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## Integrating Environmental Concerns into Rural Planning: The Case of the IRAP\*

Iminungkahi ng mga awtor ang pagsaalang-alang sa mga lokal na kondisyong pangkapaligiran sa pagpapalano para sa aksesibilidad ng mga serbisyo/pasilidad para sa rural na populasyon. Binigyang-pansin ang potensyal ng mga lokal na pamahalaan sa paglikha ng naturang plano dahilan sa ilang batas tulad ng *Local Government Code*. Nagbigay rin ng konkretong panukala sa pamamagitan ng IRAP kung saan may mga hakbang para sa integrasyon ng mga salik pangkapaligiran sa pagpapalano.

### **Background and Overview**

The Integrated Rural Accessibility Planning (IRAP) project evolved out of the desire of development planners to rectify the seeming ineffectiveness of government attempts to bring about meaningful development in the Philippine countryside. The IRAP is a local level planning tool which views difficulty of "access" of rural residents to basic goods and services as a fundamental development obstacle. If accessibility is considered as an important development parameter, it follows that measurement of the degrees of access of people to such

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goods/services could be used as a springboard in identifying and prioritizing appropriate interventions.

Developed in the country through a collaboration between the International Labour Organization (ILO) and the Department of Interior and Local Government (DILG), IRAP was premised on the increased autonomy granted to local government units (LGUs) by the 1991 Local Government Code, and was designed to augment existing local development planning practices. The key features of the IRAP which make it easily adaptable to the local level are:

- i* it generates data (on degrees of access) at the household level;
- ii* it is comprehensive (covers all sectors: economic, social and physical);
- iii* it is integrated having cross-sectoral analysis in projects identification; and,
- iv* it is simple.

This short discourse, however, is not so much about IRAP procedures but on the need to consider the environmental perspective in the process of planning for rural accessibility. The currency of environmental awareness on a global scale necessitates the integration of environmental issues/concerns within the standard IRAP training program.

The term environment may be viewed from various perspectives, to wit:

*Economic Perspective:* the environment is a kind of natural asset or non-reproducible capital good that produces a stream of economically valuable direct and indirect services for man;

*Tangible Perspective:* environment refers to air, water, mineral, fuels, food materials, etc;

*Intangible Perspective:* the term refers to scenic views, recreation, amenities, etc; and,

*Ecological Perspective:* in the structure of the ecosystem , environment pertains to the abiotic or the non-living, chemical and physical factors. These include light, temperature, water, wind, chemical nutrients, pH (acidity), salinity, among others.

Thus, environment, as used in the ecological sense, refers only to the physical and non-living aspects of the ecosystem. What is implied, however, is its symbiotic relationship with living organisms. These varying perceptions lead to a clearer understanding of the important functions of the environment. These refer to the views which regard the environment as: (i) a provider and source of materials and most resources which man uses to satisfy his wants and needs; (ii) a natural mechanism for absorbing and filtering the pollutive by-products of man's activities (simply, this highlights the purifying and assimilative qualities of the environment by absorbing and rendering harmless — over the long run — the otherwise deadly effects of pollution); and (iii) an intangible natural resource which provides aesthetic and recreational opportunities.

It is evident from the foregoing that while the term environment is easy to describe, it is very difficult to define. However, it is not lack of awareness of the phenomenon that makes definition difficult; rather, it is awareness of additional problems which may arise as one tries to impose bounds on the meaning of the concept which makes the activity formidable.

## **The Concern for the Environment**

Ecologically, man is an integral part of his environment. In the interaction between organisms and the physical or non-living factors, man finds himself in the midst of complex interactions with both components of the ecosystem.

While unable to label such phenomena, traditional societies recognize their dependence on their ecosystem for survival. They know that there exists functional relationships between man, plants, animals and the abiotic factors which bind them together into one unit called ecosystem. The majestic terracing of Mt. Banaue in Ifugao is an example of careful management to avoid erosion in high rainfall areas and, at the same time, to make full use of the abundant water for the cultivation of rice. Traditional societies believe that any interruption in the harmonious relationship between man and his environment may result to physical or environmental backwash.

Today, through modern technologies, profitability of exploiting the natural resources have changed people's attitudes towards their environment from immanent to a transcendent ones (i.e., people are distancing themselves from their ecosystems). As a substantial number of individuals benefitted, more importance was attached to material wealth. To support such lifestyles, vast amount of capital and natural resources have been appropriated. As a result, massive environmental degradation set in: forest denudation, air pollution caused by drastic increase in number of vehicles, groundwater contaminations, food contamination due to pesticides, and loss of species, among others.

The apparent lack of ecological consciousness among most people today is leading to the disruption of the life-support functions of the environment. The present levels of environmental degradation have already reached crisis proportions in the Philippines. If this persists in the next 10 to 30 years, quality of life will consequently deteriorate as air and water, natural environments, and wild species are increasingly despoiled. More and more people will become environmental refugees as depleted soil, contaminated water and other resources no longer support productive livelihood.

The present concern for the environment should, thus, be viewed not for its own sake, nor to merely highlight man as a

major cause of its degradation but, rather, in relation to the broader concept of development-- that is, how one relates to and is influenced by the other.

It has earlier been implied that development is not synonymous with growth. The former must ultimately be concerned with the well-being of the people, something which the latter alone cannot ensure. Revisions to traditional assumptions of development has, therefore, undergone drastic changes and it is becoming clearer that development issues cannot be divorced from environmental issues. This is so since many processes of development occur at the expense of the resource base which, in the long run, can undermine economic advancement.

This does not mean that we should curtail growth in the name of environmental conservation for development is a universal and integral part of humanity. The need, however, for balancing our demands for growth with the requirements of the natural functions of the ecosystem takes center stage and has been simplified to mean sustainable development, a concept which follows a basic principle of inter-generational equity.

Although policies and other legal measures have been initiated by the government in order to immediately address the growing concerns on environmental quality such as the adoption of the Philippine Strategy for Sustainable Development (PSSD), there are still other important aspects of environmental management which requires immediate action by the state. However, these policies and government pronouncements must be translated into operational forms if they are to become effective tools in protecting the environment.

### **Philippine Environment: Trends and Status**

From a general conception of the importance of the environment vis-a-vis human survival, attention shifts to a brief overview of the status and trends of the Philippine environment

### Forestry

It has been estimated that there are about 6.16 million hectares or 20.53 percent of the total land area still under forest cover. Virgin forests account for less than one million hectares. This is a far cry from the 1972 figure of 10.4 million hectares of natural forest out of a total land area of 30 million hectares. Despite the dwindling areal coverage of the forest, this sector contributed about P38.5 billion from 1972-1990 (i.e. annual contribution is estimated to be P2.03 billion). In the past, wood industry was the country's third dollar earner with logs, lumber, veneer and plywood as top export products. But in 1990, forestry share to GNP went down to just 1.1 percent from 3.6 percent in 1972.

In the Master Plan for Forestry Development, it has been projected that there will be shortage of wood and other wood products by the year 2000. Experts reveal that this condition is primarily due to massive forest destructions caused by shifting cultivation, illegal logging, forest fires, pest and diseases, and conversion of forests into agricultural and residential lands.

From 1980 to 1989, a total of 252,649 hectares of forests were destroyed of which 182,476 hectares were due to forest fires, 28,783 hectares to logging, 29,891 hectares due to kaingin and 2,382 hectares due to pests and diseases.

More recently, the DENR has estimated that for the past two decades, forest destruction has averaged at 200,000 hectares per year. Logging (both legal and illegal), forest fires, kaingin, political and military interventions, and mining operations are identified as the major causes of the destruction. It similarly cites that out of the approximately 80 provinces nationwide, 22 are badly eroded, the prominent ones being Batangas, Cebu, Marinduque, La Union, Ilocos Sur, Batanes, Rizal, Masbate, Capiz, Samar, Leyte, Iloilo and Bohol.

### Minerals

In 1988, it was estimated that 31.65 billion metric tons of mineral ores were mined in the Philippines. Of this, 6.36 billion metric tons were classified as metallic, 66 percent of which were gold and copper ores. About 25.29 billion MT of non-metallic ore resources were also found in the country. Although a major dollar earner, the mining industry has caused serious environmental problems such as the following:

- i* Mine wastes and tailing disposal;
- ii* Siltation of agricultural lands;
- iii* Mercury and cyanide pollution from small-scale gold miners; and,
- iv* Dust pollution generated by cement plants.

### Agriculture

In 1991, the country had a total agricultural lands of 9.7 million hectares. Data reveal, however, that although agricultural land areas have been increasing up to the late eighties, the per capita share has consistently decreased. Moreover, there has been a decreasing rate of agricultural land expansion. Other problems in the agricultural sector include:

- i* Population growth pressure vis-a-vis finite agricultural lands;
- ii* Conversion of agricultural lands into non-agricultural uses;
- iii* Lack of security of tenure in the uplands forcing farmers to adopt non-conservation measures;
- iv* Almost 50 percent of total agricultural lands being subjected to moderate-severe erosion; and,
- v* Heavy use of chemicals resulting in degradation of soil quality and pollution of water bodies.

### Protected Areas

The territorial ecotypes in the Philippines are highly diverse. For instance, approximately 3,000 of about 8,000 species of flora are tree species. On the other hand, about 2,500 species of fauna excluding insects and invertebrates are found on its islands. Of the 2,500 species, 196 are mammals, about 950 to 975 species are reptiles and a similar number of species and sub-species are birds. Issues and problems attendant to protected areas are as follows:

- i* Majority of protected areas in the Philippines having no management plans;
- ii* Inadequate policies and laws covering such resources;
- iii* Lack of baseline data on their biological and ecological distribution, population dynamics, utilization and conservation status;
- iv* Indiscriminate logging; and,
- v* Trade in wildlife products.

### Coastal and Marine Resources

The coastal zone covers a total area of about 11,000 square kilometers of land and 267,000 square kilometers of coastal waters. About 70 percent of the 1,525 municipalities in the Philippines including 10 of the largest cities, are found along the coast. Coastal resources include mangrove, fisheries, seagrass beds and coral reefs.

The most alarming causes of coastal ecosystem depletion are the following:

- i* Massive conversion of mangrove areas to fishponds, urban and other uses. Five thousand to 3,500 hectares per year were converted from the 1970s up to 1987;



- ii Destruction of coral reefs due to siltation, natural calamities, destructive fishing practices, collection of corals for decorative purposes, and industrial and agricultural pollution;
- iii Overfishing;
- iv Outbreaks of red tide proving costly for the fishery/shellfish industry;
- v Squatting which contributes to the pollution of coastal waters; and,
- vi Uncontrolled development of beach resorts.

### Freshwater Resources

The country's freshwater resources include all inland bodies of water such as lakes, rivers, reservoir, swamplands and fishponds which covers 569,600 hectares. But due to rapid population growth and unmanaged urban development, river systems in Metro Manila have become polluted due to poor sewerage disposal practices, garbage generated by the general public, and industrial wastes. Salt water intrusion has also affected about 480,902 hectares most of which are located in Cagayan, Bulacan and Cebu. Finally, most freshwater bodies do not have long term management plan to serve as blueprint for proper resource use.

### Urban Ecosystem

The period after the war saw massive reconstruction efforts in the Philippines, particularly in the main urban center of Manila. Two decades hence, economic growth ushered in a higher pace of urbanization with its concomitant environmental problems and ecological costs.

In the past 20 years, urban population continued to increase vis-a-vis total population. From 32 percent in 1970, urban population increased to 42 percent in 1990. The three most urbanized areas in the country are Metro Manila, Cebu

City and Davao City. By the turn of the century, Metro Manila will have a projected population of 11 million and a population density of about 17,000 persons/hectares making it one of the world's mega cities.

In tandem with the rapid growth of urban population are certain problems such as declining quality of urban environment. These include squatting and slum proliferation, pollution by toxic and hazardous wastes, flooding, and air and noise pollution. As a result, diseases related to declining environmental quality continue to increase.

### **Legislative Response to the Environmental Challenge**

By 1964, RA 3931 which created the National Water and Air Pollution Control Commission was passed. This was among the very first laws which directly addressed environmental issues in the country. Token funding and lack of punitive powers, however, made the body an ineffective mechanism for environmental protection.

The 1970s (particularly from 1976 onwards) saw the enactment of several environmental legislations. Among the significant ones was the adoption of the Environmental Impact Assessment (EIA) system. Briefly, the EIA system attempts to incorporate into development planning a management tool to assess the environmental consequences of specific projects. It does this by identifying possible impacts and provides measures to offset the adverse effects of such projects on the environment. Based on the law that institutionalized the system, there are either environmentally critical projects or other projects which are located within environmentally critical areas that are required to prepare environmental impact statements before the necessary permits can be secured from the government.

As this period was still the heyday of the Martial Law administration of Pres. Ferdinand Marcos, most laws were

undertaken via presidential fiat. Among the more important ones are included in the Appendix. [Note that the numerous department level policy directives (i.e., memorandum circulars and administrative orders) have not been included in the list].

More recently, RA 7586 or the National Integrated Protected Areas System (NIPAS) Act of 1992 calls for the establishment and management of protected areas as well as promotion of their permanent preservation. Also, the earlier cited 1991 Local Government Code (RA 7160) has refocused the orientation of LGUs with respect to their environmental responsibilities. The Code, for instance, has devolved the following responsibilities to the municipal governments.

- i* the utilization and conservation of municipal water resources;
- ii* the enforcement of fishery laws in municipal waters;
- iii* the conservation of mangrove resources;
- iv* the implementation of community based forestry projects and the management and control of communal forests with an area not exceeding 50 square kilometers;
- v* the establishment of parks, greenbelts and similar forest development projects; and,
- vi* the establishment of solid waste disposal systems and environmental management systems related to hygiene and sanitation.

On the otherhand, the provincial governments are tasked to do the following:

- i* putting up community based forestry projects such a barangay- or municipality-wide reforestation programs;
- ii* establishing communal forests with areas not exceeding 50 square kilometers each; and,

- iii* implementing laws protecting the environment as well as laws on pollution control and the small-scale mining law within the provinces' respective territorial jurisdiction.

Furthermore, according to the Code, the same powers over the environment that the province and the municipality have may be exercised by city governments.

Finally, it must not be forgotten that the Philippine constitution makes specific reference to its role vis-a-vis the environment. The most important feature of the 1987 constitution, which was absent in previous constitutions, is the fact that "the exploration, development and utilization of natural resources shall be under the full control and supervision of the state" (Sec. 2, Art. XII). Prior to the present constitution, the state only had regulatory authority over the environment (i.e., issuance of licenses, permits, leases, etc.). Other relevant provisions include: Sec. 16, Art. II (which speaks of the state's mandate to advance the right of the people to a balanced and healthful ecology); Sec. 4, Art. XII (which directs the state to protect forest resources); and, Sec. 6, Art. XII (which reiterates the social responsibility of property owners and implies the state's police powers).

### **The IRAP-Local Planning Process Interface**

The planning tradition in the country has had, relatively speaking, a brief history. Viewed as an important state function only in the past three decades or so, planning then was seen as a national concern with early attempts characterized by a highly-centralized system and a top-down orientation.

The activity has, however, slowly taken root with the creation of the then Human Settlements and Regulatory Commission (HSRC) under the Ministry of Human Settlements (MHS). It is now referred to as the Housing and Land Use

Regulatory Board (HLURB). By 1983, the concept of physical planning was explicitly recognized by way of a presidential Letter of Instruction (LOI). It was also during this time that technical assistance in town planning was being extended by the HLURB to individual municipalities.

The institutionalization of planning as an important development tool was hampered by the early tendency to view planning documents as end rather than means. With the passage of the Local Government Code (LGC) of 1991 and related directives, planning is beginning to be seen as a deliberate activity which serves as a development tool in an attempt to influence or otherwise attain an expressed goal/objective.

At present, the Philippines may still be characterized by the predominance of rural environments. Following the logic of the previous section, planning of/for rural areas, thus, implies improvement of living conditions which may loosely be defined as “development.” If such is held true, then it may be concluded that (rural) development—which is the ultimate goal of planning—is a normative concept which is people-focused. This has been recognized by the IRAP process.

### **The Local Government Code (RA 7160) and Local Level Planning Process**

The passage of RA 7160 has finally granted and enhanced administrative and fiscal autonomy of local government units (LGUs)—from the provincial level down to the barangay. While its enactment was a response to a constitutional provision on effective decentralization, the law has placed the burden on the respective LGUs to chart their own paths to development. With the devolution of a substantial amount of powers and increased responsibilities to their constituents, the urgency is there to assess the prescribed procedures and state of local capability to respond to the new challenges mandated by the Code

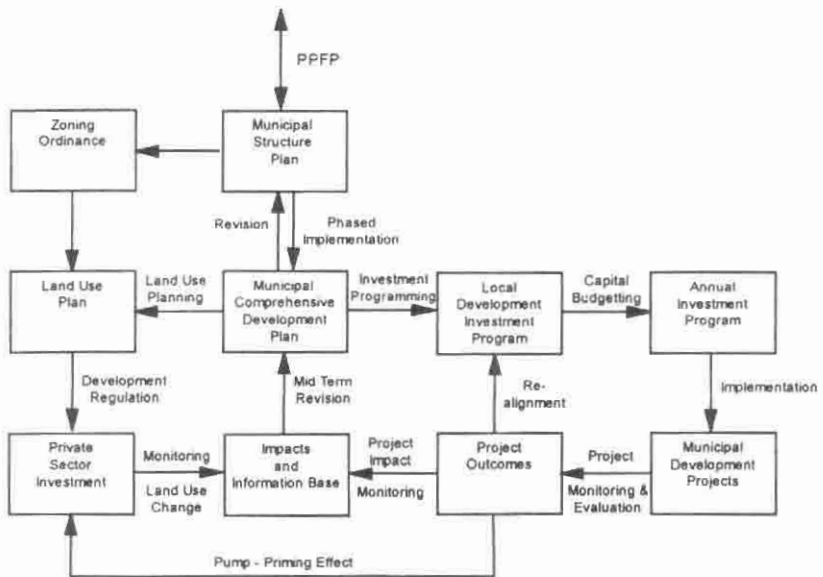
While the political structures of all levels of LGUs (i.e., provincial, municipal, barangay) and the organizational set-up of local bodies have remained virtually unchanged, a welcome addition to the local development planning procedure as contained in the Code is the mandated creation of the Local Development Councils (LDCs)—i.e., provincial, city, municipal and barangay. The respective LDCs are tasked with initiating the formulation of comprehensive multi-sectoral development plans with the assistance of a secretariat to be headed by the Planning and Development Coordinator and his staff, and headed by the Barangay Secretary in the case of the Barangay Development Council (BDC). The formulated plans are then submitted to the local sanggunian for appropriate action. Where feasible, lower level plans may be incorporated in the next higher level plans.

As contained in the Code, the composition of LDCs have changed with the enactment of RA 7160. The BDC has the Punong Barangay as chairman, all elected barangay officials, representatives of NGOs making up not less than 1/4 of the BDC, and a representative of the respective district Congressman. The MDC is headed by the Mayor with the members composed of all punong barangays, the chairman of the committee on appropriations of the Sangguniang Bayan, the congressman or his duly designated representative, and representative from NGOs making up not less than 1/4 of the MDC. The PDC mirrors the composition of the MDC except that the members are one political unit higher.

In the case of the municipal level, the planning and development system currently in operation (at least theoretically) is shown in Figure 1. The prescribed planning and development system at the provincial level, on the other hand, is indicated in Figure 2.

While the diagrams present the ideal horizontal and vertical integration of plans and flow of events toward the

Figure 1  
Municipal Planning and Development System

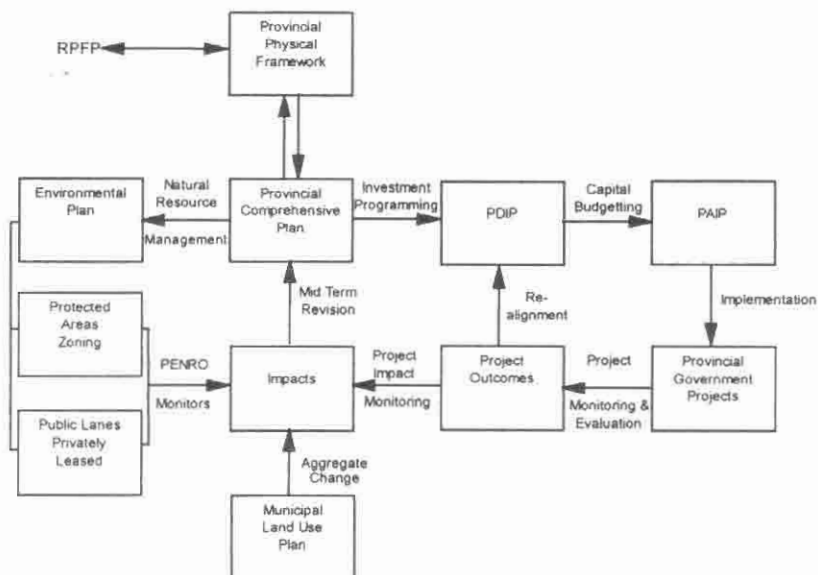


Source: E.M. Serote. Lecture notes in "Planning 210: Land Use planning." School of Urban and Regional Planning, U.P., Diliman Campus.

formulation and implementation of the planning documents, several issues/problems exist which prevent adherence to the model. Among these are the absence of a duly constituted LDC particularly at the barangay level because of the absence of registered NGOs and the non-functioning of a constituted LDC because of lack of quorum during scheduled meetings or due to the fact that it becomes simply the "rubber stamp" of the local chief executive.

A positive note is that now, planning is no longer a purely technical exercise. This is because the planning cycle has been modified to coincide with the terms of office of local chief executives. The plan may in fact be used as a gauge of a local chief executive's performance since it can be equated to his platform or program of action during his incumbency.

Figure 2  
Provincial Planning and Development System



Source: E.M. Serote. Lecture notes in "Planning 210: Land Use planning." School of Urban and Regional Planning, U.P., Diliman Campus.

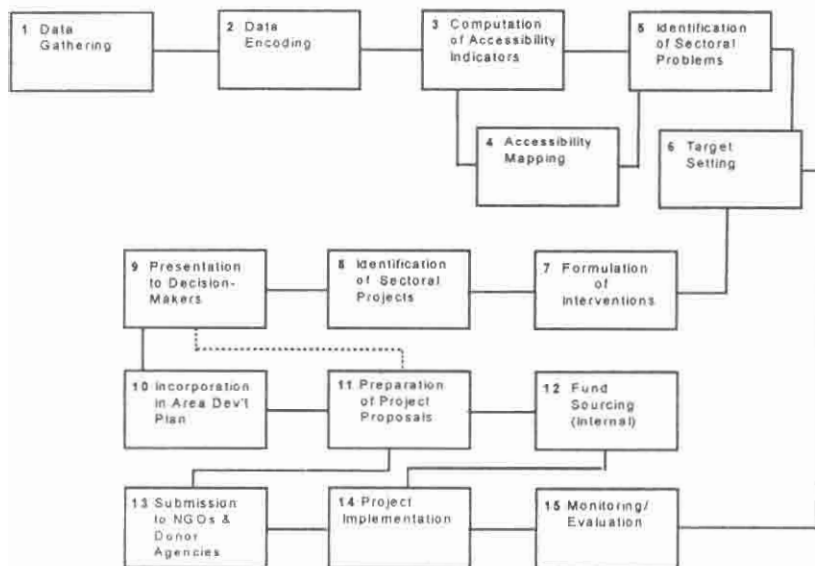
## The I.R.A.P. Process

The IRAP as an approach or as a "planning" technique is not new. Similar concepts have been used by other methodologies (basic minimum needs, for example). What makes it a practical and useful approach is its simplicity. Qualitative terms are supplemented by simple mathematical operations in an attempt to strip the methodology down to its skeletal form. Figure 3 illustrates the step-by-step procedure of the IRAP process.

A noticeable bias of the process is its physical orientation. While poverty alleviation programs depend to a large extent on physical access, there are instances when the factors that impede access is not physical in nature. Examples would be restrictive cultural norms which transcend the tangible environment



Figure 3  
The IRAP Planning Cycle



Another observation concerns the planning process itself. By depending on data collected in a specific time and not doing any projection of some kind, the nature of interventions may be characterized as reactive rather than proactive. Since planning by definition anticipates future conditions and prepares for eventualities, perhaps some projections of future needs need to be incorporated in the process to make the interventions more long term in vision.

As earlier described, central to the IRAP process is the quantification of *access* to basic services/facilities. This is operationalized by examining degrees of utilization; utilization, after all, may be viewed as *revealed access*. In other words, "it examines the ease or difficulty of how rural households avail of the basic goods and service facilities in their areas and use this as the basis for identifying and prioritizing interventions"

Explicit in the IRAP methodology are the strategies of improving access to services/facilities through either bringing the people more efficiently to the service/facility or bringing them closer to the people. Whichever one is preferred, it is a question of geographic or spatial mobility.

In seeking to explain movement, the geographic principles which underpin the basic gravity model simply state that the probability of interaction between two areas is a function of the population (in this case, household) and the distance—whether in terms of minutes or kilometers—between the settlement area and the point source of the service/facility. Such a simplified conceptualization of the “distance-decay function” gives rise to three useful concepts: complementarity, transferability, and intervening opportunity, factors on which the outcome of the interactions of users with facilities are dependent.

*Complementarity* refers to the condition of congruence between the needs of two distinct areas (i.e., there is a demand in one zone which is matched by a supply in another area), while *transferability*, states that if the distance between the demand and the supply is too great, or too costly to overcome, no interaction will occur but alternative sources will be utilized. (This focuses on the time and cost factors of movement). On the other hand, *intervening opportunity* is a negative factor because it hampers movement and interaction between two places due to the presence of other alternative point sources. It may be noted that while intervening opportunity causes the substitution of areas, transferability brings about substitution of goods/services/facilities. Geographers have noted, however, that although consideration of these typologies provide clarity in understanding observed patterns of movement (i.e., it has descriptive utility), their theoretical meaning is unclear.

The accessibility mapping procedure as part of the IRAP methodology, on the other hand, which interprets a larger catchment area as indicative of a high degree of access problem

may have similarities, at the conceptual level, with the range and threshold theorization as interpreted by the Central Place Theory. Range refers to the maximum distance a consumer/user is willing to travel to obtain a specific good or service. Threshold pertains to the minimum number of the population that will ensure the maintenance of a particular good or service. Like the typologies of movement earlier discussed, these two concepts also facilitate understanding of the significance of the size of the catchment area or tributary/service area.

### **The Planning Interface**

The previous sections provided some background information about IRAP both as a decision making tool and a planning process proposed to be adopted at the local level. Mention has been made about the potential of IRAP in rationalizing initiatives by simply pointing out the difficulty or ease of access of the rural population of particular municipalities to basic, economic and social services. The local development planning process has also been briefly presented.

What is needed at this point is to institutionalize and operationalize the IRAP process by making it an integral part of the day-to-day workings of the LGU. This can be done by incorporating the IRAP methodology into the prescribed local planning process. As far as the LGU is concerned, this can be achieved by examining the mandate of the Code as it pertains to the preparation of the LGU's local development plans.

Since the IRAP process is limited in scope (as its focus is on the accessibility issue of development planning) the only way the IRAP can be integrated into the local level planning process is by making the former an important analytical tool in the assessment of the basic sectoral concerns. Thus, the preparation of the Physical and Socio-Economic Profile (an important input in the formulation of land use and development plans) should include in the situational analysis the aspect of

rural residents' access to basic physical, economic and social services.

In the IRAP process, an important phase calls for the identification of strategic projects that hopes to address accessibility problems revealed in the previous step. For the projects to be implemented, they need to be tempered with the development thrusts of the local leadership and prioritized in consideration of the environmental dimension. This is important because the integration of the environmental aspect in accessibility planning is realized only at the project level.

Consideration of the environmental aspect in development, in general, and in local development planning, in particular, is vital to ensure a sustainable level of development. Although the environment offers a variety of potential resources, majority of these resources are finite in nature while the demand for them is ever increasing as population pressure continues to grow. As this need increases, so does the strain on the environment. Since sustainable development has come to mean inter-generational equity (i.e. meeting present needs without compromising the needs of future generations), proper management and regulation of the use and exploitation of environmental resources become urgent tasks. Two important principles that must direct our concern for the environment, are (i) the knowledge of the interlocking relationships of the components of the ecosystem, and (ii) the incompatibility of certain activities with the integrity of the environment.

After due prioritization, sectoral plans and investment programs are finalized and made a component of the local development plans. The investment program which presumably has already considered the financial position of the municipality, then forms the basis for the enactment of ordinances in support of the annual budget.

## **Rationale for Incorporating Environmental Concerns in Accessibility Planning**

It has been discussed previously that like in the IRAP, planning is an activity that attempts to identify problem areas needing intervention. Such interventions are designed to directly address perceived problems in the hope of improving the lives of local residents.

Now, planning per se is one thing; but to plan for an area in consideration of the natural environment is another thing altogether. This section tackles the ways in which we can incorporate environmental considerations in local level planning procedures.

In planning for the environment, or in planning for an area in consideration of environmental issues, two different approaches may be utilized. The first approach considers the administrative aspect of plan implementation and, thus, identifies the planning area on the basis of administrative/political jurisdictions. We may, therefore, formulate a plan for a particular barangay or municipality by building on the development issues which characterize the area in question. Such a strategy is called the "geopolitical approach."

But it must be borne in mind that the nature of the physical environment is not dictated by political boundaries. Often, environmental concerns transcend the arbitrarily-drawn lines we refer to as political boundaries. Exploitation of our natural resources, for instance, is not guided by political (boundary) considerations but by the features of the land. Therefore, an alternative approach to the planning of an area based on what the natural environment suggests (i.e., a land-based or resource-based strategy) may be referred to as the "geophysical approach."

Although both are important, recognition of the merits of the second approach is valuable since the environmental dimension

is being given a lot of weight. The use of the watershed as the basic planning unit is an example of the resource-based type of approach.

A watershed is an area which is drained by a single network of streams and is bounded by ridge tops. A watershed may be identified by either isolating a single network of rivers and its tributaries or by drawing a line along a drainage divide—i.e., the boundary along a ridge top which determines whether water will flow toward one river or into another.

Watersheds may be viewed from a macro or micro level. This implies that it is possible to find sub-watersheds nested within a large watershed. But whatever geographic scale is used, what is important to note is the vital role which a watershed plays in a given area: that of maintaining and regulating water supply within its immediate environment.

As far as planning is concerned, the logic for the use of the watershed approach rests on two important points:

- i* A watershed provides the spatial framework and biophysical linkage in the interaction of three different ecosystems. This exemplifies the interdependence of the upland, lowland, and coastal ecosystems; and,
- ii* A watershed defines the real extent of the impact of localized activities within the catchment area/basin. That is, land use activities in the upper sections of a watershed have direct effects to downstream areas. Also, only areas within the catch basin where activities occur will be directly affected since the ridges or drainage divides act as barriers.

Another area which can be introduced is the possible linkage between environmental degradation and rural accessibility of upland deforestation. The latter can have direct implications to an upland community as well as indirect but accumulated set of problems affecting the lowlands and coastal areas. Within the

vicinity of the forest clearing, it is possible to encounter local fuelwood shortages as more and more trees are cut. The loss of vegetative cover could likewise initiate soil erosion and increase surface water runoff. Both could possibly lead to flooding during heavy downpours as well as limit the productivity of agricultural lands.

The silted rivers could reduce the irrigation and fishery potential of streams. Likewise, shallow river beds and sedimentation of shorelines can have adverse implications in the navigability of stream/coastal waters resulting to inaccessibility problems for riverside and coastal communities.

It is acknowledged at this point that the nature of interventions identified through the IRAP procedure are such that most are small scale projects. But considering the present needs of local governments particularly in the area of environmental interventions, this discussion on incorporating environmental concerns in the prioritization of development projects is of paramount importance©

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## Appendix

### *Selected Environmental Legislations*

PD 1586 - establishes the environmental impact statement (EIA) system which covers environmentally critical areas (ECA) and environmentally critical projects (ECP);

PD 1151 -the Philippine environmental policy; defines the general policies on the pursuit of a better quality of life for the present and future generations, and mandates the undertaking EIAs for all projects which may affect the environment

PD 1152 -the Philippine environmental code; defines the policy objectives and strategies for various aspects of environmental management such as air, water, natural resource development, land and waste water management;

PD 705 -the Philippine forestry code; emphasizes the sustainable utilization of forest resources;

EO 277 - provides incentives to informants of forestry law violations;

EO 278 - prescribes the interim procedures in the processing and approval and applications for the development or utilization of forest lands or resources;

PD 330 - penalizes the illegal cutting of trees;

PD 953 - governs tree planting;

PD 331 - requires all public forests to be developed on a sustained yield basis;

PD 704 -mandates the preservation of optimum productivity of fishery resources through conservation and protection;



PD 1015 -bans the operations of commercial fishing within a distance of 7 kilometers from the shoreline;

PD 1058 -increases the penalties for illegal forms of fishing methods;

PD 1219 & 1698 - mandates the protection of coral ecosystems;

PD 463 -requires all mining lease holders to comply with pollution control laws and regulation and provides for penalties for non-compliance;

PD 1198 -provides for the restoration of mined-out areas to the original condition to the extent possible;

PD 1251-imposes fines and the fund generated therefrom to be used to pay for damages to land, agricultural crops, forest products, aquatic resources, infrastructures;

PD 1118 - provides for the prevention, control and abatement of air pollution;

EO 192 -sets up the administrative and regulatory machinery for pollution control;

PD 984 -provides for the control and prevention of vehicular pollution and establishes the maximum allowable emissions of specific air pollutants from all types of vehicles;

EO 927 - mandates LLDA to exercise control over all sources of pollution within its jurisdiction;

PD 979 -prohibits the discharging of noxious liquid substances, and other harmful substances into the country's inland and territorial waters;

PD 825 -prohibits the improper disposal of garbage;

PD 856 -places the responsibility of solid waste management on the LGU in their area of jurisdiction;

RA 6969 -regulates the importation, manufacture, distribution, use and disposal of chemical substances which may pose risks to human life and the environment.

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