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Asian Perspective Philippine Experience:

Piloting a Unified Model of Sustainability, CNE Equation (Cultural, Natural and Economic Capitalization) in Pateros, Metro-Manila and Its Implication to National Progress and Sustainable Development in the Philippines.

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Dr Gonzales was a Philippine Fellow at the Asia Research Centre, London School of Economics and Political Science (LSE) during the Academic Year 2004/05. He received his Master of Science in Economics and Ph.D Applied Anthropology in Economics from the Asian Social Institute, Metro-Manila, Philippines in 2002, with the dissertation 'Economics of of Ecological Anthropology in Pateros, Metro-Manila, and Its Implication to Sustainable Development'. He is currently the Director, Social Research Center of the Royal and Pontifical University of Sto. Tomas, Espana, Metro-Manila, Philippines.

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i. Abstract

Global warming, ozone depletion, and "poverty of many nations" are the most pressing issues confronting modern society today. In this study of the interface of ecology with economics, these issues are referred hereto as the Critical Natural Capital (CNC). In the global affairs of Planning and Programming for Sustainable Development, the debate remained as to whether CNC's is substitutable with the general savings of economic growth or not. The WS School (weak sustainability) says it is substitutable. But, the SS School (strong sustainability) says that it is not. What remained clear so far is the urgency of being able to integrate the conflicting forces of economy, ecology and socio-cultural affairs into a one whole body of thought so that global policy in sustainable development can integrate economics with ecology and the sociology of truths. Thus, this study is an attempt to present a more precise estimation of the conditions of Sustainable Development at the local level. The choice is Pateros, Metro-Manila, which is the poorest and smallest town in the Metro-suburbs of Manila yet is a natural depository of experiences in this interlocking problems of economics, ecology and socio-cultural concerns. This piloting of integralism in Sustainable Development consisted a formulation of a CNE *(Cultural, Natural and Economic Capitalization)* Model applied in Pateros, Philippines. The past regime of sustainability, Common Property Dependency Ration (CPDR), was computed at a positive coefficient of 1.17. On the other hand, the present regime of sustainability, Non Common Property Dependency Ratio (NCPDR), resulted to a zero coefficients of sustainability. The *inflection between CPDR and NCPDR was estimated at (1970-2000) and validated statistically with a departure from an ecology-based to a market-based society.* Its implications to an economic driven program of national development were analysed vis-à-vis the dichotomy of increased GNP versus spreading poverty of Filipinos. Lastly, its implication to Sustainable Development was also drawn as a tri-dimensional space of Integration of Economy with the Social and Natural Capitalization of Globalization.

ii. Acknowledgement

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Last, but not the least, I wish to express a heartfelt appreciation of the kindest support and personal accommodation extended to this researcher and wife (Angelica) by His Excellency Ambassador Edgardo B. Espiritu and wife, Mrs. Lydia Espiritu. It is also worth mentioning the wholesome discussions with Consul General Mario de Leon related to the development of this Philippine Fellowship program of the Embassy with the LSE. This is not to forget also the tenacity of support and kindest wishes of Mr. Angui Arando, representative of the R.P. U.K Business Foundation to this fellowship program. To this end, I wish to mention the equally significant contributions extended to this research by Officers of the Philippine Embassy in London, Mrs. Marilou Coronado and the rest of the staff.

1. An Introduction

Current "State of the Art" appears unable to explain fully well the "Status of the Situation" of the Planet Earth due to current contradictions and divergence of ideas from the highly specialized disciplines in both the natural and social sciences. Existing literatures, undeniably respectable in their particular disciplines, remained fragments of disjointed truths encaged inside the research "cubicles" of scholars unable to amplify on the current extent and magnitudes of the current situation of the Planet Earth.

This urgent need for a shift in the paradigm from the past "Regime of Reductionism" towards the current global demands for integral understanding is currently in a transition. There is a forceful shift towards a cosmological understanding of the current situation and this is happening in many fields of studies of human endeavors. As early as the 1980's, the Penultimate Draft of the Unified Sciences was circulated to scholars by the Earth Sciences of Harvard University, USA.. Today, there is a massive shift towards integralism of the different fields of scientific studies, such as: integralism in sociology (Sorokin. 1889-1968), integralism in economic growth and welfare (Krugman. 1995 & Sen. 1999), integralism in Theology, Ethics and Ecology (Fox, 1991), Greatworks (Berry. 1999) and so forth.

As this paradigm of thought in the sciences vis-à-vis morals and ethics is in the process of convergence, the "loopholes" in the current understanding of the praxis of realities remained protracted creating cascades of conflicts in the intra, inter, and multi-lateral dimensions of local and global dynamics of change. More specifically, despite colossal efforts in global level in correlating "degradations of the planet earth" with the "protracted malaise of poverty of nations", no precision of prescriptions was achieved. Global Policies in sustainable development remained ambiguous parallel to the political positioning of dominant and powerful countries to protect their endogenous way of life, protecting national interest at the expense of world peace.

A deeper scrutiny of the rigorous efforts of scholars to craft a more cohesive convergence of ideas in "integral" sustainable development reveals likewise those protracted "loopholes" in the "State of the Art" in Earth's Ecology and Poverty of Society. What remained vigorous in wealth of literatures are those which documented for many centuries the advancement of the material progress in the industrialized world diverging to the majority of nations which remained steadfast in embracing their ethical, moral and traditional way of life.

Henceforth, this inability of diverging ideas to converge towards a cosmological unity of thoughts and truths is the explanation beneath the inability of the "State of Global Policy" to weave a more cohesive understanding of the dynamics of dualism between earth's degradation vis-à-vis the cascading poverty of majority of nations.

A more specific setback of this integralism in Sustainable Development is the current polarization between advocates of WS or weak sustainability and SS or strong sustainability (Neumeyer. 2003). WS or sometimes referred to as "Hartwick-Solow Sustainability" strongly considered that the general savings of economic growth of nations is enough justification in a massive drawdown from earth's natural endowments for all people of this planet. However, SS or strong sustainability (Daly-Costanza. 1992; Norgaard. 1994; Sen. 1982, p. 347) opposed this justification because of the Critical Natural Capital (CNCs). CNCs are those natural capital losts due to the permanent destruction of the earth's ecology. In the term raised by Sen (1982): "lasting pollution is a kind of calculable oppression of future generations which is similar to torture." Reinforced farther by (Daly and Costanza. 1992): "Historically, in the empty world economy, man made capital (herewith referred as Economic Capitalization) was limiting and natural capital superabundant. Now, that we have entered the Full Economy, this role is reversed.

This dialectics of thought implied a current problematique of reductionism versus integralism of ideas to common understanding. Though the (3) three pillars of sustainable development were popularly accepted as the ecological, sociological and economic dimensions (Lehtonen.2004); the dynamics of the interface of ecology with economics remained disjointed while understanding the social dimensions remained largely unchartered. According to sachs (1999): " The sharp dividing line between social and environmental system was seen as a drawback in integrating all the three dimensions confirming the view that all the dimensions of sustainable development should be treated in a wholistic framework".

This perception of Sachs (1999) is based from the cumulative experiences of the Industrialized World for the past two centuries of transformation from a religion/tradition-based to at large a market-based society. In this praxis, the dividing line between ecology and society had remarkably widened due to the considerable length of time. In the case of Asia, however, the inflection point of transition is still within reach. The length of time of transition herewith is still less than a century and in some cases still within recall of the oldest sector of the population. In the case of Singapore and Malaysia, modernization of society towards market-based system of corporate culture is still largely of very recent origin, less than (40) years. South Korea was still in the ravages of war during the 1950's. But, today she had grown by leap and bounds to a mainstream of industrialization parallel to the achievements of Japan.

Therefore, the inflection point in several parts of Asia in this paradigm shift of traditions towards industrialization is still not as wide as those of the west due to passage of centuries already cut the wedge for a study of cohesions and integralism of economic to natural and social capital of progress and development. In Asia where majority of populations are still ecology-based rather than economic based and rather sustenance by orientation, the praxis of reality is still cohesive of integration of the economic, ecological and social way of life.

This research is aimed at establishing this praxis of reality as a point of reference in the integralism of Sustainable Development which is of crucial importance to modern man's ability to understand the dichotomy of global realities in both the rich and the poorer worlds. This is therefore to pilot an approach and fine tune research methods established in a study of Pateros, Metro-Manila, Philippines as a parable for making Globalization a vehicle for Solidarity of Nations against the pervading realities of marginalizations due to industrial expansions of the modern world.

2. Objectives of the Study

The general objective of this study is to pilot a study on an integral framework of the (3) three dimensions of sustainable development: CNE or Cultural, Natural and Economic Capitalization in Pateros, Metro-Manila, Philippines.

The more specific objectives of this study are herewith as follows:

- To test the existence of an inflection point which mark the departure from traditional systems into industrialization, paradigm shift from an ecology-based of the past to market-based system of the present.
- To verify and estimate on the coefficients of the ecology-based regime in the past, referred hereto as the Common Property Dependency Ratio (CPDR).
- To verify and estimate on the coefficients of the departure from CPDR towards the market-based system of the present regime, referred hereto as the (NCPDR) or Non-Common Property Dependency Ratio.
- To make inference on the implications of the findings to the polarization of economic progress with widening poverty in the Philippines
- To assess the implications of this phenomenon to Integralism in Sustainable Development.

3. Research Methodology

3.1 The Theoretical Constructions:
Regimes of Ecology-based CPDR, Inflection Point, and, the Market-based System NCPDR.

The Graphical Model (The Integrators of C, N, and E)

Diagram A: The CPDR Regime, Ecology-based Community System. (CPDR or Common Property Dependency Ratio)

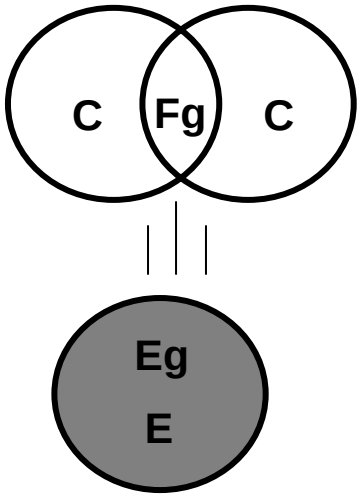
Stage of Contradiction	General Characteristics	Diagram / Symbol
The Regime of the CPDR or Common Property Dependency Ratio With an estimated coefficients of sustainability with a value greater than (1).	**Culture – Nature (C-N) System** • Life-giving and life-nourishing • Sustainable balance between Culture and Nature (*C* + *N*) = *Fg* • *Norms*: General Respect accorded to God, nature, ancestors, fellowmen, families and communities • Relationship: more personal than impersonal • Popular Culture (beliefs, values, traditions, customs, arts) flourishes among relational levels of persons, families, kinship, communities and societies **Economic System** • Primary subsistence with non-monetary types of interactions of persons or communities • More flow of *Free Goods* (*Fg*) from nature than *Economic Goods* (*Eg*) from the economic system • Economic organogram is not individually but rather popularly determined	 $= V \geq 0$ or + 1 Where: *C* = Culture *N* = Nature *E* = Economy *Fg* = Free good *Eg* = Economic goods And $CNE = f(Fg)$ $\frac{\alpha CNE}{\alpha Fg}$ $\frac{\alpha CNE}{\alpha Eg}$

Diagram B: The Inflection Point of Transition

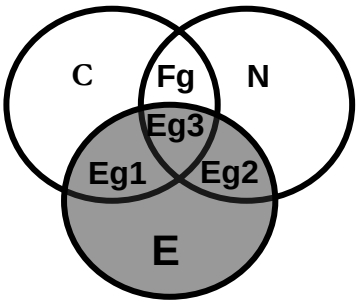
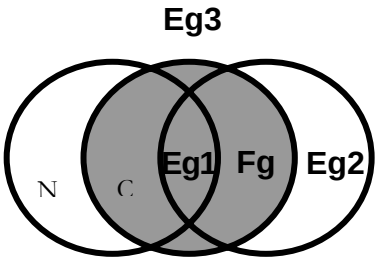
Stage of Contradiction	General Characteristics	Diagram / Symbol
Initial entry of market-based corporate culture to a predominantly ecology-based community culture	**Culture – Nature System** • Life-giving forces of *C* and *N* threatened by imbalances in Modular Integrators • Unsustainable imbalances *CNE* = *Fg*1 < *Eg*1 + *Eg*2 + *Eg*3 • *Norms*: Individual interests for survival dampen respect for God, nature, traditions, family, fellowmen, communities, society and national well-being • Contradictions among traditions, industrial interests and survival **Economic System** • *Eg*1 + *Eg*2 + *Eg*3 > *Fg* • Mixture of the conflicting subsistence and commercial activities • Contradiction between flow of Free Goods from economic goods from economic systems	 *Where*: $CNE = f(Fg - Eg1)$ $= \lambda Fg - (Fg) - \alpha(Eg1 + Eg2 + Eg3)$ *and* $\frac{\alpha CNE}{\alpha Fg} \Big/ \frac{\alpha CNE}{\alpha Eg} = V = 0$

Diagram C: The NCPDR Regime or Market-based Community System.

Stage of Contradiction	General Characteristics	Diagram / Symbol
The Regime of NCPDR with the estimated coefficients of sustainability of a value less than zero.	**Culture – Nature System** • Imbalances between Culture, Nature and Ecology • Total disregard of God and Nature with increased appetite for affluence • Alienation of persons to the new Dominant Culture and confused perspective on the Popular Culture • Flourishing economic institutions and infrastructures at the expense of popular culture and natural environment • Rise of industrial enterprises and infrastructures over and above weakened nature and culture, plus confusion in cultural norms and traditions **Economic System** • Primary industrial prominence • Total shift from non-monetary to monetary culture with impersonal relationships • More flow of *Economic Goods* with loosing proportions from *Free Goods*	 Eq 4 Where: $CNE = f(Fg - Eg1)$ $= \lambda Fg - \alpha(Eg1 + Eg2 + Eg3 + Eg4)$ and $\frac{\alpha CNE}{\alpha Fg}$ $\frac{\alpha CNE}{\alpha Eg}$ $CNE = V < 0$

The Mathematical Model (Indicators of C, N, and E)

This CNE Model is a threefold combination of the quantitative systems of Culture, Nature and Economy. This system is based on the basic ratio between theoretical free goods (Fg) to economic goods (Eg). Free goods is a function of both natural (Nk) and cultural capital (Ck). This is the regime where the Ecology-based communities is less affected by the expansion of mainstream economy. This is the theoretical conditions of communities before the inflection point which is the entry of industrialization in that particular community. After the inflection point, (Ek) becomes the function of economic capitalization in the modernization of society. At the integral level, Ek is basically the consumption

function (Hhc) which is also a function of household sizes (Hhy and Hhm). At the theoretical level Hhy and Hhm is the dimension of migrations.

In general, the sustainability ratio is formulated by using the ratio of CPDR or Common Property Dependency Ratio before the inflection point. Beyond the inflection point is a NCPDR which is a ratio of the departure from Nk towards the Economic Capitalization of Society. NCPDR means non dependence upon common property resources or ecology but towards the economic system.

Henceforth, the n-CPDR is the other side of sustainability where there is minimum dependence on free goods. Empirically, this model could be operationalized on the estimations of the dependency ratio over common property which is the start up indicator of the measurement of sustainability or protection to the Critical Natural Capital or CNCs.

$$CPDR = \frac{Fg}{Eg} \quad \text{where } Fg = f(Nk, Ck)$$

$$Eg \quad \text{where } Eg = f(Ek)$$
$$Ek = f(Hhc)$$
$$Hhc = f(Hhy, Hhm)$$

Where:
- Fg = Free goods
- Eg = Economic goods
- Nk = Natural capital
- Ck = Cultural capital
- Ek = Economic capital
- Hhc = Household consumption
- Hhy = Household income
- Hhm = Household members

3.2 The Empirical Designs (Use of the System of Indicators and Integrators)

The data requirement of the Sustainability Frontier is to be collected through oral history mainly based on the recall data of the selected respondents. It is a requirement that the respondents of the study come from the native population of the town proper, with ages from 70 years and above. A total of 30 respondents were interviewed from the native population of the town totaling 5,000 persons (estimated) out of the total population of 55,286. It was estimated that the native population of the town is only about 9% equivalent to 5,000 out of the total population of 55.286.

Based on the statistics, there are a total of 315 males and 312 females with ages 70 years and above. Nine percent of the total 627 senior population of this study is equivalent to 56 persons. Therefore, 30 respondents totals to around 53% of the total population of native/more senior citizens of Pateros.

The data matrix to be collected are determined by the following variables, which will also be collected:

Table 1: C, N, and E Indicators
(Cultural, Natural and Economic Capitalization)

RESPONDENTS	DATA REQUIREMENTS	
a) Regime of Eco-anthropology (CPDR, Common Property Dependency Ratio)		
Age: 70 years old & above	*Fg1:*	Free Goods Food for the Household
	Fg2:	Free Goods Clothing
	Fg3:	Free Goods Shelter
	Fg4:	Free Goods Medication
	Fg5:	Free Goods Leisure
	Eg1:	Economic Goods Food from Commercial Outlets
	Eg2:	Economic Goods Clothing from Commercial Outlets
	Eg3:	Economic Goods Shelter from Commercial Outlets
	Eg4:	Economic Goods Medication from Commercial Outlets
	Eg5:	Economic Goods Leisure from Commercial Outlets
b) Regime of Eco-Industrialization (n-CPDR) Non-Common Property Dependency Ratio		
Age: 25 - 50 years old	(Entries same as above: *Fg1* to *Fg5* and *Eg1* to *Eg5*)	

Model A: The CPDR Ratios (Thirty-years before the Inflection P**oint)**

Overall, a total of sixty (60) respondents participated in this endeavor, who was divided into two equal tranches. For the first part, thirty (30) respondents were interviewed. The focus of the interview is a recall of the time frame before the Second World War. The main purpose is to present the actual situation of the town prevalent during the Regime of Eco-based system, where there is balance between community and his ecology.

The nature of the interview followed the structure of the C, N and E or Culture, Nature and Economy. In brief, the purpose of this structured interview, referred hereto as oral history, is to create the interconnectivity of C to N and E in the "balut-duck raising- eco/dependent" economic system of this town. Actually, this synergy between people and their environment or ecological anthropology is what is also referred to by economists as the Sustenance Economic System.

In the area of Culture, the respondents were asked about their cultural experiences during the period in study: their growing years shaped by the systems of values and beliefs of the once sustainable town like Pateros, where there were dependencies between man's social life to ecology and the norms about the perfect relationship between system of ecology and their beliefs in God. For one, this will highlight the significance of their experience with their "Ninong" (Godfather) and "Ninang" (Godmother) during Christmas days extending with the kinds of relationships with their relatives and friends. There were also extensive deliberations about their practices on year-long celebrating various festivals or fiesta, as these relate to their devotion to their patron saints, whom they consider as the great provider of sustenance to their families and communities.

The oral history also integrates the estimation of the valuations of their household consumption in relation to their utilization between Eg and Fg. This is important to present the situations of sustainability in actual mathematical terms.

Afterwards, the measurements of the variables of sustainability were correlated with the interpretations of the findings from oral history. The measurements became the inference to the broader picture of reality provided for by the Modular Integrators. However, it must be pointed out that the essentials or contents of the Modular Integrators may vary from case to case depending upon the actual situation of the studied area.

Model B: The NCPDR Ratios

The same empirical framework was used during the interview of a second set of thirty (30) respondents. Unlike the first where the respondents are senior citizens, the interviewees came from the ranks of the existing families in Pateros. The purpose here is to present the actual frame of situations. The tools to be used in the estimation of the current state of the situation were also the Modular Integrators and the Modular Indicators.

The Modular Indicators were also similar to the first but the only difference is that the data to be collected were no longer "recall data" but were based on the prevailing conditions of their economic, cultural and ecological life.

The objective here is to present the distinct differences between the results of the regime of sustainability and those of the regime of unsustainability. From these data, the target interpretations of the prevalent reality were drawn, conditions which beset the town of Pateros now in the area of economy, culture and ecology.

Coefficients of Sustainability

The research design is subdivided into two, namely: (a) Eco-based system and (b) Market-based system. The sustainability frontier of eco-based system, theoretically, is the regime of the balance between natural capital (Nk) vis-à-vis economic capital (Ek). This is a situation where Nk over Ek is positive. This is the regime where ecology and anthropology of the economic system is arranged in balance with each other. With regards to time frame, this covers the situations of the past, which is retrieved from the oral historical data taken from interview of the native population of Pateros with the age range of 70 years old and above.

The data to be taken from their responses will be enriched by a complete study of the anthropological and ecological frontier of the town. This anthropological data could be retrieved from the thesis done by Cesar de Leon about Pateros and the community in the riverbanks of Pasig sometime in 1917. This study is retrieved from the files of Prof. Beyer of Australia. These files were sent back to the National Library in the form of a microfiche, which were retrieved by this student. On the other hand, the data about ecology are to be based on the physical maps of the area, which indicates on the riverine areas of the town in the olden past. This map is to be compared with the present map of the town.

On the other end, the *n-CPDR or market-based system* is characterized by a situation where the ratio between *Nk* vis-à-vis *Ek* is already below zero. This literally means that there is a considerable imbalance between the ecology and anthropological system of economy. Empirically, this is the present time period when the whole town is already experiencing the effects of industrialization both anthropologically and ecologically. This situation is to be estimated using the Integrators (Graphical Model) and Indicators (Mathematical Model).

4. The Findings of the Study

4.1. The Inflection Point:

(A Shift from Eco-based CPDR to Market-based NCPDR)

- The CPDR Regime (Ecology-based Community)

The data clearly indicate that the inflection point of the change in the economic landscape and population of Pateros occurred highest during the 1970s. For instance, the population growth rate was abnormally very high at 86% in the 1970s, 72% in the 1980s, 31% in 1990s and 8% in the year 2000.

Figure 2: POPULATION GROWTH TRENDS
Pateros, 1940—2000

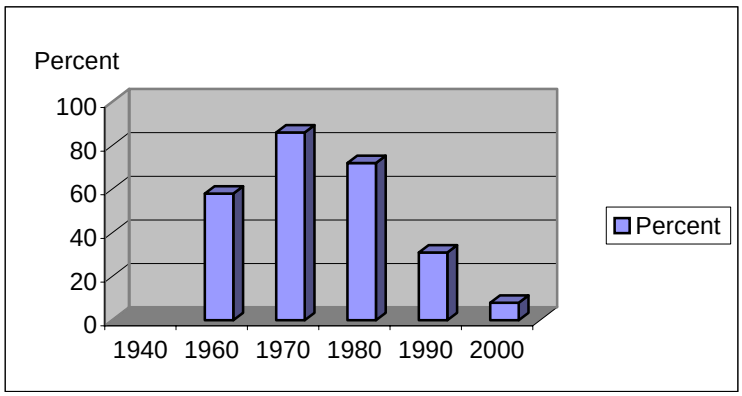


Table 4: POPULATION GROWTH TRENDS
Pateros (1948—2000)

YEAR	POPULATION	% INCREASE
1948	8,340	--
1960	13,173	58%
1970	24,468	86%
1980	42,094	72%
1990	55,286	31%
2000	59,471	8%

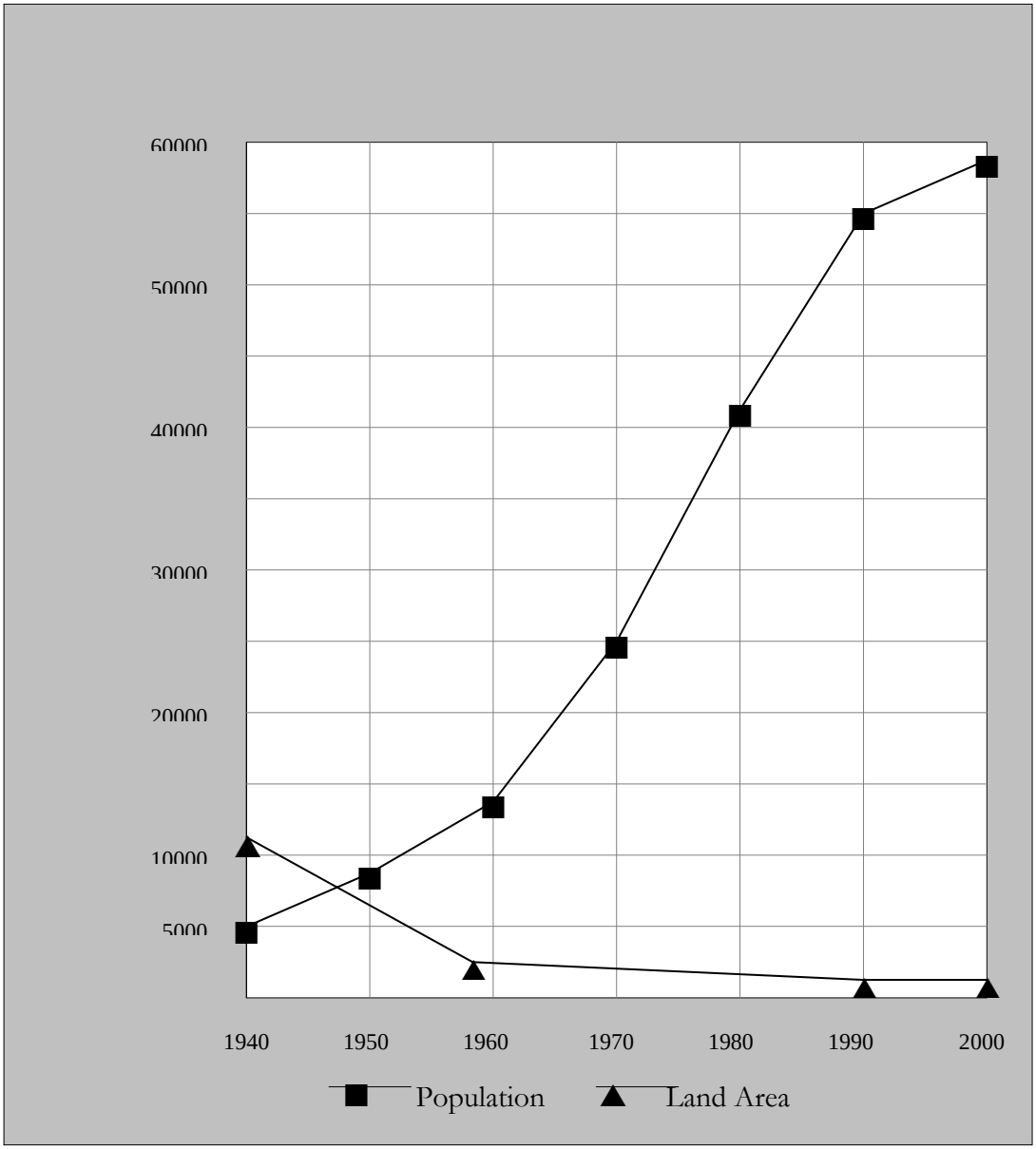
It was during this inflection period (1970s) that massive in-migration had taken place. When one considers the fact that the natural increase in birth rate in the town at 1.7% the major components of this population in Pateros is in-migration by origin. Actually, this had created the formation of new communities predominantly coming from the mass eviction of squatter families from the hub of Metro Manila Areas during the early Martial Law years from 1972- 1980. These clusters of new communities outside the hub of the native communities of Pateros were sitios within the Sta. Ana Barangay, i.e., Pagkakaisa, Panday-Paltok, Sto. Nino and many others.

Actually, Barangay Sta. Ana comprises 35.79% of the entire Pateros. Aside from having the largest land area, Sta. Ana is also the barangay with the largest population, where 40% of the households in Pateros are located. The total number of households in Pateros is to 11,377.

Aside from this pressure emanating from increase in population, there is a decreasing trend in the total land areas of the town due to the commercial and economic expansions of the adjacent municipalities, on but one of which became cities at present, i.e., Pasig, Makati, Taguig, and The Fort. From the original territory of 1,800 has. (Rosales 2001, personal communication), Pateros land area decreased to 1,038 has. in 1960. By January 7, 1986, the Presidential Proclamation No. 2475 was signed by the then President Ferdinand E. Marcos declaring the lands within Pateros but now located in the Makati areas can now be sold to the occupants who are residing in areas known to be the Military Barangay Organizations. Because of this development, the previous 1,038 has were drastically reduced to only 210 has. At present, Pateros is the smallest municipality in the whole of the Philippine Archipelago and the poorest in the whole of the Metro Manila areas.

In order to gain a more comprehensive view of the inflection point (1970) enriched by the regime of sustainability (1940 to 1970) and regime of unsustainability (1970 to 2000), the following diagram was formulated (in the next page) as follows:

Figure 2: GEO-DEMOGRAPHICS
Pateros, Metro Manila (1940-2000)



The whole of Pateros was considered then as a town of home industries, where the dominant activities include "balut" and shoe making. The rest were predominantly agricultural. Out of the total land areas, only a total of 84 has. are cultivated comprising of around 50 has. in rice farming with (35) palay farmers, 13.9 has. in corn with (11) farmers, and the rest are minimally in papaya farming in 0.05 has., star apple at 0.03 has., and (13) banana farmers.

Based on this study, there are also considerable numbers of livestock in the town, as follows: 114 carabaos, 39 cows, 118 hogs, 164 horses,14 goats, 14,060 chickens and 3,732 ducks. The presence of carabaos reflects the agricultural situation in this town that could still be lacking of full mechanization and infrastructures. The presence of 3,732 ducks reflected much about the extent of the operation of the balut industry in the town. About 90% of the ducks laid eggs daily. This meant that the daily production of duck eggs in Pateros during this period was no less than 3,360. With the peak months this means that Pateros in the period studied before the inflection points was already producing a total of around more than 100,000 eggs per month, which meant a total production per year of more than 1 million eggs.

The prevalence of the traditional values in the town, like the popular practices of bayanihan, and sharing of natural foods taken from the natural environments like native species of fishes in the surrounding rivers, captures our interest. These natural food include dalag or snakeheads, hito or catfish, biya or Gobi, kanduli or catfish and not to mention snails and crustaceans like small white shrimps and others. More detailed discussions about the cultural practices and beliefs of the town are presented separate from this economic study of the town before and after the inflection point.

From the ecological front, the whole of Pateros was very wholesome. There were the widespread green fields in the whole town shaded, with bamboos extending up to the banks of the river system in the area, beautiful and big rivers surrounding the whole town, which connects to the Laguna Lake proper.

There were no factories in sight, only lush ricelands and cornfields. There also were spots of Chinese-designed vegetable garden plots equipped with human-made wells to get the water from comprising a total of around 2 to 3 has. of farmlands.

Life was indeed slow economically but very warm socio-culturally. There was only one rural bank on the other side of economics and about four or five church buildings on the sides where the biggest is the Roman Catholic Church in the town center.

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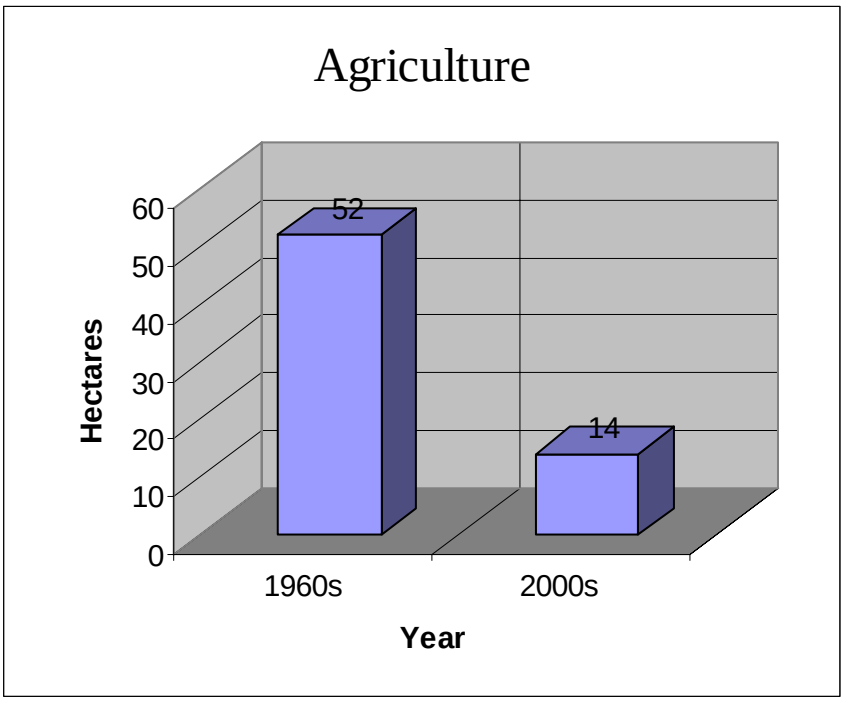
The n-CPDR Regime (Market-based System)

The above diagram indicates the clear reduction of farmlands from (52) has. in 1960 to only (14) has. in the year 2000. A closer study of this shift reveals that expansion of commerce and industries are characterized by increased total of manufacturing establishments at (227) units, with ancillary sectors totaling 1,120 establishments as well as (55) financial establishments

Figure 3: AGRICULTURE SECTOR
The Changing Economy of Pateros
Comparative Graphics (1960-2000)
(Agricultural Land in Has.)

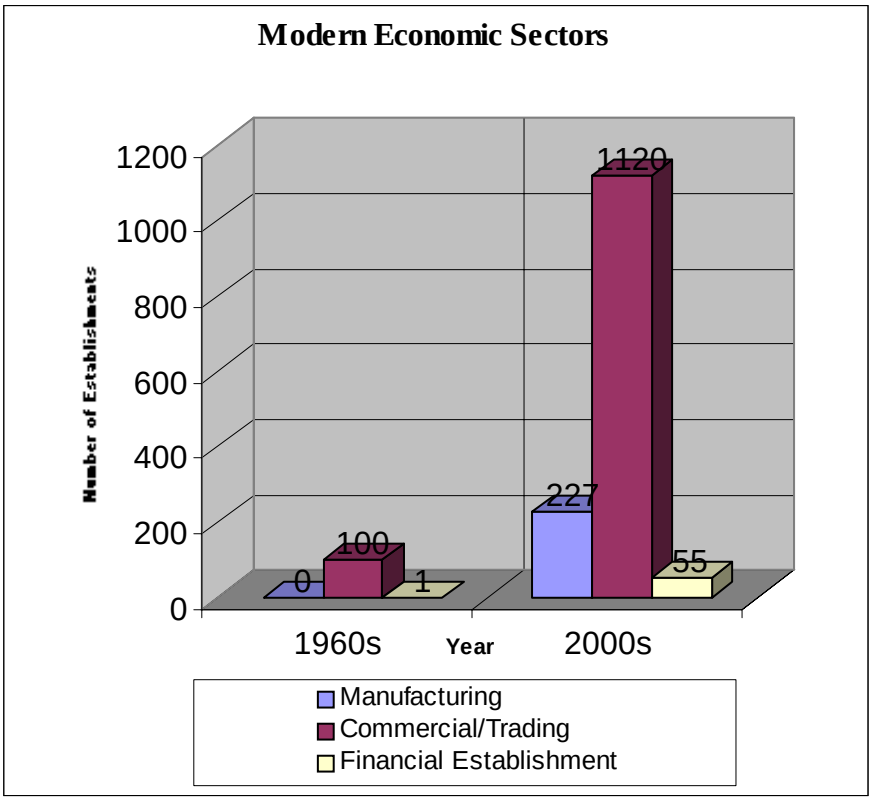


A special case was the farmlands and vegetable gardens in the 1960s became the site of two major business establishments in the area, namely: the Nutrilicious Puree Plant and the high end subdivision Lexington on the eastern side. Actually these areas are only several meters away from the newly constructed Kalayaan Avenues which connects EDSA Highway to the C-6 Highway currently under construction. The C-6 Highway connects to the Calabarzon Highway in the South and designed to connect to the Arch Highway System which is to connect Northern Quezon Province towards the Subic Bay Area westward.

This is the Northern side of Pateros towards the Greater Pasig City Area. On the Western side is the Greater Makati City Area and the "Fort City," which is also expanding very rapidly, together with the most current transportation system, not to mention the Manila Railway Transit System and the modern Radial Highway system, which connects to the Circumferential Highways in the area.

This is the tremendous economic force, which manifests its impact on Pateros beginning since the 1970s and protracting up to the present. It remains clear that this smallest town in the Metro Manila area is currently besieged by these tremendous urban development of the Metro-cities area.

Figure 4: MODERN ECONOMIC SECTOR
(Manufacturing, Commercial, Service/Banking Sectors)
The Changing Economy of Pateros
Comparative Graphics 1960 to 2000
(In Number of Establishments)



4.3 **The Ecology-based Regime (CPDR) in Pateros**

The scientific validation of the sustainability frontier of Pateros before the onslaught of materialist industrialization was done using the *CNE* Equation operationalized by the CPDR or Common Property Dependence Ratio, with data coming from oral history. Oral history pertains to solicited responses from respondents who are senior citizens and native population of Pateros.

These people must have lived in the town during the CPDR Regime. This regime was specifically forty (40) years before inflection decade of the 1970s where the way of life was still molded by ecology and anthropological character of Pateros. The respondents are senior citizens whose estimated age must be 70 years old and above. They must be coming from the endogenous population of the town rather known at the "native" or sometimes called "kaming mga taga Pateros."

The native respondents are estimated to be about 9% of the current total population of 55,286, which is equivalent to about 5,000 persons. Out of the total population of Pateros, there are only a total of 315 males and 312 females with ages ranging from 70 years and above.

Therefore, nine percent of these elder population totals about 56 persons. Thus, the total respondents of 33 interviewed in this study is roughly more than (50%) of the elderly and "native" of Pateros which were previously estimated as totaling 56 persons.

The basic data collected are presented as follows:

Table 3: SUSTAINABLE VILLAGE DATA PROFILE (2001)
Pateros, Metro Manila, Philippines

Respondent (R1 – R 33)	Fg1: Free Food	Fg2: Free Shelter	Eg1:Eco. Goods Food	Eg3:Eco. Goods Clothing	Eg4:Eco. Goods Social Needs
R1	365	100	300	50	60
R2	300	150	240	50	- -
R3	219	120	300	50	60
R4	350	120	300	50	20
R5	292	120	320	20	50
R6	250	130	300	30	30
R7	250	50	350	50	60
R8	250	400	300	50	30
R9	300	50	350	60	60
R10	250	20	108	20	20
R11	250	90	300	20	40
R12	50	100	300	20	10
R13	300	300	400	20	20
R14	100	300	300	20	30
R15	75	40	150	20	20
R16	336	400	- -	20	104
R17	200	200	300	20	50
R18	150	400	84	50	50
R19	100	200	150	20	50
R20	200	200	250	50	30
R21	237	200	300	20	20
R22	300	200	300	15	20
R23	200	300	350	50	50
R24	200	300	300	50	30
R25	250	250	350	50	60
R26	150	400	350	50	20
R27	250	90	300	20	15
R28	200	150	350	40	20
R29	200	400	400	50	30
R30	250	300	350	100	20
R31	250	250	350	30	15
R32	250	200	320	50	30
R33	200	90	250	30	10

Table 4: SUSTAINABLE VILLAGE DATA PROFILE (2001)
With CPDR (or Common Property Dependence Ratio)
Pateros, Metro Manila, Philippines

DESCRIPTIVE STATISTICS SUMMARY

Symbols	Labels	Unit/Measure	No. of Observation	Mean Index	Standard Error of the Mean	Standard Deviation
Cfg	Consumption Free Goods	In Pesos	33	428.61	23.245	133.531
Fg1	Food (Free Goods)	In Pesos	33	228.00	13.08	75.139
Fg2	Shelter (Free Goods)	In Pesos	33	200.61	20.491	117.71
Ceg	Consumption (Eco. Goods)	In Pesos	33	366.03	14.599	83.86
Eg1	Food (Eco. Goods)	In Pesos	33	292.88	13.33	75.41
Eg3	Clothing (Eco. Goods)	In Pesos	33	37.73	3.22	18.50
Eg4	Soc. Needs (Eco. Goods)	In Pesos	33	35.42	3.54	20.37

A study of the table reveals that the values during the Regime of CPDR are about 1,000x below the present values of household consumption after the Inflection Period. Yet, the perceptions of the respondents are enriched by their belief that it is definitely better before than now economically.

For instance, the total household consumption per year only aggregates to the nominal mean value of PhP428.61. Two of the household consumption items still come freely from nature namely: protein foods valued at PhP228/year from rivers and swamps in the ricefields, and shelter valued at PhP200.61 per year. The protein foods coming freely from the immediate natural environments are delectable fish species loved by the natives namely: dalag or snakehead fish, hito or catfish, biya or goby, carps, and freshwater clams and snails.

They recounted the days of old when the rivers were still grand and greenfields were vases nourished by the bounty of indeed fresh protein foods. Lastly, the materials needed to construct a simple shelter came from bamboos and nipa leaves in bounty especially near the lakeshores and rivers.

The above stated values are imputed in order to permit a good level of analysis. The other household consumption items which are already bought commercially in the area are: rice grains totaling PhP292.88 (mean average per year), clothing averaging PhP37.73 per year and social needs like medication, education, transportation etc. averaging to an annual mean values of PhP35.42.

Therefore, it may be observed that the total Household Consumption of free good items is an aggregate of PhP428.61 per year at imputed values and PhP366.03 in nominal values.

The CPDR Ratios (Estimated at Forty Years before Inflection)

Unlike the Regime of N-CPDR (materialist industrialization) whose ratio was computed in terms of coefficients of values from standardized regression, the above Regime of CPDR is determined by using the arithmetic ratios of valuations. In this process, the actual valuations of the ratio comes from the data on household consumption items coming freely from nature for Free Goods (Fgi) and the other item on consumption coming from commercialized sources (Egi) and therefore commands monetary considerations.

In the case of the N-CPDR ratios, the household consumption was considered as the reciprocal of natural capital meaning those components of nature which is converted into economic goods absorbed by the economic system. The N-CPDR ratio was computed by using the reciprocal of Natural Capital meaning Free goods all over the consumption goods used by the households.

Therefore, the CPDR ratio of the oral historical group was taken by using the following formula:

SUSTAINABILITY (CPDR) COMMON PROPERTY DEPENDENCE RATIO

$$\textbf{CPDR} = \frac{\textbf{Fg}}{\textbf{Eg}} = \frac{\text{Free Goods}}{\text{Economic Goods}}$$

Where **Fgi =** f(Nk, and Ck)
Ek = Egi
Fgi = Fg1 and Fg2, Where Fg1 = Free Food
And Fg2 = Free Shelter
Eki = Eg1, Eg3 and Eg4 Eg1 = Food (commercial)
Eg3 = Clothing (commercial)
Eg4 = Social Needs (Medicine, Education, etc.)

Computations:

$$\frac{Fg1 + Fg2}{Eg1 + Eg3 + Eg4} = \frac{2284 + 200.61}{292.88 + 37.73 + 35.42}$$

$$CPDR = \frac{428,61}{366.03}$$

Computed CPDR = 1.17 ratio

Thus, the resultant ratio of 1.17 means that Pateros is still sustainable during this regime because the society is still predominantly being nourished by the natural environment or the ecology of the village.

The ratio of 1.17 meant Pateros was being sustained by the goods taken freely from nature. Therefore, it was a Sustainable Village.

4.4 **The Market-based Regime, NCPDR Pateros, Metro-Manila**

The scientific validations of the frontier of N-CPDR is measured by using the *CNE* Model or equation. The assumption here is that the coefficients of determination is supposed to be less than 1 in value.

Simply put, the "lifeblood" in the economy of the Sustainable Village, Pateros, no longer emanates from the richness of her ecology. The economic nourishment of the residents is now coming from the economic system at large.

Thus, the consumption function of Pateros therefore becomes the measurable tool to measure the quality of life the town. The reciprocal of the household consumption function is mathematically equivalent to *Nk / Ek* (*Please see CNE structural equations*) or *Ek* = Household Consumption (*Hhc*) of the studied community. The hypothetical ratio of the *Nk / Hhc* therefore becomes 0 / *Hhc*. Zero values refer to the absence of the Free Goods in the consumption function of an industrialized village.

Using the computer program Statistical Package for the Social Sciences (SPSS), the following Coefficients of Determination representing the Ratio of N-CPDR is estimated as follows:

Table 5: N-CPDR

Pateros, Metro Manila, Philippines

DESCRIPTIVE STATISTICS SUMMARY

Variables Symbols	Variable Labels	Unit of Measures	No. of Observation	Mean Index	Standard Error of the Mean	Standard Deviation
Hhy	**Household Income**	**In pesos**	**30**	**260,189**	**57,290**	**274753**
Hhm	**Household Members**	**In numbers**	**30**	**4.63**	**.265**	**1.450**
C1/Eg1	**Food**	**In Pesos**	**30**	**89,728.93**	**7,976.12**	**43,687.01**
C2/Eg2	**Shelter**	**In Pesos**	**30**	**28,021.74**	**2,557.72**	**12,266.43**
C3/Eg3	**Clothing**	**In Pesos**	**30**	**12,211.11**	**1,447.89**	**13,710.27**
C4/Eg4	**Social Need**	**In Pesos**	**30**	**40,491.86**	**13,710.27**	**73,832.10**
Total C1- C4 Ci	**Consumption**	**In Pesos**	**30**	**161,344.40**	**19,381.29**	**106,155.73**

Table 6: N-CPDR
Pateros, Metro Manila, Philippines

RAW DATA SUMMARY TABLE

RESPONDENTS (R1- R30)	Hh Income (Ind.Var.)	Hh Members (Ind.Var.)	C1= Eg1 Food	C2= Eg2 Shelter	C3=Eg3 Clothing	C4= Eg4 Social Need
R1	--	3	63,800	10,000	--	--
R2	624,000	6	141,960	30,000	10,000	1,820
R3	240,000	3	130,000	20,000	20,000	10,000
R4	90,000	5	46,960	15,000	10,000	3,000
R5	48,000	4	50,000	25,000	2,000	12,000
R6	1,200,000	5	214,000	--	12,000	312,000
R7	--	4	150,000	20,000	20,000	100,000
R8	223,812	6	73,684	4,500	--	12,376
R9	368,220	5	98,098	30,000	26,000	89,138
R10	69,120	3	36,010	25,000	6,500	17,030
R11	180,000	4	100,000	---	12,000	5,000
R12	60,000	9	86,580	30,000	15,000	52,000
R13	--	4	100,000	30,000	15,000	30,000
R14	168,000	5	87,440	25,000	12,000	12,000
R15	480,000	5	169,520	30,000	5,000	74,960
R16	48,000	6	27,616	---	4,000	1,000
R17	96,000	3	59,290	---	---	9,360
R18	---	7	100,000	30,000	10,000	5,000
R19	---	6	100,000	20,000	10,000	7,000
R20	60,000	-	36,400	---	5,000	3,000
R21	---	6	100,000	20,000	20,000	5,000
R22	2,340,000	6	76,534	30,000	5,000	39,260
R23	540,000	4	42,744	50,000	20,000	260,000
R24	108,000	4	119,000	---	5,200	9,620
R25	600,000	4	106,100	30,000	36,000	78,000
R26	109,200	3	66,110	25,000	3,000	5,000
R27	30,000	2	137,800	50,000	12,000	6,760
R28	240,000	5	64,022	50,000	10,000	18200
R29	---	5	79820	25,000	12,000	10,000
R30	252,000	3	63,574	50,000	12,000	15,000
R31	156,000	5	40,560	---	5,000	10,000

Respondents

The data used in the estimation of the coefficients of N-CPDR came from the native or indigenous people of Pateros. Most of them reside in the Poblacion area, which is actually the town center both in the past and present. Based on the latest statistics collected by this study, there were a total of 511 household population in the whole of the Poblacion area. As previously determined that the ratio of native population to the total population is 9%, it is estimated that the native households in the poblacion totals 46 households (511 x 0.09 or 9%). The

respondents of this study total (31) sample households which is actually more than 50% of the native population of the entire poblacion area.

Interpretations of the Results of Regressions

The basis of the Regression of Sustainability (N-CPDR Coefficients) are Table 11, on Raw Data and Table 10, on the Descriptive Statistics of the Data. It may be observed that there are no more household goods coming freely from nature (Fgi of the CNE Equation). All goods used by the household instead come directly from the economic system (Egi of the CNE Equation).

For instance, each household consumes an average total of PhP89,728.93 for food, PhP28,021.74 for the repair and maintenance of the shelter, PhP12,211.11 for clothing needs of the household members, and a total of PhP40,491.86 to defray the costs of social amelioration expenditures for medication, education and transportation, etc.

With these, the average consumption per household per year aggregates to PhP161,344.40 while their average household income per year totals to PhP260,189. There appears to be an aggregate savings per household of PhP98,844 per year or roughly around PhP8,237.05 per month. These data suggest that this excess in form of savings could be the money used in the purchases of either cars or other equipment needed by the households.

Almost all the native populations interviewed own their house/lot and some even have farmlands outside the town proper. The value of lot today averages PhP15,000 per square meter and therefore the total market value per hectare of land totals PhP150m. This value of land now is justified by the town access to the major thoroughfares of the cities which have encircled Pateros today.

On the other end, the estimation of the regression coefficients of the Non-sustainability (N-CPDR) parameters of Pateros is presented as follows:

Table 7: N-CPDR Ratio (Non Common Property Dependence Ratio)
Pateros, Metro Manila, Philippines, 2001

PEARSONS CORRELATION COEFFICIENT

PARTICULARS	CONSUMPTION (C)	HOUSEHOLD INCOME (Hhy)	HOUSEHOLD MEMBERS (Hhm)
Consumption	1.00	0.852	-0.012
Income	0.852	1.00	0.091
Household Members	-0.012	0.91	1.00

Table 8: N-CPDR Ratio (Non Common Property Dependence Ratio)
Pateros, Metro Manila, Philippines, 2001

COEFFICIENTS OF REGRESSION

Model	Constant	B	Standard Error	Stand. Coeff. Beta	*t*-Statistics	Sig. Diff.	Lower Bound
1	**(Constant)**	**103,343**	**35426.2**		**2.917**	**.007**	**30654.99**
	Income (Hhy)	**0.373**	**0.043**	**0.860**	**8.631**	**.000**	**0.284**
	Household Members (Hhm)	**-6472.273**	**7136.004**	**-0.090**	**-0.907**	**0.372**	**-21114.1**

The result of the econometric test of the regression is within the acceptability range making the conclusions valid statistically *(Please see Table 12)*. For instance, the correlation coefficient between Household Consumption and Income falls within the 0.852 range. On the other hand, the Household Consumption vis-à-vis Household Members is down at -.0.012.

Nevertheless, in the regression of the N-CPDR coefficient of the town of Pateros, there is a considerable significance. *(Please see Table 13)*. Firstly, the *t*-statistics of Household Income vis Household Consumption totals to 8.631 whereas Household Members (Hhm) add up to an acceptable range of 0.907. Therefore, the derived Household Consumption Function in Pateros is as follows:

b. N-CPDR

$$Hhc = f (Hhy, Hhm)$$

Where *Hhc* = Household Consumption
Hhy = Household Income
Hhm = Household Members

Computed *Hhc*:

$$Hhc = 0.860\ Hhy - 0.090\ Hhm$$

Since HH C is the reciprocal of the Nk/Ek, therefore, the CPDR Coefficient is equivalent to:

$$\text{N-CPDR} = \frac{Nk}{Hhc} \quad \frac{0}{0.860\ Hhy - 0.090\ Hhm}$$

$$\text{N-CPDR} = 0$$

It may be assumed from the coefficients of sustainability which is from 0 to negative (-) valuations that Pateros now approaches the Regime II, or the point of inflection.

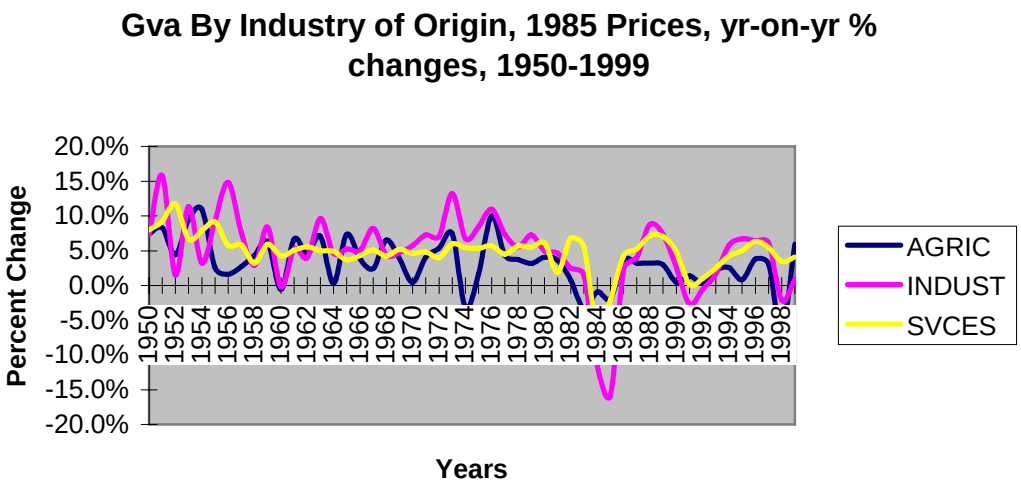
Taken from the paradigm of Regime of the Modular Integrators, the interconnectivity of economy with culture and ecology appears as approaching the critical stage of contradiction between the old values to the new materialist values attributed to industrialization. The norms of the sustainable village shifted from the traditional values system to the atomized values of a community which is entering the threshold of materialist globalization.

4.5 **Implications of Findings to Philippine National Development**

Some scholars, as early as the 1960's, have been expecting that an economic miracle in Asia is to take place in the Philippines (Hussein, pers.comm..2005 LSE). Firstly, the country was next to Japan economically and the prevailing economic indicators converge to a trend conducive for take-off. But, the reverse had happened. The country plummeted downwards to a series of crisis cascading to a level as the second poorest country in Asia, next to Bangladesh today.

As a matter of fact, the country had not lagged behind in utilizing the modern conventions of economics. Actually, Philippines is among the first in Asia to have used with flair the arts of economic analysis, policy and governance. We have a School of Economics at par with the others in Asia, if not one of the best.

A review of the Economics Data from the 1950's to the present time was undertaken in order to gauge trends and events which have transpired in the country. This is presented herewith as follows (Ref.: S.K.Roxas. pers.comm..2005)



It remained very clear herewith that the deepest dived of the national economy was at the time that most countries in the Asia and the Pacific were on the advance during the 1980's and the 1990's. A closer scrutiny of the data shows very clearly that the worst decline was in 1983-86 which had signaled the first Peoples Power Revolution in the world against the Regime of the Dictatorship in the Philippines. The next dived in equal proportion was in 1998-2000 when the

world again saw the re-emergence of the 2nd Peoples Power Revolution in the Philippines which had booted President Estrada out of office and installed Her Excellency President Gloria Macapagal Arroyo up till today.

It was never suggested by the data that situations have gotten any better because S.K.Roxas and A.Lichauco (2005) have publicly released that the worst economic problem in the country is not the "fiscal crisis" but rather, starvation and hunger. According to these two most revered economists in the country, eight (8) out of (10) families in the country now are hungry. This severe poverty situation in the country was seconded by the National Survey undertaken by the Social Weather Station validating these claims on the national situation of hunger and starvations.

Another national predicament is that nothing substantial economically have happened in the country despite the foreign borrowings that accumulated to a proportion equivalent to around 80% of the Gross Domestic Product of the Country, worth (5) five trillion of pesos.

Today, the perversion in national development had deepened its root that for every 1% increase in Gross National Product, there is an equivalent spread of national poverty by 9%. Today, more than 50% of Filipino Families are languishing in poverty. Out migration is the outright indicator to dramatizing how difficult the situations have become for majority of Filipinos. A total of more than 3,000 daily applicants go to the different Embassies in Manila, in search of the first opportunity to leave the country.

In brief, the findings of this study in Pateros validated the current trends in the national economic situation. Firstly, there is no net economic growth in fifty (50) years! Secondly, there is massive degradations of the natural environment and the endogenous way of life of Culture. Therefore, the minimal gains in economic capitalization was offset by tremendous losses in natural and cultural capital of the country. Yet, this dimension of cultural and natural capital remained the "invisibles" of national development. Therefore, cultural and natural indicators of development had never interfaced with economic variables in order to create a more balanced dynamics of national development where the net economic gains have flooded the local communities with opportunities for a better socio-economic life for the majority.

Moreover, Pateros amplify the destruction of ecology by economic expansions from localities to localities in the country that wreak havoc on the primary dependence of ecology-based communities which abounds in the island coastal country sides in thousands of fishing villages and upland tribal communities in the country. As a matter of fact, economic expansions in the formal sector had outrightly excluded these people who are not schooled and anthropologically not able to cope up with the life in the expanding Metropolis.

Because of cultural and ecological dislocations in their villages of origin, these are the families seen in the many marginalized sections of the cities living in shanties and makeshift houses under the bridges, riverbanks, and in the

dumpsites of solid wastes. This is the sector of the Filipino society, at large, without any homes, clothes, food and any other amenities totaling to 5 Million Families as worst hit and a total of around 60% living below the poverty line.

Therefore, if the CNE model interface with current "mother framework" of Medium Term Development Plan which is macroeconomics, then the "phenomenon of marginalizations of ecology-based communities could be minimized. When this is operationalized in the level of national planning and programming, then national situations of poverty could be minimized if not at all considerably improved.

4.6 Implications to Sustainable Development in the Philippines

At the time that the economic performance of the country is highest in Asia during the last Financial Crisis of 1997, the then President Fidel V. Ramos had issued an Executive Memorandum creating two instrumentalities of sustainable development in the country: (PCSD) or the Presidential Commission on Sustainable Development and PEENRA or Philippine Economic Environmental Natural Resource Accounting Systemsoffices in all the agencies of the national government.

Today, these two agencies mandated for sustainable development were largely made dysfunctional when the current administration had abolished the former, (PCSD) with the belief that the National Poverty Commission and the Department of Environment and Natural Resources are already doing most of their functions. This presidential decision for the past (2) years already had created a wedge of polarization between the Non-Governmental Organizations with the Civil Society against the high level of governance in the country.

This disenfranchisement of sustainable development at the national level weakened governance to calibrate her national policies and programs with matters of environment and cultural development. Sustainable development, which is the integration of economics with the natural and cultural capitalization of progress, had weakened into a unilateral dynamics of economics growth at the direct expense of ecology and social intergrity of our people. Therefore, the expectation of economic governance diverge substantially with the outright results at the national level. This explains quite well enough why it had turned out that a 1% increase in GNP lead to a spread of poverty by 9%. It protracted at the national level because of the destruction of the natural ecology and endogenous culture of millions of ordinary Filipinos in our thousands coastal island countrysides.

In the global dimension, it remained popular that sustainable development must take its toll to calibrate globalization with considerable respect to planetary ecology and socio-cultural integrity of poorer nations. Two successive global conferences in "environment and development", first in Rio de Janeiro, Brazil in 1992 and second in Johannesburg, South Africa in 2002, have not diminished the ambiguity of the global approach neither imposing her will against the current extent of the integrity of the global ecology.

In a more recent conference held at Exeter, England last February 2005, it was written that policies in sustainable development appeared unable to provide precision to minimize the degradations of the ecological integrity of the planet.

As the hole in the Ozone in Antartica had doubled the size of the entire continent of the U.S.A, and the continental ice "*Larsen"* is melting and given way, the works of earth scientists proved the causality of advancement in dirty productivity to the increased degradations of the Planet Earth. What had remained clear so far is that this once "beautiful and big blue ball" first seen by man in the outer space last July 20, 1969, had now turned into color "grey". Whether this ecological degradations of the Planet Earth is primarily caused by the thirty years (1970's to 2000's) of inflection due to the economic take off of the Asia and the Pacific Region in particular and the whole world in general, what remained mandatory is that global response must equate the globalized extent of the problem. This is the rationale behind the Montreal and Tokyo Protocol, the UN Commission on Sustainable Development formulation of the new regime of EPR or Extended Producers Responsibility in World Trade, International Standard Organization ISO 14000 in Environment and so forth.

At the extent that powerful Industrialized Nations as well as Newly Industrializing countries will protect their Utilitarian *way of life,* there is a worsening allegation that we actually need three more earths in order to sustain the materialism of post-modern society. Whether current scientific findings are enough or not, no one could deny the fact that the current extent of the effects of EL Nino and La Nina to the planet earth is already so devastating specially to the poorer worlds. This is not to mention the added phenomena on ozone depletion, global warming, green house effects, and so forth. The scientific framework had given way to the reality that the extent of the problem is no longer within the domain of science but more so already in the *"realm of values and ethics of the modern man"*.

The only way out of this seeming inability of the science framework per se must be thoroughly equipped by a broader and more comprehensive praxis of analysis. And, this praxis could rather be a convergence between the reductionism of science and ethics. **This is indeed referred hereto as Integralism in Sustainable Development.**

Thus, there is an urgent need for Integralism in the sustainability of the CNC or Critical Natural Capital in order to provide a steady handle to "sustain life" of the Earth in the next century. This is the major challenge confronted by us today.

5. Derived Conclusions

A cross section of developmental realities at a local level in the Philippines, Pateros-Metro Manila, revealed on-going malady of not being able to calibrate economic growth programs with integral sustainable development prescriptions at the local level. The case of massive impoverishment of Pateros, as an ecology-based society, upon the massive entry of the market-forces during the inflections years of 1970's to 2,000, was mainly due to the wanton destruction of the natural endowments (reach rivers, riverbeds with vast expanse of greenfields connected to the mainstream of Manila Bays and the Grand Laguna Lake resources). This destruction of the local ecology was exacerbated by the concomitant dislocations of the local cultural life of a religious and traditional society.

The Hartwick-Solow Substitutability Principle, which may be true in the Richer Worlds is ridiculously irrelevant to the current conditions of the poorer worlds. What remained ambiguous in the praxis of analysis of environment and development is the lack of integration of a geographical reality of transition which had happened two hundred years ago in Europe. But in the case of Asia in general and Philippines in particular, this wedge, referred hereto as the inflection years only have happened last (1970-2000). The data in some parts of Asia is still within recall of the senior residents. In the case of the industrialized world, this inflection point had happened many centuries ago.

Therefore, the derived problem of the lack of integration of economics to cultural and ecological capital of globalization of progress is partly caused by the current reductionism in the sciences. What is of urgent necessity is the convergence of the current cosmological forces of thoughts into a single integral unity of understanding not only of economics but also of its interface with ecology and sociology.

An indepth study of this phenomenon at a local level in Pateros, a balance between culture and nature is life giving and life nourishing. There is a general respect to God, nature, ancestors, fellowmen, families and communities. And, the type of relationship among the members of the community is more personal and relational. The economic system is primarily subsistence with non-monetary types of interaction of persons and communities. There is a free flow of free goods from nature than economics good from the market system. Economic organogram of society is not individualizing but popularly determined. This is the phenomenon of an Ecology-based society described herewith as the Regime of CPDR or primary dependency to the Common Property Resources of the Natural Ecology by Communities.

On the other end, the phenomenon of the nCPDR or the Non-dependence on Common Property Resources, in the realm of culture and ethics, are described herewith as follows:

- The life giving forces of culture and nature have been threatened by imbalances in the system of economy, ecology and society. Individual interests for survival dampened respect for God, nature, traditions, family, fellowmen, communities, society and the general well being of people.

There is perceived a growing contradiction between traditions, industrial interests and survival. Economic system on the other end integrate a perceived conflict between subsistence and commercial activities. There is already a contradictin between the flow of free goods and economic or commercial goods because of the degradatins of ecology dueto the massive entry of the forces of commercialization and materialist industrialization.

6. Recommendations

6.1 Planting the 'Seeds of Hope' (Cultural and Physical Rehabilitation)

Cognizant of the fact that we cannot go back to our past, we can only 'hold on and protect' what remains of it as 'seeds of hope'. These seeds of hope are intended to insulate and protect the 'umbilical cord' that connects the town to her glorious past. To try to save these seeds of hope, so as to weave the thorns of social norms to attain the best possible results, hereunder are the proposals based from the findings of this research:

First is to elevate the Association of Senior Citizens into a status of "Wisdom Keepers' or Light-Sharers, and use oral history to properly document their perceptions of the said 'accounts of the pasts' of this beautiful town.

Secondly, encourage these Wisdom Keepers to provide key inputs for the historical records of the Pateros Historical Society.

Thirdly, a historical committee (under the Office of the Mayor) must be organized to aggressively pursue and adopt concrete measures via a Municipal Policy on the Comprehensive Physical, Social and Ecological Rehabilitation of Pateros into a Model Program so that the many other 'Pateroses' located in the growth corridors of the Philippine Archipelago can follow suit.

Fourthly, make a Comprehensive Plan to rehabilitate the rivers of Pateros through the establishment of the River Parks of Panday Pira and other five (5) rivers of the town. These river parks are envisioned to concretize the closeness of our youth to the town's glorious past. These parks can also be used as channels to integrate the other 'Heritage Sites' of the country, which could function as depositories of important historical and cultural documents of the town.

Lastly, in cooperation with the local Catholic Church and the educational sector of Pateros, formulate a "Youth Renewal and Development Program, is designed to create a mainstream of hope so that these highly vulnerable age group, with whom the future of the town and of the nation lies, will be systematically recalibrated into the values inherent in this town's heritage.

6.2 Proposal to Rehabilitate the Social Capital of Pateros

The following proposed steps are suggested to bring back life to the Social Capital of the town: (a) strengthen the existing cooperatives of the town to serve as genuine institutional functionaries in filling the gaps of opportunity decimated by the expansion of globalization in the adjacent cities; b) augment these organizational programs to strengthen local cooperatives by formulating Lecture Modules about the Ecological Anthropology of Villages in the Philippines; and, c) build closer links between the local cooperatives of Pateros and the national cooperative federations in order to infuse new ideas to these 'instrumentalities' of economic justice, especially for the poorest of the poor of the town.

6.3 Proposal to Mainstream Research

The debate of established scholars is expected to protract as the forces of economy take its toll over the ecological dimensions of human life in this planet. The dominance of the *Neoclassical Doctrines of the Free Markets* is now being challenged by the rise of the influence of the Ecological Economics over the Paradigm of the Economic Development especially in the less developed worlds. Likewise, the detrimental effects of mainstream economy to Social Capital is clearly seen in the increased emphasis from the usual corporate based paradigms towards community-based programs.

This study therefore verified at the local level (*Pateros)* the existence of a phenomenon in the interactions among the forces of economy (*economic capital*), ecology (*natural capital*) and society (*social capital*). In brief, this is a departure from the Schools of Thought of Scarcity of Nations (*Classical, Neoclassical, Marxian and Keynesian Economics)*, towards the Schools of Integralism in Sustainability of the Planet.

Therefore, the great divide at the moment is whether accumulated savings of economic globalization is enough justifications for a continuous draw down from the finite resources of the planet earth(Hartwick-Solow Substitubability Paradigm) vis-à-vis the current concerns about Critical Natural Capital of the *Ecological Economics Group.*

In the light of these current issues to be confronted by the mainstream research of scholars, the tremendous challenge is to be able to weave a system of thought that integrates the three dimensions of the life of nations state such as economy, ecology and society.

Lessons learned in Pateros where the interactions of the three systems of capitalizations of society were estimated as the CNE equation (cultural, natural and economic capital), there is an urgent need to define the corners of this integrations in the three dimensions of economic development today. Maybe, this is a step closer to integrations of the conflicting views between the neoclassical economics versus ecological economics. When this is achieved then integral forces of earths ecology and economy could be invoked in order to operationalize enhanced welfare of modern society specially in the developing worlds where poverty and hunger is very chronic today.

7. Bibliography

Ayres and Kneese. 1969. R.U. Ayres and A.Y. Kneese. Production, consumption and externalities. **American Economic Review** 59(1969) pp. 282-297.

Arrow, et.al 1995. K. Arrow, B. Bolin, R. Costanza, P.Dasgupta, C.Folke, C.S. Holling, B.O. Jansson, S. Levin, K. G. Maler, C. Perrings, and D. Pimentel. Economic Growth, carrying capacity, and the environment. **Science** 268 (1995) pp. 520-521.

Berry, Thomas. *The Great Works.* New York, USA: Bell Tower. 1999.

Costanza, Robert and Steve Farber. 2002. Introduction to the special issue on the dynamics and value of the ecosystem services: integrating economic and ecological perspectives. **Ecological Economics.** Vol. 41, Issue No. 3, pp. 367-373.

Costanza, Robert, Ralph d'Arge, Rodulf de Groot, Stephen Farber, Monica Grasso, Bruce Hannon, Karin Limburg, Shahed Nacem, Robert V. Oneill, Jose Panuelo, Robert G. Rasskin, Paul Sutton, Marjan vanden Belt. 1998. The Value of the World's Ecosystem Services and Natural Capital. **Ecological Economics.** Vol. 25, Issue 1, Pages 3-15.

Coase, 1960. R.H. Coase. The Problem of Social Cost. Journal of Law and Economics 3 (1960), pp. 1-44.

Clert. 1999 Carine Clert. "Evaluating the Concept of Social Exclusion in Development Discourse. **The European Journal of Development Research.** Vol. 11, No. 2, pp. 176-199.

Costanza, et. al. 1997a. In R. Costanza, C. Cleveland and C. Perrings. Editors, The Development of Ecological Economics, Edward Elgar, Chelterham.

Costanza. 1991. In R. Costanza, Editors. Ecological Economics: The Science and Management of Sustainability. Columbia University Press, New York, (525, pp.) Costanza, R., David Stern, Brendan Fisher, Lining He and Chunbo Ma. 2004. Influential publications in ecological economics: A Citation Analysis. **Ecological Economics.** Vol. 50, Issues 3-4, pp. 261-292.

Chiesura, A. and R. De Groot. 2003. Critical Natural Capital: a socio-cultural perspective. **Ecological Economics** 44, 2-3, pp. 219-231.

Costanza, R. and Daly H.E. 1992. Natural Capital and Sustainable Development. **Journal of Conservation Biology 6,** pp. 37-46.

Daly and Cobb. 1989. H.E. Daly and J.B. Cobb. For the Common Good: Redirecting the Economy toward Community, the Environment and a Sustainable Future. Becon Press, Boston, USA.

Dubois, J.L. and Mahien, F. R. 2002. La Dimension sociale du developpement durable: reduction de la pauvrete on durabilite sociale? In: Martin, J.Y. and Guillaume, L., Editors. 2002. Development Durable: Doctrine, Pratiques, Evaluations. IRD Editions, pp. 73-94.

Daly, Herman E 1992. Steady-State economics-Second Edition with new essays, London: Earthscan, first published in 1977.

Daly, Herman, E. and Robert Goodland (1994): An Ecological Economic Assessment of Deregulation of International Commerce under Gatt, **Ecological Economics 9(1).** Pp. 73-92.

Daly, Herman E., 1996. Beyond Growth: Economics of Sustainable Development. Boston: Beacon Press.

Empacher, C. 2002. Die Socialen Dimensionen der Nachhaltigkeit-Vorsclage Zur Konkretisierung und Operationalisierung. Vortrag au der ordentlichen Mitgliederversanimlung des Dokturanden-Netzwerk Nachhaltiges Wirtschaften, 26 April. Koln. Institut fur sozial-okologische Forschung.

Evans, P. 1995. Embedded Autonomy: States and Industrial Transformation. Princeton, University Press. Princeton, N.J. USA.

Fox, Matthew 1991. Creation Spirituality. San Francisco, USA: Harper Co.

Fukuyama, F. 1995. Trust: The Social Virtues and the Creation of Prosperity. Free Press, New York. USA.

Georgescu-Roegen, 1971. N. Georgescu-Roegen. The Entropy Law and the Economic Process. Harvard University Press. Boston Ma.

Gonzales, Ernesto R. 2002. *The Economics of Ecological Anthropology of Pateros, Metro-Manila and Its Implication to Sustainable Development in the Philippines.* A Doctoral Dissertation. Asian Social Institute. Metro-Manila, Philippines.

Gonzales, Ernesto R. 1996. Economic Ontology of Nature-Culture Induced Poverty in the Philippines. **Journal of Graduate Research. Vol. 24.** No. 2. Manila, Philippines, University of Sto. Tomas Press.

Gonzales, Ernesto R. 1987. A Socio-economic Geography of the Laguna Lake Resources (1961-1985) and Its Implication to Aquatic Resource Management and Development in the Philippines Islands. England, U.K. University of Cambridge.

Hueting, R. 1974. New Scarcity and Economic Growth. Agon/Elsevier/North Holland, Amsterdam.

Hicks, 1996. J.R. Hicks. Value and Capital, Oxford University Press, Oxford U.K.

Hukkinen, J. 2003. From groundless universalism to grounded generation:improving ecological economics indicators of human environmental interaction. **Ecological Economics. 44 1, pp. 11-27.**

Krutilla, 1967. J.V. Krutilla, Conservation reconsidered. **American Economic Review** 777 (1967), p. 784.

Jansson, et. al, 1994. In: A.M. Jansson, M. Hanimer, C. Folke and R. Costanza, Editors. Investing in Natural Capital: The Ecological Economics Approach to Sustainability: Island Press, Washington DC (504 pp.)

Levin, 1999. S.A.Levin. Fragile Dominion: Complexity and the Commons. Perseus Books, New York. 1999.

Lehtonen, Markku. 2004. The environmental-social interface of sustainable development: capabilities, social capital, institutions. **Ecological Economics.** Vol. 49, Issue 2, pp. 199-214

Leff, Gordon. History and Social Theory. USA: The Merlin Press Ltd. University of Alabama Press, 117 pp.

Meadows, Dennis. Donella Meadows, Eric Zahn and Peter Milling. 1972. The Limits to Growth. New York, Universe Books. USA.

Neumeyer, Eric. 2003. Weak versus Strong Sustainability: Exploring the Limits of Two Opposing Paradigm. 2nd Revised Edition. Cheltenham and Northampton: Edward Elgar.

North, D. 1990. Institutions, Institutional Change and Economic Performance. Cambridge University Press, New York. USA.

Norgaard, R.B. 1994. Development Betrayed: The End of Progress and a co-evolutionary Revisioning of the Future, Routledge, London.

Passet, R. 1996. L'Economique et le vivant., payot, Paris 2nd edition.

Peace and Turner. 1990. D.W. Pearce and R.K. Turner. Economics of Natural Resources and the Environment. John Hopkins University Press, Baltimore M.D. (1990)

Rawls, J. 1971. A Theory of Justice. Clarendon Press.

Robeyns, I. 2000. An unworkable idea or a promising alternative? Sen Capability Approach re-examined. Center for Economic Studies. Discussion Paper DPS 00-30. Katholieke Universitit. Leuwen.

Ramirez, Mina. "Reflections on Culture", Monograph Series. Manila, Philippines: Asian Social Institute, 1992.

Sen, A.K. 1999. Development as Freedom, Anchor Books, New York. USA.

Sen, A.K. 1987. Commodities and Capabilities. Oxford, India Paperbacks. Oxford University Press, Oxford, U.K.

Sachs, I. 1999. Social Sustainability and whole development: exploring the dimensions of sustainable development In: Becker, E. and Jahn, T., Editors. 1999. Sustainability and the Social Sciences MOST Project, UNESCO/ISOE, Zed Books, Paris. Pp. 25-36.

Vitousek, e.al. 1986. P. Vitousek, P.R. Erlich and P.A. Matson. Human appropriatin of the products of photosynthesis. **Bioscience.** 34 (1966) pp. 368-373.

Walter, Gerald, R. 2002. Economics, ecology-based communities and sustainability. **Ecological Economics.** Elsevier B.V. Vol. 42, Issues 1-2, pp. 81-87. Netherlands.

Zaccai, E. 2002. Le development durable: Dynamique et constitution d'un project. P.I.E. Peter Long. Bruxelles. 385 pp.