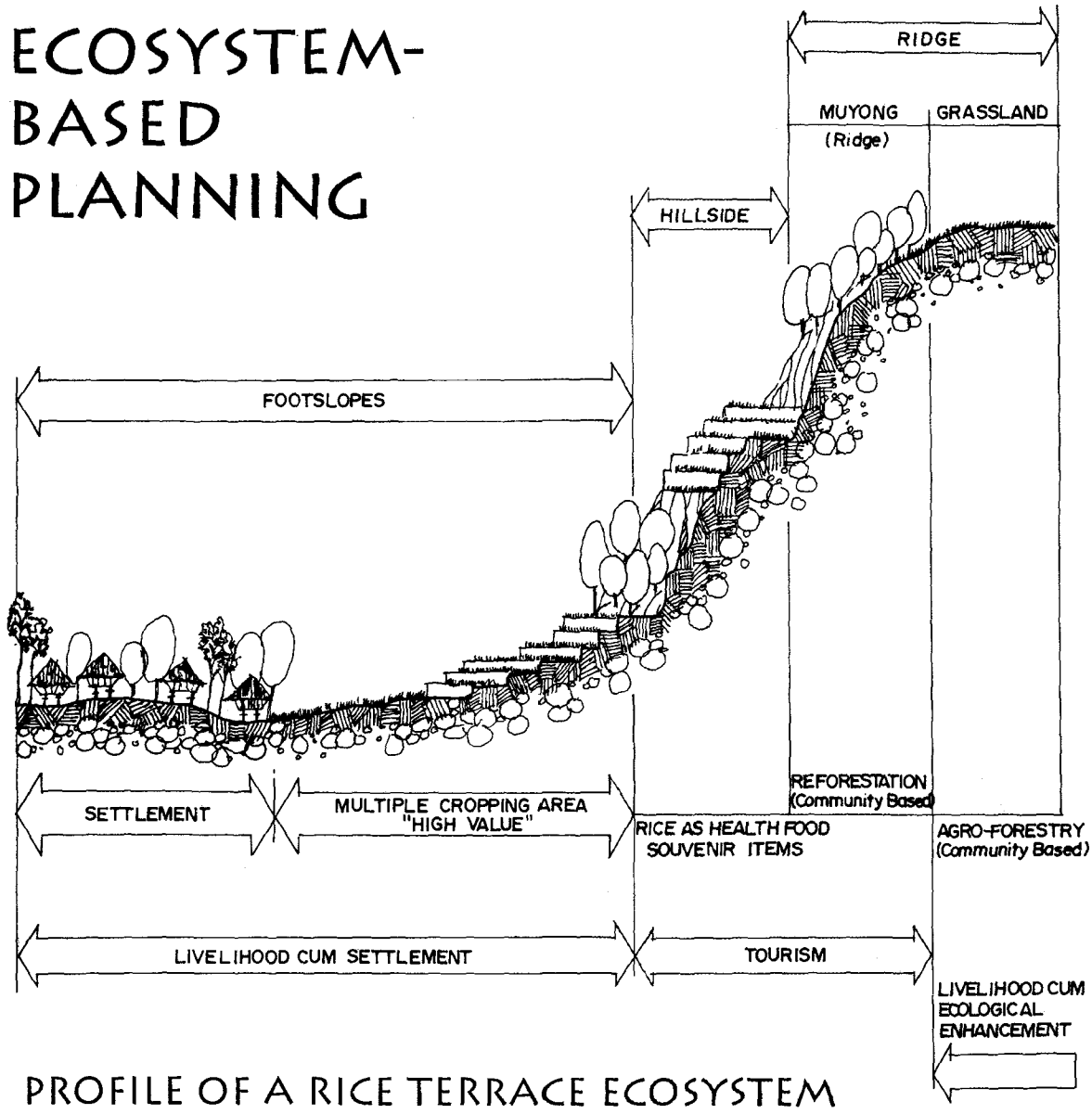
ECOSYSTEM-BASED PLANNING



PROFILE OF A RICE TERRACE ECOSYSTEM

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THE CULTURAL LANDSCAPE

The Ifugao terrain has been altered by human hands for several centuries in a manner that the lands may suffer if the people do not stay to till the land. Recognizing that the area's economy is closely linked with nature and culture, its sustainability for development must be analyzed holistically, synergistically rationalized, planned optimally, and implemented with the people's participation so that they benefit from the bounty of the place.

It is a daily occurrence that low clouds drift amid the mossy pine forests as temperature shifts are induced by cold winds. It is a regular phenomenon to experience drizzles in the forests, grasslands, and micro watersheds called *muyong*, chilling the tropical peaks with early morning mist. The droplets of water continue to irrigate the age-old rice terraces, and cascade down towards the Magat Reservoir to further feed life-giving liquids to the lowland fields of Nueva Viscaya and Isabela.

Table 1: Vital Statistics of Ifugao Municipalities

MUNICIPALITIES	INCOME CLASS (DoF E.O. 249, 1991)	1990 POPULATION (NSO, 1990)	BARANGAYS (NSO, 1990)	AREA (Ha)[1]	AREA (Ha)[2] (PPDO List)
1. Aguinaldo	6	19,830	15	49,121	15,117
2. Alfonso Lista	5	14,816	19	37,453	41,020
3. Banaue	5	16,943	17	28,335	32,640
4. Hingyon	6	8,373	11	9,608	12,414
5. Hungduan	6	7,254	8	16,275	26,030
6. Kiangan	5	12,190*	14*	14,534	21,222
7. Lagawe	5	12,437	17	19,413	43,210
8. Lamut	5	14,101	18	16,079	10,460
9. Mayoyao	5	23,942	25	23,923	38,971
10. Tinoc	6	8,256	12	21,472	18,350
11. Asipulo	6	9,139*	9*	15,565	22,108
		147,281	**165**	**251,778**	**281,542**

*ASIPULO POPULATION BASED ON BARANGAYS SEPARATED FROM KIANGAN
[1]The Soils and Water Management Bureau data were adopted for quantifying area.
[2]From the Provincial Planning and Development Office.

[+]This article was obtained from the proceedings of the National Symposium on Filipino Architecture and Design held on 7-9 December 1995 at the Science Teacher Training Center Auditorium, UP Diliman, QC. This article is published here with the permission of the UP College of Architecture and the author.

This is Ifugao Province, located on the southwestern bulge of the Cordillera Administrative Region. The 251,778-hectare tropical highland overlooks the provinces of Nueva Viscaya and Isabela to the east and is straddled by the highland provinces of Mountain Province to the north and Benguet to the southwest. The capital of the province is Lagawe. All of its towns, except for Lamut and Alfonso Lista, have awe-inspiring rice terraces. Ifugao Province is home to over 150,000 people residing amidst 2000-year old rice terraces, now administered by 11 local governments (Figure 1).

Ifugao is a clear example of a dynamic cultural heritage. It is a province of culturally managed steep terrain, scenic volcanic peaks up to 2,900 meters above sea level, and chains of rice terraces threatened by the vagaries of changing times.

Originally covered with woodlands, perpetually visited by tremors of the ground, the landscape has been carefully altered by human hands. Stone-by-stone, the rice terraces were built. Over the centuries the rice terraces in Ifugao have completely altered and stabilized steep sloped rice lands through localized practices which now awe the world with their uniqueness.

Because of the difficulty in striking a balance between nature and the growing reluctance to perpetuate rice planting in a difficult environment, the challenge is to find the most appropriate approach that allows for changes to the living cultural landscape.

An in-depth analysis of the functional elements of human development in Ifugao will bring out one of the finest examples of traditional culture before Western civilization diminished what is considered consistent with rice culture. It is through a systematic and comprehensive intervention of the functional elements of the biophysical aspects, the socio-cultural parameters, and development, that networks will in the long-run preserve the locality's wealth of biodiversity and community synergy.

SPACE FUNCTIONS AND THE RICE TERRACES

To the Ifugaos, boundaries are ambiguous. The self is perceived as part of, and not separate from, the surroundings. Tronqued (1985) says the Ifugao incorporates the "body-self" in such a way that boundaries expand to accommodate "what the Ifugao sees as convergence of space." This is well-expressed in the pyramid roofs of their houses and the rice terracing that converge skyward. She further explains that the Ifugao experiences the world in a more holistic manner. Because of this, they feel a very close affinity to the land and to each other. In terms of structure, the house goes beyond the four walls. The self expands to incorporate the environment. The environment is an extension of the house.

"Space to the Ifugao," she concludes when hewn in culture and symbol, becomes essentially holistic. The virtual souvenirs integrated into the physical forms of the buildings, the lack of rigidity in structure, as well as, the multi-use of space, all characterize the world they have defined symbolically as integrated into their own person and incorporated into awareness of and consequent learning from the immediate surround."

This is how the Ifugao values space and the environment. This is also how the rice terraces are valued. They are not treated in isolation, but are linked with the watershed, the forests, the kaingin farming systems, and the Ifugao's settlement pattern. For the outsider, these are the signs of skills and masterful understanding of the ecosystem. The uniqueness of the Ifugao culture, its artifacts and cultural symbols are attractions to the outsider, who barely realizes that each functional element is intertwined with nature and culture. Remove one functioning element and the system can collapse. Alter the functioning element that sustains the rice terraces, and the structure collapses. Remove the rice from the terraces, and the system of terracing will have to be changed. Alter life-

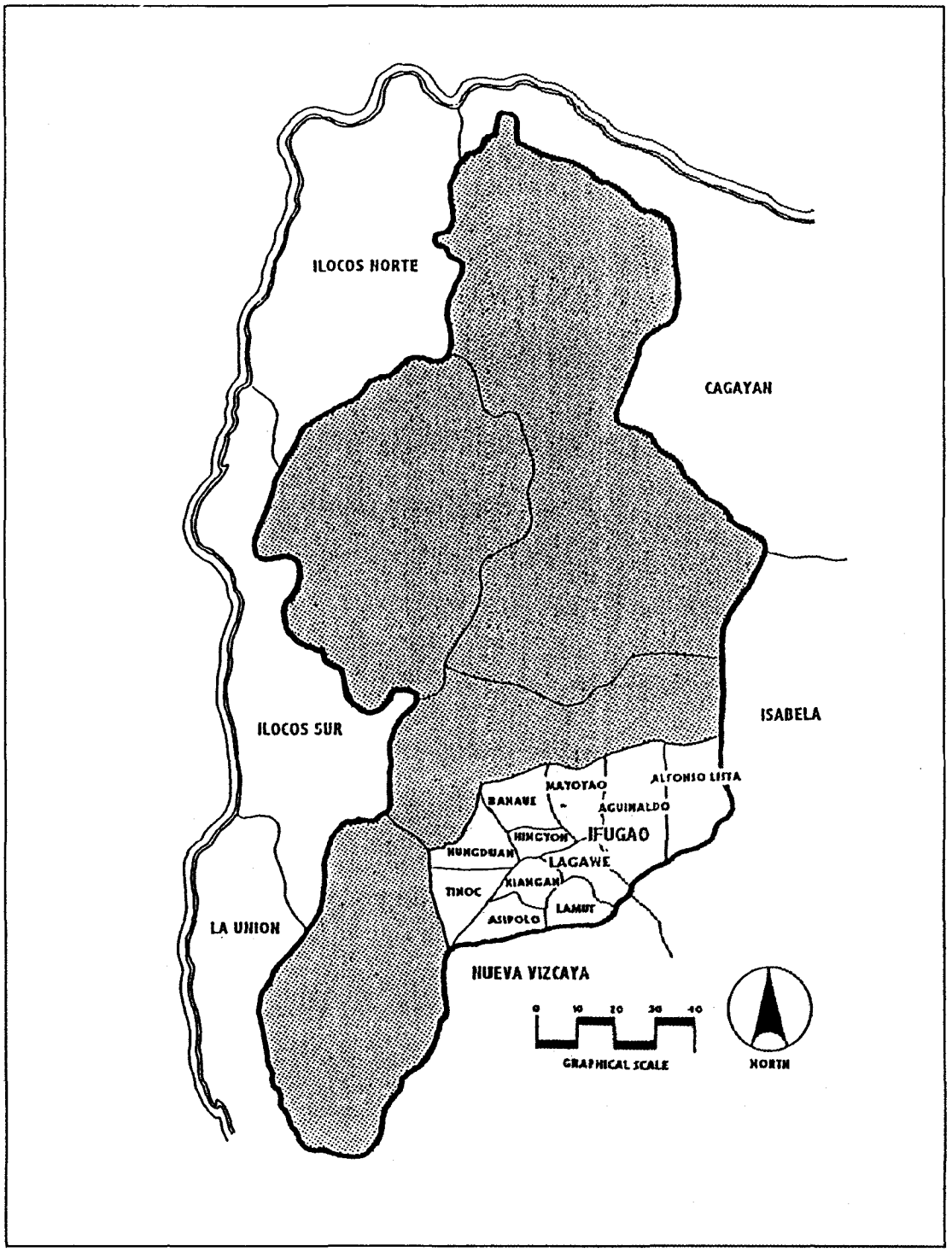

Figure 1

Map of the Cordillera Administrative Region

style and livelihood without integrating the rice terracing, and the Ifugao as a community can deteriorate fast. This is the essence of the Ifugao rice terraces. This is the rationale of rice terrace restoration. The sudden exposure to modernizing development and the rapid changes in Ifugao demographics can exacerbate the plight the rice terraces ecosystem is in now.

Banaue is a good case in point. It is in this area where very unique terracing is located. It is also here where growing pressures of tourism and rapid development can be viewed as manifestations of opportunities and threats to the sustenance of the Ifugao.

BASIC ELEMENTS OF A RICE TERRACE

Every terrace construction in Ifugao contains three basic elements: the terrace base, the embankments, and the soil body. The rice terraces are more accurately called ponds. A well-maintained pond field terrace consists of four visible parts:

- A flat inundated closure
- A low retaining dike on the outer edge
- Artificial or natural slopes surrounding the downhill side
- Slopes arising from the inner flooded area on the uphill side

The terrace base has three important characteristics: the slope gradient, the hardness of the underlying rock, and the roughness of the surface. The slope gradient is as small as possible to obtain a sufficiently deep soil body. The hardness of the rock determines to what extent it is technically possible to flatten the original slope.

The embankments are classified according to the material used to construct the walls, which can either be rock, earth or mud, and in a few cases, wood and mud.

Rock embankments are made either of volcanic boulders, jagged stones with sand and clay, or a combination of the two. There are two types of rock embankments depending on the construction method. Inclined walls are one or two stone layers thick. The biggest stones are used to construct the base of the wall. On top of these are similar stones with the gaps inserted with small wedge-shaped stones and the smallest holes filled up with clay. On top of the stone-clay wall, a small clay bund is normally constructed which is connected with the soil body of the terrace. The inclination of the walls is toward and leans against the soil body of the terrace.

The vertical walls lean against the soil of the terrace. They contain more stone layers, and the inside and outside slope gradients incline in opposite directions. In Ifugao, inclined walls are more frequently found than vertical walls (Figure 2).

The earth embankments are constructed by saving a portion of the weathered rock mass as a terrace wall during the excavation. The earth walls are always thicker than the inclined rock walls. The base usually exceeds to more than a meter and its characteristics are similar to those of the vertical rock wall.

The mud embankments are of two types: the non-rock and the non-earth embankments. The non-rock is constructed from real mud, which may consist of varying parts of clay, sand, and stones. The non-earth is constructed from igneous blocks or posts and mud. These embankments are normally less than 1.5 meters in height and base width of 2.0 meters. These serve as temporary repairs of damaged earth or rock walls.

The soil body of a terrace varies in thickness. The deeper layers of the soil body usually consist of a mixture of clay, sand, and stones. The deeper the soil layer, the coarser the material. The surface/upper layer contains sandy or loamy clay, and is fairly impermeable. The soil body consists principally of materials which have been conveyed from elsewhere by means of a mud stream in a ditch with rapidly running water.

TERRACING SYSTEM

Weathered rock and the abundance of groundwater in the Ifugao area favor terracing work. Excavations can be carried out fairly easily. The availability of irrigation water is an essential requirement in developing and maintaining terraces.

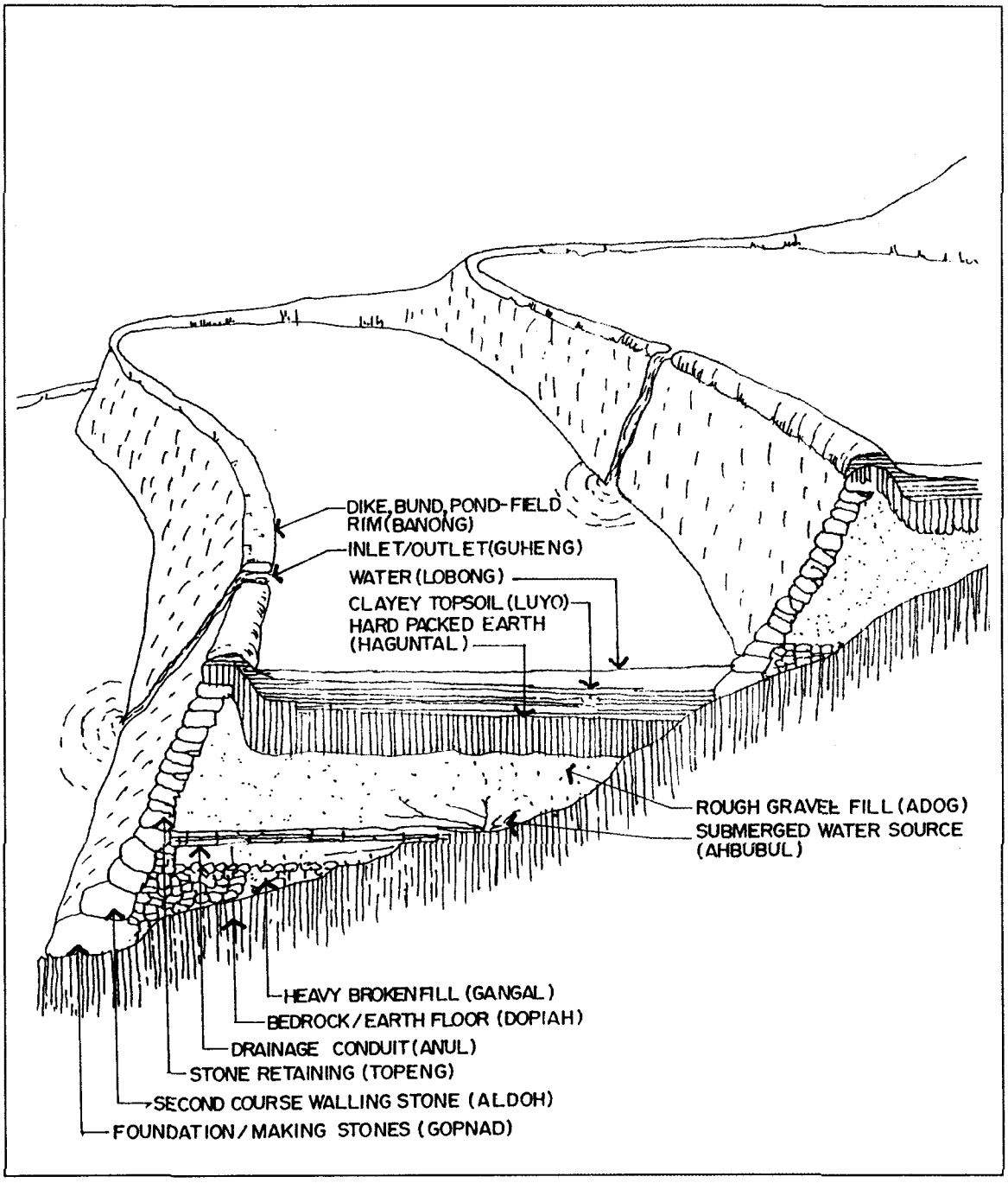

Figure 2

Typical Cross Section of a Rice Terrace, Concave Slope Type

(after H.C. Conklin)

Different types of topographic settings have given rise to the development of specific terracing systems. These are the V- or U-shaped valleys of the larger rivers, the V-shaped tributary valleys, and the slip-off slopes formed by in-grown meanders.

In the valleys of the bigger river, slopes are rather gentle permitting the construction of terraces. If the slope gradient is small enough, it is not necessary to construct walls along contours, resulting in straight, angular wall shapes and very wide pond fields. On steeper slopes at higher elevations, the terraces run parallel with the contours. The slope gradient in the V-shaped valleys range from 7 to 38 degrees.

In the tributary valleys, many of the smaller valleys have been dammed by terraces with rock embankments perpendicular to the direction of the former stream. In this direction, the slope is often not very steep (7 to 18 degrees), so that walls are built straight, and hectarage per terrace is quite substantial. In the slope of a tributary valley, gradients range from 31 to 45 degrees. The earth and rock embankments run parallel with the contours and the terraces are very narrow.

The slip-off slopes are characterized by steep slopes near the river, while the gradient decreases going up. Slope gradients range from 38 degrees on the lower parts to 3 degrees on the higher part. Above the river, the slopes are too steep to permit terracing. However, on the level parts, terraces are very large. Earth and/or rock embankments run along the usually strong curved contours. The crest of a ridge can be flattened for terrace construction as long as water can be conducted to this terrace from higher elevations.

The following types of terraces are found in the Ifugao region:

Type I – Earth wall terraces, excavated from a moderately earth to steep slope;

Type II – Terraces with rock walls to replace destroyed earth walls;

Type III – Terraces with original rock walls and, compared with Type II, less excavation is involved. It has a shallow soil body; and,

Type IV – Rock wall terraces with embankments on both sides and the gently sloping rock surface forms the terrace base.

The different types of terraces are distinguished primarily by the nature of the earth removal required, terrace shape and size, and topography in relation to available groundwater. For instance, Types I, II, and III all involve significant initial excavation, while Type IV involves no excavation.

The type of terrace to be constructed is determined by the following factors:

- Slope gradient of the original soil surface
- Material available for wall construction
- Hardness of the rock
- Available tools
- Technical or agricultural evaluation of terrace type by the Ifugao

Steep slopes necessitate the construction of Type I or Type III terraces. If the rock surface is very hard and if construction materials for the wall are available nearby, Type III is preferred. Otherwise, if the underlying rocks are strongly weathered, permitting easy excavation, Type I is preferred. Type IV terraces are exclusively limited to gently sloping areas and valley bottoms.

TERRACE CONSTRUCTION

A particular irrigation and drainage system and the corresponding terraces make up a unit. The technical implements used in the construction work are primitive crowbars, hammers, and spades. Sometimes, very big boulders are split by heating part of them with fire.

Rock Wall Terraces

The construction of rock wall terraces starts with the digging of a small ditch in a spot above the construction site. Then a meander-shaped extension of the ditch is dug in the soil. The ditch is then connected with an irrigation canal. The water running through the meandering ditch causes rapid erosion at the bends. At the site where the terrace wall is to be erected, the underlying rock is flattened

carefully. When an inclined rock wall is built, the area of the terrace behind the wall has to be filled with a soil layer each time the wall has been built up one or two stone layers higher. A vertical wall can be completed before conveying soil to the terrace area. The required volume of soil dug out on the mountain slope above the terrace is conveyed into the site through a ditch with running water. The coarse textured materials are transferred first and after the terrace basin has been filled to a sufficient depth, the clay part follows. The soil body of the terraces thus consists of a clay surface layer and sandy subsoil.

Earth Wall Terraces

In the construction of earth wall terraces, the base and wall are excavated in the disintegrated rock by means of water, spades, and crowbars. The waste materials are removed through a slit cut in the wall. After the work on the wall and the terrace has been completed, the slit is filled with stones and clay, and soil material is conveyed to the terrace basin to form the soil body in the same way as with rock terraces.

Terrace Maintenance and Repair

Damage to terrace is generally caused by caving in or landslides. A landslide may occur if leakage is such that a slip plane develops. When the slip plane coincides with the terrace base, the whole terrace may come down. Slip surface develops inside the soil body, thus only part of the terrace will slip down. The danger of slides is always high immediately after heavy rainfall, especially in dry terraces. In sandy soils, leakage is considerable, hence slides may easily occur. The presence of earthworms may aggravate leakage and thereby increase the danger of landslides.

A damaged earth embankment is repaired by using volcanic or sandstone boulders brought to the site, or by using fragments of the original wall and/or unconsolidated soil material.

A damaged rock wall is rebuilt with the original stones. The restoration is carried out in the same way as the construction of rock walls. When the damaged terrace and the adjacent lower terrace are the property of the same person, the collapsed parts are joined with the lower terrace. This requires new stones and other construction materials. Many subsequent restoration of this type results in the enlargement of one terrace at the expense of higher terrace level. This process has the advantage of decreasing the total occupied area and increasing the size of the fields.

Another way of restoring damaged rock walls is the construction of a small terrace to replace the collapsed part of the damaged terrace, thus dividing it into two smaller fields. This type of repair is often temporary because it results in a decrease in arable area.

Terrace Irrigation System

Irrigation water is often drawn from springs. A complete irrigation system in the rice terraces is composed of the following elements:

Collecting Canal

This type of canal is constructed to catch the water which runs off and drains from the mountain slopes above the terraced area and conducts it to the corresponding irrigation canal. Collecting canals always run along contours.

Irrigation and/or Drainage Canal

This type of canal directs the water to the trenches or directly to the terraces, and drains excess water. In areas above the terraces, natural water courses (brooks or small rivers) can be used as irrigation canals. In the downstream area, where the drop is small, the original watercourses can be used for drainage purposes. In terraced areas, provisions have to be made for the water to come down in steps.

Trenches

These direct the water from an irrigation canal to the highest point of a terraced area and run along contours. Trenches are used exclusively to direct irrigation water. They are normally found on the slopes just above the terraced areas. In a few cases, a trench is found to cross a series of terraces. Trenches generally have smaller diameters than collecting canals, but length may be the same.

Various Structures

There are other types of structures that are part of the irrigation system such as:

- waterfalls and cascades,
- water distributing constructions,
- tubes,
- inlets and outlets, and
- internal drainage.

Water is kept in the rice fields during fallow periods. The main reasons for keeping the fields submerged are:

1. To prevent the soil from drying. Heavy rainfall on dry terraces cause landslides which can seriously damage the terraces.
2. To preserve the population of small fish and other edible animals in the pond fields.
3. To facilitate weed control.
4. To let rice grains, which fall onto the mud during harvesting, germinate and develop into mature plants with the aim of harvesting their panicles as a kind of "second crop".
5. To facilitate soil preparation by keeping it wet.

GENERAL ISSUES AND PROBLEMS

Farmers, have been leaving their fields because of modernization coupled with the lure of the urban economy. This is exacerbated by the perceived limited economic prospects of their present state. This is beginning to cause a dysfunction in the ecology of the forest, the *kaingin*, the *muyong*, the rice terraces, as well as the settlement pattern which were for years developed around land risks. These conditions, if not reversed, will in turn pose serious threats to tropical forest ecology and biodiversity.

By making use of the socio-cultural opportunities and by enhancing the local initiatives of the inhabitants of the province as the traditional ecological caretakers, the protection of both the natural and built environments can be sustained. If the true worth of the rice terraces is valued with the local culture that perpetuated the dynamics of productivity, the physical setting will continue to exist, safeguarded by the desire to marvel at the people's will to live with nature.

In order to bring about a minimum of disturbance to the way of life as well as the landscape of the Ifugaos, a hierarchy of accessibility will have to be adopted. Tourists, sightseers, and nature lovers must be made aware of the critical balance the Ifugaos have struck with nature. As a retired teacher in Mayoyao in a meeting last 4 August 1994 said:

> *Tourists must stay on their trekking paths. We take pride in what we have built. We are proud of what we have in Mayoyao. But we need responsible tourism to maintain our usual life. We need economic well-being and extra money to run our community and the rice terraces properly. We do not want to go back to our G-strings just to perform for others.*

It is in recognizing these clashes of culture and nature that a carefully crafted physical and land use planning approach is being used for the study (*Figure 3*).

PHYSICAL AND LAND USE PLANNING

Physical and land use planning can be defined by way of the following objectives:

1. Provision of accessibility.
2. Employment of resources as economically as possible.
3. Separation of incompatible land uses.
4. Carrying out of all development in as visually pleasant a manner as is practicable.
5. Setting up of thresholds to optimize practical usage of land.

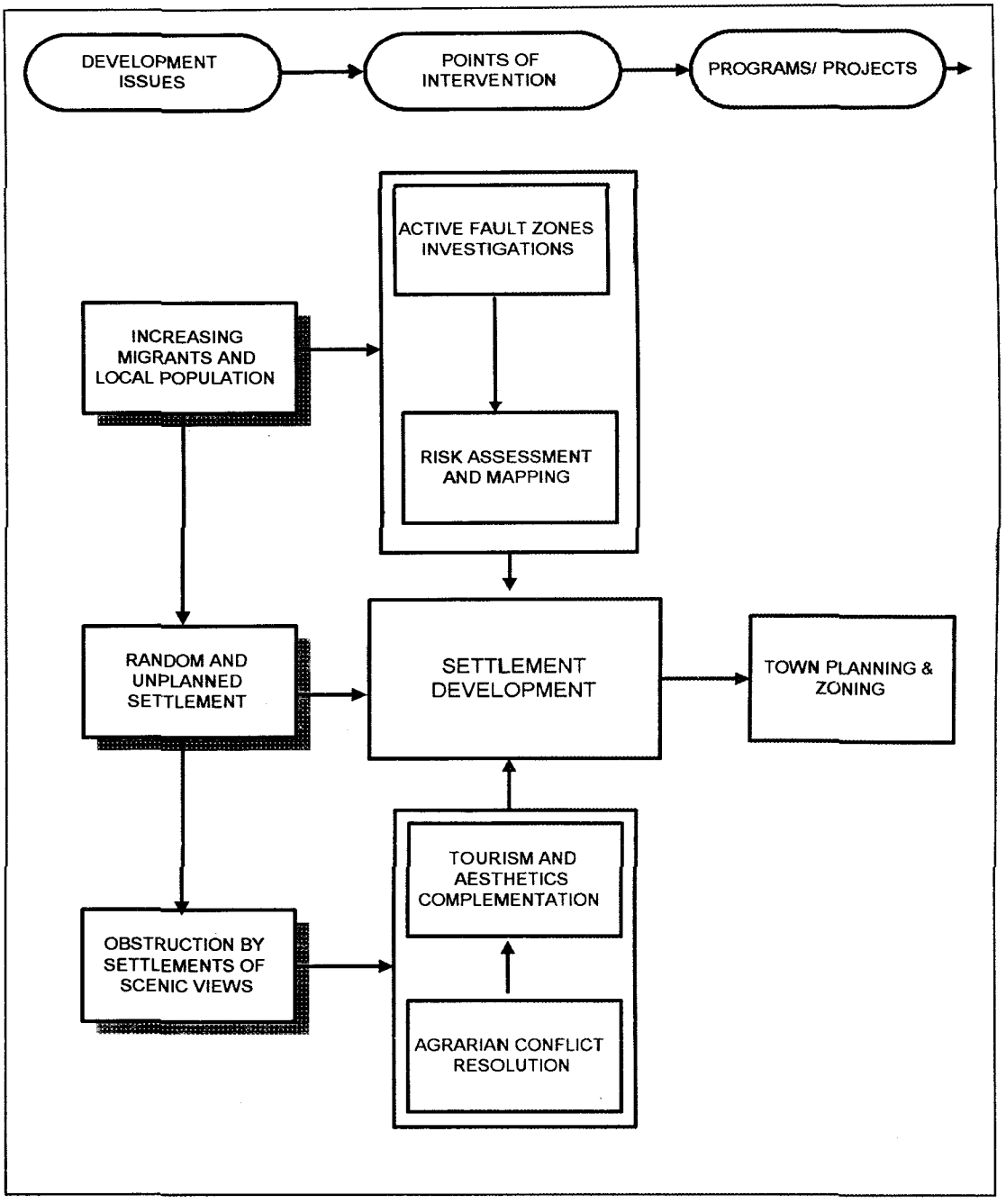

Figure 3

Development Intervention Analysis Matrix
(Settlement Development)

The scope of physical and land use planning will necessarily include the social aspects which have the objective of making people's lives happier. To encourage the compact development and the efficient assignment of transport and communication systems, the economic aspects of planning must be considered as well. In the analysis of these various conditions one will have to consider the ultimate beneficiaries of the plan, and how they themselves will make plan implementation a success. The administrative aspects, which help effectuate efficient management and upkeep of resources, will enter the process particularly during the plan implementation stage.

ECOLOGICAL PLANNING PROCESS

By applying the ecological planning approach, composite maps of both physiographic and ecological expressions are developed. These in turn are used to generate a social values map.

1. The first step in the ecological planning process is to establish dominance of the natural areas ranked in the order of value and neutrality to human use. These natural features are:

   - Steep slopes
   - Flood plains
   - Forest lands and woodlands
   - Flatlands
   - Aquifer recharge areas
   - Surface water
   - Aquifers
   - Cogonal areas
   - Wetlands

2. Then, the ecological factors that are to be considered for social valuation of the natural processes are mapped:

   - Climate
   - Pedology
   - Geology
   - Vegetation
   - Physiography
   - Wildlife
   - Hydrology
   - Land use

3. *Finally a set of valuation overlays* are super-imposed to establish a synthesis of natural and social processes:

   - Slopes
   - Soil foundation
   - Soil drainage
   - Land values
   - Residential values
   - Institutional values
   - Historic values
   - Bedrock foundation
   - Water logging
   - Water values
   - Areas susceptible to erosion
   - Recreation values
   - Agricultural values
   - Forest values
   - Surface drainage
   - Scenic values
   - Wildlife values

4. From these valuations, an ecologically conscious land use classification can be derived. Some categories are:

   - Valley floors
   - Barangay center location
   - Forested valleys
   - Unforested valley walls
   - Livelihood processing areas
   - Sitio location
   - Promontories for landmark building locations
   - Water areas
   - Promontories for natural vantage
   - Unforested plateau
   - Institutional zones
   - Poblacion location and its greenbelt
   - Others

CAPACITIES AND THRESHOLDS: STANDARD SETTING

Considering the need for a well-balanced development of the Ifugao region, an over-concentration or overuse of the assets of the province can cause a disaster which the community and its culture will find difficult to recover from. A means of establishing thresholds for development is thus called for. By evolving a carrying capacity guideline for land occupancy, the following steps will help achieve the desired balance in using nature as a feature of design:

1. A land capacity analysis to delineate varying environmental zones.

2. Depending on their sensitivity to develop, different levels of density ceilings and performance standards are evolved to allocate growth.

3. Population thresholds are given for each barangay with the suggestion that these are staged in five-year increments.

4. Decide on what is the lowest capacity of population, given the type of technology that is affordable to the locality. Population thresholds are derived from a number of indicators such as assimilative capacity of the natural environment and capacity to allow for the safe evaluation of hazardous sites in the event of a disaster.

5. The Sanggunian will then enact performance standards out of recommended guidelines by translating these into enforceable regulations or ordinances.

6. A development permit process is put in place and improved further by issuing updated standards. A permit is granted to a site application only if the applicant has demonstrated that the development has complied with conditions to mitigate impacts on geologic features, hydrology, and ground cover.

DEVELOPMENT MODALITIES

Through the principle of mutual accommodations, the spatial restructuring of the towns of Ifugao must give emphasis on these objectives:

- Pride of place
- Enhancement of local tourism to give pride to the Filipino
- Balancing of development by designing with nature

The ultimate objective is to jump-start the implementation of plans for the rice terraces of Ifugao Province. Figures 4 and 5 succinctly express the modalities for spatial structuring. These modalities also reflect the recommended geographic intrusion of development upon the agricultural and natural resources of Ifugao.

Poblacion Renewal

The town center or poblacion is where a visitor gets an indelible impression on the state of the municipality. The poblacions shall be subject to a renewal study coupled with a private sector-led redevelopment and beautification program. The aim is to make the poblacion the centerpiece of community activities that have external links. The image of a revitalized poblacion, is physically identifiable in its relation with the natural environment and for its unified built environment ambiance. By evolving a unified landscaping scheme, like the propagation of flowering species that are unique to the area, the town's image gets to be known for such a landscape. Other towns can develop their own image by emphasizing their geologic features, waterways, crafts, and other unique cultural or natural assets. Nevertheless, all must project the rice terraces as a proprietary asset including their special value to humankind.

Of special interest in the poblacion renewal scheme are the siting of the town hall as well as the accompanying need to landscape its surroundings. A small general library and information bank close to the town hall, and a prominent postal office will unify the accessibility image of the town to the public. Better still, a specialized museum will be a counter-point to the building ensemble's drawing power. The whole complex will normally expand to include a public market which in itself will become a people's center. With an adequate open space system and eating places on balconies or view platforms, visitors will be lured to stay longer.

A transport interchange will offer a convenient congregation area for first-time visitors to the place. Along with utility services support, good telecommunication and information facilities, as well as an efficient bank, make a complete link to the outside world. Places of worship either act as accents to the poblacion or as key landmark structures to the town.

The type, intensity, and massing as these relate to the site will greatly depend on the functional modality of the town: a protected town (full protection from encroachments), buffer town (modifiable), or as a town subject to dynamic changes.

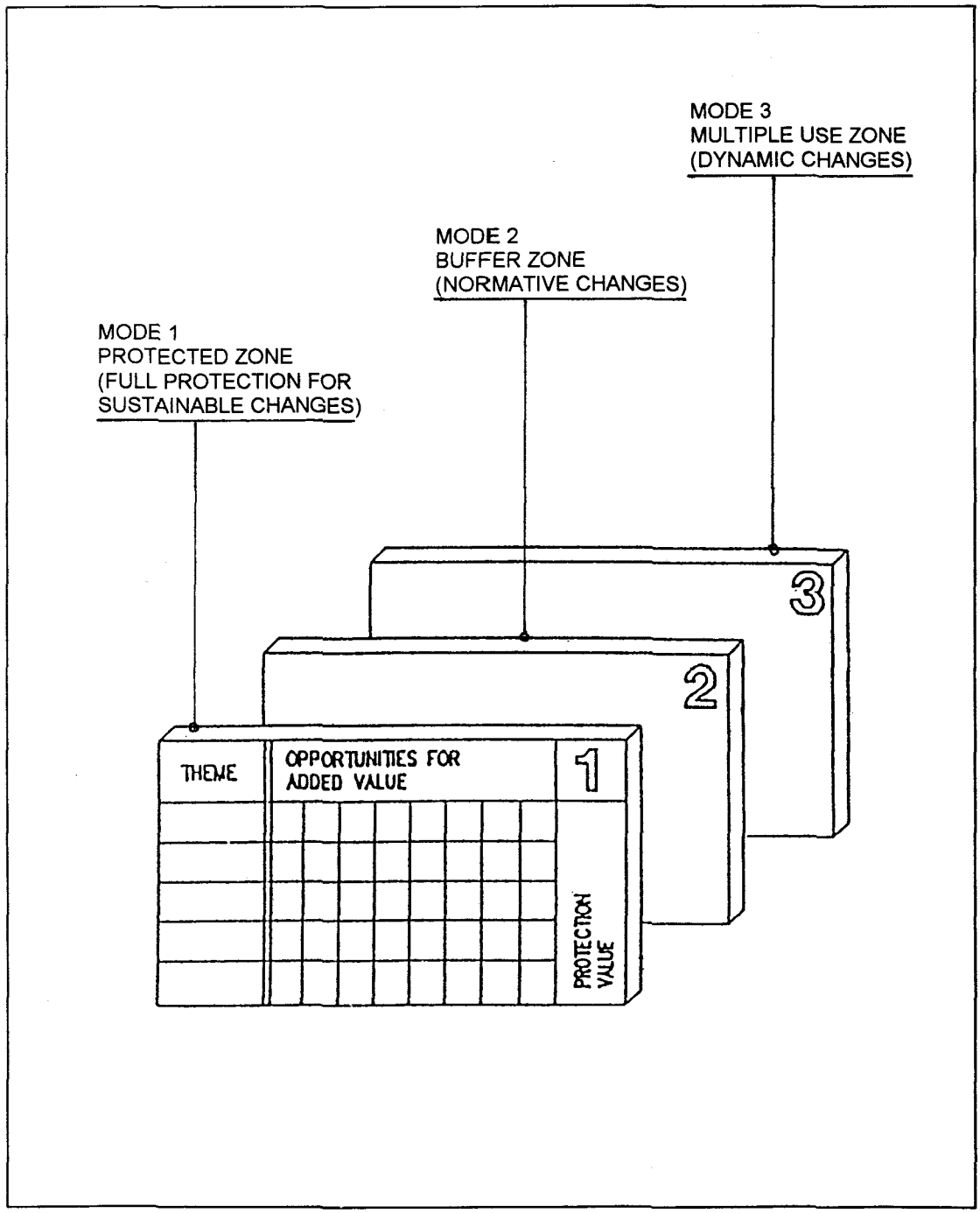

Figure 4
Modalities for the Province of Ifugao

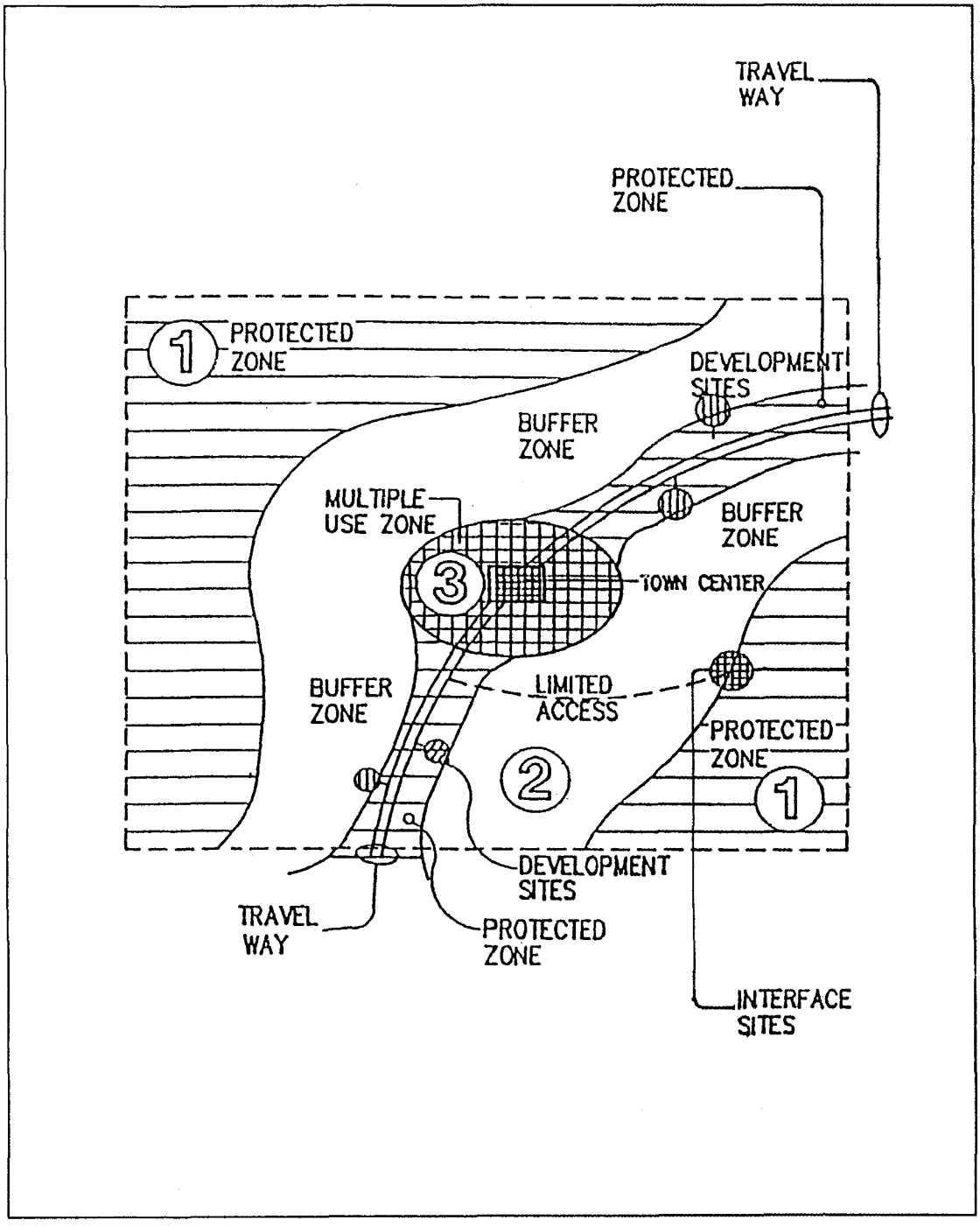

Figure 5
Sub-Modalities for the Municipalities of Ifugao Province

Development Functions

The array of development functions each town in Ifugao shall perform, given their respective modalities, are shown below:

Lagawe	▪ Urban growth center ▪ Business and convention facilities ▪ Processing areas for nature tours
Lamut	▪ Agro-industrial service center ▪ Agro-machinery and post-harvest servicing center
Banaue	▪ Jump-off point for eco-tourism ▪ Crafts and cultural facilities for mass tourism
Hingyon	▪ Spillover area for Lagawe and Banaue ▪ Buffer for urban overspill from Lagawe ▪ Crafts center
Hungduan	▪ Nature trekking; ▪ Service center for eco-tourism area ▪ Geologic/Scientific tours
Kiangan	▪ Historic and cultural tours ▪ Agricultural support for hinterlands ▪ Possible educational center for southwest Ifugao ▪ Post harvest facilities for hinterlands
Mayoyao	▪ Mainly eco-tourism site with emphasis on rice terraces
Aguinaldo	▪ Trade and agribusiness center of east Ifugao ▪ Emergent agro-industrial center with post harvest facilities including ice-plants for fish industry
Asipulo, Tinloc and Alfonso Lista	▪ Agri-based with poblacion to be developed for urban functions ▪ Farm to poblacion linkages necessary ▪ Post-harvest facility system to be given emphasis ▪ Strengthen communication and security of the place

Barangay Center as People's Center

With the growing influence of the barangay leaders, there is a need to provide the barangay with a physical setting for the officials to perform political leadership functions. Being agents of change, they can perform cultural functions which traditionally the *mumbaki* performed. With land as an important commodity in Ifugao, a territorial presence for the barangay is a significant feature to consider. Each barangay must have a traditional village cluster for visitors. A productivity center with a very specific enterprise may also include an area for mixed uses (trade, visitors accommodation, information center, communication facilities, etc.). The concept of the sitio settlement can very well be replicated in laying out the modern version of this socio-economic cluster. It is very much recommended that each barangay center specializes in a particular enterprise or activity such as crafts, food processing or arts, so that visitors to the place will be forced to move about and visit several barangays. One essential element in this development strategy is correctness of location, the choice of the enterprise, and timeliness of information for the locals. On the side of the paying visitors, aside from scenic views of the terraces and the mountains, they would like to look for cultural/educational value, new experiences, authenticity, safety of abode and communication links, as well as cleanliness and sanitation of surroundings.

STRIP DEVELOPMENT

Typical of the Philippines is the sprouting of development along major roads. The frontal access being offered to structures along the strip is one advantage that is sought after. But clearly, there are several disadvantages associated with a strip development directly along a major road. In Ifugao, one clear disadvantage strip development presents is the diminished visual impact of the terraces. The unregulated construction of residences and micro-enterprises along vantage points has obstructed views. The situation is further worsened by the fact that the architectural designs of these obstructions resemble shanties, in effect polluting the visual environment (Table 2).

Table 2
Issues and Concerns Regarding Strip Development and Recommended Measures

ISSUES/CONCERNS	PAST/EXISTING MEASURES	RECOMMENDED/ ADDITIONAL MEASURES
• Unregulated development of residences and micro-enterprises along vantage points has diminished the visual impact of the rice terraces	• Very liberal permission given to entrepreneurs and occupants, specially if landowners of the property	• Establishment of control areas • Allow for tree planting sites to provide color and shade
• Architectural design of these structures are not coordinated nor suitable to the landscape, resulting in noise/visual pollution		• Formulation of architectural design standards these structures must conform with
• Stilts used by these structures are eyesores as well		• Cover stilts with clinging vines
• Lack of solid waste disposal system for these establishments degrades environmental condition of surrounding area	• Dumping	• Establishment of a solid waste disposal system with an operational schedule to be announced to all establishments within the controlled zone

CONTROLLED ZONE

In order to rid vantage points of these obstructive eyesores and at the same time provide for livelihood opportunities to local residents geared towards tourism, controlled zones along road sections with high scenic value shall be established. These controlled zones shall encompass an area covering about 75 meters wide, if terrain permits, on each side of the road, and a length that would vary according to the location of the scenic spot.

Within the declared controlled zone, structures would have to be designed to conform to the architectural standards set for the area. This would include restrictions on dimensions, materials, provisions of view deck, etc.

SOLID WASTE MANAGEMENT

A close scrutiny of the banks of waterways along human settlement sites in Ifugao will show that solid wastes of all sorts are dumped here. This is an indication of the alarming need for a waste management awareness program in order to spread the value of proper solid waste disposal. Even a recycling program for each town of Ifugao, down to the barangay level, has positive prospects. Initiating a zero-waste management scheme can be pilot-tested as a demonstration project in the more populous barangays of each town. This will determine whether the farmers' practices of composting rice stalks after the harvest can be brought closer to their community in order to mitigate the dumping of raw refuse.

IMAGE BUILDING AND TOURISM CONTROL

It is an oft-repeated message, though not expressly stated, that local culture, its social organization, and its technology are "primitive," thus aggravating its problems without increasing its strengths.

Natives have been popularly depicted by the dominant urban class as the destroyers of the world environment. They are seen to be responsible for denudation, slash and burn farming or *kaingin,* and erosion that endanger the natural ecosystem. They are continually blamed for the ecological disturbances caused by over-population in a fragile environment, causing competition for forested lands and even hastening the depletion of resources of the local economy.

The natives are not viewed as the cultivators of fragile lands who mold their social behavior to the natural laws of the environment. Very few see the achievements of the natives. This traditional knowledge could hold the key to sustainable development. This situation is very true in Ifugao. The measures and standards, coupled with their local norms and conduct by which the peoples of Ifugao are gauged, are not those that can bring out the strengths and rationale of their centuries-old practices.

The views of Maria Luisa Doronila, the UNESCO International Award winner for Literacy Research, have relevance to this cultural dichotomy:

> *In communal, largely oral, communities, to be 'literate' was to know the lore of the tribe to meaningfully participate in the rhythm of its life. Teaching them to read and write was largely irrelevant. Similarly in communities where development had began, people taught themselves to be literate.*
>
> *We must act in the middle where non-literacy is a source of shame, synonymous with poverty, marginalization and inability to participate in community life. This is what we must combat so that each may gain dignity.*

It is but proper therefore when the number become so great at the expense of a proper appreciation of the cultural heritage or cause physical damage to the sites, a tourism control plan must be considered in order to elicit the most appropriate protection program (Figure 6). A tourism control plan must be considered to maintain proper appreciation of the cultural heritage and prevent physical damage to the sites.

Anticipated issues in tourism control cover the following:

1. Peak loadings which can be reduced by suitable scheduling of sites and visits.
2. Wear and tear of surfaces and sites.
3. Pollution by tourists (garbage, smoke, noise) and motor vehicle exhaust.
4. Vibrations made by cars as well as tourists.
5. Vandalism and graffiti.
6. Illicit traffic of movable cultural properties which can be mitigated by regulations made known to visitors.
7. Illicit drugs, crimes to persons and property and even prostitution which can be properly handled by surveillance.

GENERAL RECOMMENDATIONS

1. The dynamics of a free market economy must be counter-balanced with environmental ethics, responsible tourism, political will to regulate and execute, and the socio-cultural dynamics of the people. Put back the village, the rural folks in the mainstream of deciding what they should do about their lives. Organize the manner of their participative empowerment.

2. The burning duties that the community must perform so that visitors can respect and value the Ifugao's coping with life and the environment are:
   - pride of place,
   - pride of culture and its positive teachings,
   - pride of the past,

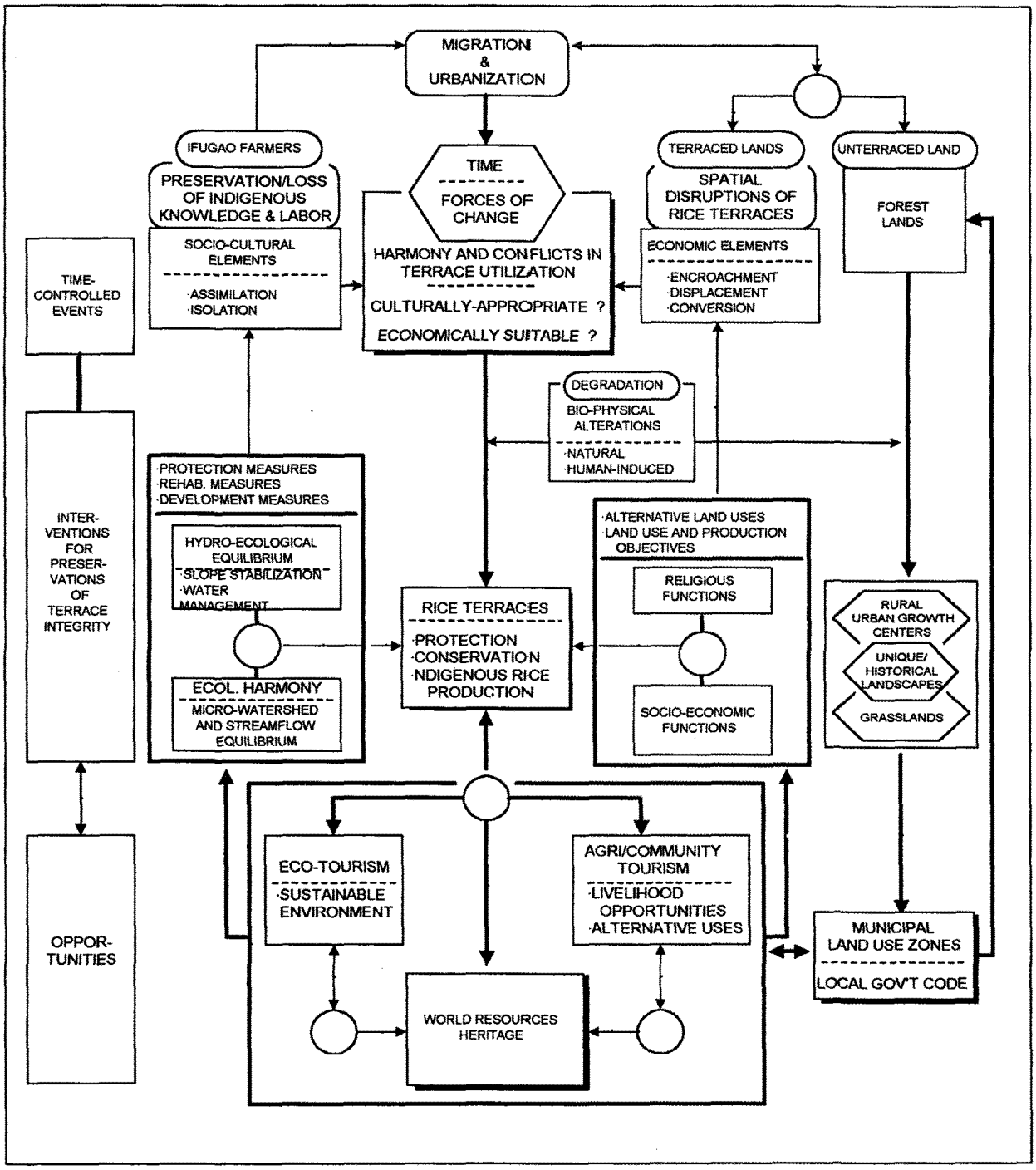

Figure 6
Development Framework
Restoration and Preservation of Ifugao Rice Terraces

- proper use of the water, and
- cleaning and greening of the surroundings.

3. There is still the opportunity to put up a Native Design Center to further develop the handcrafted products of the Ifugaos. The commercial prospect of handicrafts will require better quality products, better labeling, and packaging without losing their authenticity. A categorized certification scheme by the town officials as to the amount of handcrafting will be necessary to preserve value.

4. Still unexplored are the varieties of genetic resources available in the tropical cloud forests of Ifugao. By enlarging the unsullied nature areas, the natural gene banks can be sustained.

5. Avoid the economy-first strategy. Do not put the area's development policy mainly in the hands of fiscal regulations. Balance this with a hierarchy of accessibility measures on physical and cultural aspects.

6. Minimize the impact of artificial borders particularly if geographically indicated. Use natural indicators in developing areas to be protected together with the infrastructure that ought to serve the locality.

7. Avoid the setting up of numerous training programs, which will only whet local initiative without follow-up through supports. Build upon the continuity of positive norms and standards that strengthen local practices, initiatives and culture.

8. Do not alienate the Ifugao from their locality. Develop concepts as frameworks that can heighten their modernizing lifestyle and yet provide lessons for outsiders to learn their inherent culture.

EPILOGUE

"Hey! Terrace Trekker, there is no road. You must create your own map. You must look for signs in nature so that you do not lose your way. Get the proper orientation. Listen to your modern mumbaki, for the signs are there for you to find..."

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THE WATERSHED AS A PLANNING UNIT
A CHALLENGE TO REGIONAL PLANNING[1]

Rex Victor O. Cruz

INTRODUCTION

This paper focuses on the use of the watershed as a planning unit. It discusses the basic concepts in watershed management and highlights its relevance to regional planning. The justifications for the use of the watershed as a planning unit are also presented along with the essential requirements for an effective and efficient use of the watershed as a unit for planning.

This paper hopes to further spur the interest of planners in watershed management and its use as a planning unit. Conservation of watersheds will become the primary concern of every individual including the economic sector.

BASIC CONCEPTS

A watershed is defined as any topographically delineated area that can collect water and be drained by a river system (Brooks et al., 1991). It includes all land areas extending from the ridge down to the stream from which water is collected. Thus, a watershed contains, aside from land and water, many other important resources such as plants, animals, and minerals. A watershed is a self-contained system consisting of intricately interacting biotic and abiotic components of a number of linked ecosystems.

Watersheds are not necessarily found in upland areas or mountains. They can be situated in all types of terrain such that there is an upland watershed, a lowland watershed, an urban watershed, an agricultural watershed, and so on.

A watershed is a living, functional, and integrated system capable of yielding various products such as water, timber, and non-timber products. Hence, it is a production system, which may consist of various subsystems such as water, timber management, grazing, outdoor recreation, agroforestry, and settlement subsystem.

THE WATERSHED APPROACH

Watershed management is defined as the process of guiding and organizing land and other resource uses in a watershed to provide desired goods and services without adversely affecting soil and water resources (Brooks et al., 1991). It is also defined as the application of business methods and technical principles to the manipulation and control of watershed resources to achieve a desired set of objectives such as maximum supply of usable water, minimization of soil erosion and siltation problems, and reduction of flood and drought occurrences (Clawson, 1970; Satterlund, 1978).

The watershed approach can be defined as the application of watershed management concepts, tools, and practices to the integrated management of natural resources (Fellizar, 1989). It is an approach which is capable of operationalizing a holistic and systematic natural resources management required for sustainable economic growth and development.

The watershed approach recognizes the intricacies of relationships among the various components of a watershed ecosystem. It is conscious of the positive and negative impacts that alteration of one watershed component can have on other components. It has a full

[1] This is a portion of the paper originally presented with the title, "Watershed Approach to Sustainable Forest Management" as the Second Guillermo Ponce Professional Lecture in Forestry delivered on 17 February 1995.

view of how people are impacted by the interactions of water, soil, climate, and other resources, and how people's actions, beliefs, and attitudes affect the resources in return. It dispels the misconception that watershed management is based purely on physical interrelationships and that water is the only important concern. The watershed approach therefore strongly requires integrated and holistic strategies to achieve a particular set of management objectives.

Furthermore, it recognizes that the forces of nature that affect land and water operate within the natural watershed boundaries and socio-economic forces of development within political boundaries. More often than not, these two boundaries do not coincide. For instance, the Casecnan watershed lies within four provinces, namely, Nueva Ecija, Nueva Viscaya, Quirino, and Aurora.

Since a watershed has multiple, sometimes conflicting uses, it may have different values to environmentalists, conservationists, economists, sociologists, hydrologists, naturalists, and the community. In terms of land use, it may be used as a site for residential, agricultural, commercial, industrial, educational, experimental, environmental, and forest uses. In view of this, the watershed approach provides a workable framework for the resolution of conflicts of interests on the use of watershed resources. Conflicting interests and uses can be harmonized and evaluated on the basis of the quantity and quality of harvestable water from the watershed. Since water is one watershed resource that is highly sensitive to human interventions, it is often used as a parameter to gauge the sustainability, acceptability, and suitability of management strategies.

As mentioned, a watershed is not an independent system, but is linked with other terrestrial and aquatic ecosystems. Hence, the behavior of a watershed is influenced by factors and processes within and outside its boundaries. In turn, the watershed influences the factors and processes within and outside it. For example, the amount and quality of streamflows from a watershed will always have pronounced impacts downstream which heavily relies on the watershed for water supply. In return, the economic activities in the lowlands will continuously affect the rate and pattern at which watershed products are exploited. Additionally, such activities will also influence the rate at which watershed lands are converted to other uses that will significantly alter the volume and quality of water supply.

It will be easier to generate greater participation from the various sectors of the society to cooperate in the management of resources if they are aware of how the state of their sector and that of the watershed are interrelated. Hence, the watershed approach can facilitate the operationalization of community-based resources management.

Lastly, the watershed approach recognizes the limited capacity of the watershed to sustain its productivity and usefulness. It therefore subscribes to the use of land capability classification[2] and land use suitability assessment[3] for setting the limits to the type and intensity of activities that can be carried out in a watershed area. Both procedures are useful in the selection of suitable land uses and management strategies.

RATIONALE FOR A WATERSHED APPROACH

There are several reasons why a watershed approach is necessary in sustainable forest management:

1. Limited land resources and a rapidly increasing population are tough realities challenging the growth and development of the national economy. As the population grows, the per capita arable land in the country will further shrink. Most arable lowlands will continuously be converted to industrial, commercial, and residential areas. Poor agriculture-dependent communities will be forced to move farther toward upland areas in search of new lands to till. Unlike the lowlands, however, the uplands are more sensitive to human intervention, less able to tolerate intensive

[2]Land capability classification refers to the subdivision of land into homogenous units based on its inherent physical and biological attributes such as topography, soil properties, vegetation, and climate.

[3]Land use suitability assessment refers to the evaluation of the response of a given land management unit to a particular land use.

human activities, and prone to erosion. Through proper planning, an inherent feature of the watershed approach, the limit to which the uplands can be used by the people can be appropriately determined and set.

2. About 90 percent of the total land area of the Philippines (about 28 million hectares) can be considered watersheds. Yet, there are only about 121 watershed reserves in the country with an aggregate area of only more than a million hectares. Of these, around 10 to 20 watersheds are either managed through a watershed approach or at least have a watershed management plan. It is conceivable that almost all forest lands in the country are watersheds. Most of these watersheds are in varying stages of degradation with problems of deforestation, excessive soil erosion, declining land productivity, and disturbed hydrology. This is largely attributed to the excessive rainfall, rugged topography, and highly erodible soil which make the country's watersheds vulnerable to hostile land use practices. Unless watersheds are treated and managed as precious resources, the remaining healthy watersheds will suffer the same fate.

3. Watersheds are exclusive and limited sources of many goods and services needed by people. The production of these goods and services are oftentimes in conflict with each other. This is exacerbated by the scarcity of lands available for agriculture and the unabated growth of human population. If left unresolved, these conflicts of interests in the use of watershed resources will eventually lead to the conflict between humans and the environment. On this particular situation, the concepts of multiple use and sustained yield become very important for harmonizing conflicting uses of watershed resources and assuring its sustained productivity. The watershed approach provides a suitable venue for the operationalization of multiple use and sustained yield concepts. The watershed approach can be instrumental in bringing about the optimum mix of many uses of watershed resources in an equitable and sustainable manner. Moreover, it can pave the way for the cooperative participation of the public and private sectors which hold differing stakes in the watershed. Consequently, resources for the development of watersheds can be optimally used through integration and coordination of different development programs.

4. In the pursuit of economic development, marketable products such as timber are regarded as highly valuable, while non-market commodities like water rarely top the list of valuable goods. Nevertheless, water is a very important commodity that every sector of the society and the entire continuum of ecosystems need. The usefulness of water transcends natural, physical, biological, and political boundaries. It is almost omnipresent in the watershed, affecting almost every other component in all the ecosystems and vice versa. Hence, water is a very ideal indicator or parameter in the monitoring and evaluation of impacts and effectiveness of various management activities in the watershed. Through a watershed approach, changes in the quantity and quality of water are conveniently and more accurately monitored within the fixed boundaries of a watershed under a specific set of management objectives.

5. Upland and lowland areas are intricately related with one another. To sustain the development in these two areas, there is a need to clearly understand the biophysical and socio-economic linkages between the uplands and the lowlands. In this regard, the watershed approach will be very useful in many ways in that upland and lowland development programs can be synchronized and harmonized, so that areas of potential conflicts, inconsistencies, and commonalities are properly identified and addressed. The integration of such programs can promote a more efficient use of available financial and other resources. It can also minimize, if not totally exclude, the adverse impacts of an area's development program on the other.

OPERATIONALIZING THE WATERSHED APPROACH

In order to operationalize the watershed approach, a number of conditions should exist. These are the following:

An Adequate, Up-to-Date Body of Knowledge

Watershed management is an applied field of endeavor. It relies heavily on the availability of relevant and sufficient scientific information, which are useful in the management planning and decision-making process. Until today, watershed management in the country depended so much on the extrapolation of research findings of other countries with significantly different environmental settings. There is an extreme need to reinvigorate our basic watershed research to generate highly needed empirical data. Before watershed research was scrapped from the government's research priority areas in the late eighties, research compilations such as the one prepared by the ASEAN-US Watershed Project (1988) revealed the dearth of basic watershed research studies. What constitute the locally available watershed scientific information today are mostly limited data generated from fragmented studies commonly using a plot approach. There are very few research studies conducted using a watershed approach. That is why up to now we still perceive water and timber production and other such combinations of uses as mutually exclusive because of insufficient research findings to conclude otherwise. This is the very reason why we are tentative in operationalizing a multi-resource management.

Soil erosion estimation and prediction is another research area where the Philippines is lagging behind her Asian neighbors. It has been adequately shown how destructive soil erosion can be. Yet, there is not one valid single soil erosion prediction method that can be applied in the country. The Universal Soil Loss Equation (USLE) is an old and popular tool. It has undergone so many studies and revisions in many parts of the world except in the Philippines where soil erosion problem is so prevalent and destructive.

To fully support a watershed approach, watershed research in the Philippines should be refocused to what is substantially useful. A favorable balance between reactive and pro-active studies and between basic and applied researches should be struck. Research thrusts driven only by existing problems will contribute little in averting environmental disasters associated with time and development. In the same manner, research imbalance in favor of applied over basic research will gain little in developing truly viable watershed management strategies. A watershed approach to basic and applied research should also be vigorously pursued. To do this, there is a need to establish a network of experimental watersheds in the country. This will provide the much needed venue to study and monitor the whole range of impacts of human interventions in the watershed. Experimental watersheds will help in filling up information gaps in watershed research and will solve the problems associated with upscaling plot-based research results into the watershed level.

Development of Appropriate Technology

The success of the watershed approach depends to a large extent on the availability of technology which is compatible with the general objective of sustainability. Critical to this is the presence of mechanisms by which research findings are transformed into practical management tools and strategies. Technologies for harvesting non-timber products that are not damaging to soil and water resources must be developed. There is also a need to develop management division support systems such as resource valuation and accounting system, watershed resources information systems, and watershed models for predicting future scenarios.

Development of Technical Capability

The watershed approach requires a pool of competent experts. In recent years, even the basic watershed management course was not included in the Bachelor of Science Forestry curriculum of the University of the Philippines College of Forestry in Los Baños, Laguna. To fully support the application of the watershed

approach, the human resource base of forestry and natural resources management should at least be equipped with the rudiments of watershed management. This will have to be complemented with a vigorous development of watershed expertise.

Information and Education Campaign

Programs to educate a wider sector of the society and increase the level of awareness on the values of watersheds and the watershed approach should be conducted. The table below presents a matrix of possible watershed information needs of various actors and users. This will make it easier to drum up public and institutional support for the use of a watershed approach to forest resources management. General public support is needed to ease the excessive pressure on the forest and other resources of the watershed. The public should be made aware of the limitations to which a watershed can be used to supply their needs. In addition, active participation of an informed public in the formulation and implementation of a watershed management plan is vital to the effectiveness of the watershed approach. Politico-institutional support is required especially in bringing about the redefinition of the administration boundaries of resources management. A strong political will is necessary to make the change from the politically-set boundaries to the natural watershed boundaries. This will entail reexamination of relevant policies and the administrative capability to respond to the demands of a watershed approach such as integration of sectoral issues in and outside the watershed, resolution of jurisdictional problems, and the monitoring and evaluation of various watershed projects (Fellizar, 1989).

Possible Watershed Information Needs of Various Actors and Users

INFORMATION THEMES / ACTORS OR USERS	UNDERSTANDING OF								
	Basic Concepts and Principles	Benefits and Linkages	Needs	Technology and Resource Requirements	Techniques of Watershed Management Planning	Design, Evaluation and Appraisal Methods	Technical Options	Management and Organization	Field Techniques
Policy makers and sector planners	GA	GA	GA	GA	GA	GA	GA	GA	GA
Regulatory staff	SK	LS	LS	SK	SK	GA	GA	GA	SK
Project-level planners and managers	SK	LS	LS	LS	SK	LS	SK	LS	LS
Field-level staff	SK	LS	LS	LS	GA	GA	LS	LA	LS
Local leaders and NGOs	SK	LA	LA	LA	GA	GA	LS	LA	LS
Farmers and other land users	LS	LS	LS	LS	GA	LS	LS	LS	LS
Trainers of Trainers	SK	SK	SK	SK	SK	SK	SK	SK	SK

Adapted from Brooks, 1994.
Legend: GA – General appreciation; SK – Specific knowledge; LS – Local specific knowledge; LA – Local general appreciation

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OPEN SPACE PLANNING FOR QUEZON CITY

A CONCEPTUAL ENVIRONMENT[1]

Rabinder Dickton S. Rye

INTRODUCTION

This paper discusses concepts and principles of open space planning. It also compares and contrasts divergent approaches that have evolved in the planning of open space. These changing concepts, in the context of urban development, are examined amidst the experiences of Great Britain and the United States, and a focus on their development in Philippine planning is also discussed. Finally, this paper outlines some of the major issues pertaining to open space in contemporary urban planning.

RATIONALE FOR OPEN SPACES

In a rapidly urbanizing world, open space is fast becoming a vital asset of a healthy and livable city (Pitt et. al, 1979). In fact, the more open spaces there are, the better. In the planning of modern cities and towns, the provision for adequate open space is considered an essential requirement for the proper functioning of the urban system (Halprin, 1972). As a functional land use in the urban area, open space serves two primary purposes (NE Ill. Metro Area Plan. Com., 1962), namely:

1. "To give structure, shape and form to the city—separating clusters, preserving wedges, dividing and giving identity to urban communities and maintaining a balance between urban and rural land uses.
2. "To provide space needed for recreation, preserve scenic and historic sites, protect watersheds, aquifers, natural habitats of flora and fauna, and provide natural drainage."

Today, the most critical problems of open space stem from its misuse, as brought about by a lack of understanding of its concept as a functional land use, as a basic element in planning, and as a classification of land use in land disposition and management (Davis and House, 1968). As a result, the wrong approach is often chosen for the preservation of open space. Urbanization is another critical threat to open space. Urban growth traditionally eats into open space. "It proceeds by increasing the density within and extending the periphery, always at the expense of open space" (McHarg, 1969). Moreover, in cities and highly urbanized areas, a commonly held viewpoint that open spaces such as public parks do not produce taxable income or become taxable real property discourages long term public investments in open space for community use (Gold, 1973). Furthermore, where land is limited and expensive, open space has to compete with other urban essentials such as *residential and commercial uses which, by* tradition, command the best locations and the highest land values. Therefore, open space is the first to be sacrificed in the name of growth and development.

By the 21st century, the world will face the prospect of a global population that is half-urban (Cities of the 21st Century, 1991). In Third World "mega-cities" such as Metro Manila, where much of this growth is occurring, the demand for urban land will undoubtedly be felt to the greatest extent. Land in Metro Manila is already in short supply, and the tremendous strain of urban growth is exerting greater pressure on its limited open spaces (MMDA, 1996). Unless efforts to conserve open spaces are given serious attention, the positive

[1] This article is based on the preliminary draft of the author's masteral thesis entitled "Open Space Development in Quezon City."

aspects of development may eventually be overshadowed by the negative impacts brought about by rapid urbanization. In time, the loss of open space in urban areas coupled with other socio-economic problems such as slums, poverty, crime, unemployment, traffic congestion, environmental pollution, high stress levels, and low level of government services will inevitably lead to urban blight or decay.

In the sprawling area of Quezon City, urban decay is already being manifested in the uncontrolled proliferation of squatter communities, congested roads and highways, polluted river systems, increased levels of total suspended particles in the air, and depleted groundwater resources, among others (Office of the Mayor, Quezon City, 1997). The deterioration of environmental quality therefore threatens the long-term health and vitality of the city.

Open space is considered as one of the essential components of human settlement and urban planning, and yet, it seems to be the most neglected aspect of urban development.

IMPORTANCE OF OPEN SPACE IN URBAN DEVELOPMENT: A HISTORICAL PERSPECTIVE

Within the fluid and occasionally unpredictable process of urban development, the concept of open space in society has since evolved from its early function as a mere status symbol. In Great Britain, during the pre- and early industrial periods, open space for recreation per se was an attribute of social class. The teeming masses had to carry out their leisure activities on the streets, town squares, and markets. These alternative venues were augmented by areas of common land which were frequently used for fairs, meetings, and sporting events. According to Williams (1995), open space existed in the form of ornamental private gardens at first and only in a few privileged homes. Over time, urban development regulations were enacted to protect and advance the right of the people to a healthy environment, such as the 1875 Public Health Act, which imposed certain basic standards upon development. It was around this time that open spaces in the form of parks were provided and made accessible for public use. Their immense popularity led to a dramatic rise in the number of parks, from only 19 in 1849 to 111 by the end of 1880.

By 1945, statutory land planning became a major factor in the evolution of open space and became a tool in regulating urban development. It was during this period that open space, through greenbelt planning, started to be used as a means of controlling the sprawl of suburbia associated with continued physical expansion (Williams, 1995). The greenbelt concept involved the use of undeveloped open space at the periphery to limit the physical size or shape of a city or neighborhood, and was widely accepted in many cities throughout Europe (Miller, 1988).

In the United States, the provision of open space in the planning of urban regions dates back to Benjamin Franklin's plan for Philadelphia. However, during the industrial growth of the 19th century, a period dominated by private enterprise, open spaces in urban development plans were often disregarded. As growth pressures mounted, efforts to preserve public open space eventually became subordinate to economic growth. However, through sustained public advocacy by conservationists, the campaign to preserve open spaces within cities proved successful when philanthropists made significant contributions of land for the development of public open spaces. Among the more notable public open spaces that were created out of these donations are Central Park in New York City and the Cook County Forest Preserve in Chicago (Recht and Harmon, 1969). From the post-war recovery years until the early 1970s, a period characterized by tremendous growth in the U.S. economy, rapid population growth, and increasing mobility, government policy toward open space began to change from a 'stand by' for other uses to a concept of primary urban land use (Zisman, 1968).

In Great Britain and the United States, open space has become a key element in restructuring the urban environment. This became apparent at the beginning of the 20th century when a surge of proposals to promote garden cities and model communities featured a focal park and garden plaza around which major buildings were grouped. The prophetic Garden City model of Sir Ebenezer Howard, a

visionary whose time may well have come, was promoted in Great Britain in the early part of the 20th century as a response to the degradation of the urban environment brought about by the Industrial Revolution (Miller, 1988). The Garden City model was the basis upon which plans of countless communities and cities were built. Urban development strategies to enhance the environment such as the Garden City concept, the green belt legislation of Great Britain in the early post-1945 period as well as contemporary efforts towards the greening of cities all underscore the important use of open space as an aesthetic as well as 'structural' element to provide order and balance.

The process of urban renewal is linked closely to policies for urban enhancement. This became prominent during the post-war recovery period after 1945 and has become a recurrent theme. War damage and the collapse of aged Victorian inner cities in England prompted drastic initiatives to revitalize the hearts of cities (Williams, 1995). Today, these efforts are paying off through the transformation of former dockland areas into economically viable mixed-use developments (Williams, 1995). The U.S. urban renewal period from 1954 to 1972 witnessed the transformation of deteriorating business districts and crumbling adjacent areas into sites that were made available at below market rates for desired types of projects (Goldsteen and Elliot, 1994). Under these circumstances, urban renewal led to the restructuring of land based on cohesive and comprehensive land use plans, which provided a means for varied open space improvements. The opportunities provided by urban renewal created visually pleasing spaces, which eventually resulted in increased land and building values within and around the site (Goldsteen and Elliot, 1994).

OPEN SPACE DEFINED

Putting it simply, open space is land or water surface open to the sky (Zisman, 1968). As a resource, it possesses some of these characteristics (Davis and House, 1968):

- Relatively free from development, that is, having a low percentage of surface covered by building and other impermeable surfaces.
- Low permanent population.
- Vegetated to provide a visual contrast to man-made environment.

Open space is provided, either primarily or incidentally, through areas devoted to farms, forests, recreation, or institutional uses (Davis and House, 1968).

Land designated as open space has a functional use, and serves a vital purpose in land classification and land use planning. This statement implies that open space or vacant land is more than a residual category in a land use survey. Therefore, as an equally important land use, open space can be classified in some detail and can be accorded special attention in land use planning. Under this concept, open spaces together with land designated as left-over, idle, undeveloped, unused, or "vacant," all become part of an open space system. Within this context, open space can and does become a determinant of development, providing a basis for meaningful and effective planning (Zisman, 1968).

The nature of open space in the urban area can be described as a continuum. Beginning at the urban fringe, open space comes as 'quasi-wilderness', marked by relatively pristine natural conditions that present a variety of plant and animal species with hardly any presence of human activity. This is followed by a 'modified wilderness' that is subjected to some form of human interference such as cutting, burning, or some continuing low intensity land use. These first two categories have extremely high natural values. Natural values of open spaces decrease as these approach the city center. Finally, at the urban core, open space comes in the form of "high cost civic landscapes" within so-called 'urban jungles', dominated by hard surfaces, simple vegetative cover, and controlled natural landscaping (Manning, 1979).

OPEN SPACE VALUES AND BENEFITS

The values and benefits of open space are substantial. Whether big or small, open space resources improve environmental quality in general. Numerous studies have also shown that open spaces enhance air quality and lower dust levels, provide breathing space for play

and recreation, preserve natural beauty and scenic values, serve as a habitat for natural communities of plants and animals, reduce water run-off and erosion, and facilitate the percolation of water into aquifers and underground streams (Davis and House, 1968). These values and benefits are elaborated under the following categories:

Social

Open spaces have profound social benefits. They serve as venues for people to interact among themselves as well as with nature. With their variety, they bring people together for enjoyment, recreation, spiritual renewal, and education. In fact, areas with high open space values help enhance such mundane day-to-day activities as walking, working, traveling, and shopping. In modern urban milieus, open spaces provide the setting to celebrate the arts and cultural diversity, political discourse, and athletic competition. As a resource, open spaces are investments in the social fabric of the community and thereby become critical elements in the economic development of the city (Goldsteen and Elliot, 1994).

Aesthetic

Another set of reasons for preserving open spaces has to do with aesthetics. This includes preserving natural beauty, improving ugly, disjointed, or cluttered urban structures or elements, concealing or buffering disturbing or unpleasant views, and providing a readily available escape, if only for a short while, from the city and all its real or imagined discomforts. People in general favor open, uncluttered land to walk through, to admire while on a drive, or to photograph with (Davis and House, 1968).

Still others see open spaces as major means of providing visual relief from manmade cityscapes or as welcome breaks from the otherwise usually harsh lines and hardness of materials in buildings and streets (Davis and House, 1968). Moreover, an open space system, which is the fitting together of open space elements in a continuous connected series, gives an area a distinct character and identity within the larger context of the city. A system of open spaces can also relate or integrate various urban forms, activities, and land uses to produce edges, foci, nodes, and districts that vary in size, scale, and character (Zisman, 1968).

Given proper planning, design, and maintenance, open spaces contribute to the aesthetic enhancement of the total environment of cities and metropolitan areas (Gold, 1973).

Psychological/Health

Open spaces also play a role in maintaining mental and emotional well-being. A noted psychiatrist, Dr. Karl Menninger stated in Davis and House (1968) that one of the essential human needs is the need for air, preferably unpolluted, for exercise and for contact with nature which can be achieved through "the somewhat artificial but pleasant provisions in an accessible and properly maintained park, complete with trees, flowers, shrubs, lawns, lakes, and streams." He further added that the presence of green open spaces such as agricultural areas or wilderness are essential to the people's mental health (Davis and House, 1968). Moreover, as George Macaulay Tevelyan, an English historian, once said (Davis and House, 1968), "All of us have deep emotional drives which impel us whenever possible to seek the open sky, open spaces, open land."

Therefore, preserving natural beauty is a serious matter of preserving a primal source of spiritual well-being. The wellness and sanity of human beings are sustained by their contact with nature that renews them (Davis and House, 1968).

Economic

In addition to aesthetic, social, and psychological and health reasons, there are also financial motivations for promoting improved open spaces. Spatial improvements are also linked to a city's economic future through development programs, neighborhood improvements, and city booster efforts, all of which help create jobs, stabilize business cycles and unstable economies, increase wages through the competition of new employers, hold down increases in city and

county tax rates, increase retail sales and tax revenues, increase tourism, create higher property values, and increase loan business for local banks. As a whole, spatial improvements promote the concept of "growth is good for the business community" and thereby strengthen the perception of overall city improvement (Goldsteen and Elliot, 1994).

Structuring Development

Open spaces are used to separate densely-developed urban areas or buffer them against conflicting uses. They serve as a buffer between disparate and conflicting types of development such as a strip park along a highway that reduces noise and dirt which would adversely affect the livability of nearby residential areas. Cropland or other open space uses adjacent to an airport can insulate approach and takeoff zones (Davis and House, 1968).

As a structural element, open spaces through separators and buffers give visible form to neighborhoods, distinguish corridors of development strung along transportation arteries, and define and separate towns, cities, and metropolitan areas. Aside from its usefulness to structure or control development, large open spaces adjacent to built-up areas provide flexibility for future development (Davis and House, 1968).

Hence, people living in built-up areas have the best of both worlds—living amidst urban facilities and services and living near open spaces.

In comprehensive planning, open space elements such as greenbelts, greenways, corridor separators, and strip and area buffers are used to limit the physical development element in order to control sprawl (Zisman, 1968). Concentrating building development and controlling their outward expansion through greenbelts could reduce the cost of providing streets and utilities in areas of sprawling, scattered development (Davis and House, 1968). In England, greenbelts are commonly used to limit the physical size or shape of a city or neighborhood (Halprin, 1972).

In summary, open space contributes to an orderly development of the community by integrating or separating urban areas, neighborhoods, districts, or zones from each other or from the surrounding area (Gold, 1973).

Ecological Processes

This next category of reasons for preserving open space relates to human existence itself. Adequate amounts of carefully located open space are vital for the improved management and use of the most essential natural resources—air and water. Large amounts of open land near cities are needed to act as air recharges or mixing areas where noxious air coming from cities are diluted with fresher air. In fact, the preservation of large agricultural areas as "ventilating green spaces" was one of the three anti-pollution measures proposed in the Santa Clara County, California General Plan (Davis and House, 1968). Forests, parks, and other green spaces also serve this purpose.

The preservation of the natural cover of trees and grass is equally important. The destruction of these natural absorbers of moisture and dust and their replacement with concrete pavements and roofs have tremendously accelerated run-off and have greatly complicated problems of flood control areas in the U.S. (Davis and House, 1968).

Although less apparent, loss of open spaces results to a decrease in the percolation of water into underground streams and reservoirs, which are natural sources of fresh water supply. Consideration must be given to streams and water tables, as they relate to the water supply of the city.

Hence, open spaces in metropolitan areas are needed to contribute in maintaining the balance of nature (Davis and House, 1968).

OPEN SPACE TYPES AND CLASSIFICATION

Based on its nature and function, two classes of open space are presented by Stanley Tankel (Zisman, 1968). The first is the

kind of open space that most people are aware of (Davis and House, 1968):

> *[Open space] used for the wide range of active and passive recreation activities, for circulation; it is viewed from the home, the road or other vantage point; and it is felt – it gives privacy, insulation or sense of spaciousness and scale.*

The second type is that which most people are not aware of but which nevertheless serves them beneficially (Zisman, 1968):

> *Open space which does urban work—protects water supply and prevents floods by soaking up runoff; acts as a safety zone in the path of aircraft takeoff and landings; and open space which helps shape the development pattern—such as space between buildings or communities, or space which channels development, or as a land reserve for the future.*

Clawson provides a specific classification of open space, which is based on the intensity of use and the input of resources (Zisman, 1968):

- Open space surrounding public buildings.
- Open space for recreation.
- Open space for ecological protection or for preservation of certain desirable natural characteristics.
- Open space for urban structural and aesthetic purposes.
- Open space provisions for future urban growth.

In the planning of the San Francisco Bay Area, open space advocates settled for a more pragmatic open space classification system that was based on a commitment to keep land for open space uses (Kent Jr., 1970). The categories proposed included:

1. ***permanent open space*** *which consists of* public and private parks, open space land held expressly for park or open space purposes, wildlife refuges, and the holdings of private conservation organizations;
2. **semi-permanent open space** that includes public and privately-owned land for which a strong commitment to continued open space exists. These include watershed lands, academic institutional lands, military reservations, and holdings of the Bureau of Land Management. Private lands include golf courses, cemeteries, and quasi-public recreation areas; and
3. **temporary open space** which includes privately-owned lands that provide for the commitment of land to open space uses for a minimum number of years.

Based on its functional uses, Zisman (1968) classifies open space into three broad categories: utility, green space, and corridor spaces. Each category is briefly described as follows:

1. Utility Spaces

These are surface spaces, water or land, which act as storage of water, whether surface impounded or underground, or provide drainage or flood control by absorbing and holding water or channeling its flow. These are also the surface spaces which contain the direct productive uses of land in forests and farmlands or deposits, fishing, and wildlife. A possible inclusion would also be land reserves for the conservation of resources as storage functions or the reserves of land for development as land banks. The nature of utility open spaces is in their use as a basic land resource.

2. Green Spaces

These are land and water surfaces used for 'green' purposes such as parks and recreation, greenbelts and greenways, or bodies of water which define, limit, or control development, natural scenic protection, and the spaces around and between buildings. This broad category *includes a variety of space forms, from* regional parks to neighborhood parks, playgrounds and other local parks, landscaped areas, and areas designated for the preservation of natural characteristics. The nature of green open spaces is in

their use as the designation of natural sites in relation to other urban uses.

3. **Corridor Spaces**

These are the spaces, land and water, used for the rights-of-way of movement and transportation. The nature of corridor open space is that of passageways or channels of circulation and directly related landing places.

In addition to these three broad categories, open spaces may be subjected to multiple uses. Referred to as multiple-use open spaces, its determination is based on the existing and potential use of the land. Such is the case of a water reservoir (utility open space) that can also serve as a significant recreation facility (green open space). The primary function may be that of utility, to store water as a resource, but because of its nature, the resource also becomes useful and available for both water and shore-related recreation.

Another example is a major highway, which may offer possibilities of green space uses through the provision of a tree-lined road island or greenbelts and greenway areas. Some examples of multi-use open spaces are college and university campuses, cemeteries, zoos, and airfields. In the planning of an open space system, they can be classified either as primary or secondary open space elements.

PARAMETERS IN DETERMINING OPEN SPACE VALUES

The general parameters that are usually applied in determining and classifying open space include both measurable data and value judgments (Zisman, 1968). These parameters are:

Primary Functional Use

Open spaces may be classified primarily according to their function as a distinct land use and their relation to other uses.

Relation to Development Values

Whether open space values are greater than potential development values and therefore should be protected against any development would be value judgments in classification.

Size of Land

Open spaces come in varied sizes or scales: site, city areas, urban metropolitan areas, and regions.

Urban-Rural Considerations

Open spaces vary in rural and urban areas. A classification system should consider the uniqueness of the area and suited according to context: urban impacted areas, the urbanized region, or the 'remote' region. Classification should be site-specific.

Intensity of Use

Factors that may affect classification could include intensity, frequency, or period of use, among others. These characteristics may be used in making detailed classifications within the general land uses.

Land Characteristics

Land characteristics such as vegetation, soil conditions, geological formation, and previous use can be a basis to classify open spaces.

Other parameters may include accessibility, ownership, open space activity, historic and other cultural significance, and management problems.

OPEN SPACE CLASSIFICATION SYSTEM

Below is an example of a classification system developed by Zisman (1968) that illustrates some of the criteria used in the inventory of open space resources. The criteria used to assess open spaces include many open space values, including natural resources:

I. Utility Open Spaces

A. Resource Areas

Land and water for production or extraction such as forests, grazing areas, lakes, and rivers for water supply.

B. Urban Utility Spaces

Areas allocated for direct urban use such as dam sites, reservoirs, landfills, waste disposal areas, and sewage treatment facilities.

C. Flood Control and Drainage

Land that requires special protective measures to protect land from being destroyed such as flood plains, flood banks, watersheds, protection areas, drainage ways such as ditches, creeks or paths of run-off water, and erosion control areas.

D. Reserves and Preserves

Land or water reserved or protected for future resource use such as forests, wildlife refuges, breeding areas, sanctuaries, and lands for future urban expansion.

II. Green Open Spaces

A. Wilderness Areas

Land best left in its natural state for scenic, geological, and ecological values. Usually designated by government agencies.

B. Protected Areas

Areas of limited access and controlled development for the protection of scenic and other natural values such as wildlife refuges, scenic areas, coastlines, and shore areas.

C. Natural Park Areas

Areas accessible to the public, characterized by nature setting or showcasing natural elements unique to the area such as national parks and forests, city parks, etc.

D. Urban Park Areas

Parks found in cities or metropolitan areas such as zoos, botanical gardens, arboretum, urban forests, nature trails, riding areas, boating and other water facilities, and open-air facilities such as fair grounds, amphitheater, and outdoor recreational facilities.

E. Recreational Areas

Areas developed for organized activities and outdoor recreation such as golf courses, play fields, playgrounds, swimming pools, tennis courts, picnic areas, racecourses, and running tracks.

F. Urban Development Open Spaces

Open spaces that structure or control development such as greenbelts, green wedges, greenways, buffers, separators, plazas, squares, commons, setbacks, and open spaces around buildings.

III. Corridor Open Spaces

A. Rights-of-way spaces such as highways, streets, alleys, drives, rivers, canals, creeks, railroad and other rail transit lines, and utility rights-of-way easements.

B. Landing spaces for terminal and interchange uses such as parking areas, airfields, and interchange areas such as cloverleaf and transfer areas.

IV. Multi-Use Open Space

Other uses which meet the open space definition. Usually a mix of development and open space such as campuses, private clubs with recreational facilities, garden areas, cemeteries, etc.

As pointed out, the classification of open spaces should include fundamental natural processes as parameters in determining their growth and distribution (Little, 1969). Open spaces must therefore respond to these natural processes that need to be accounted for and conserved. According to McHarg (1969), there are eight natural open spaces where certain land uses may be permitted or prohibited:

Surface Water

Only land uses that are compatible with waterfront locations should occupy them, and

even these should be limited so as not to diminish the present or future capacity of surface water for supply, recreation, and amenity.

Marshes

Land uses should consider the flood and water storage function of this type of open space so as not to diminish its capacity.

Flood plains

It is accepted that all developments should be prohibited from a 50-year flooding, except certain activities which are unharmed by flooding or are inseparable from flood plains.

Aquifer

This resource should be protected and managed by prescribing land uses that do not imperil the aquifer. Developments that include disposal of toxic wastes, biological discharges, or sewage should be prohibited.

Aquifer Recharge Areas

As points of interchange between surface water and aquifers, polluted rivers must be carefully separated from the aquifers, and clean streams that transect it must be impounded for these areas to be managed and recharged. Land uses on these permeable surfaces must be regulated to allow normal percolation.

Steep Lands

To minimize floods and erosion, steep lands or slopes in excess of 12 degrees should be classified as unsuitable for urban development or cultivation. Compatible land uses should be limited primarily to forestry and recreation.

Prime Agricultural Land

The protection of the best soils in the city or metropolitan area should be considered as desirable because of their long-term value or irreplaceable nature.

Urban Forest and Woodland

Vegetative cover improves microclimate conditions thus contributing to the balancing effect upon the water regimen—diminishing erosion, sedimentation, flood and drought. Moreover, this type of open space provides scenic values and serves as a habitat for flora and fauna. Their recreational value is among the highest of all categories.

OPEN SPACE PLANNING APPROACHES

The issue on how much open space is required poses practical difficulties in estimating true demand. Nevertheless, numerous contrasting approaches have been tried and tested to determine open space requirements, especially for recreational purposes (Williams, 1995):

Standards Approach

This approach is the most firmly established method for setting levels of provision. The basis of all standards planning requires that a fixed level of provision should be associated with a given population base, for example, six acres of open space per 1,000 population. This approach, however, has been criticized for its uniformity in approach and its limited capacity to take into account local demographic, economic, social, or physical conditions.

The advantage of this approach lies in its simplicity and perceived equity. For planning purposes, this approach reduces the difficulties of forecasting demand since it does not consider uncertainties of identifying hidden demand. To measure any shortfall in the provision of open space, it simply assumes fixed population levels, which are known or can be projected with some accuracy.

Spatial Approach

Although the standards approach can define a level of deficit in an urban area, it provides less guidance as to where new facilities should be located. In such cases, a spatial approach is more useful. Using a map, the extent of the catchment area of a certain facility can be delineated. Such factors as distribution, degree of specialization, and characteristic patterns of use of the facility determine the extent of the catchment area.

An advantage of this approach is that areas with service deficiencies can easily be pinpointed since they lie beyond the catchment area of existing open spaces. This justifies the provision of open space in these geographical gaps, provided that there is actual demand for the facility under consideration by people living in these areas.

Organic Approach

This approach is essentially an incremental approach wherein authorities take regular stock of their existing provision, assess its patterns of use, and highlight any deficiencies that their analysis suggest. Any deficiency is addressed based on resource availability, development prioritization by concerned agencies, or a political decision from above. This approach is based on a more realistic view that local authorities do not have the resources to provide for all types of recreation spaces in all parts of their jurisdiction. The availability of needed provision, therefore, grows in an incremental fashion or in an ad hoc manner. The organic approach is common in Great Britain because planning the local conditions rarely permits a large-scale strategic approach to recreational open space provision.

Hierarchical Approach

This approach is based on the conventional Central Place Theory of Christaller. Occupying the upper echelons is a small number of large and/or specialized facilities that attract users from a large catchment. At the base is a larger number of small, non-specialist recreational open spaces that have a much more localized appeal. This can therefore provide a rationale for the planned provision of recreational facilities in areas where there are no existing provision.

Community Development Approach

This approach evolved out of the democratization of planning in Great Britain during the 1970s when public participation became a feature of the new planning process. The approach relies on public consultation as a way of gathering information to plan for recreational needs that are felt as necessary by the local people. An advantage of this approach is its use of consultation through which public authorities can keep in touch with interest groups and gather feedback or opinion on the needs of the community.

Open Space System Approach

Open space elements by themselves have distinct functions to perform; but, it is by viewing open space as a system of continuity and related parts that the "structural framework" for urban development can be established (Zisman, 1968). This approach offers a large-scale strategic view of open spaces in the city or metropolitan area. As defined, a system of open space fits together various open space elements such as utility, green, and corridor open spaces into a continuous connected series disposed in a functional pattern. The main characteristic of an open space system is that each element has a positive relation to other elements, and that the whole system has a form in which each element has a meaningful and functional place (Zisman, 1968).

Such an approach recognizes open space as a positive and functional land use that must be designated and planned for, and coordinated with all other developments in the use and management of land resources. Under this broad context, the function of open space serves to provide a framework necessary for obtaining a balance between development, particularly urban development, and non-development. The primary function of open space is to serve as the 'fixed' element in planning to which other uses are related. However, it is through a system of open spaces that a "structural framework" can be established to guide the over-all physical development of an area (Zisman, 1968). Zisman (1968) describes the nature of an open space system in the following manner:

> *The open space at any scale must be seen in relation to the whole hierarchy of scales: the site in relation to its neighborhood, the neighborhood in relation to the city, the city in relation to the metropolitan area, the urban area to the larger region of which it is a part. It is in the open space that one size of area relates directly to other in the hierarchy of*

scale, and it is in this relationship that a system of open space develops, from the smaller detail to the larger broader elements of a system, from the broad scale to the local detail.

In summary, an open space system, provides the 'fixed' element in the planning of an area and a basic control for the total pattern of urban development. Therefore, by first designating the system, a comprehensive plan can be organized to give full play to building development, to optimize opportunities for good building design and urban development, and to provide for such practical requirements as drainage, utilities, circulation, recreation, and aesthetic amenities. As a basis for comprehensive planning and development, an open space system provides a number of design characteristics, which are useful to identify, establish, and organize the system.

As a holistic approach in the urban development process, an open space system can serve three major functions (Zisman, 1968):

- To provide for a logical determination of the best uses of land beginning with natural characteristics, its functions to hold and drain water, and its use as a primary resource.
- To provide the essential means for physical order and continuity in planning by providing an over-all physical control in the use of land.
- To establish the best and most advantageous siting for building development to create, maintain, and increase site values.

PLANNING OF AN OPEN SPACE SYSTEM: A CONCEPTUAL FRAMEWORK

As mentioned, open space is characterized as a positive and functional land use that should be designated and planned for, and coordinated with all other developments in the use and management of land resources. This is based on the principle that there is a need to plan all resources as part of an interdependent system.

To ensure that open space is properly preserved and used, Zisman (1968) devises a step-by-step approach in the planning of an open space system. To arrive at a meaningful and broader understanding of this approach, the study presents a conceptual framework (Figure 1) to underscore the relative position and importance of open space planning activities in the context of comprehensive planning.

This conceptual framework is a five-phase urban development policy-making process through which all recommendations, either plans or programs, must pass through. Based on the open space system approach, plans and programs become relevant and realizable if they are tied up to a broader comprehensive plan. The conceptual framework therefore integrates the planning of open spaces into the process of defining public policy regarding the growth and development of an area. The conceptual framework consists of the following phases:

1. Identification of community goals and objectives.
2. Inventory of existing resource conditions which includes a forecast of community needs.
3. Designing a policy framework based on resource conditions and community needs.
4. Implementation of policy through plans and programs, or through controls or regulation.
5. Appraising policy effects through policy evaluation in terms of the significance and/ or mitigation of impact.

The key elements of the process are outlined below. Highlighted within each phase are the major steps that are primarily based on Zisman's approach to open space planning. This study attempts to discuss in detail the activities to be undertaken in fulfilling each step.

Phase 1: Identify Goals and Objectives

Step I - Delineate the area of study and planning on a map—a city and its surroundings, a municipality, a province, or region. When necessary, sub-areas are determined for closer study.

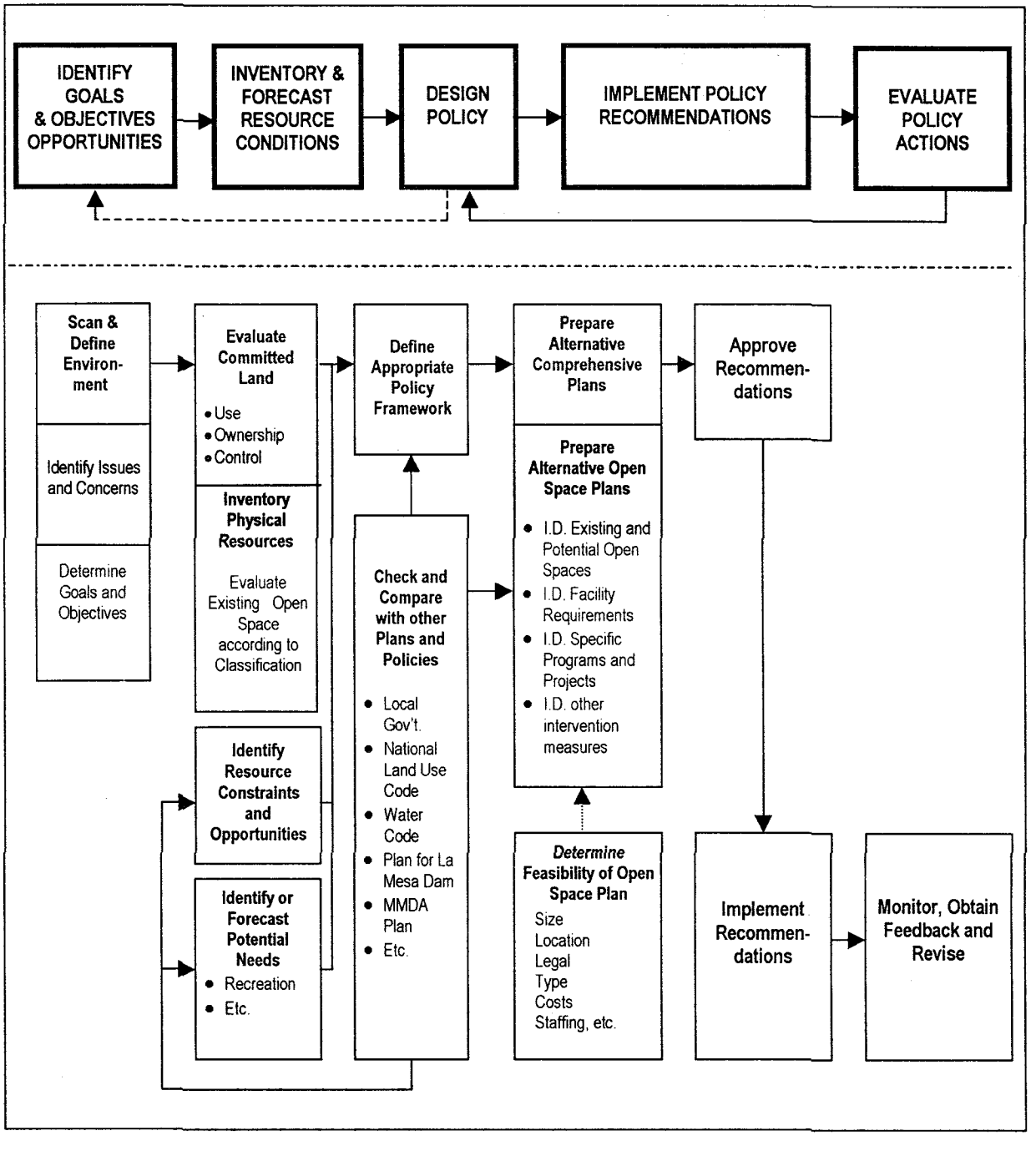

Figure 1

CONCEPTUAL FRAMEWORK
A Process For Urban Development Policy-Making

The following activities are essential in contextualizing the area under study. These include:

- Defining the physical boundary of the areas.
- Determining development issues and concerns pertaining to the area in order to: (a) compare and contrast past and present urban development policies such as land use plans to determine development trends and (b) examine past and present open space policies and plans to determine if such a resource is increasing or decreasing over time.

Based on the first two activities, define the goals and objectives for the area by highlighting the relevance of open space in the urban development process.

Phase 2: Inventory Resources and Forecast Potential Needs

Step II - Define the land in terms of its present and known use, working progressively *from the broader context to smaller units.* Identify readily available information on the study area.

Step III - Make an initial evaluation of committed lands in terms of use, ownership, and control. Land must be categorized as within the public domain, owned by the local government, privately owned, or under the jurisdiction of other authorities. Establish the 'fixed' elements such as national parks, city/ municipal parks, urban forests, dams and reserves, etc. including the spaces used or committed for highways.

Step IV - Evaluate open space according to the classification of open spaces as utility, green, and corridor spaces, and identify single and multiple open space uses. Prepare a crude open space plan to identify gaps and missing details that may be added in the future.

The essential activities for fulfilling these steps include:

1. Collecting relevant data and information to establish a profile of existing conditions.
2. Reviewing existing information to identify open space resources that are significant because of public or technical recognition or which are likely to be affected by urban development impacts or policies.
3. Identifying land in terms of its present and known use, ownership, and controls.
4. Determining land in the public domain in terms of those owned by the city or other public agencies, those privately-owned, as well as lands under the control of other authorities.
5. *Making an inventory of existing* open space resources.
6. Classifying existing and potential open spaces according to an appropriate classification system that considers green, corridor, and utility spaces.
7. Establishing the 'fixed' elements including major parks, urban forests, city or municipal parks, etc.
8. Identifying resource constraints and opportunities imposed by existing plans and policies.
9. Identifying or forecasting potential development needs based on existing and projected demand, as well as existing plans and policies. Towards this end, the sub-activities include:
    - Identifying open space deficiencies by evaluating existing open space, assessing its patterns of use and highlighting shortcomings in terms of facilities, amenities, or size, among others.
    - For recreational open space needs, determining the area required based on established standards.
    - For both recreational and non-recreational open space needs, identifying areas based on established parameters such as primary functional use, relation to development values, size of land, urban-rural considerations, intensity of use, land characteristics, drainage and water surface characteristics, accessibility, ownership, activity, and historic and other cultural significance.

Phase 3: Design Policy

In designing a policy framework, it is important that development issues and concerns form the bases in defining goals and objectives. The policy framework provides a sufficient basis for proposed courses of action which government, in cooperation with all stakeholders, should undertake to achieve its goals and objectives. It should include policy statements on land uses including open space. To ensure consistency or compatibility, the policy framework should be based or harmonized with existing plans and policies.

Phase 4: Implement Policy Recommendations

Step V - Detail the elements of a broadly-sketched open space system for a closer examination of uses of the open spaces themselves. Delineate as best as possible the borders or edges of the open space system. Review the classification of open space uses to work out a more definite designation of uses, whether single or multi-use. Identify where the system is interrupted and make a determination of what changes should and could be brought about to make the system complete.

Step VI - After defining a broad open space system, check and compare with other plans, including the comprehensive plan, which may have been made by other agencies or organizations. Where appropriate, give suggestions to harmonize the system with such existing plans, either by proposing changes in the plan or making adjustments in the system.

Step VII - Make a more detailed study of sub-areas or parts of the planning area with particular reference to development use, whether actual or proposed. This will be the point at which some basic determination can be made of the possible areas for industrial, residential, public, and other uses. The open space system should be able to control or order other developments.

Step VIII - First make a schematic plan of an open space system for the area. Map out significant areas of use as anchor points of the system, and see what open space elements can be used to tie these areas together in a system of continuity. Open spaces such as watercourses, highway rights-of-way, and special topographic features can be used as anchor points.

Step IX - Coordinate open space planning with other stakeholders. Work out with them suggestions and proposals for development patterns and assist as much as possible in getting regulations drawn up or revised in order to produce desirable patterns and procedures of development in relation to open space.

It is during this phase that the policy framework is concretized through the formulation of open space recommendations. Among the activities to be included are:

- Making a final evaluation of open space resources, existing and potential, based on defined parameters and classification system.
- Determining open space elements that can tie significant areas and anchor points together in a system of continuity. Some of these elements could include water courses, highway rights-of-way, and special topographic features.
- Preparing alternative schemes-identifying areas with significant open space values and anchor points of the system as well as single and multiple purpose open space uses. The preferred option thus becomes a first basic statement of an overall open space plan.
- Detailing a broad open space system by defining as best as possible the borders or edges of the open space areas in the system. Review the classification of open space uses for a more definite designation of open space uses.
- Checking where the system is interrupted and determining what changes should and could be brought about to make the system complete.
- Tying up the schematic open space system with a comprehensive plan.
- Addressing gaps and details through the iteration of the comprehensive plan.
- Checking or comparing of the overall land use plan with relevant plans or policies prepared by other entities. Where appropriate, making suggestions for change to harmonize the system, either

through changes in the plan or through adjustments in the system.

- Making a more detailed study of the overall land use plan, with particular reference to actual or proposed development uses. At this point, some basic determination can be made of the land most valuable for industrial, residential, public, or other uses. Of special interest will be the areas designated in relation to the open space system as possible areas for development. The open space system is the framework that will control and order development in relation to open space.
- Addressing open space planning problems in relation to the broader plan so that identified open spaces are incorporated as a positive element of the plan.
- Determining the feasibility of the open space system.
- Making recommendations and having them approved.
- Supporting approved recommendations by fiscal and non-fiscal measures such as deferred taxation schemes and zoning regulations.
- Implementing recommendations.

Phase 5: Evaluate/Appraise Effects of Policy

Step X - Review and revise open space plans and related factors. Open space planning is a continuous process wherein not all the answers will be available at once and where details will be needed and added later. By taking the lead in open space determination and planning and by assisting local authorities and local groups, a firm and workable open space plan can be developed for continuous use.

Monitoring, reviewing, and revising the plan based on the effects of policy action are the activities included in this phase.

Planning is a continuous cyclic process wherein not all the answers can be addressed at once. Plans are improved on the basis of additional details needed. In the context of urban development, planning should be based on a well-defined policy framework that should serve as a potent guide in determining the direction of growth patterns and development priorities. A comprehensive plan is a translation of government policies that includes policies on open space. Through a concerted effort and commitment of local authorities, and in coordination with civic groups and the public in general, a comprehensive and workable open space plan can be developed for continuous use.

QUEZON CITY'S OPEN SPACE POLICY: AN INITIAL ASSESSMENT

Open space is considered as one of the essential components of human settlement and urban planning, and yet, it seems to be the most neglected aspect of urban development.

In the Philippines, the concept of open space as integral to urban development was best exemplified in the 1949 Master Plan of Quezon City, proclaimed as the new capital *city of the nation by then President Manuel L.* Quezon.

This section presents an initial assessment of the open space policies of Quezon City using the conceptual framework presented earlier. The assessment shall attempt to reveal the city's open space values and their evolving importance in the growth and development of Quezon City.

Open Space as an Element of Quezon City's Vision, Urban Development Goals and Objectives

The 1949 Master Plan was anchored upon a vision to build Quezon City and transform it into the first garden city of the country. The original framers of the plan were inspired by the appeal of the Garden City concept of Sir Ebenezer Howard that gained prominence as a model during the first decades of the 20th century. As such, the Plan for Quezon City visualized an expansive system of interconnected parks, greenbelts, and recreational facilities. The Master Plan stated that the Central Park in the Diliman quadrangle would be the "heart of the park system" in Quezon City (PIA, 1979).

However, the Capital City Planning Commission (CCPC), the lead agency in master planning Quezon City, lacked administrative controls over the Diliman Quadrangle. Juris-

dictional control and authority were vested on the Quezon City government. This institutional problem hindered the implementation of the plan. Moreover, when CCPC was abolished, its functions and powers were transferred to the National Planning Commission (NPC) in 1950. As a consultative body, the NPC was not vested with the power and authority to make decisions that would supersede those of the local government (PIA, 1979). In short, it suffered the same fate as the CCPC.

In retrospect, the plan's failure was due mainly to the absence of an agency that had the sole power and authority to implement the plan. Today, given the powers and functions of local government, the tasks of identifying, accounting, recording, developing, conserving, protecting, and monitoring Quezon City's open space resources should become part of the city's functions to ensure the long-term sustainability of these resources.

Through the years, after its inception, the vision for Quezon City as a garden city should have taken into consideration the unprecedented population growth that occurred between 1950 and 1970 in order to clearly define and mark out adequate open spaces for future uses. During this period, Quezon City experienced rapid urbanization and population growth which peaked at 11.48 percent in 1960. Government attention and resources were focused on meeting the residential requirements of the city's burgeoning population. Through the years, and until now, much of the city's vacant land, especially in District 2, are being built upon with little concern for district-wide open space requirements.

In 1995, the City Planning and Development Office (CPDO) revealed an unbalanced distribution of open spaces within the city. This is evident in 35 barangays which are not served by any neighborhood park. This situation has long-term implications on the health and well-being of the constituents living in these barangays. Where then are the nearest recreational opportunities which the affected population can avail of at any time? How do the people in these barangays cope with the absence of green open spaces in their neighborhood such as parks or playgrounds? These issues have to be addressed soonest in order to minimize the adverse impacts of the absence or lack of open space on the health and well-being of some sectors of the city. In terms of addressing these issues, the CPDO has identified location, spatial distribution, and accessibility as important parameters in planning the city's open space needs.

The city's policy options concerning urban development are made either by design or by default. Based on the original plan for Quezon City, the vision for the city underscored the need for a variety of open spaces. The main reason for such a plan was to enhance the city's function and character as the new capital city and to provide recreational venues for its visitors and inhabitants. Subsequent policy actions and outcomes, however, showed a strong bias towards urban sprawl and all its concomitant evils—ugliness, sub-standard living conditions, and loss of potential recreational spaces for outdoor sports activities, among others.

Thus, despite the avowed commitment to preserve or develop the city's open space system, realities indicate that actual preservation was hardly put into practice. An assessment of the Diliman Quadrangle and the rampant encroachment of structures and squatter settlements along the easements of the city's drainage corridors attest to this. Although there are existing laws that prohibit squatting along river banks, these are not strictly enforced or monitored by the city government.

Another example where policy is inconsistently applied involves the plan to commercialize a wide swath of open land adjacent to the University of the Philippines Arboretum, considered part of the 'green lungs' of Quezon City. The city has yet to make public its position regarding the adverse impact of certain developments on its open space resources such as the U.P. Arboretum. Even if such an open space is not under the city's control, the U.P. Arboretum is a natural resource that has both positive and beneficial effects on the city and its constituents. Therefore, it has to be protected against developments that may encroach upon it or adversely affect it.

A cursory examination of the proposed zoning map of Quezon City, however, reveals a clear bias towards building up both sides of Commonwealth Avenue as special economic zones. Moreover, the zoning ordinance designates the sides of all major thoroughfares within the city as special economic zones. This means buildings would not be subject to height limits. But, what are the implications or effects of this policy on the city's open spaces? As noted earlier, although it classifies the U.P. Arboretum as open space, the city has yet to acknowledge this open space as an invaluable natural habitat or natural asset of the city's ecology. In light of this situation, several questions must be answered:

1. How can the city protect its open spaces if it does not recognize the intrinsic values of these resources in the context of urban development?
2. How can the Quezon City government ably assess the impact of changes or proposed developments on these resources?
3. What are the possible impacts of the proposed developments in the U.P. Commonwealth property, such as potential land use conflicts, vis-à-vis the ecology of the Arboretum?

Inventory and Forecast of Resource Conditions

In terms of defining open space resources, the 1949 Master Plan was more comprehensive in scope and coverage compared to what is formally recognized today. The 1949 Master Plan recognized the following elements as part of Quezon City's open space system: creeks and rivers, parks and playgrounds, greenbelts along river easements, a system of neighborhood playgrounds, one athletic field per neighborhood, a large park for each district, as well as provision of parks and greenbelts for future uses.

In short, the 1949 Master Plan clearly defined the city's open space system which it vowed to develop or preserve. Each element was given due importance in a hierarchy of open spaces, with the Diliman Quadrangle as the center of the city's open space system. The plan, however, fell short of quantifying open space needs. Perhaps, as in the open space system approach, the 1949 Master Plan recognized the difficulty in quantifying open space needs and regarded the rule-of-thumb standards approach as meaningless. However, it viewed the need to determine "where open space can be found" as a more relevant parameter in open space planning. The Plan reflected this parameter when it acknowledged the drainage corridors of the city as alternative recreational areas.

The need to determine how much open space is required to serve current and future population requirements, especially for recreational purposes, is a major issue that the current city government should address, particularly since a substantial portion of its population belong to the youth. In terms of planning, parameters such as open space type, frequency of use, intensity of use, location, and distribution should be able to guide planners in forecasting potential recreational open space needs.

The 1949 Master Plan of the city did not adequately forecast the impact of a growing population when it envisioned the open space system. From 1950 to the present, unplanned urban growth coupled with changing national policies and priorities on the city's open space reduced the city's open space from 30 percent to about 20 percent of the total land area. Of the original 400 hectare park system prescribed in the Plan, only 50 hectares have been preserved for recreational and aesthetic purposes which includes the Quezon Memorial Circle and the Parks and Wildlife Nature Center.

Because of a lack of foresight or commitment to implement the 1949 Master Plan, part of the 400 hectare Diliman Quadrangle was converted for institutional uses to accommodate projects of the national government such as the Lung Center, Heart Center, Children's Hospital, and the buildings of various government agencies (i.e. Department of Agrarian Reform, Department of Agriculture, Bureau of Soils and Water Management, National Power Corporation, among others). Moreover, large portions of the Diliman Quadrangle are occupied by informal settlements such as areas adjacent to the Philippine

Science High School, National Power Corporation, and Bureau of Internal Revenue.

Another reason why the city's open space policies have been ineffective is the absence of a comprehensive open space classification system identifying the city's existing and potential open space resources. As emphasized by the open space system approach, this is an important step before any resource assessment can be done. Such an approach underscores the need to identify, record, and classify resources with open space values before they are assessed. Currently, the city recognizes a very limited number of open space elements such as parks and playgrounds. This indicates a limited understanding of the nature and types of open spaces. If it expands its views on open space, a more appropriate classification system should include the city's drainage corridors, vacant lands, urban forests, golf courses and sports facilities, and school campuses, among others.

In general, a classification system of open space resources should not be constrained or limited by ownership and management control issues. Moreover, classification should be based on criteria that can be used to assess open space vis-à-vis other uses or to resolve conflict between potential uses. Such criteria or parameters could include productivity, monetary value, amenity and visual quality, health and safety, variety and uniqueness, historical or cultural significance, coverage and extent, educational and scientific value, recreational value, ecological value, etc.

The application of these parameters in classifying open spaces should provide some basis of measuring or judging the use for which a plot of land is suitable with consideration of its constraints and opportunities. For example, it is possible to assess the relative scenic value of the U.P. Arboretum based on public opinion. If such an opinion is expressed strongly enough, then it can be reinforced by law. Consequently, its protection and conservation against certain developments are guaranteed.

Design Policy

Because of the rapid growth of residential areas in the city, Quezon City's policy on urban development did not place much emphasis on the importance and value of an open space system as envisioned in the 1949 Master Plan.

The primary legal tool that is presently being used to control growth and land use in the city is the 1981 Metro Manila Commission (MMC) Zoning Ordinance. Sixteen years after its enactment, the ordinance has become unreliable in charting the growth and development of the city and unresponsive to current urban trends and issues. The Quezon City government is therefore faced with the urgent need to formulate a comprehensive land use plan and zoning ordinance that is more responsive to the growing needs of the population and to the constant changes occurring in the city. There is a clear trend towards increasing building development especially along major thoroughfares. This has been the trend based on the land use maps of Quezon City from 1972 to 1995. In the absence of a cohesive policy framework that highlights the importance of open space in the context of urban development, the city's bias towards building-up could consume its potential open spaces.

From 1980 onwards, Quezon City's open space reservoir was augmented with the passage of several national laws in order to ensure that open space was provided in building and subdivision developments. These are the Building Code and the laws on subdivision development such as P.D. No. 1216 and P.D. No. 957. Although these laws continue to generate open space for the city, there are ways to circumvent them. For instance, P.D. 1216 requires property developers of at least one hectare to make allotments for open space. But, developers circumvent this law by subdividing their lands into parcels smaller than a hectare, and then attaching individual titles to each parcel. This explains the absence of recreational open spaces in about 35 barangays.

Existing open space policies therefore do not assure an equitable distribution of public open spaces within the city. Results of the assessment show that most public open spaces of city-wide significance such as the Quezon Memorial Park and the Ninoy Aquino Parks and Wildlife Nature Center are located in District 1 while District 2 has the most number of neighborhood parks and playgrounds with

limited public accessibility. District 2 however, has the most number of informal settlements and the biggest squatter population. Most of the residents, if not all, are not served by any public open spaces such as neighborhood parks and playgrounds.

Unless the city expands its views on the concept of open space in order to clearly define a comprehensive open space policy, it would seem that efforts to protect, conserve, and develop such a resource would be futile. In the face of competing demands on limited urban land and rampant encroachments on potential open space reserves such as drainage corridors, utility easements, and existing open spaces such as the U.P. Arboretum and the La Mesa Reserve, open spaces in Quezon City will always be in constant threat. Squatter encroachment on the city's drainage corridors such as river easements is so rampant in Quezon City that these open spaces have become unavailable for development as potential recreational venues.

Implementing Policy Recommendations

In 1990, the city's concern for open space was underscored through the creation of the Parks Development and Administration Department (PDAD). The PDAD was tasked to formulate plans and programs for the improvement of open spaces in the city. Since its inception, however, the agency has not received adequate financial support to implement its programs and projects. Budgetary allocations reveal that from 1992 to 1997, the bulk of PDAD's financial resources was actually concentrated on personnel services rather than on capital outlay (Figure 2). Moreover, the PDAD has been concentrating more in the planning, development, and maintenance of open space within residential subdivisions as well as in-city greening efforts, without venturing into city-wide open space planning.

According to the PDAD, its performance has been hamstrung by budgetary constraints which disables it from implementing most of its programs and projects. Also, it is constrained by limited technical expertise in open space planning. As to monitoring, PDAD finds it impossible to closely monitor on a regular basis more than 900 parks and playgrounds throughout the city. It concedes the low priority given to the development and maintenance of the city's open space which partly explains why the department responds to problems like encroachments when they are only reported. In any case, public tolerance or lack of initiative to report encroachments continually put to test PDAD's efficiency and productivity in performing its far-ranging tasks. In 1995, the City Planning and Development Office (CPDO) carried out the formulation of a Comprehensive Parks and Open Space Development Program. Considered as a first of its kind, the plan essentially crystallized the city's open space policies and programs which seek to address the urgency of providing adequate open spaces through conservation and development for the health and welfare of the population (Quezon City Planning and Development Office, 1995).

Although its policy framework included goals and objectives as well as strategies and programs, the Open Space Development Program has yet to be approved for implementation by the Mayor's Office. In the meantime, it is currently being refined to make it consistent and compatible with the city's Comprehensive Development Plan. Both plans, conceived in 1995, are still awaiting official approval.

An examination of the open space plan of the city revealed the following:

- The inventory of the city's open space resources includes only existing open spaces.
- Its accounting was based on a limited view of open space—its types and classification. Because of the limited parameters used in identifying, recording, and classifying open spaces, no new open space types are added to the existing open space reservoir of the city.
- The proposed strategies and programs are generic, not site specific, and seem to be limited to greening, upgrading, and maintenance of neighborhood parks and playgrounds.
- Among its recommendations is the identification of all areas designated as open space for program implementation.

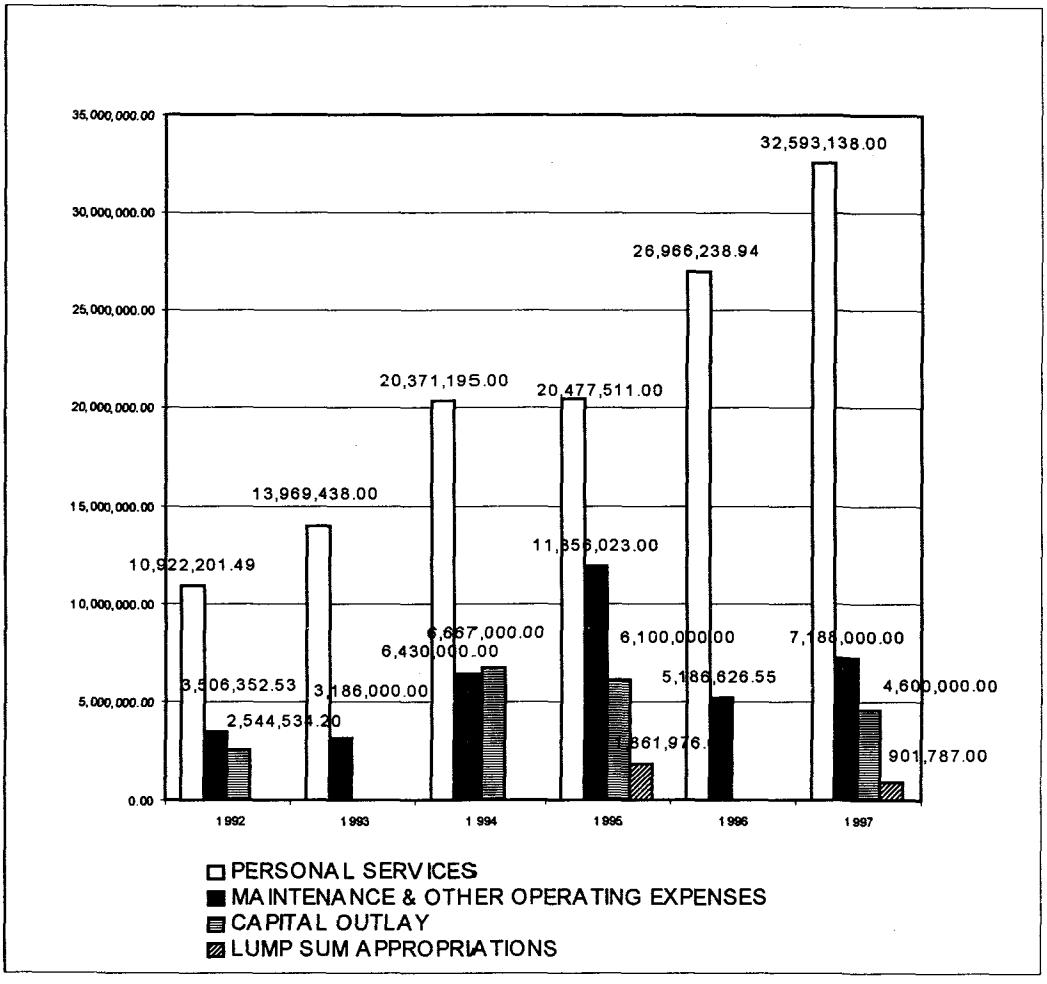

Figure 2:
Approved Budget from Cy 1992 – 1997
Parks Development and Administration Department

- The plan did not make any reference to the proposed Comprehensive Development Program of the city.

Although based on the city's policy to preserve and develop its open space resource, the open space plan is not feasible because it was not conceptualized within a broader plan– the Comprehensive Development Plan. Even if the broader plan has yet to be approved, there must be some linkages and consistency in terms of programs and strategies between the two plans.

A cursory examination of the proposed Comprehensive Development Plan revealed an emphasis on city-wide greening programs and the maintenance of the existing open space reservoir. In the mean time, no concrete measures were suggested to conserve existing open space elements such as drainage corridors, vacant lands, and utility easements from illegal encroachments or to develop more open spaces of city-wide significance.

Although the city's open space plan identified the need for more open space for city-wide use, it did not recommend any new developments of this nature. Moreover, it did not identify strategies to develop public open spaces to serve areas without such provision. Neither did the plan expand its open space classification system nor suggest parameters that could be of use for future planning.

In 1997, the Office of the City Mayor enacted Executive Order (E.O.) No. 8 in order to address the problem of random conversion of open space into built-up areas. An ad hoc Committee on Open Space was then created to set the guidelines for the treatment and disposition of the city's open spaces. The E.O., which is based on the policy of the city to preserve its natural environment, was in effect expressing the city government's commitment to protect its open spaces against rampant squatter and building encroachment. Aside from parks and playgrounds, it also identifies creeks and rivers as parts of its open space reservoir.

Although the 1995 open space program of Quezon City is still awaiting approval, some of its recommendations are already being implemented. Among these are the greening of main thoroughfares and side streets, and the reforestation of parks, playgrounds, and other public areas. These activities are being undertaken by the PDAD.

Open Space Trends of Quezon City

Table 1 shows that from 1972 to 1995, open space growth in Quezon City was maintained at less than two percent of the total land area of the city. This, however, may not be an entirely accurate picture of the city's open space resources. Although the city takes pride in its open spaces, these have not been developed fully to meet the needs of a growing population. Throughout the years, the city likewise has relied on the private sector to provide for this urban essential through subdivision and building developments. These developments have contributed to the city's open space reservoir.

An examination of Table 1 reveals that the sudden increase in the city's open space reservoir in the proposed land use plan was due primarily to the inclusion of the La Mesa Reserve under the parks/recreational category. The city has yet to arrive at a comprehensive definition of open space to classify potential open spaces such as institutional open space, open space around buildings, cemeteries, vacant land, and ecologically sensitive areas.

Using the definition of open space as a functional land use serving a vital purpose in classification and planning, the city's open space resources include, among others, the following:

- All parks and playgrounds.
- La Mesa reserve.
- Faultline easements.
- Open space distributors such as waterways, creeks, rivers, and other water channels and utility easements.
- All penetrants such as the U.P. Arboretum and green wedges such as golf courses, urban forests in between buildings and residential developments.
- Centerpieces such as U.P. Campus, Ateneo Campus, and Miriam College.
- Landmarks such as the Quezon Memorial Circle.
- Strip buffers and corridor separators such

Table 1: QUEZON CITY COMPARATIVE ACTUAL LAND USE ALLOCATION
(1972, 1985, 1995, Proposed 1997 Land Use Plan)

LAND USE	1972 (HAS)	%	1985 (HAS)	%	1972-1985 INC/DEC	1995 (HAS)	%	1985-1995 INC/DEC	PROP. LUP (1997)	%
Residential	3370.64	21.07	5582.60	34.89	2211.96	5007.09	31.30	-575.51	8102.74	50.64
Commercial	129.89	0.81	388.48	2.43	258.59	484.32	3.03	95.84	1818.43	11.36
Industrial	261.96	1.64	662.08	4.14	400.12	708.57	4.43	46.49	1076.87	6.75
Institutional	537.59	3.35	801.22	5.00	263.63	824.23	5.15	23.01	1528.87	9.55
Parks/ Recreational	169.54	1.06	142.56	0.89	-26.98	160.99	1.01	18.43	2872.22	17.95
Utility	69.54	0.43	138.66	0.87	69.12	193.18	1.21	54.52	216.70	1.35
Cemetery	31.65	0.20	48.68	0.30	17.03	61.92	0.40	13.24	61.92	0.39
Military	212.78	1.33	210.46	1.32	-2.32	225.58	1.41	15.12	0.00	0.00
Squatters						795.42	4.97		0.00	0.00
Vacant	8642.91	54.02	5451.76	34.07	-3191.15	4965.20	31.00	-486.56	0.00	0.00
Socialized Housing							0.00		323.16	2.01
TOTAL URBAN AREA	**13426.50**	**83.91**	**13426.50**	**83.91**		**13426.50**	**83.91**		**16000.91**	**100.00**
TOTAL RES.	2574.41	16.09	2574.41	16.09		2574.41	16.09		0.00	0.00
TOTAL	16000.91	100.00	16000.91	100.00		16000.91	100.00		16000.91	100.00

Source: CPDO, 1997

as rights-of-way which can sufficiently provide green space for separating and buffering.

To rationalize these elements into a functional and orderly system, the element of continuity of an open space system should be provided by linkages. Open spaces that provide continuity such as major routes and waterways should be used to connect and give access to green and utility open spaces. The city's linkages may also include plazas and landmarks such as the Quezon Memorial Circle as well as other focal points or areas which fix, locate, or join the elements of the open space system.

To further enhance the ecology of the city, open space that serves as breaks into development such as green wedges (i.e. U.P. Arboretum, Parks and Wildlife Nature Center, and urban forests) and open space areas extending from a linear system (i.e. golf courses, La Mesa Reserve) could serve as the city's true breathing space and provide a balance between the man-made and natural elements of the urban environment. These spaces should provide variety and contrast to the urban landscape.

Furthermore, the city's greenbelt could be centered on its sprawling institutional campuses (i.e. U.P. - Ateneo - Miriam College) where building development should be limited. This greenbelt area could be used for multi-purpose activities and provide an alternative setting for outdoor recreation. The city's river, utility, and faultline easements could serve as greenways that link up with other elements of an open space system. Lastly, the major highways of the city could provide green space use for separation and buffering. All these elements of an open space system already provide the skeleton form that can string together otherwise disjointed and unrelated built-up areas within the city.

FUTURE DIRECTIONS FOR PLANNING

This study recognized the importance of open space as an essential resource and land use that contributes to the over-all improvement of the urban environment. In Quezon City, it cannot be denied that certain issues and concerns have to be addressed in connection with the protection, conservation, and development of its open space resources, especially in the face of competing demands on limited urban land supply.

Foremost is the local government's lack of appreciation and understanding of the concepts of open space. With some notable exceptions, open space is still generally treated as a residual land use after other urban development demands have been met. Open space is and should not be treated as a residual use of land, but as a vital component of the urban environment that serves many irreplaceable functions.

An open space system viewed on equal footing with other land uses is needed to prevent ill-advised or destructive development and to ensure a more liveable environment. Elements of the city's open space system threatened by encroaching urban development need immediate protection. Urban development and open space development must be linked together or integrated through planning that is based on appropriate policy-making process for urban development.

Change is inevitable. As gleaned from its proposed land use plan and zoning map, Quezon City will be further converted into a highly-built up city with commercial districts lining almost all of its major thoroughfares in the coming years. However, subdivision development is expected to slow down.

As pointed out, the significance of open space in Quezon City's urban development, since the inception of its 1949 Master Plan, became muted over the course of time. This was aggravated further by changing government priorities and policies pertaining to Quezon City's urban development. After the 1949 Plan of Quezon City, there has been a lack of a clearly-defined policy framework that guides local government actions and responses in protecting, preserving, and developing the city's open space resources. At best, the city's policy actions towards open space conservation or expansion have been sporadic and haphazard. At worst, they have not been consistent with the original vision for Quezon City.

Today, as population increases, the city government has realized, that its reservoir of open spaces, especially in residential subdivisions, is threatened by the encroachments of building developments and informal settlements. If pursued vigorously, E.O. No. 8 should be able to address the growing problem of illegal conversion of open spaces. This has to be complemented, however, with a well-defined policy framework that will establish the importance of open space conservation and development within the context of the city's long-term growth and development. Such a policy framework should guide the city government in its planning and implementation efforts.

Towards this end, an appropriate open space plan for the city should also be formulated to alleviate, if not improve, present open space conditions. It is essential that such a plan must be linked to, if not anchored on, the city's comprehensive development plan and zoning ordinance. The open space plan should establish appropriate planning parameters to redefine and delineate the city's open space resources, both existing and potential. The plan should also recommend measures, fiscal and non-fiscal, to conserve and develop these resources on a sustained basis. Ultimately, what is good for the city should be based on what is best for the common good—the long-term health, welfare, and well-being of the city's constituents.

This study advocates the following suggestions and planning directions in which the primary consideration is the city government's support and commitment to attain its vision for Quezon City. The recommendations underscore the importance of a well-defined open space policy to ensure the conservation and expansion of the city's open space resources. An overall framework of open space conservation and development, including relevant parameters, is therefore recommended as follows:

1. *Develop an essential framework for policy* making. As earlier pointed out in this study, open space is an essential component of sound urban planning. The suggested framework — Process of Urban Development Policy-Making — guarantees that open space is given its proper place in the planning process. This entire process is fully explained in the section on the planning of an open space system.

2. Before a set of assessment criteria can be developed, it is first necessary for the city to determine, record, and classify all of its open space resources, both existing and potential. Based on a cursory examination of Quezon City's physical resources, a broad classification of open spaces is recommended:

   I. Open space for managed resource production
      - Lands for water supply such as ground water recharge areas, watershed areas, and reservoir sites.
      - Energy production and transmission easements.
      - Easements of water supply and distribution systems.

   II. Open space for the preservation of natural and human resources.
      - Water courses such as rivers and creeks.
      - Urban forests and animal refuge such as the U.P. Arboretum.
      - Geologic features such as fault zones.

   III. Open space for health, welfare, and well-being
      - Land to protect the quality of *groundwater.*
      - Open space for disposal (i.e. garbage, etc.).
      - Open space to improve air quality.
      - Areas for recreation such as:
        - Neighborhood parks and playgrounds.
        - Community parks.
        - City-wide parks.
        - Campuses and other institutional facilities that provide recreational values.
        - *Walks, trails, tracks for* hiking, jogging, riding and bicycling.
        - Roads and highways providing scenic views.
        - Golf courses and fields for outdoor recreation.

- Areas that provide visual amenity:
  - Hillsides, lakes, lagoons, etc. that provide visual and physical relief to the built-up or man-made landscape.
  - Centerpieces such as courts, patios, parks, natural and man-made landmarks.
  - Golf courses and outdoor sports facilities.
- Open space to shape and guide development
  - Open space that provide neighborhood, district and city identity.
  - Open space that serve as separators or buffers between conflicting land uses such as greenbelts, greenways, corridor separators, strip buffers, and area buffers.
- Open space for public safety
  - Flood control reservoir, flood prone areas, and drainage channels.
  - Easements of rivers, canals, creeks and other water bodies.
  - Power transmission line routes.
  - Water distribution and aqueduct routes.
- Open space for urban expansion
  - Open space around commercial, residential, and industrial areas including vacant lands, cemeteries, etc.

A comprehensive inventory of existing and potential open spaces should consider those which are publicly owned as well as those privately held as part of an open space plan. The total open space system may be a composite of public and private land used for open space purposes and protected against encroachments and permanent damage.

Location, distribution, accessibility, type, size, and density of use of open space must be among the parameters in planning the city's open space system. They take into account population density and distribution, recreational needs per district, and the distribution of existing open spaces within the city, among others. The city's reservoir of open space must be developed with emphasis on linkage and continuity. Priority of use as a parameter should determine the hierarchy or relationships among various open space elements within the system.

As much as possible, the city's open spaces should serve multiple purposes or in a way where they can be put to multi-use in relation to non-open space uses. To get the maximum benefits from open spaces, sites that serve more than one function are preferable. For example, the preservation of river banks and utility easements will assure the integrity of the natural drainage way, provide recreation areas if appropriate rights are acquired, protect urban development, and afford visual relief from the urban scene. Furthermore, roads and highways should be integrated into the overall open space program of the city, so that efforts to 'green' them through plantings or as buffers would enhance the overall open space system.

The city should consolidate all enactments, policy statements, executive pronouncements, plans and programs, and others that are directly relevant to open space development and conservation in order to serve as the legal basis of future planning and administrative actions. Also, the Building Code should be carefully re-examined to introduce innovative approaches so that building developments can become essential units of the open space system.

All open space elements presently existing in the city such as Quezon Memorial Circle, Parks and Wildlife Nature Center, the U.P. Campus, Ateneo de Manila, Miriam College, the La Mesa Reserve, the Balara Reserve, cemeteries and memorial parks, golf courses, and others should be declared as part of the city's open space resources. Towards this end, the city government should initiate a policy of cooperation, collaboration, and assistance to all the entities involved, so that future actions pertaining to these open space resources could be monitored or guided by specific rules and regulations.

A campaign to educate the public, particularly Quezon City residents, should be undertaken to increase their awareness. Residents can serve as guardians or watchdogs to protect, conserve, and promote the expansion and development of open space for public use. For instance, in Paris, France, people are made to be aware that each tree is considered an essential part of the city's assets. Trees should, therefore, be inventoried individually and be considered as the responsibility of the city and the property owner in order to ensure that they are not irresponsibly cut down.

By no means is all of the city's land reservoir needed or suitable for urban development. It is clear that urban development should not occur in flood prone areas, rivers and drainage systems, and in natural areas needed for educational or recreational purposes. Although development has occurred and continues to occur in these locations, this can be prevented in the future through the adoption and implementation of a long-term city-wide open space plan anchored on a broader plan for the city.

The preservation of open space in Quezon City is needed because of the following reasons: to protect and preserve its natural drainage corridors and waterways, its flood-prone areas, existing parks and playgrounds, and recharge areas; to make optimum use of its remaining vacant spaces in order to ensure a quality environment for living; to provide suitable space and appropriate sites for the recreational needs of its present population and that of the future; and to provide a socially-desirable environment for all its constituents by assuring that natural and significant open spaces shall be interspersed throughout the urban area through an appropriate open space system, thereby avoiding a pattern of unbroken urbanization.

Although facilities such as golf courses and country clubs should be part of the city's open space system, they cannot be used to satisfy public recreational open space needs due to the limited nature of their membership and use. The city government should therefore see to it that the development of more public open spaces are encouraged for the benefit of the majority of its inhabitants.

Lastly, potential areas for further research for the benefit of cities, urbanizing municipalities as well as metropolitan areas such as Metro Manila are suggested by the following questions:

1. What are the costs and benefits to the local government of a comprehensive open space plan? How much public investment is needed in implementing an open space system?
2. How can an open space system be operationalized in Quezon City?
3. What methods or techniques of preserving open spaces are appropriate in Philippine context? What are the fiscal and non-fiscal measures that can be adopted to implement an open space system?
4. What kind of open space system is suitable or appropriate in a heavily built-up city like Manila?
5. What are the preferred recreational activities of Quezon City's inhabitants?
6. How can recreational and non-recreational open spaces be measured or planned for?
7. What kind of public environment or urban landscape do the constituents of Quezon City envision?
8. What open space classification system is appropriate for Quezon City?
9. What are the existing and potential open space resources of Quezon City? What kind of open space system can be formed given the city's open space resources? What types of open spaces, single or multiple, can be formed to constitute the city's open space system?
10. How much monetary value of property stems from an improved open space system? Does the presence of specific open space elements raise the desirability of a commercial or residential area in any quantifiable way?
11. What are the evidences to show that open spaces have a positive effect upon the mental health and emotional well-being of human beings?
12. How do people in Metro Manila spend their recreation and where? How much recreational open space is needed by Quezon City?

13. What sort of activities can be encouraged in an open space like La Mesa Reservation?
14. How much airshed is needed to cleanse the air within Metro Manila?
15. What microclimatic changes would occur within the U.P. Arboretum if the University of the Philippines pushes through with the development of its Commonwealth property?
16. How can open spaces be used to restructure the form or pattern of development of Quezon City to improve the overall urbanscape of the city?
17. What kind of open spaces can be developed under the mass railway transit system? Along a fault line? Along power transmission easements? Along water distribution easements? Along canals and creeks?
18. What kind of open space system can be developed within Metropolitan Manila and its suburbs? What should be the planning parameters?
19. Does the presence of green open space heighten environmental awareness of people which is then reflected in the value they place upon such a resource?
20. How much recreational value does the University of the Philippines in Diliman provide for the benefit of Quezon City? How can the open spaces of U.P. Campus be optimized to serve the recreational needs of Quezon City's constituents?
21. How much green open space should there be within an area's open space system? How much should be conserved or protected to be able to have a beneficial impact on a given population?
22. How can an open space system approach be successfully adopted to improve the environment in urban areas?

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GLOSSARY OF PLANNING TERMS

Ancestral Lands	– all lands exclusively and actually possessed, occupied, or utilized by indigenous cultural communities by themselves or through their ancestors in accordance with their customs and traditions since time immemorial, and as may be defined and delineated by law.
Areas of Critical Environmental Concern	– areas where uncontrolled development could result in irreparable damage to important historic, cultural, or aesthetic values or natural systems or processes of national significance.
Critical Watershed	– a drainage area of a river system supporting existing and proposed hydroelectric power and irrigation works needing immediate rehabilitation as it is being subjected to fast denudation causing accelerated erosion and destructive floods. It is closed from logging until it is fully rehabilitated.
Ecology	– that branch of science that deals with the study of the interrelationships of living things (organisms, plants and animals) and their environments.
Ecosystem	– the ecological community considered together with non-living factors and its environment as a unit.
Forest Lands	– lands of the public domain which have not been declared as alienable or disposable, public forests, permanent forests or forest reserves, forest reservations, timberlands, grazing lands, game refuge, and bird sanctuaries.
Human Settlements	– the habitat or built environment of human beings encompassing both rural and urban areas where man settles himself to live.
Indigenous Cultural Communities	– Filipino citizens residing in the Autonomous Region who are:1) Tribal peoples whose social, cultural and economic conditions distinguish them from other sectors of the national community and whose status is regulated wholly or partially by their own customs or traditions or by special laws or regulations; and 2) Bangsa Moro people regarded as indigenous on account of their descent from the populations that inhabited the country or a distinct geographical area at the time of conquest or colonization and who, irrespective of their legal status, retain some or all of their own socioeconomic, cultural and political institutions.
	– the minority groups as defined by the United Nations Subcommission on Prevention and Protection of Minorities, those non-dominant groups in a population which possess and wish to preserve stable ethnic, religious or linguistic traditions or characteristics markedly different from those of the rest of the population. As strictly applied to the Philippines, it refers to those who are somewhat outside the orbit of the Hispanic Christian culture which has characterized the majority of inhabitants of the Philippines.
Inland Water	– an interior body of water or watercourse such as lakes, reservoirs, rivers, streams, creeks, etc. that has beneficial usage other than public water supply or primary contact recreation. Tidal affected rivers or streams are considered inland waters for purposes of effluent regulations.
Irrigated Areas	– lands which are artificially provided with water to enhance or increase agricultural production.
Irrigated Lands	– agricultural lands which are supported by irrigation services.
Kaingin	– a portion of the forest land, whether occupied or not, which is subjected to shifting and/or permanent slash-and-burn cultivation having little or no provision to prevent soil erosion.
Local Government Unit	– a political subdivision of a nation or state which is constituted by law and has substantial control of local affairs.
	– a political subdivision of a nation or state which is constituted by law and has substantial control of local affairs, with officials elected or otherwise locally selected. In the Philippines, it refers to provinces, cities, municipalities, and barangays.

National Integrated Protected Areas Systems (NIPAS)	– the classification and administration of all designated protected areas to maintain essential ecological processes and life-support systems, to preserve genetic diversity, to ensure sustainable use of resources found therein, and to maintain their natural conditions to the greatest extent possible.
National Park	– a forest land reservation essentially of primitive or wilderness character which has been withdrawn from settlement or occupancy and set aside as such exclusively to preserve the scenery, natural and historic objects, and wild animals or plants therein, and to provide enjoyment of these features in such a manner that will leave them unimpaired for future generations.
Neighborhood Playground	– a place designed to serve children under 14 years of age, and may have additional interesting features to attract teeners and adults. Its location is in some neighborhood park school.
Open Space	– areas allocated for the following purposes: circulation, community facilities, park/playground, easements, and courts. – areas for recreation; preservation/conservation, ecology and as tools to enhance and control urban growth; an area reserved exclusively for parks, playgrounds, recreational uses and other similar facilities and amenities.
Park and Playground	– that portion of the subdivision which is generally not built on and intended for passive or active recreation. – a type of center piece open space which may range from neighborhood to city/municipality park which cater to the recreational needs of the residents of the community.
Playlot	– a safe recreation and play area designed for the pre-school children. It is usually located in densely populated areas with high concentration of pre-school age group and with a service radius of 0.25 kilometers from every home and commonly located on playground sites.
Primitive Tribe	– a group of endemic tribe living primitively as a distinct portion of a people from a common ancestor.
Protected Area	– identified portions of land and water set aside by reason of their unique physical and biological significance, managed to enhance biological diversity and protected against destructive human exploitation.
Protected Landscape/ Seascape	– area of national significance which is characterized by a harmonious interaction of man and land while providing opportunities for public enjoyment through recreation and tourism within the normal lifestyle and economic activity of these areas.
Public Way	– any street, alley or other strip of land unobstructed from the ground to the sky, deeded, dedicated or otherwise permanently appropriated for public use.
Resource Reserve	– an extensive and relatively isolated and uninhabited area normally with difficult access designated as such to protect natural resources of the area for future use and prevent or contain development activities that could affect the resource pending the establishment of objectives which are based upon appropriate knowledge and planning.
Strict Nature Reserve	– an area possessing some outstanding ecosystem, features and/or species of flora and fauna of national scientific importance maintained to protect nature and maintain processes in an undisturbed state in order to have ecologically representative examples of the natural environment available for scientific study, environmental monitoring, education, and for the maintenance of genetic resources in a dynamic and evolutionary state.
Watershed	– a land area drained by a stream or fixed body of water and its tributaries having a common outlet for surface run-off.
Watershed Reservation	– a forest land reservation established to protect or improve the conditions of the water yield thereof or reduce sedimentation.
Water Zone (WZ)	– bodies of water within cities and municipalities which include rivers, streams, lakes, and seas except those included in other zone classification.

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