Chapter 2. URBAN ECONOMY
The Ecological Economics of Sustainable Ekistic *Formation in the Philippines*

I. Introduction

1. The term "sustainable city" is an oxymoron. A city, assuming it refers to the settlement on the boundaries of its physical structures, must be unsustainable in itself. It is unsustainable if it grows little food and cannot meet its own requirements for its population's housing needs and other basic necessities.

2. A city is potentially sustainable only if it encompasses its entire "footprint" (Reese and Wackernagel) or its "ghost territory" (Arthur Oku)—which refers to the territory it must draw into its production, consumption, capital formation, and waste disposal systems to sustain its inhabitants. At the minimum the footprint will encompass a region. At the maximum it might extend to a whole empire.

3. For this reason, it may be assumed that there has never been a sustainable city anywhere in the world or at any time in the 10,000 years of urban history.

4. This poses the fundamental question that this chapter seeks to address: In the whole evolutionary history of the universe—spanning over 15 billion years of evolution—why has the process ended in a cycle of rise and decline of cities and the empires that have sustained them?

5. Paul Kennedy, author of the *Rise and Fall of Great Powers*, documented this process of the rise and decline of cities, as did Arnold Toynbee and Joseph Spengler before the publication of his work. If we are to determine the urban design that will facilitate the sustainable development of our country, we must look to these studies to understand the forces underlying the issues of unsustainability and how to impose limits on the insatiable greed of man for wealth and power. What Ervin Laszlo calls "extensive evolution" (Laszlo, 2001) and David Korten labelled "*Empire*" (Korten, 2006) has driven the transformation of human societies into nation states and empires, and dotted the planetary landscape with cities of varying sizes over the past five or ten millennia. These nations and empires and their civilizations have risen and fallen in a recurrent cycle over that period, thus reflecting their non-sustainable characters.

6. This chapter explores the principles of both urban pathology and health to give us the basis on which to draw up designs for sustainability. The definition of sustainability provided by the Brundtland Commission suffices for this purpose. The Commission's Report spoke of humanity's ability to achieve a development that "meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987, p. 5). In a world leaders' summit in Rio de Janeiro in June of 1992, an agreement was drawn indicating that such a development would encompass the three elements of economic, ecological, and social sustainability. To accomplish such a development, the member states of the United Nations adopted a program of action codified into "Agenda 21."

7. The pathology of non-sustainable growth manifests its most horrible marks in the towns and cities of both the developed and the developing worlds. Cities in the industrial countries face problems of "deteriorating infrastructure. Environmental degradation, inner

city decay, and neighborhood collapse" (op. cit. p.16). These countries have the resources to address the problems but must muster the political and social will to act accordingly.

9. The developing countries have far more serious and basic problems with rapidly growing populations crowding into the cities. Among these are shortages of basic goods and services, clean water, sanitation, schools, and transport; and poor sanitation. Such shortage marks the urban landscapes with "mushrooming illegal settlements with primitive facilities, increased overcrowding, and rampant disease linked to an unhealthy environment (*Ibid*)." They lack the resources, depth of understanding, technical skills, and the political will to deal with this crisis.

10. The human race is in crisis precisely because profound historical, philosophical, ideological, psychological, economic, social and political forces have been driving the course of social transformation and the exploitation of nature and weaker societies. They are also at the root of urban structures that are domains of inequity and ecological disasters.

11. This chapter probes into the nature of unsustainable development and the sources of pathological effects; explores the root causes of the unsustainability of urban development in the country thus far; defines the conditions for sustainability; and searches for the means to redirect development toward a sustainable path.

12. The themes discussed are as follows:

a. Development and urbanization encompass the process of change, development and growth of society and the economy, and the embodiment of the transformations in the evolution of hamlets, villages, towns, cities, metropolis, megalopolis, and *ecumenopolis*.

b. The evolution of urban "anatomy" and "physiology" is analyzed using the *Ekistic* framework of Constantinos Doxiadis: *Nature, Man, Society, Shells, and Networks. Nature, Social institutions and Structures, Shells and Networks*. Man's make-up comprises important aspects without and within as individuals and as collectives.

c. Unsustainable development is a problem that must be defined in relation to the concepts of healthy or sustainable development. Where do we turn to find the basis for defining development health? Sustainability is a condition of symbiotic cohabitation with nature. The processes of nature and its modes and relationships have emerged over millennia of evolutionary formations and transformations. We need to understand these processes to understand the laws of symbiosis.

d. Until the emergence of *Homo sapiens*, evolution was driven by processes that worked spontaneously and by themselves. This changed once man emerged. His powers of reflection meant that, independent of the many species of living organisms, he had the powers of reflection and conspiration, which enabled him to develop the twin disciplines of science and technology, form societies and build cities from conscious design. He developed the ability to design ways that could destroy nature along with him. Such ability, however, was not accompanied by the knowledge, wisdom to use it one way or the other. History shows that man has not learned his lesson.

e. The key to social evolution has been the symbiotic unification of personalization and socialization on the one hand and symbiotic coexistence with nature on the other.

f. In our search for the principles and models of sustainable development, we ask: What is the level of observation at which sustainability can be both understood and managed? What is the unit of organization and management? What is a sustainable *ecoregion*? What are the principles of sustainable symbiotic cohabitation between human colonies on one hand, and between human colonies and the rest of nature on the other? Where do we look for guidance on the ethics—or behavior codes—of sustainable development? How do we translate these into urban design principles for sustainability?

g. Finally, we face the problem of practical operationalization. Hence we ask: what forms of social and institutional organization and what protocols of management in planning, designing, building, and forming sustainable cities in their regions should we pursue? On the economic design of a sustainable region, what definitions and measures of ecological footprint, ecological deficit or ecological shortfall, ecological surplus, ecological trade and gains from ecological trade, as applied to the economics of sustainable regions, do we pursue?

13. In sum, our aim is to arrive at the philosophy, science, and art of building and managing sustainable cities in ecoregions.

14. Cities depend on networks of other human settlements for their life support. To make an assessment of sustainability meaningful then, we have to view those networks of human settlements. The generic concept is best captured by a term put forward in the 1960s by a Greek planner, Constaninos Doxiadis: *oikos,* Greek word for house or home. He termed the field *ekistics* for the "theory of human settlements"—the more generic terms to encompass the full range of human abodes: namely, camps, rooms, houses, neighborhoods, villages, towns, cities, metropolises, etc. using a grid called "ekistic scale." (For a meaningful discussion of sustainability, we have to speak of "ekistic formation," or the formation of clusters of human settlements on a territory.)

15. Historically and over time, these settlements undergo transformation processes. We can differentiate without dissociating at least three of these processes—change, development, and growth—to refer to the change in physical scale and size of the settlement. For convenience, we use the term *sustainable development* to refer to all three processes.

16. The processes to be understood and assessed against the concept of sustainability are integral and not merely economic or political, or social and cultural, and religious and moral, psychological and behavioural as well as physical and institutional. They entail all of the above. For this reason, no one discipline can provide an adequate frame of analysis. We need both the physical and the social sciences. The expanded term we use is "ecological-economics" although "ecological social science" is probably more precise.

17. The terms then define the scope and perspective of this chapter. It will describe the process of *ekistic* formation in the Philippines; analyze it from a holistic theoretical framework that brings in both the ecological and social science disciplines; assess its sustainability from that integral perspective; and explore alternative modalities, organization and management strategies and normative criteria for tracking a sustainable path for the future.

18. The patterns and results of economic and social transformations are most dramatically embodied in the structure and form of the country's villages, towns, and cities: the quality of settlements and human life characterizing them. Healthy development makes healthy settlements. Unhealthy development makes unhealthy villages, towns, and cities.

19. The state of our settlements, the trajectory that their evolutions through history have tracked, and the kind of living and lifestyle they provide now for the greater mass of our people tell the sad story of an unsustainable development process.

20. We need an in depth understanding of the true nature of the forces driving our country's transformation through the decades to arrive at clear and true insights into the pathology of our settlement formation. And we have to explore the alternative courses, modes of organization, and strategies and methods of management to redirect those forces towards a sustainable future for our country and our people.

II. Overview of the Analytical Framework

A. *Ekistics*

21. *Ekistics* provides a powerful framework for analyzing the formation of human settlements. In his monumental work, *Ekistics*, Doxiadis contends that a proper study of human settlements would include, if not focus on, the simultaneous study of the interrelationships that exist between a settlement's elements, and not merely focus on the elements themselves (Doxiadis, 1968). These elements are nature (environment, location), man, shells (structures, built form), society, and networks (circulatory network functions). It is the relationships and interactions among these that bring a settlement into existence and characterize its dynamic nature. This broad classification may mislead others to forego subdividing these into more detailed elements, and be tempted to focus their study on the parts while overlooking the whole. As would be discussed later on, an important criterion for sustainability is taking an integrated rather than a fragmented and compartmentalized approach.

22. *Ekistics* defines the nature of human settlements as organic with three of human settlements' five elements (man, nature, and society) belonging to the organic world.[i] The evolution and development of human societies take concrete forms in human institutions, culture patterns and human settlements, thus making settlements a social phenomenon. The structural evolution of these settlements then reflects all the influences of cultural and institutional transformations that take place over historical time.

23. *Ekistics* provides a framework for classifying those structures according to the essential elements mentioned above and the forces that have determined the spatial patterns that have developed from the provisioning of societies of different sizes, technology, culture, values, and environmental, material and relational circumstances.

25. In dealing with its planning, design, and improvement, it is best to keep in mind the biological aspect of human settlement—its anatomy, composition, characteristics, physiology, etc. For our definition of sustainability, we will use *ekistic units* as the basic cell of human settlements and the physical expression of a community's lifestyle. It represents demographic and geographic dimensions that correspond to certain functions.

26. Fifteen elements define the order of *ekistic* units from the smallest element to the greatest—man, room, dwelling, dwelling group, small neighbourhood, neighborhood, small town, town, large city, metropolis, conurbation, megalopolis, urban region, urban continent, and *ecumenopolis*—a global city**.**

27. Three *functions*: production, transportation, residence, and their synthesis define an ekistic unit's operational aspects. And four factors, namely, money, labor force, building materials, and urban land, represent the factors *ekistic* operations work with.

28. The analytical and planning process underlying each order of ekistic unit involves a consideration of the elements, functions, and factors inherent in each.

29. The *ekistic* theory is based on empirical studies of urbanization certain regularities or laws that define the morphology of settlements in relation, on the one hand, to the demographics, culture, worldviews, values, and life conditions of the society, and on the other to the characteristics of the terrain, or the geography of their natural habitats. These are forces that have empirically determined the directions of settlement formation, and the physical forms that settlements have taken. It then derives from the patterns some "norms" for "ideal" dynapolitan development.

30. Doxiadis lays down certain laws of ekistic development, which are divided into categories of *development* (creation, development, and extinction), *internal balance*, and *physical characteristics* (size, structure, form), which govern the evolution of human settlements.

31. In selecting the relevant geographical scope of any ekistic analysis, Doxiadis extended the area to encompass what Reese and Wackernagel of the University of British Columbia call the "ecological footprint" (Rees, 1992) and what the economist Arthur Okun terms the "ghost territory." Both refer to the entirety of the areas beyond the physical metes and bounds of the city limits, on which the inhabitants of the city rely for the provision of their needs.

32. Analysis then requires an understanding of the modalities by which the city acquires on a regular and secure basis the supply of materials and services from those territories. An example is domination through military and political force or mutually beneficial trade.

33. The sustainability condition defines the limits that nature imposes on the human economy and the moral principles that govern the distribution of resources among nations and social classes and between the present and future generations.

34. Understanding those limits requires the use of an analytical framework that goes beyond economics and the social science and must look to the natural sciences for guides to human action. But history is the result of human beliefs, values, and cultural patterns that are reflected, indeed embodied and reified, in human institutions, lifestyles, class differentiation, power structures, and the physical forms of human settlements.

36. Evolutionary processes over time and historical periods have driven the transformations of human societies and their settlements. At least three major streams must be differentiated without dissociating them from each other:

a. *Change* that draws focus on the forms that are receding;
b. *Development* that views the emergent forms, and
c. *Growth* that concerns itself with the fact of increase in physical size

37. Mainstream economists have confined their analyses to *growth*, on the basis of which their tools have been refined accordingly. But change and development are primarily historical, social, political, psychological and religious processes.

38. The needed analytical framework must then combine both the natural science of ecosystems and integral science of individual and social human behavior alongside the workings of social institutions. This requires nothing less than an integral ecological social science framework.

B. Biological Capacity and Ecological Footprint

39. The ecological-economic aspect of sustainable development means maintaining the overall use of nature's capital within the limits of its capacity for sustained reproducible production that keeps its productive powers intact for future generations. Managing resources to stay within this limit entails, first, a measurement of nature's biological capacity, and, second, a measure of the load imposed on nature's capital by current human production and consumption activity.

40. In the early 1990s, William Rees and Mathis Wackernagel, two scientists from the University of British Columbia, developed a method for estimating these two measurements. They started from the obvious fact that cities were not economically self-sufficient and must rely on areas far beyond those encompassed in their city boundary. Using the term "footprint" that architects apply to the metes and bounds of the area on which a building stands, they labelled as the "ecological footprint" of a city all the areas beyond its borders on which it draws the food, fuel, materials that support the day-to-day needs of its inhabitants—the area beyond the city borders that the ecologist Okun referred to as "ghost territory."

41. Over the years the estimating methods have been refined such that it is now possible to use a global standard unit to measure both the biological capacity available to any entity for its material and service needs as well as its actual usage over a measurement period. The unit is termed a "global hectare."

42. The biological productivity of natural capital is its capacity to produce usable biomass. "Usable" here means the portion of biomass generated by the terrestrial and aquatic resources of the earth that can be renewably harvested and is valuable to people. This capacity originates from different types of terrestrial and aquatic resources of the earth: land used for crops, pasture, forests, and built-up areas of settlements; as well as marine and fresh water resources used for both capture and culture fisheries. Using the UNFAOs crop suitability studies for different types of soils as a basis for selecting an average basket of specific forms of biomass (which is actually used by the world's population) and combining it with studies of the global average productivity of each item in the basket from each category of the earth's resources, the method posits a standardized "global hectare" based on the world's potential average biomass productivity for each measurement year.

43. Based on this unit, the production potential of the resources of any area can be measured in units of "global hectares." This is called "biocapacity." It is then defined as the total global hectares (natural capita) available for human use at the level of the area for which the measurement is undertaken—the world as a whole, a country, a region, a city, a village or an organization. In other words, the actual hectares of terrestrial and aquatic resources within the management of the unit concerned can be converted into equivalent global hectares through the use of standardized global standards.

44. The biocapacity measurement defines the maximum potential of the bioresources of the unit under study—the "supply side" of the resource "balance sheet." Using the standard units, a corresponding estimate is made of the global hectares actually used by human societies to sustain their level of usage for each year. This can be calculated at any level using the standardized global units as reference units so that the capacity and usage are expressed in standard global hectares.

45. Applied to the world population, the biocapacity is as calculated since the global average productivity of the bioresources is the reference standard. Thus the "Global Yield Factor" is equal to 1. This requires estimating the equivalent global hectares actually used by the world population given the pattern and level of its consumption for the given year, say, 2002.

46. The 2002 estimate yields the actual usage of the world at 13.7 billion hectares against a biocapacity of only 11.2 billion. The human population in 2002 used the planet's natural capital beyond its reproductive capacity to the extent of 2.5 billion hectares, or 22%, above the sustainable capacity of the planet's resources.

47. In per capita terms, each of the planet's 6.2 billion inhabitants in 2002 had available biological capacity of only 1.8 global hectares. Yet, the average consumption required the use of an average of 2.2 global hectares. Clearly, at the global level, humanity is living beyond its natural means, and is in effect borrowing resources from future generations that it may not be able to repay.

48. The same natural resource supply-demand calculations can be done at any level below the global estimate. But by using the standardized global hectare unit, any calculation is bound to come up with a biocapacity and a footprint number that is consistent with the global measurement.

49. The global biocapacity is a function of the average mix of resources available for human use in the planet, the mix of biomass categories in the planet's consumption basket, and the average productivity with which each resource produces the corresponding mix of usable biomass products. This represents a global average capacity of total global resources employed for human use to produce the global average basket of biomass used by the world's population expressed in terms of global hectares per unit of consolidated biomass.

50. Since each use of resource—crop land, forest, pasture, fisheries, energy, built-up etc. —will have its own productivity, expressed in hectares per unit of the particular basket of biomass generated by each resource usage, the method needs a set of *equivalence factors* to express the particular productivities into standard global hectare units. The hectares per unit for each resource use (e.g., crop land, or forest, or pasture, etc.) is standardized into global hectares through a set of equivalence factors giving the global hectare of overall average productivity per particular hectare of specific use productivity.

51. Each particular region or country or other sub-national unit of territory, will have its own endowment of resources which it will allocate to each of these uses. Depending on the quality of those resources and the production organization and technology, each of these usages will yield average productivities particular to the country. To determine the biocapacity of those country resources then expressed in units of global hectares, the method expresses the yield factors of each land usage as a ratio of the country's productivity to the global average productivity of that usage category. For example, if the Philippines uses 3.6 million hectares of crop land to produce 7.2 million tons of crop biomass per year but at the global average yields the same volume would need only 1.8 million global hectares, then the yield factor would be: 2 tons/hectare/year divided by 4 tons/hectare/year equals 0.5. If then the Philippines devoted 3.6 million hectares of land to crops, its biocapacity for crops would only be equivalent to 1.8 million hectares of global cropland. Standardized in global hectares, this would then be 1.8 million times the equivalence factor of 2.2 global hectares/hectare or 3.96 million global hectares of biocapacity.

52. If improved farm practice and infrastructure investments in irrigation raised the yields to 6 tons/hectare per year, then the yield factor would increase to 1.5 and its 3.6 million hectares would equal 5.4 million hectares of global land. As well, its biocapacity would rise to 11.2 million global hectares.

53. The global averages for each category of resource use—croplands, forest, pasture, fisheries, energy, built-up area, etc.—become the basis for calculating "equivalence factors" that, combined with the yield factor specific to each country, convert the actual terrestrial and

aquatic resources of the country, and their actual productivity in the country into equivalent global hectares" of biocapacity particular to the country for the given year.

54. Based on the country's level and pattern of consumption of goods directly produced or imported in exchange for goods produced from the resources and exported, a similar process using the Global Standard Hectare as the reference point and unit of measurement, the ecological footprint is calculated. This measures the actual usage by the country for the given year of the planetary biocapacity in terms of global hectares of land equivalent for each given year to supply the population with its food, energy, materials, and services for that period.

55. The biocapacity of a country may decline over the years because of deteriorating quality and productivity of its natural resource endowment compared with the global average productivity of the corresponding types of resources. Thus the productivity of its land and fisheries resources can deteriorate from abuse and lack of sustainable management.

III. Current Status and Trends

The Philippine Scenario

56. The problem of sustainability of Philippine development must be viewed within the context of the overall evolution of Filipino society through the different periods of its history. The study of Philippine urbanization involves three historical processes:

a. The "natural" evolution of settlements from rural villages to urbanized towns—the emergence of proto-urban settlements driven by the processes of social, economic, political and religious change, development and growth. The shift in technology and production processes from food gathering, long fallow, bush fallow, short fallow to continuous agriculture, the generation of food surpluses and their entering into trade.

b. The colonization process—the implantation of an urban culture into the rural and agrarian societies from colonizers whether foreign or Filipino colonizers moving from metropolitan centers into the rural and agrarian areas of the country.

c. The process drives the transformations and growth that Ekistics terms "Dynapolis," or the evolution from proto-cities to polis, metropolis, and megalopolis.

There were two great periods in the genesis of ekistic formations in the country:

a. 1570 to 1770 – a period of relative isolation that incubated Christian Filipino national identity and the basic structures of the country's settlements: the network of barrios, *poblaciones*, large towns and the two largest cities, namely, Manila and Cebu; and

b. 1770 to 1920 – from Fernand Braudel's "long nineteenth century" (McCoy, 1982) to the present when the political and economic revolutions in Europe created the "new world order" with its metropolitan cores and colonial peripheries (Wallerstein, 1984), disrupted by two world wars, the political decolonization of the post-World War II period, and the cold ideological war between communism and capitalism, but restored after the break-up of the Soviet Union, with the formation of the World Trade Organization and the economic re-colonization of the Third World periphery through a system of globalized trade.

1. Centripetal *Ekistic* Formation

57. The first period represented a centripetal phase, an inward-looking consolidation of separate chiefdoms into a nation and scattered villages into a network of interconnected hamlets, villages, townships, towns, districts, and regional cities. Over two centuries of Spanish colonial administration and Christianization consolidated the several hundred tribal chiefdoms in archipelago, not perhaps into a single nation as yet but at least into over a dozen ethnic communities in as many regions by the end of the eighteenth century. For more than half of that period, the country was relatively isolated from the ebb and flows of global trade. It had a comparatively small population and the incentives and capacity to exploit the natural resources were largely absent. Total population at the time of the Spanish conquest in the late 16th century was 668,000, which grew at a slow rate of 0.41% per annum to 1.6 million by 1800. Since most of the 7,100 islands were montane and forested areas, the population concentrated in a few of the 7 river valleys of the country, a relatively small number of alluvial plains and coastal zones, and areas with rich volcanic soils. This concentration persisted even to the end of the 18th century.

58. The *Reduccion* program introduced by the Spanish to cluster the natives systematically into villages and pueblos commenced Filipino society into its urbanization path. Following the town layouts, adopted by the Spaniards during the *reconquista* of the Iberian Peninsula from the Muslims in the 15th and 16th centuries and used in the New World, the layout of the Pueblo became the standard pattern of urban formation. The natives of what was called by the colonizers *Filipinas* were thus physically settled in organized settlements, proselytized, and converted to the religion and cultural lifestyles of their Hispanic conquerors.

59. These evolutionary processes determined the ekistic forms that human settlements assumed in their wake. Centripetal evolution formed the network of villages and *poblacion* that make up the commercialized agrarian communities in which 70% of the Philippine population still lives, the communities of fisherfolk and farmers along the coasts and of upland villagers that interlink with the *poblaciones* (*pueblos*) where the markets served as the center that bound them to a communal economy. The whole process pulled the scattered tribes together and moulded them into a nation. It was a centripetal force that lasted some 200 years. During this period of inward-looking evolution, it should be stressed that in spite of the presence of an elite class, resources were appropriated to serve the needs of the local communities.

60. Colonization superimposed onto the social structure and the physical landscape of the city the dominion of the colonizers, while the native hierarchy and class structure aligned itself around the colonial governmental forms and a new social stratification and social differentiation process was started. A new and larger non-producing class developed that had to be supported by the native system and created demands for food, materials and human services that diverted effort from the local subsistence of the villages. In the beginning the productive resources of the villages were appropriated by force, but relationships and transactions were formalized in a new legal system that created rights and obligations over property, established contractual relations among persons and institutions. In short a formal economic system began to take shape, with systems of property, rights and obligations in contracts, establishment of values and the use of monetary and financial instruments, and facilitation of market exchange for physical goods and services.

61. With the advent of the European concept of private ownership of land, many pioneers sought possession of their own private parcels. Nevertheless, vestiges of the traditional communal tenure concepts survived, as did communal labor practices. But the influx of this new economic system resulted in the persistence, if not, strengthening of the patron-client

relationship, as profits and competition began to figure in more prominently in local economic decisions (McCoy, 1982). Instead of valuing individual land ownership, peasants found it more secure to be a follower of a powerful leader and thus gain access to land through share-cropping. This period saw the rise of commercial agriculture and export incentives, leaving cultural and social patterns open to disintegration and weaker peasant members of the communities unprotected in the midst of a rising local gentry.

62. Ekistic formation accelerated into urbanization as the country entered into the world economy in the late 18th and through the late 19th centuries after the Industrial Revolution in England and as Europe and the United States industrialized.

2. Centrifugal Ekistics and the Domination of Enterprise

63. In the second period, the driving force was external: the demand in the newly industrializing countries of Europe and of the United States for food, raw materials for their industries and markets for their products. It was a centrifugal force pushing direct linkage with different regions of the country, establishing enclaves within the country where their merchant agents could relate with local entrepreneurs and plantation owners, or mining and logging towns to exploit the forest and mineral wealth of the countryside.

64. There were four different phases in this centrifugal period:

a. The period of primary production to serve the 19th century colonial pattern: colonies exporting raw materials and importing finished consumer goods.

b. The period of early industrialization and import substitution when the country purchased capital equipment and intermediate goods as it tried to diversify and modernize the local economies.

c. The period of re-exportation and local value adding to export commodities as the developed countries, faced with rising local labor costs, sought countries with semi-proletarianized households in the Third World, to outsource the succeeding labor-intensive later of manufacture.

d. The latest period in the wake of the Information and Communication Technological revolution that has made certain personal service lines unattractive and expensive in the developed countries and seductively attractive to the opportunities-starved young populations of the Third World. This has had a twofold centrifugal manifestation. Outsourcing of these personal service tasks from the developed world has diverted the educated populations of countries like the Philippines to computer and communications related tasks for foreign corporations. These vary from the simpler encoding and provision of technical support services to the more sophisticated tasks of operating specialized software such as Computer Aided Design and even computer software and applications development. Also, the demand for the performance of the more menial medical care services, such as nursing and operating medical technology, and household maintenance and care for children and the aged, has attracted a historically unprecedented flow of overseas workers from the Third World to the developed and more rapidly developing countries.

65. In the late 18th and through the late 19th centuries, the Philippines was linked to the global trading network, and a new phase of ekistic formation set in that created larger conurbations in response to direct links with world markets, an outward-looking kind of urban

development in the few regions where production for the foreign markets was developed such as Sulu, the Visayas, Bicol, and Central and Northern Luzon.

66. With the industrial revolution in England in the last quarter of the 18th century, English merchants took on a more active role in intermediating trades around the world. In Asia British country traders were active in intra-Asian trade. Thus they established regular contacts with *compradors*, mainly Chinese mestizos, who called at Manila and sourced local textile products from Panay and the Ilocos Coast, sharks' fins, sea cucumbers and birds' nests from Sulu (for the China market), which they traded for the British imported Indian cloth.

67. The stimulus spurred the growth of the handicraft weaving industries in the 18th century, and the flowering of a capitalist spirit, particularly among the Chinese mestizos who became the home-grown entrepreneurs. They set up the commercial ventures, mobilized the capital, organized the factors, and created opportunities for transforming bodies of the peasantry into wage-earning labor in an emerging labor market.

68. In Iloilo they drew and assembled the women weavers so that by the late 18th and early 19th centuries its population had grown to 71,000 which made it one of the larger cities of the world—as large as Chicago, Sydney, Valparaiso, and Caracas. One observer reported that there were 61,000 spindles in the city. Likewise, Vigan, in Ilocos Sur grew from trade in Ilocos cloth and indigo and the Chinese mestizos in Ilocos lined the streets of Vigan with rows of fortress-like houses.

69. Europe's world trade rose sharply. The relative isolation of the Philippine Archipelago was overcome with new maritime technology and European industrial growth. Shipping of bulk products from the Philippines became economically feasible. Anglo-American merchant houses then began to source agricultural commodities for both intra-Asian and international markets. The areas where native entrepreneurship and the commercial and capitalist spirit had already taken root, and a wage-labor market had already developed, were in the best position to respond. Entrepreneurial interest shifted from textiles to the larger volume products: tobacco in northern Luzon (Cagayan Valley), rice and sugar in Central Luzon, abaca for sailing cordage in Bicol, sugar in Western Visayas, and Chinese foodstuffs in Sulu.

70. The same Anglo-American merchant houses began to bring in the textile piece goods from the mechanized textile mills in Birmingham and the competition gradually pushed out the products of the local handlooms. At the same time, the entrepreneurial energies, and local capital shifted to the plantation ventures for the new export commodities.

71. As the local weaving industries receded and eventually collapsed in Vigan and Iloilo in the 19th century, the population growth that had been stimulated by years of economic growth needed fresh opportunities. Ilocos and Ilongo peasants became pioneers and migrated to the neighboring regions to open up new lands. These were Central Luzon and Cagayan Valley for the Ilocanos and Negros Island for the Ilongos.

72. These developments in the Philippines took a pattern that Jane Jacobs hypothesized in her *Economy of Cities*. The City became the staging area for agricultural development (Jacobs, 1969). The textile industry created the capital, entrepreneurship and labor force that then made it possible to launch the commercialized agricultural ventures in rice, sugar, hemp, and tobacco in the period of Philippine history that corresponded to Braudel's earlier mentioned "long 19th century."

73. By the closing years of the millennium that also saw the end of Spanish and the beginning of American colonization of the Philippines, the country had polarized into five differentiated social and settlement types:

- The tribal communities, some of which were still in the hunting and food gathering stage and others in a more settled horticulture stage swelling in small subsistence villages
- The lowland, largely coastal, subsistence rural communities mostly Christian and Catholic and in the south Mindanao and Palawan, Muslim
- The commercialized agrarian communities in barangays, clustered around market pueblos established in the period of the *reduccion*
- The *hacienda*, plantation, or mining or logging communities operated either by the monastic communities ("friar lands") or capitalistic entrepreneurs, or formal corporations
- The urbanized communities in larger and more commercialized *barangays*, *pueblos*, small and large towns, small and large cities

74. This period saw transformations in the political and economic structures of Europe that created a whole new world economic order. The nature of these transformations—in particular, their ideologies and political, economic, and social roots—had an impact on the colonial periphery of the European core countries that were, in so far as the internal integrity of those countries were concerned, disintegrative and fragmenting. Commercial agents and profit-hungry entrepreneurs from Europe viewed the country as *a collection of areas from which valuable commodities could be mined or grown* to process in the newly established factories of Europe and supply the growing markets of the world. They sought direct pipelines with different regions of the country through local *compradors* and fragmented loyalties and interests among the communities. They were a centrifugal force.

75. The period also saw the recruitment of the powerful elite of these urban centers to become the local agents of the industrial economies for appropriating the resources of their hinterland to serve the needs of the industrialized metropolitan centers of the world.

76. During the period of inward-looking evolution, the elite appropriated the resources to serve the needs of local communities. During the period of outward-looking evolution, serving the needs of the industrialized nations offered immensely more attractive gains. Out of this evolutionary thrust emerged the urban forms that were the centers linking the production of the hinterland not to the local communities but directly to foreign markets. And since part of the reward for serving these markets was the means to live the lifestyles of the advanced metropolises they served, they looked to those countries as well to supply them in exchange the luxurious accoutrements that came out of London, Paris, and New York to adorn their homes and grace their tables. These communities became enclaves more related to the global network than to our own communities.

77. The pattern of *ekistic* formation reflected the pattern of social and economic evolution in the country: the formation of small elite classes that, over time, appropriated the ownership and control over the land and other natural resources of the country, and extracted the larger shares of the produce and income from their use, through a combination of political, legal, and financial power.

78. *Ekistic* formation in the Philippines is the story of the emergence of religious, political, administrative, economic and financial elites and the systematic transfer to them of the control of natural productive resources from the tribal and agrarian peoples who were their original settlers.

IV. Critical Issues, Challenges, and Opportunities

The Problems of Sustainability in Philippine *Ekistic* Formation

79. A most fundamental part of our problem lies in the assumptions and ideologies on which our perspectives are based and with which we view our goals and our tasks and navigate the course of our country's voyage through history. This applies most particularly to the economics of our national policies and strategies.

80. For at least the period from the beginning of the Philippine Republic to the present, our policies have been informed by a paradigm that places profit-making economic enterprise as the primary engine and vehicle for achieving national development. Over the years there have been changes in strategy regarding the balance between private and state ownership of these enterprises and between full and unlimited freedom and close regulatory direction that will be allowed them. But all throughout the principle has remained: business enterprise must be the primary vehicle and its profitability the primary criterion for performance of developmental tasks.

81. In the Philippines, the government had earlier chosen to own directly enterprises pioneering in fields considered strategic, in food processing, ship building, steel making, electric power generation and transmission, waterworks, property development, commercial and development banking. But implicit was the principle that when private enterprise became able and willing to take over, the government would retire from the venture. Even when government operated the enterprises, profit remained the primary measure of performance, with the implicit assumption that enterprise profit meant economic efficiency and economic efficiency meant public welfare.

82. More often than not, government performance in producing enterprise profit was quite poor. But the principle remained honoured even when it was breached.

Figure 2.1 Philippine Biological Demand versus Biological Capacity

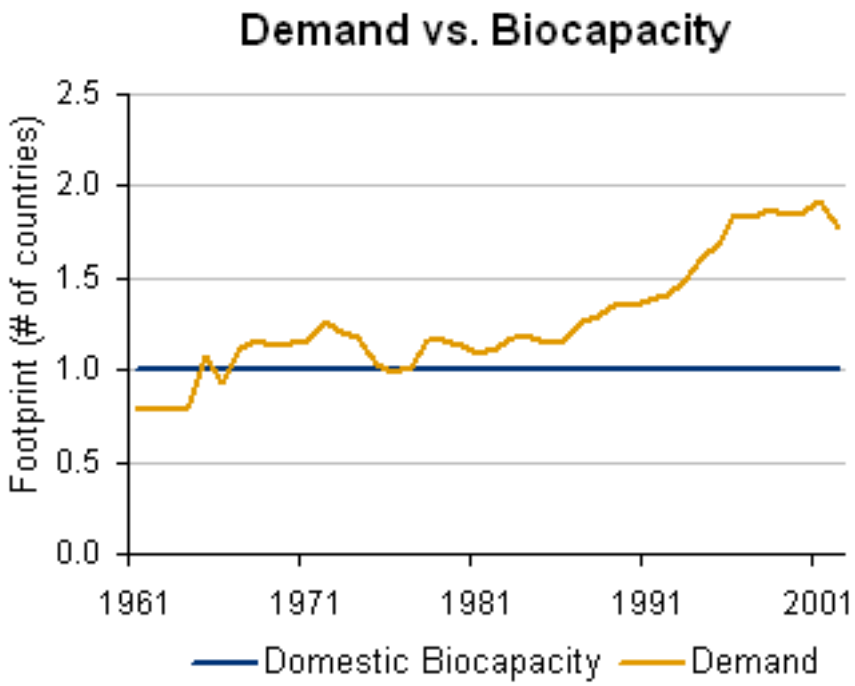


Figure 2.2 Philippine Ecological Footprint by Component

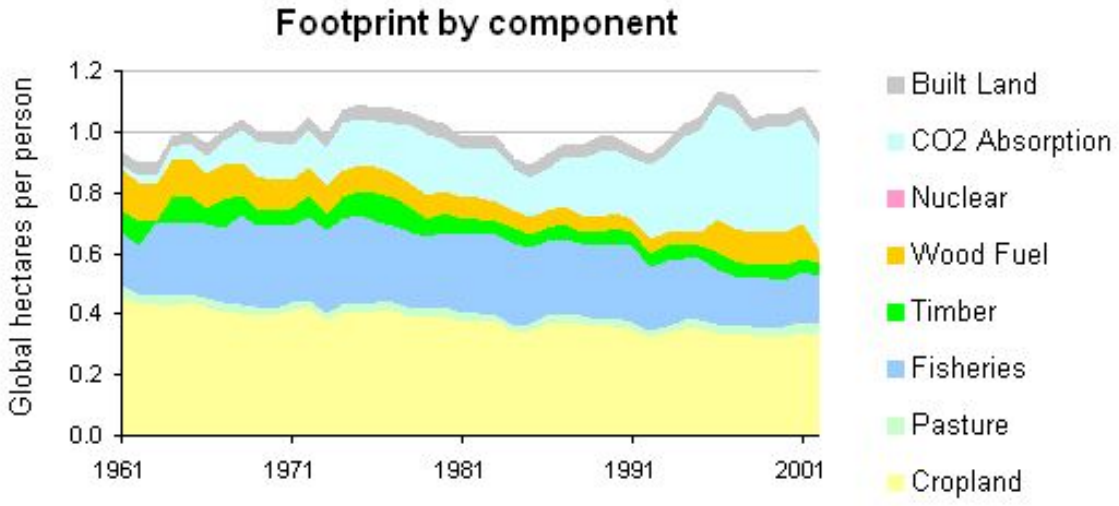
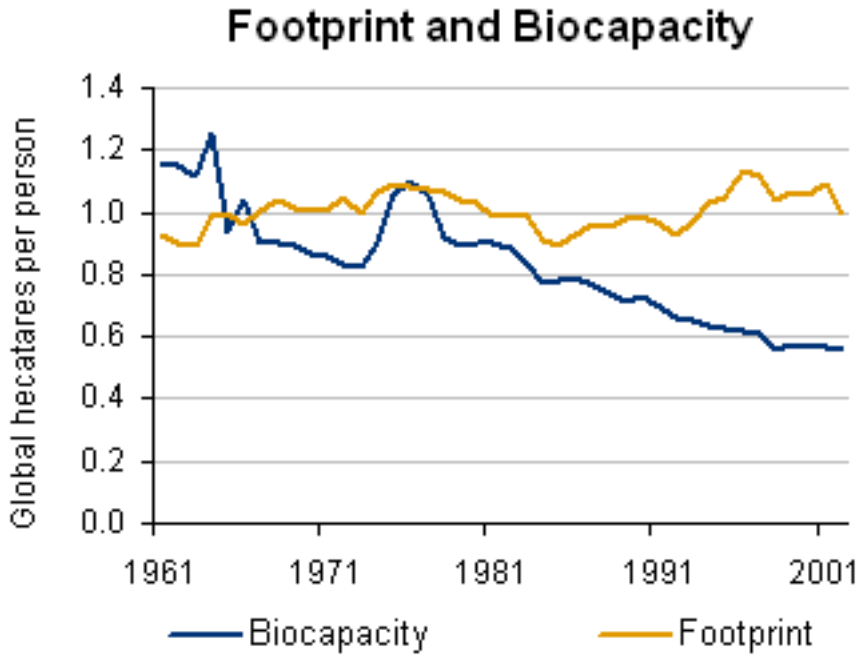


Figure 2.3 Philippine Ecological Footprint and Biological Capacity



83. If this principle governed development strategy and policy, it was the driving force behind human settlement development. Property development business principles ruled over land use and the management of other natural resources.

84. The different phases presented above had profound impacts on the patterns of ekistic formation. The emerging patterns may be tracked using the ekistic scales of Doxiadis.

1. The Rural *Ekistic* Formation

85. Nature and its ecosystems take the form in the Philippines of "wedges" that go from montane uplands down to the coasts where streams flow from their upland sources to drain into the "municipal waters" of coastal towns and villages. These are watershed units that are made up of different pedo-ecological zones: cool and sometimes still forested uplands, warmer midlevel rolling hills and plateaus, alluvial plains blending into the coastal mangroves, sea grass, and corals on to the near and far shore marine waters.

86. Human communities have colonized these wedges first along the shores and on the rich alluvial plains best suited for wet rice agriculture, and as population densities increased, up along the rivers and finally on the upland zones, establishing villages that have grown into townships and, later, into larger towns and cities.

87. The schematics formulated by Earl Kulp provide a clear picture of these phases. The pattern roughly corresponds to the Ekistic Logarithmic Grid of Doxiadis. Adapting Kulp's scheme to typical Philippine conditions gives us the following scheme:

Table 2.1 Kulp's Scheme

	Farm Families	Rural Population	Subunits
Village	100	500	
Township	1,000	5,000	10
Municipality	10,000	50,000	10
Biodistrict	50,000	250,000	5

Source: Kulp, Earl M., "Ekistic Documentation: The ekistics of rural development", *Journal of Ekistics*, vol. 38, no. 224, July 1974, Athens: Athens Center of Ekistics of the Athens Technological Organization, p. 73

88. The "Biodistrict" usually covers a distinct wedge or watershed area that encompasses a cognate ecosystem with the municipal waters, the coastal and lowland alluvial plains, the mid-level dry agricultural areas, and the mountain forested watershed with the river sources. Typically, this will comprise a thousand square kilometres of land and 3,000 square kilometers of municipal waters. The average density will be 250 per square kilometer.

89. The *ekistic* properties will multiply as we go up the scale. The following table (Table 2.2), taken from Kulp's 1974 article, applies to the Philippines as well as to a number of countries in Southeast Asia:

Table 2.2 Typical Rural Ekistic units

Ekistic Scale		Standard Nomenclature	Rural Typology		Some typical rural administrative hierarchical structures (positioned on the table to show approximate scalar magnitude)	
Class	Population		Families	Population	Thailand	Taiwan
I	40	Family Dwelling Group	10	60		
II	250					
		Village	100	600	Mubaan 600	Village 700
III	1.5t[1]					

		Township	1,000	6,000	Tambon 6,000	
IV	7t					
						Township 12,000
V	50t					
		District	10,000	60,000	Amphur 60,000	
VI	300t	Province	50,000	300,000	Changwad 350,000	

[1] Thousands
Source: Kulp, 1974

Table 2.3 Stages of Rural Ekistic Evolution

Feature	Stage 1	Stage 2	Stage 3	Stage 4
Roads	- All weather roads to provincial center	- Paved to every province - All weather to all districts	- All weather to every township	- Paved to every township - All weather to every village
Permanent Markets	- Provincial Center	- Every district	- Some townships	- All townships
Crop-buying cooperatives w/warehouses and trained managers	- Provincial Center	- To many Districts	- In many townships	- In all townships
Commercial bank branches	- A few Provinces	- Most or all Provinces	- Most districts	- Many townships
Specialized shops	- provincial center only	- district center	- some townships	- all townships
Professional agricultural agents	- provincial level only	- district level	- township level	- one per 3-4 villages
Secondary schools				
Higher to level 12	- most provinces	- many districts	- all districts	- most townships
Lower to year 10	- a few districts	- most districts	- most townships	- all townships
Medical facilities				
Hospital and doctors	- most provinces	- all provinces	- most districts	- most townships
Clinics	- many districts	- all districts	- most townships	- most townships
Orientation of farmers	- subsistence, mixed	- mixed	- mixed-diversified	- diversified/ high value
Catalytic innovations	- improved seeds	- agricultural chemicals	- small equipment, horticulture	- horticulture, livestock (Dairy)
Illustrative countries	- Laos	- Thailand, Philippines	- Malaysia, Philippines	- Taiwan

Source: Kulp, 1974

90. Rural development is spurred by the diffusion of facilities and services from higher-order to lower-order ekistic units. It that is accompanied by on-farm evolution of agriculture from subsistence to market-oriented high-value diversification. Ekistic diffusion is very important.

91. The rich alluvial plains in the seven river valleys of these islands attracted dense population settlements relying for their support on the broad rice-paddy ecology. The basic evolution of agriculture from subsistence to high-value diversification is the backbone essential to pay for services. In fact, considered basic is production of physical goods entering the labor consumer baskets. The principal catalysts for the process were introduction of new methods and farm inputs—horticulture, livestock, improved seed.

92. The township is an *ekistic* focus of rural development—many administrative functions tend to move up to township as development proceeds.

93. Basing his observation on his personal experience in Asia and Latin America, Kulp placed the standard meaning of township, level III-IV, on the ekistic scale—at 1,000 families, 6,000 population—units the Thais labelled "Tambon." The size might be larger in small island countries with dense populations such as Taiwan, where the corresponding unit might have populations of as many as 12,000 or between orders IV and V on the scale.

2. The Social Accounting Framework

94. The development of the *ekistic* pattern may take place as a more natural evolution driven by the growth of the local communities and the desire of the people for improvement of their lives, or it may be pre-empted by powerful outside forces that direct the energies of the population and the use of their resources to needs and demands of markets outside the local communities.

95. The impact on the social and economic structure of the local community may be captured more fully and dramatically in a formal set of accounts. Such a system has been designed and proposed by the present author in his book *A Community-Centered Accounting System: A Method for Operationalizing Sustainable Development Management.*[1]

96. The framework is a social accounting matrix, with a community balance sheet and a statement of community income and investment. In 1974 the International Rice Research Institute commissioned a group to prepare such an accounting statement for a village in Laguna along the Laguna de Bay. When reformatted in a Social Accounting Matrix the figures reveal some very important insights into the structure and problems of village formation in the country. Table 2.4 (see Annex) presents the picture for Barangay Tabuan. It gives a more precise technical specification of the ecological-economic circumstances of the village.

97. On the surface, the village is richly endowed with natural resources. With only 95 households, there are 191.7 hectares of rich alluvial plains, a large lake, abundant rainfall, an irrigation system which serves 172 hectares of rice lands. It is also near the highway.

98. But the balance sheet shows that ownership claims from non-villagers cover most of the land, 183.7 hectares, i.e., 170.1 hectares of irrigated rice lands and 13.6 hectares of

[1]Asian NGO Coalition for Agrarian Reform and Rural Development, Third Asian Development Forum, 14-18 February 1994, Kathmandu, Nepal)

coconut lands. Villagers own only 1.9 hectares of the rice lands and 6.1 hectares of the coconut land.

99. From these lands, in the crop year 1975-76, the villagers generated for themselves US$784 of gross value-added per hectare. The exchange rate then was P7 per dollar, so that overall village income would be equivalent now to P21,155 (US$846) per hectare. The income generation reflects a low-intensity use of resources: very little income from fisheries in a water-abundant village; no processing income at all, and inefficient use of exchange synergy with the rest of the region. The result shows a low "Leontieff multiplier" because of the lack of intermediate sectors.

100. The matrix details the community in several ways:

a. The resource endowment is specified in the asset side of the balance sheet. The resources are not only listed and valued, but assigned to the sector of primary productive use. That distribution shows the production structure of the community.
b. The valuation of the assets reflects the valuation of the resource to the village. The asset statement reflects the degree of development of the village resources and the availability and configuration of complementary capital. The combination should indicate the production and income generating potential of the resources which should be reflected in the valuation. For example, land with an irrigation system should have greater value than rain-fed land. In the same way, production that generates resource-damaging waste should reflect the negative value of the waste.
c. The liability side shows the claims of non-villagers on the assets located within the village. Improvements on assets may be accompanied by reductions in community net worth, in which case they may be of dubious value to the community.
d. The transactions flow-matrix (see Table 2.5 in the Annex) defines the parameters of the community's production and distribution system. It shows the range of products and materials generated from the use of resources and the potential for processing of primary materials and their by-products. It shows how production is organized.

101. In the case of Tabuan village, the total value of production in 1975-76 was US$143,200. Palay output was US$110,500 or 77% of the total. Only 2% of production went to local consumption. Over two-thirds, or 68.5%, was sold outside the village or paid as lease rental to landowners living elsewhere. The distribution pattern was dictated by the structure of ownership claims to village resources. Table 2.6 (see Annex) shows the system performance under each set of assumptions. The bottom line is per household income, which in the base case is P29,217 or US$1,169 per year (at roughly current exchange rates).

102. But one is able to assess then the intensity efficiency of resource use. The only two resources shown are land and water, which comprise the base for the village livelihood. The overall average income generation in the base case is US$2.21 per hectare-day or under P60.00 per hectare-day in local currency terms. Two-cropped rice uses 26,800 hectare-days out of a total available of 40,698 hectare days (based on 365 days of use which is of course not realistic). The utilization rate is 66%.

103. Higher intensity is of course possible with intercropping and rotation, but rice agriculture represents far greater cropping intensity than coconut. The usual average density of coconut planting is 140 to 160 trees per hectare for 365 days a year. But the coconut tree actually occupies only a portion of the land, perhaps 1 square meter per tree.

This leaves an in-between space available of some 95% of the land area. Given the moisture conditions and the suitability of crops that will thrive at reduced solar radiation, this leaves a substantial percentage of the 19,700 hectare days available in the village.
104. The income generation per hectare in non-rice agriculture (which was mainly coconut) was only US$0.73, or P20, per hectare day compared to P66 (S2.44) from rice. The most interesting underused resource was the 133,800 hectare-centimeter-days of standing sweet water in the rice fields, which is used only for weed-control for the rice plants. The experience in Vietnam, for example, is that fish culture on this water concurrently with the rice growing period can double the income yields of the rice farmer per hectare-day.

105. The system thus provides the village with a framework for the following:

a. Understanding the way its livelihood system operates, the key factors and the precise quantitative impact of the different variables on the village income; the terms on which the village trades with the outside world; the generation of resources for capital formation; and the constraints and opportunities posed by their resource endowment and the structure of claims against these resources.
b. Determining what changes in its structure are dictated by the changing circumstances of the village people. Growth and shifts in consumption patterns will necessitate changes in the patterns of resource usage and in the input-output parameters. These include the results of introduction of new crops, of handling and processing plants, expanding the non-agricultural production and service sectors, etc.
c. Readily estimating the effects by inserting suitable columns and rows into the structure and determining the impact on income generation, per hectare day of land and per-hectare-centimeter-day of water, with the resulting enhancement of per household incomes, and the assessment environment-harming gas, liquid and solid wastes. In brief, it is possible to see what range of scenarios does not involve fundamental changes in the system structure: no new crop or new industry or change in cropping patterns, etc. It can also determine the impact of changing the structure itself, changing coefficients, introducing new columns or new rows, etc.

3. Weaving in the Sustainable Development Criteria

106. The classification of human settlement scales and the social accounting framework just described provide powerful tools for tracking the course of both social and economic development and the embodiment of the process in the ekistic formation. As the settlements move up along the grid of the ekistic logarithmic scale there should be a corresponding growth and development of the economy and a multiplication of specialized skills and of occupational employment. This is the pattern such development has followed in the countries that have succeeded in pursuing a more inner-directed strategy.

107. In the Philippines, as some economists have pointed out, urban formation has proceeded rapidly without, however, the corresponding development of the economy: the increase in agricultural land productivity accompanied by the growth of processing industries that has made it possible for rural populations to leave the farms and find non-agricultural employments in the urbanizing centers.[2] Shifts in population have been caused rather by types of investments that have appropriated the resources of the countryside for export production, marginalized rural populations without either raising the productivity of food agriculture, or created manufacturing industries to support the rural to urban migrants.

[2] See article by Balisacan, Medalla, & Pernia, “Urbanization and Economic Growth Patterns in the Philippines,” no date.

108. Normal, healthy development is reflected in the Social Accounting Matrix in the multiplication of the industry sectors and the lengthening of the production chain so that physical product going from agriculture and fisheries and forestry and mines go through urban settlements of different sizes that process them and transform them into a wider variety of finished products for local consumption, capital formation, and foreign trade in ecological surpluses exchanged at favourable terms for needed capital and intermediate goods.

109. In the Philippines, in the years since the end of the Marcos regime, the degree of domestic processing has steadily declined. The country has been de-industrializing and figures are reflected in the national Input-output matrix up to the latest in 2000 showing that there has been less and less passage of physical products from primary through intermediate to final processing. (The 1994 Input Output accounts showed that every peso of expenditures on consumption and capital formation generated 1.24 of total production in 1994 and only P1.20 in 2000 showing a declining degree of inter-industry linkages.)

110. But the most alarming aspect of our ekistic formation has been its unsustainability viewed from all three aspects of sustainable development: the ecological, the social and the economic. This was starkly evident in the studies of the country's biological capacity and ecological footprint over the 40 years from 1961 to 2002 which showed that the "biological capacity" of our natural resources has been declining at the same time that our use of those resources has been increasing beyond the capacity. The low gini coefficient shows a widening divide between the very wealthy and very poor. These trends explain the two most pressing problems of the country: poverty and ecological destruction.

V. RECOMMENDATIONS

111. The past ekistic formation trend has been clearly unsustainable and the double whammy of a declining biological capacity of our resources and increasing load of our *ekistic* formations are imposing on nature will lead to disaster. A consciously designed and well-conceived program is required to put us on a sustainable path. What are the most essential steps for accomplishing this?

112. The unsustainability of the whole country's ekistic formation comes out in the estimates of the overall ecological footprint that indicates that the average Filipino uses the equivalent productivity of 1 global hectare to sustain our average lifestyle. Yet, all the Filipino settlements combined have a biological capacity of only 0.6 of a global hectare per person. We are overusing our natural resources by 0.4 of a global hectare per person. Stated another way, sustaining our level of life will require an additional two-thirds of the Philippine **area size**.

113. This is not surprising since economic activity is conducted day-to-day by private and government institutions and private households according to performance criteria that do not take into account biological capacity limits. We need an organization structure that places these ecological constraints as an essential and integral factor in the manner and intensity of our usage of resources.

114. Business enterprise with its profit-maximizing objective takes no such account. Neither do national and local government entities in their sectoral and departmental orientations. The country as a whole is too large and diffused an entity for this kind of decision making on a daily basis. At local levels, the regions and the provinces are too large and the cities and municipalities too small to make sustainability explicit objectives in their management administration.

115. To be responsive, we need a fundamental change in the analytical approach underpinning our diagnosis and strategy. We must recognize the reality that the Philippines is made up of diverse ecosystems, each with a community that must find a symbiosis with its ecosystem. In an island country like the Philippines this unit ecosystem is what we call the watershed wedge. Some of our planners said this seems to be the best unit for area planning and management.[3] A precarious symbiosis must be found and must be established, sustained and supported for each habitat. This requires more than the manipulation of the instrument variables found in the economist's models, and more than the mere construction of roads, bridges, ports, public markets, and power plants.

116. In the ekistic grid, each of these watershed wedges would be the habitat of some five municipalities consisting of about 10,000 families each, making up a total of around 50,000 families. The ekistic formation pattern would be constituted by some 20 villages around the market town center, or *poblacion*, of each municipality and one of the five municipalities would have a larger and more urbanized center performing more social, economic and political functions. We might also use the term “biodistrict” for these *ekistic* clusters.

117. It is in the context of the varied ecosystems, that the production, processing, and marketing networks must be designed and installed, appropriate to each habitat to become its life support. Only systems designed in this manner can give substance to the rhetoric of equitable distribution among classes and regions, and that of achieving a balance between exploitation and conservation of nature. Dependence on pure market forces operating with the present distribution of resources and bargaining power makes a mockery of the rhetoric.

118. To achieve sustainable development, each of these biodistricts would seek the following objectives:

a. First, to raise the productive efficiency of each of these biodistricts to maximize and optimize its biological capacity.

b. Second, to adopt economic and social development patterns and ekistic formation designs that minimize the ecological footprints they impose on the natural capital.

c. Third, to ensure that the utilization of the district’s biological capacity is enjoyed equitably by all the stakeholders and that no family falls below the poverty line.

Raising Biological Capacity

119. The preservation and enhancement of biological capacity in a country and every part of it is a vital objective that, whether in the Philippines or in most parts of the world, has received scant attention.

120. It has come into prominence relatively recently as nations and their leaders realized that no amount of capital will ever fully substitute for natural assets. Ultimately the biomass from photosynthesis is the only source of new material in the planet, and all the financial resources and human technology will never take the place of the land and seas as converters into biomass of energy from the sun, and that the interconnectedness of all nature sustains the life supporting capacities in ways we do not yet fully understand. The

[3] See for example, Rex Victor Cruz, “The Watershed as a Planning Unit: A Challenge to Regional Planning,” and Geronimo V. Manahan’s plan for the Ifugao communities, “Space Utilization and Spatial Intervention in the Ifugao Highlands: The Ecology of the Rice Terraces,” in the October 1997 issue of the *Philippine Planning Journal*.

new rule of development is “to achieve human development with the minimum of interference in the natural environment.”

121. Sustainable ekistic formation must therefore design systems that meet all the needs of human communities with the minimum conversion of natural landscapes into urban space. This should be the end goal of all ekistic formation. If the currently ruling modes of organization of human activity are not accomplishing this as a matter of course, then we must look for the alternative modes that will work.

122. In that quest, we start from an analysis of the systems of organization and management that have produced over the past 230 years the wonders of science and technology, unprecedented wealth, and gigantic megalopolises, or what Patrick Geddes calls *conurbations*—“undifferentiated, formless urban mass made up of constellations of cities” (Mumford, 1961)—of our millennium. This is the economic enterprise system that has institutionalized the human drive for wealth and power and harnessed both human genius and creativity as well as human greed and ambition alongside the predatory instincts to fashion from nature’s productive capacities the tools, weapons, and artefacts to gratify human needs and desires.

123. The potency of the economic enterprise lies in its focused single-purpose character, the development of its rigorous operating technology, and the evolution of a class of dedicated highly professional and rigorously trained managers. Its problem rests on the values reflected in its “bottom line” objective: maximum profit for its owners. In the profit calculus considerations of ecological preservation and restoration and social costs are externalized.

124. This unit of organization was the central growth engine of both capitalistic and socialistic regimes. The difference lay only in the ownership of those engines: being private in the one and state-owned in the other. Although in both, the need was recognized to set ground rules to maintain a balance between the workings of the micro-organization unit and the macro-social perspective. The perspective went from the individual unit to the nation state. The intermediate or meso-perspective was generally sectoral in character—a taxonomic rather than a natural or systemic aggregation—industry groups rather than territorial systems.

125. Set loose on nature, such a powerful engine of exploitation was capable as well of wreaking serious havoc on nature. Which it did—with no less impact than in an ecologically fragile state such as of the Philippines. The question then is not one of repudiating a system that has developed tools and technology of proven power, effectiveness and efficiency, but of exploring a way of harnessing the tools and technology in an organization designed to encompass everything essential to sustainability that the enterprise system left out, specifically, *symbiosis with nature and human society.*

126. An *ekistic* formation on a watershed district can become, at the meso level, such a unit of organization and management for navigating social transformation and human settlement formation along a sustainable path. But it must be structured to make use of all the tools and technology that made the economic enterprise so powerful and effective. It requires an appropriate operating technology and an accounting system and, plus a class of professional practitioners rigorously trained in the protocols of its management.

127. Because the watershed *ekistic* formation includes both the human colony as a community and its habitat as a natural ecosystem and is structured as a unit of organization and management to attain sustainable development, the unit can be labelled ECSOM—an ecosystem-based, community-centred, sustainable-development, organization and management unit.

128. In the economic enterprise the philosophy and technology are embodied in the accounting system that serves as the principal instrument that guides management in the use of its assets to achieve its objectives of maximizing profit and net worth of the owners.

129. This is the importance of the social accounting matrix for the management of what we would call the ECSOM unit. Two sets of monitoring systems are required. The most comprehensive is the Social Accounting Matrix (SAM). The sustainability considerations are reflected in the periodic calculation of both the Biological Capacity of the unit's natural capital and the Ecological Footprint imposed by the level and pattern of its consolidated production-consumption-trade-investment operations.

130 It is important to understand that the SAM is not a mere economist's or ecologist's research tool. It is a management accounting system and acquires its live character because its categories ("fields") and numbers come out of the live plans, decisions and performance of the ECSOM organization.

132. That organization is not an institutional unit operating within the community—like the local government's subunits at barangay, municipal, city, or province levels, nor the national government's departments and agencies. It *is community*-organized—civil society in the sense in which Lenin understood the term! It is the constituency, the stakeholders organized as an operating juridical entity (informal at the start but more and more formalized as the system matures).

133. Organized means formally interlinked so there is a systematic process of effecting what Habermas calls "Communicative Action" in all the areas affecting individual and community lives. The ekistic formation on each "Biodistrict" encompasses 50,000 some 100 *barangays*, ten township centers and five *poblacions*. Organizing for "communicative action" entails clustering households into groups of five to 20 households per cluster, each with a cluster "leader," and correspondingly leaders for every *barangay*, township, *poblacion*, municipality, and a council for the biodistrict.

134. These leaders selected for every level serve as facilitators in the stakeholder deliberations, consensus building and decision-making, and as "collective bargaining agents" for their group of stakeholders in discussions and negotiations with other leaders and with intervenors outside of the stakeholder groups. In this sense there is a differentiation of identity and personality between the stakeholders as civil society and the government and political leadership who are only virtual spokespersons of civil society and in fact are spokespersons for the entities they represent—the local government, the national government agencies, private business or even formal local and national NGOs which are their own juridical personalities.

135. The leaders/collective-bargaining-agents are strictly *agents* of their *principals* composed of the stakeholders in their respective groups, and all together these agents constitute the body of representations for the stakeholders of the entire biodistrict. Their role as collective bargaining agents defines a responsibility for negotiating on the basis of the sustainable development interests of the community and its habitat that is formulated through a visioning and planning process that is fully participatory and conducted in stages from the clusters up to the biodistrict level. The process is facilitated through the leaders and provided with technical resource persons specially trained to make their expertise available as consulting counsel "on tap" rather than as authoritative intervenors "on top."

136. The resource persons are marine biologists, soil scientists, agronomists and farm systems specialists, agricultural and industrial engineers, economists, sociologists, town planners, finance, accounting and managerial specialists, among others. Through their

assistance, the results of the visioning and planning processes articulate the visions and plans in two pro forma media—the Social Accounting Matrix and the Ekistic Formation Plans.

137. The SAM embodies the economic and financial plans, while the Ekistic Plan comprises the social and physical plans. The sustainable development criteria ensure that the plans are ecologically, socially and economically sustainable, viable and feasible. This means that they provide for maximization of the biological capacity of the resources, maintain the overall footprint *within* the limits of the biological capacity, optimize the utilization of natural, artefact, material and financial capital, and ensure equitable distribution of benefits in the form of wealth and incomes.

138. Since these visions and plans are built up from ground-up consultations, their articulations are built up from the micro (household and clusters) to the meso (municipal, city, biodistrict, and regional for metropolitan centers), and eventually to the macro (National for primate capital city) levels.

139. It is important for the economic growth and development plans that the strategy revolve around the enhancement of the lives and livelihood of the stakeholders. This is provided for in the structure of the Social Accounts where the bottom lines are the income and net worth of the family, the cluster, the village, township, municipality, and biodistrict consolidated in stages at each level.

140. Since the different sectoral production systems are detailed out in the matrix, the categories differentiate out the physical goods production sectors—food and other consumer products, raw and intermediate materials (including construction materials), capital and durable goods—from the service sectors. The latter are also subdivided into services linked to physical goods production such as transport, storage, banking, insurance and direct personal services such as medical and dental services.

141. The importance of the planning lies in the inventory of the biodistrict's natural resources for the purpose of estimating the biological capacity of the area. This means taking stock of the quantity and quality of the terrestrial and aquatic resources and their usage as crop lands, forest areas, pasture, fishing waters and aquaculture, areas set aside for CO2 emission absorption, and used for town-sites and built-up areas. The productivity of each of these areas in terms of tons of biomass per hectare is determined in order to compare with global averages and determine what the capacity is of each of those resources in terms of global hectares. The overall biocapacity of the district is then determined in units of global hectares (by multiplying them with a standardized unit of global hectares per hectare of each specialized usage like cropland, pasture, forest, etc.) This calculation makes the measurement of biological capacity at the biodistrict level comparable with the calculations at national and global levels. As mentioned earlier, in 2002, the estimated biocapacity of the Philippines was 0.6 ha. per person. On the basis of the population of 78.6 million, this puts the country's biological capacity in that year at 47.2 million global hectares. The breakdown was in million global hectares:

a. Crop land 21.2 million
b. Grazing land 1.6 million
c. Forest 9.4 million
d. Fishing ground 8.6 million
e. Others not specified 6.4 million

142. By expressing the biological capacity of the biodistrict in the same standard global hectares if, say, the typical wedge has a biological capacity per capita at the level of the

national average, its 100,000 hectares of land and 250,000 hectares of fishing waters would have a biological capacity as follows:

a. Crop land 63,500 ghas.
b. Grazing 5,000 ghas.
c. Forest 30,000 ghas.
d. Fishing 27,500 ghas.
e. Others 20,000 ghas.

Total Capacity 150,000 global hectares

143. As discussed earlier, each global hectare is a combination of natural resources capable of providing the biomass required to provide the average person with a level and composition of consumption at a certain lifestyle together with some public services and allowance for savings and capital formation (level of "final demand").

144. This hypothetical calculation would thus show that the biodistrict at its state of technology and economic organization has a capacity to produce biomass from its natural resource endowment on a sustainable basis (without damaging the ecosystem) equivalent to the capacity of 150,000 hectares of standardized global land, This is equivalent to 0.3 of 1% of the country's biological capacity.

145. Planning for development must follow certain priorities. Our priority is to shrink our ecological footprint and expand our biological capacity. The most important task then is to maximize the production of physical products, food, feed, oil bearing crops, fiber, and construction materials. In Philippine development planning based on targets of Gross Domestic Product (GDP) growth rates, there is no particular distinction made between physical products and services, since in terms of value added in GDP accounting, a peso of value added in physical production is the same as a peso in personal services. It makes no difference whether one produces rice or provides massage services—both augment GDP equally.

146. When one considers the interconnectivity and mutual support of industries, however, it does matter. In other words, certain infrastructure, such as roads, is not necessary if there is no physical product to be transported. There is also a sequencing that ensures efficient utilization of resources. Crop production of pineapples and tomatoes must be synchronized with the construction of processing plants for canned pineapples or tomato paste, etc.

147. The design of human settlements must maximize utility and aesthetics again with minimum disturbance to natural ecosystems, economizing land use increasing both population and income densities per unit of terrestrial and aquatic resources (avoiding reduction in biological capacity).

148. This can be tracked on the Social Accounting Matrix, where the value-added streams are linked to both the stock of terrestrial and aquatic resources assigned to particular sectoral production systems and the efficiency of their usage tracked in the flow of hectare days along the value streams.

149. The productivity of the natural capital base is also enhanced by the development of inter-industry linkages that have a multiplier effect on biomass utilization. This is the so-called Leontieff multiplier that operates when the primary production of terrestrial and marine resources go through processing that generates a stream of products and by-products that are the feedstock of other processes and the whole system turns out a wide variety of useful and valuable products for human use.

150. The new science of “Industrial Ecology” studies the design of such production systems that imitate the metabolic chains of nature—achieving almost perfect complementarity among processes so that there is maximum utilization of biomass production, minimum waste and maximum turning out of valuable products.

151. The management of the ecological footprint entails a number of factors. The consumption levels and patterns and the selection of so-called satisfiers for different human wants and needs. The key is the *dematerialization* of lifestyles—making lifestyles less dependent on actual material consumption. This cuts across the basic categories of food, clothing, shelter, and recreation.

152. Then there is the selection of production systems to ensure optimization of the use of natural resources and the selection of processing technologies and energy systems that entail lower demands on the biological capacity of natural resources.

153. A major factor in the management of the footprint is the design of the ekistic elements: shells and networks. The lifestyles of different classes of society are reflected in the designs of their homes, their neighbourhoods, their workplaces. The architects and professional planners are often the arbiters of taste in these matters. It is important then that sustainable development architecture and new planning theories and ideologies reflecting the consciousness of ecological limits and sustainability criteria become established in the societies of practitioners.

154. The principles of the New Urbanism (Katz, 1994) or Smart Growth that are gaining wider acceptance in the western countries can find applications in the planning of biodistricts. This includes the greater recognition paid to vernacular styles and design modes the suitability of which to local environmental conditions have had long experience. The use of materials that are endemic in local biodistricts, also the consultative process called the *charrette* would be quite similar to the participatory visioning and planning processes that are part of the ECSOM operating protocols.

155. A simulation based on hypothetical parameters but using data based on the actual ecological footprint studies of the Philippines will demonstrate how a planning process would establish targets based on the biological capacity of the district.

156. The 50,000 households are domiciled in 10 rural villages and five urban centers. Let us assume that the population distribution is the same as in the country: 49% urban and 51% rural. In the urban population a powerful 10% elite dominates the use of resources and distribution of incomes, there is a 30% middle class that achieves a lifestyle equivalent to 1/3 that of the elite’s. The rural populations and the masses accounting for 60% of the urban population have to make do with the residual. We express the incomes in terms of allocation of global hectares to support the lifestyles of the classes.

157. At the estimated average footprint level of the Philippines in 2002 of 1 global hectare per person, if the urban elite lives a lifestyle 5 ½ times the national average (that is, 5.5 global hectares per person is equivalent to the lifestyle of the average Swede or Frenchman), then the average rural villager will live at a style taking only 0.54 of a global hectare and the average urban mass, 0.64 of a hectare. The rural folk would live at the level of the average Bangladeshi or Cambodian, the urban mass the level of the average Pakistani. But the whole system would be over using the biological capacity by as much as 0.4 of a global hectare per person or 2/3 of the biological capacity.

158. If the footprint were to be reduced to the biological capacity of 0.6 of a hectare per person, the 10% urban elite would have to reduce its footprint to possibly 3 global hectares per person, a level somewhere in between the average Malaysian and the average South

Korean; and if the urban middle class lives a lifestyle that takes 1 global hectare per capita, then there will be a struggle between the urban mass and the rural villager. If the urban mass appropriates 0.66 of a hectare, the rural villager will get only 0.22 of a hectare. But if the rural villager succeeds in living at about the level below the average Bangladeshi at 0.46 global hectares, then the urban mass will have to live at a level of a little over half the average Bangladeshi.

159. There obviously is a level at which bare survival is reached. If the rural villager or the urban mass is pushed below this level, then they will take measures to survive even if it means destroying ecological capacity. These are processes that the stakeholders, with the assistance of their leaders and collective bargaining agents, must understand in order to define bargaining positions on which to base their representations with the political leaders and arbiters in society.

160. In summary, the approach advocated here for an organization structure and process brings into a meso level decision process, somewhere between a municipality and a province, about the size of an American county, all the essential elements of a development that is ecologically, socially and economically sustainable. The system takes as the unit of human settlement management, not single cities but *ekistic formation units* made up of a hierarchy of human settlements ranged along a logarithmic scale from village to city.

161. The smallest such unit is a watershed wedge centered on a large town or small city, depending on the population size and density. The intermediate scale would be composed of interlinked clusters of such biodistricts in an urban region with a large regional city or small metropolitan center. (See the paper of Dr. Einseidel arraying the possible metropolitanizing clusters of cities and towns in different regions of the country).

162. The country would then be structured as a group of such metropolitan regions around the primate city, Megalopolitan Manila. But for this formation to assume a healthy and sustainable path, then each biodistrict must be so organized and managed as to achieve internal sustainability that not merely maintains ecological footprints within their biological capacities but also *raises biological capacities of their respective resource endowments* to such an extent as to generate ecological surpluses that will cover the ecological deficit of the metropolis in the metropolitan region to which they belong and that each metropolitan regions generates enough surplus to sustain the deficit of the Metro Manila megalopolis.

163. Herman Daly proposed three basic ‘Daly Rules’ for sustainability (Meadows, 1999):

a. Renewable resources (fish, forests, soils, ground waters) must be used no faster than the rate at which they regenerate.
b. Non-renewable resources (mineral ores, fossil fuels, fossil ground waters) must be used no faster than renewable substitutes for them can be put into place.
c. Pollution and wastes must be emitted no faster than natural systems can absorb them, recycle them, or render them harmless.

164. Our corresponding rules for sustainable *ekistic* formation would thus be:

a. “The hierarchy of human settlements within a biodistrict must so maximize the biological capacity of its natural capital and maintain its ecological footprint at such a level below that capacity as to generate enough surplus to cover the ecological deficits of its urbanized sectors.
b. “The hierarchy of biodistricts within a metropolitan region must so maximize its total biological capacity and maintain its ecological footprint at a level enough below that capacity as to cover the ecological deficit of its metropolis.

c. “The hierarchy of Metropolitan Regions within the country should so maximize its biological capacity and minimize its ecological footprint at sufficiently below that biological capacity as to cover the ecological deficit of the National Capital Region.”

165. Only in this way can we put the Philippines on a sustainable development track. And only if every country in the world succeeds in keeping within these rules will we have a sustainable planet.

REFERENCES:

Atienza, Bernardino A. 1998. “City Size and City Efficiency of Selected Philippine Cities”, in *Philippine Planning Journal, vol. XXIX, no. 2,* and *XXX, no. 1, April-October 1998*. p. 71.

Bairoch, Paul. 1988. *Cities and Economic Development: From the Dawn of History to the Present*. Chicago: The University of Chicago Press.

Boserup, Ester. 1965. *The Conditions of Agricultural Growth*. London: George Allen & Unwin Ltd.

Corpus, Arturo G. “The Philippine Hierarchy of Human Settlements and the Growth Center Strategy: Limitations and Planning Considerations”, in *Philippine Planning Journal, vol. XIX, nos. 1 and 2, October 1987-April 1988*. p. 16.

Cruz, Rex Victor O. “The Watershed as a Planning Unit: A Challenge to Regional Planning”, in *Philippine Planning Journal, vol. XXIX, no., October 1997*. p. 19.

Douglass, Mike. “Income and Employment in Asia: Policies Under Two Development Strategies”, in *Philippine Planning Journal, vol. IX, no. 1, October 1977*. p. 1

Doxiadis, Constantinos A. 1968. *Ekistics: An Introduction to the Science of Human Settlements*. London: Hutchinson & Co. Ltd.

Einseidel, Nathaniel von. ----

Jacobs, Jane. 1969. *The Economy of Cities*. New York: Random House.

Katz, Peter. 1994. *The New Urbanism: Toward an Architecture of Community*. New York: McGraw-Hill, Inc.

Kennedy, Paul. 1987. *The Rise and Fall of the Great Powers*. New York: Vintage Books.

Korten, David C. 2006. *The Great Turning: From Empire to Earth Community*. Bloomfield: Kumarian Press, Inc. p. 20.

Laszlo, Ervin. “Human Evolution in the Third Millennium”, in *Futures, vol. 33, Issue 7, 2001*. p. 649.

Manahan, Geronimo V. “Space Utilization and Spatial Intervention in the Ifugao Highlands: The Ecology of the Rice Terraces”, in *Philippine Planning Journal, vol. XXIX, no. 1, October 1997*. p. 1.

McCoy, Alfred W. and Ed. C. de Jesus, eds. 1982. *Philippine Social History: global Trade and Local Transformations*. Quezon City: Ateneo de Manila University Press.

Meadows, Donella. 1999. “Indicators and Information Systems for Sustainable Development”, in David Satterthwaite, ed. *Earthscan Reader in Sustainable Development*. London: Earthscan Publications, Ltd. p. 370.

Mumford, Lewis. 1961. *The City in History*. Harmondsworth, Middlesex: Penguin Books.

Wallerstein, Immanuel. 1984. *The Politics of the World Economy: The States, the Movements and the Civilizations*. Cambridge: Cambridge University Press. p. 4-5.

World Commission on Sustainable Development (WCED). 1987. *Our Common Future*. Manila: Lingkod Tao-Kalikasan. p. 5.

Table 2.4 A Village Social Accounting Matrix
Constructed from the data collected by Yujiro Hayami et al.
Anatomy of a Peasant Economy
Barrio Tubuan, Laguna, 1975-7S
(InThousand USS)

Sector	Rice	Non-rice agri.	Non-agri. Ent.	Capital Prod'n.	Consump.	E xport	Inventory change	Capital formation	Final demand	TOTAL OUTPUT
Rice	2.3	4.6	0	24.4	75.7	3.5	0	103.6	110.5	
Non-rice agriculture	0	0	0	5.7	20.9	0	0	26.6	26.6	
Non-agri. enterprise				0.6	0.2	0	0	0.8	0.8	
Capital production				0.1				5.2	5.2	5.3
Hired labor wages	21.4	0	0				0	0	21.4	
Family labor wages	14.4	4.1	0.2	1		1.2		0	1.2	20.9
Rent to res. landlords	8.3	0	0		2.4				2.4	10.7
Rent to owned land'	0	0	0					0	0	
Capita] rental to villagers	0.5	0	0					0	0.5	
Profit (residual)	20.5	10.3	0.3			18.2			18.2	49.3
Rent to absentee landlords	24.9	0	0		-24.9			-24.9	0	
Capital rental to non-villagers		3.3	0	0		-3.3			-3.3	0
Purchased non-village inputs		14.9	7.6	0.3	4.2	48.7	-75.7	0	-27.0	0
Savings/Taxes					23.4				23.4	23.4
TOTAL INPUT	110.5	26.6	0.8		102.8	14.7	3.5	5.2	126.2	269.4 Beginning as of 1 June 1975
BALANCE SHEET			137.9							
Assets										
Fixed assets										
Land	127.2	21							148.2	Buildings & structures
0.8	0	0		40.1				40.9		
Major consumer durables					13.9				13.9	
Machines & implements		22.5	8.5		0.1					31.1
Livestock	7.5								7.5	
Perennial plants		6.							6	
Public infrastructure			8.8						8.8	
Inventories										

Farm products	3.5							7.4	
Farm inputs	0							5.2	
Financial assets									
Savings								4.7	
Cash								7.8	
Total assets	131.5	57	17.3	54.1	0	0	0	0	281.5
Liabilities									
Debts outstanding	31	0	0					38.9	
Non-village owned equity									
Total obligations								38.9	
Net worth	100.5	57	17..3	54.1				242.6	
Total liabilities & net worth	131.5	57	17..3	54.1					281.5

Table 2.5 Initial Condensation
Barrio Tubuan. Laguna
Village Social Accounling Matrix, 1975-76
(In Thousand US $)

Sector	Rice	Non-rice	Hon-agri. agri.	Capital ent.	Consump. prod'n.	Export	Inventory change	Capital formation	Final demand	TOTAL
OUTPUT										
Rice	2.3	4.6	0	0	24.4	75.7	3.5	0	103.6	110.5
Non-rice agricuHure	0	0	0	0	5.7	20.9	0	0	26.6	26.6
Non-agri. enterprise	0	0	0	0	0.6	0.2	0	0	0.8	0.8
Capital production	0	0	0	0.1	0	0	0	5.2	5.2	5.3
Hired labor wages	21.4	0	0	0	0			0	0	21.4
Family labor wages	14.4	4.1	0.2	1	0	1.2	0	1.2	20.9	
Rent to res. landlords	8.3	0	0	0	0	2.4		2.4	10.7	
Rent to owned land	0	0	0	0	0				0	0
Capital rental to villagers	0.5	0	0	0	0				0	0.5
Profit (residual)	20.5	10.3	0.3	0	0	18.2		18.2	49.3	
Rent to absentee landlords	24.9	0	0	0	0	-24.9			-24.9	0

Capital rental to non-villagers	3.3	0	0	0	0	.3.3			-3.3	0		
Purchased non-village inputs	14.9	7.6	0.3	4.2	48.7	-75.7	0	-27.0	0			
Savings/Taxes					23.4				23.4	23.4		
TOTAL INPUT	110.5	26.6	0.8	5.3	102.8	14.7	3.5					
	5.2	126.2	269.4									

Table 2.6 Calculating the Demand to Production Multipliers
Calculations of Leontieff multipliers US$100 fd by sector *In US$*

Sector	Rice export	Non-rice export	Non-agrl. export	Capital prod'n. capital	Income from non-village sources
Rice	120.68	37.56	19.27	5.93	18.17
Non-rice agriculture	4.08	104.38	4.24	1.30	3.67
Non-agri. enterprise	0.43	0.46	100.45	0.14	0.45
Capital production	0.00	0.00	0.00	101.92	0.00
Village factor income	73.57	78.92	76.43	23.52	122.29
Imports of goods & services	83.25	82.04	82.60	94.65	72.16
Savings & taxes	16.75	17.96	17.40	5.35	27.84
TOTAL INPUT	298.76	321.32	300.39	232.81	122.29
LAND (Has.)	131.20	131.20	131.20	131.20	131.20
Exports	100.00	100.00	100.00	0.00	27.84
Net resource balance	33.50	35.93	34.79	(89.29)	55.67
FACTOR INCOME/HA.	560.78	601.55	582.53	179.24	932.05
IN PH PESOS ©7/?	3,925.48	4,210.83	4,077.73	1,254.69	6,524.37
IN PH PESOS © 7/?	15,141.13	16,241.79	15,728.40	4,839.51	25,165.44

ANNEX

Box 2.1 Iloilo's Bittersweet Progress

The opening of Iloilo to foreign commerce in 1855 has left an indelible mark in the country's economic history. Among the first to arrive was British vice-consul, Nicholas Loney. Though he admired the local weaving industry with its home-based looms, division of labor, and putting-out system, Loney was still primarily a commercial agent for British international trade. His business was not to support the organic weaving industry but to expand the market for the Manchester textiles by displacing Ilongo textile handicraft with cheap factory produced British cotton cloth.

He also saw the promise of sourcing cheap sugar if centrifugal sugar mills could be installed in place of the crude muscovado mills and local landowners could be induced to shift crops from rice to sugar cane. From the British point of view it was a perfect arrangement. Ship textiles to Iloilo and on the return voyage the ships could load sugar.

As history would have it, the cheap prices of British cotton proved fatal to the Ilonggo industry with European and American cloth "produced to look like the native varieties" (*Memoria de la Provincia de Yloilo, Año de 1892, Varias Provincias, PNA*; McCoy). Exports of the Ilonggo cloth plummeted from 30,673 in *piezas* in 1864 to 5,100 in 1873. (*Gaceta de Manila (Manila), 7a Seccion, Movimiento Maritimo, 1861-1880*, McCoy).

With the end of the local weaving industry in sight, surplus rural labor and the vastness of the frontiers in Negros awaiting claim, the growth of the sugar industry dealt the final blow to the weakening local, centripetal Ilongo economy. It completed the cycle of change, development, and growth transformations, although it was bound to bring crisis and compound socio-economic relations especially with regard to equity.

Iloilo fell and relinquished its economic primacy to Negros, which became the prime sugar producer. Iloilo's once dynamic local economy was transformed into a satellite of the London and New York sugar market economies, with the city's prosperity hanging by a thread to the "sugar planter, his foreign patrons, and, perhaps most importantly, its own population of stevedores" who had become the city's working class. Its economy was at its most vulnerable. True, there had been impressive improvements in infrastructure and transport facilities, but its real role clear was to become a colonial entrepot in a satellite export enterprise economy.

Ekistic formation principles dictate that settlements and improvements made therein are all geared to satisfy the needs of its inhabitants. That said, these structural and network improvements—made to facilitate colonial trade—exacted its costs in the degeneration of natural habitats and the creation of a far deeper income divide between the wealthy elite and the impoverished rural populations. The rise of this "core" city characterized by an export economy left the City with a less coherent economy than it had during the local weaving boom. The city had to rely increasingly on imports for its local consumption of basic necessities such as rice and cloth, at one time even coming close to offsetting its export-related surplus. As McCoy relates, "In 1888, Iloilo earned P4.8 million in exports, P4.7 million of that from sugar, but also spent 4.7 million on imports—P3.3 million for textiles, and P708,000.00 rice."

ANNEX

The Negros Plantation Frontier. The extensive development of the sugar industry was supported by meager wages and continuous acquisition of new lands, instead of investing in new technology for a more intensive cultivation.

In large part, the Negros planter elite that emerged were once the Jaro-Molo elite of the 1850s who dominated the weaving industry. A comparison of the 1897 Negros land list and Molo's *gobernadorcillos* in the 1840's to 1860s would show a direct genealogy. (p. 315)

Labor and labor issues. A continuous labor flight from the rice farms to the sugar plantations created the City's incapacity to meet its food requirements resulting in recurring famine. The December 31, 1884 Commercial Report by the British vice-consul in Iloilo showed foreign rice imports of 466,184 *piculs* in that year as against 150,000 *piculs* the preceding year (p. 311, McCoy).

This concentration of rural labor on the production of sugar exerts pressure on other areas for its supply of food, thus, creating "ghost territories" (Okun) and increasing its ecological footprint. This is further aggravated by the gradual decline of the land's biocapacity by intensive monocropping. The influx of luxury items resulting from direct world trade brought about changes to the local lifestyle and consumption patterns. This change in taste creates a demand for those items, thereby increasing its ecological footprint.

Despite the expansion of the plantations, the notable shortage in labor persisted until the 1920s which prodded the *mestizo* landowners to resort to almost the same labor control means employed in the haciendas of the Central Luzon Plain that the landowners use on their tenants. In the Negros system of plantation labor, as in the share tenancy arrangements in Luzon, debt bondage, cash advances to encourage migration by permanent workers, and the employment of *sacadas* maintained the supply of labor. Corporal punishment was employed to keep the laborers to adhere to such conditions and insure their performance. This exploitative condition was enforced by a complex system of security patrols and passes to capture runaway laborers.

The sugar plantations in Negros brought about deep striation between the workers and the planters marked by harsh working conditions and the continuous expropriation of land from smallholders into the mestizos' haciendas. A remarkable event was the seeming culmination of this labor struggle in an uprising led by Dionisio Sigobela or "Papa Isio" as he (and the revolt) was popularly known. The spirit of the uprising was accurately summarized in McCoy by the American commander in Negros, Col. James Smith, as a fight of "former plantation laborers...for the destruction of the sugar industry and the redivision of the haciendas into small rice farms." (*General James F. Smith, Report, 31 July 1899, U. S. War Department, Annual Report of the War Department (Washington, D. C.: GPO: 1899), 344-46*; p. 324, McCoy).

Thousands of stevedores served under distressing conditions as the legs on which the sugar industry stood on. These conditions resulted in the mushrooming of labor unions each representing either the laborers' interest or the millers' as a counterattack to the former. This mobilization of the working class "has the quality of an inter-class dialogue" with members of the local literati as leaders and an impoverished working class as members. The urban morphology of Iloilo reinforced this quality and resonated in its settlement formations. "Instead of being divided into class-segregated neighborhoods, Iloilo was a city of hollow squares, each with its localized class gradient…First-class commercial and residential structures were built upon the roadway's elevated frontage, establishing two criteria for prime real estate – locality and proximity

to the roadway…Forced away from prime frontage land by the prohibitive costs of rentals, the city's working class rented small plots and erected temporary bamboo and *nipa*-thatched stilt houses in side the city's hollow squares." (p. 333)

This peculiar morphology afforded both the working class "interiors" and their "social superiors" frequent contact with each other. This proximity gave rise to patronage relationship that bridged this social divide as the sympathetic elite neighbors took on roles as godfathers, fiesta patrons, political aspirants, and even as friends. (p. 336)

The rise in consciousness of the working class paved the way for the decline of the "Queen City" as planters, millers, and workers continued an embittered battle for their interests. In the end, the sugar industry took leave of the City seeking 'greener pastures' elsewhere. (p. 346)