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Editor's Note

This issue is mainly concerned with the forestry. The first article, "A Review of Theories on the Effects of An Export Based Economy on Regional Development : Primary Products and Developing World" is written by Dr. Banasopit Mekvichai.

Dr. Jacques Amyot presents "Social Forestry, Fishery and Links to the Natural Resources Sector" in the second article.

The third article is written by Vitoon, Ph.D. student of the Michigan State University. The Paper is "Social Forestry Extension : A Look on Its Constraints".

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A Review of Theories on the Effects of an Export Based Economy on Regional Development : Primary Products and the Developing World

Banasopit Mekvichai

1. Introduction

In the open world economy, most developing nations are involved in an export economy initially introduced and maintained by western "developed" countries. In recent decades, developing countries throughout the world have engaged in a policy of export promotion as a means of economic development. For many nations the main goods they have available to export are raw materials, either agricultural produce or natural resources. The effects of a policy of a resource-based export economy have been widely discussed in both planning and ecological theories.

Recent natural disasters associated with illegal logging, along with the sharp decline in area covered by natural forest have led to an increased concern in Thailand over the ecological effects of the forest industry. Opponents of logging claim the ecological costs far outweigh any economic benefits. Supporters of the forest industry emphasize the economic benefits derived from logging and related activities. They argue that stopping the exploitation of forests and other natural resources will hamper national and rural development. Few people, whether opposed to or in favor of the forest industry, make a balanced assessment of both the ecological and political-economic costs and benefits.

The following is a review of theories about both the ecological effects of forest use and the political-economic effects of the introduction of an export-based economy in a developing region. Both types of theories should be considered in any study of the actual or potential effects of a forest industry, so that all the costs and benefits, both ecological and political-economic, can be weighed against each other in any decision to continue or to end logging and other forest industries.

2. The Export of Primary Products by the Developing World

Until the late 1700's Europe imported spices and manufactured goods (mainly cloth) from Asia in exchange for gold and silver. At first the precious metals came from Europe itself; after the "discovery" of the Americas at the end of the 15th century, the Europeans paid for the Asian goods with silver and gold they took from the Americas.[1] Economically, many of the societies in Asia, especially India and China, were much wealthier than Europe. The Industrial Revolution changed that.

With the development of industrial capitalism in Western Europe and later in the United States and Japan, a pattern of world trade emerged in which much of the world supplied raw materials and foods, all primary products, to the industrial countries while importing manufactured goods from those countries. In most cases, this pattern of economic production and trade was

[1] Andre Gunder Frank, *Dependent Accumulation and Underdevelopment* (New York: Monthly Review Press, 1979), pp. 14-15.

enforced by colonial rule over today's developing countries by the industrialized states. Local industries in the colonized countries were eroded and subsistence agriculture was replaced by the production of crops needed by the ruling country.[2] Other natural resources were extracted for use by the industrial countries. Even where there was no direct colonial rule, as in the cases of Thailand and of most of Latin America after its independence from Spain and Portugal, the pattern of trade and economic production remained essentially the same.

This has continued to be the dominant pattern of world trade up to the present. With few exceptions (notably Taiwan, South Korea and Singapore in Asia) the developing countries still export mainly raw or rude produce in the primary sector, whether agricultural goods or extracted resources, or goods classified in the secondary (manufacturing) sector which are either processed agricultural products or minimally processed extracted resources.[3] Table 1, derived from a World Bank Study on development patterns from 1950 to 1970, shows the extent to which developing countries depend on primary products for their export earnings. Of the so-called developed countries, only Australia with its vast natural resources exported more primary products than manufactured goods. In contrast, the primary sector accounted for well over half of the export earnings of almost all the developing countries, except for a few such as Jordan and Panama, which have few natural resources and little industry and must depend on the export of services (mostly labor) to earn foreign exchange. Thailand seemed typical of developing countries in 1965, with primary goods accounting for 64 percent of its exports.

This division of exports tends to reflect the structure of production in the various countries. Table 2 shows the structure of production--that is, the value-added proportions of the GNP attributed to the primary, manufacturing, utility, and service sectors--of the same countries, and in the same order as presented in Table 1. Australia again is an exception, with a much larger manufacturing than primary sector though it exports mainly primary goods. Brazil also has a manufacturing sector proportionally as large as its primary sector, while Jamaica has a larger manufacturing than primary sector. Nonetheless, as with some other developing countries, their export trade still depends on primary goods, while mauufactured goods--many of which are also dependent on the primary products-are mainly for domestic consumption. Most developing countries, however, still have much larger primary than manufacturing sectors. Thailand again appears typical of these countries, with 41 percent of its production directly from the primary sector and only 19 from the manufacturing sector. As with all countries, a substantial portion of the GNP comes from the service sector: in Thailand's case it accounts for 31 percent of the GNP.

Since many of the primary products are natural resource based, the countries exporting such goods have experienced not only political-economic changes but also ecological changes. The various effects of these changes on the human and natural resources of developing regions have been analyzed widely. However, studies on the political-economic effects and those on the ecological effects are usually carried out independently. Connecting the two often reveals a cause-effect

[2] Please refer to Clifford Geertz, *Agricultural Involution: The Process of Ecological Change in Indonesia* (Berkeley: University of California Press, 1966), Colin Leys, *Underdevelopment in Kenya* (Berkeley: University of California Press, 1975), and James C. Scott, *The Moral Economy of the Peasant: Rebellion and Subsistence in Southeast Asia* (New Haven: Yale University Press, 1976) for examples of the changes in colonized countries brought about by the new pattern of world trade after the Industrial Revolution in Europe.

[3] For example, milled rice and teak planks are classified as manufactured exports from Thailand, though clearly both are minimally processed primary goods.

Table 1

Division of Exports by Sector of Selected Countries, 1965, in Order of Proportion of Primary Goods Exported

	Primary	Manufactured	Service		Primary	Manufactured	Service
1. Japan	4	82	14	21. Peru	62	27	11
2. Austria	8	60	32	22. Syria	62	7	31
3. United Kingdom	11	63	26	23. Morocco	63	13	24
4. Italy	12	56	32	24. Thailand	64	18	18
5. Norway	14	37	49	25. Philippines	64	8	28
6. France	17	59	24	26. Turkey	64	6	30
7. Yugoslavia	21	53	26	27. Ivory Coast	66	11	23
8. Jordan	24	5	71	28. Australia	68	16	16
9. United States	25	54	21	29. Ghana	71	12	17
10. South Korea	36	55	9	30. Uruguay	71	5	24
11. Canada	38	47	15	31. Ethiopia	74	1	25
12. Taiwan	40	47	13	32. Brazil	77	14	9
13. Panama	40	0	60	33. Honduras	81	11	8
14. India	44	38	18	34. Argentina	81	9	10
15. Mexico	48	10	42	35. Tanzania	82	6	12
16. Egypt	49	14	37	36. Mali	82	2	16
17. Pakistan	53	30	17	37. Malaysia	83	9	8
18. Jamaica	53	8	39	38. Sierra Leone	87	0	13
19. Kenya	55	11	34	39. Sri Lanka	90	1	9
20. Benin	55	4	41	40. Indonesia	91	2	7

Source : Derived from "Table S3. Resources Allocation and Trade Processes," in Hollis Chenery and Moises Syrquin, *Patterns of Development, 1950-1970* (New York: Oxford University Press, 1975), pp. 192-195. In the original the amount of exports are shown as a percent of GDP. These were then converted into the proportions which each sector comprised of the total exports for each country.

Table 2

Structure of Economy by Sector of Select Countries, 1965, Presented in Table 1

	Primary	Manufactured	Utilities	Service
1. Japan	11.1	32.4	15.8	40.7
2. Austria	8.9	49.2	9.7	32.2
3. United Kingdom	5.7	41.6	11.7	41.0
4. Italy	14.0	34.2	9.4	42.4
5. Norway	9.8	34.1	20.5	35.6
6. France	8.7	45.1	6.7	39.5
7. Yugoslavia	23.3	39.2	10.2	27.3
8. Jordan	24.3	14.3	9.5	51.9
9. United States	5.4	33.1	8.7	52.8
10. South Korea	43.3	20.8	5.1	30.8
11. Canada	10.4	33.5	11.7	44.4
12. Taiwan	27.9	25.0	7.8	39.3
13. Panama	26.0	20.7	6.9	46.4
14. India	48.9	19.2	5.2	26.7
15. Mexico	15.4	28.9	4.3	51.4
16. Egypt	29.7	26.3	10.1	33.9
17. Pakistan	47.8	15.4	7.4	29.4
18. Jamaica	21.4	25.7	8.7	44.2
19. Kenya	35.4	15.4	10.5	38.7
20. Benin	42.7	10.6	8.0	38.7
21. Peru	26.4	20.8	5.4	47.4
22. Syria	29.2	18.9	8.8	43.1
23. Morocco	34.9	16.5	2.7	45.9
24. Thailand	41.2	18.6	8.7	31.5
25. Philippines	33.3	22.2	4.4	40.1
26. Turkey	36.9	22.2	8.4	32.5
27. Ivory Coast	41.7	14.2	11.4	32.7
28. Australia	13.8	36.5	11.0	38.7
29. Ghana	N.A.	N.A.	N.A.	N.A.
30. Unuguay	13.7	30.8	9.4	45.1
31. Ethiopia	62.1	12.1	3.9	21.9
32. Brazil	22.6	22.0	8.7	46.7
33. Honduras	42.4	17.8	6.9	32.9
34. Argentina	18.7	37.7	9.9	33.7
35. Tanzania	56.7	7.9	5.1	30.3
36. Mali	50.2	12.5	3.9	33.4
37. Malaysia	41.4	14.4	6.9	37.3
38. Sierra Leone	50.5	9.9	8.6	31.0
39. Sri Lanka	34.1	16.1	10.5	39.3
40. Indonesia	61.2	9.4	2.2	27.2

Source : Derived from "Table S3. Resources Allocation and Trade Processes" in Chenery and Syrquin, *Patterns of Development, 1950-1970*, pp. 192-195.

relationship in which environmental degradation is attributed to the economic changes and to the technology that has driven the economic development.[4]

This situation has spurred debates between environmental protectionists and those promoting economic development. The former claim that economic growth will impair the environment, and urge the developed countries to reduce drastically their current industrial activities.

> A massive campaign must be launched to restore a quality environment in North America and to dedevelop the United States. De-development means bringing our economic system (especially patterns of consumption) into line with the realities of ecology and the world resource situation.[5]

On the other hand, many economic development advocates believe the environmentalists to be overly pessimistic about the limits of resources and man's ability to adapt. Man will most likely continue to find new resources, find more efficient ways to use existing resources, and new ways of extracting resources, such as minerals in the ocean, by means not at present technologically or economically feasible.[6] Furthermore, the anti-growth attitude of many environmentalists is criticized as being elitist and discriminating against the poor countries and the poor in the industrial countries.

> From the point of view of critics in the developing countries of the Third World, the environmental movement--as well as the related calls for a "no-growth" or a steady-state economy--is often perceived as an invitation to remain poor. The criticism of the movement that its membership is elitist finds reflection here in the advocacy of environmental controls by the rich countries, while the criticism that the poor suffer most finds reflection in the assertions that environmental restrictions hamper economic development and restrict international trade.[7]

Some who have joined this debate claim that the real culprit of both the ecological degradation and the unequal economic development in the world is the capitalist system. A new socio-economic system is needed that will enable economic growth and technological development without destroying the environment.[8]

The next two sections present ecological and economic theories relevant to the development of the timber industry. First, the ecological changes expected from exploitation of forests is discussed. Next, theories of political and economic changes which result from the development of an export economy in a region are reviewed.

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[4] Many reasons--most of them closely linked with economic development or with the character of capitalist society--have been given for the human destruction of the natural environment, among them rapid population growth, western religions (mainly Judeo-Christian) beliefs toward nature, and "inappropriate" modern technology. See Carvell and Tadlock, eds., *It's Not too Late...* (Beverly Hills, California: Glencoe Press, 1971) for articles by various authors who have different viewpoints on the reasons for ecological ruin. Also Erik Cohen, "Environmental Orientations: a Multidimensional Approach to Social Ecology," in *Current Anthropology*, Vol. 17, No. 1 (March 1976), pp. 49-70, describes the variety of cultural and social factors that affect people's attitudes and actions towards their environment.

[5] Anne H. and Paul R. Ehrlich, *Population, Resources, Environment* (San Francisco: W.H. Freeman and Co., 1970), p. 322.

[6] David L. Sills, "The Environmental Movement and Its Critics," in *Human Ecology*, Vol. 3, No. 1 (1975), pp. 12-13.

[7] Ibid., p. 34.

[8] Hans Magnus Enzensberger, "A Critique of Political Ecology," in *New Left Review*, No. 84 (March-April 1974), pp. 27-31.

3. Ecological Effects of Some Economic Development Projects on the Forest Ecosystem

In the forest ecosystem, the more mature the system, the closer the interrelationships will be among the different ecological elements, i.e., flora, fauna, soil characteristics, nutrient cycle, and hydrological regime.[9] Within the more complex forest ecosystem, the system is essentially closed and separate from the macro-ecosystem. Since the system of the late successional stage forest is so tightly knit, any disturbance which causes an interruption to the system will alter the self-sustained nature of the forest. The severity of the alteration depends on the types and the intensity of the activities modifying the system.

Theoretically, the forest ecosystem can be altered from one extreme to the other in either direction, i.e., from the climax ecosystem (closed forest) to a disclimax ecosystem (savanna or settled agriculture or other disclimax) or vice versa. In each transition, the members of the system will be succeeded by other species invading from outside once the original members are destroyed and have left empty spaces available for substitution.[10] The time span of each transition varies according to the intensity of the activities modifying the system and the recovery rate of members of the system. The more complex the system and the more destructive the activity, the longer the amount of time the system will need to return to the same ecological condition.

These transitions can either be natural or artificial (caused by human acts). Those which are natural include changes of the climatic condition, hydrological regime, fire, and other natural catastrophes. Those caused by humans range frome traditional crop growing and cattle raising systems to any current economic development projects. If we focus only on development projects of the past two decades, ignoring possible natural causes of change, we find that economic development projects (both rural and urban) have had adverse effects on the natural environment. As Sunkel described,

> The ascendant style of development has generated processes which have had repercussions on the deterioration of the physical environment. Neither the initial processes nor their effects are new in Latin America; they have occurred naturally. In earlier periods, the occupation of space and the new forms and system of exploitation gave rise to processes of deterioration, but the difference lies in the magnitude of the phenomenon as it had occurred in the recent decades, the new technologies used and the areas covered. **The most characteristic processes of the ascendant style of development are: deforestation, unbalanced use of the land, and the excessive "artificialization" of the ecosystems.**[11]

Many of these activities, especially those which aim to help the rural population mainly through the development of agriculture in such a way that will modify the rural area, can have great impact on the forest ecosystem. The type of forest which tends to be most affected is the tropical moist forest, since this system is fragile while at the same time most of the activities modifying it are intensive and destructive. The Food and Agriculture Organization estimates that a total of about 7.3 million hectares of tropical forest are destroyed worldwide each year as a

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[9] Paul R. Ehrlich, Anne H. Ehrlich, and John P. Holdren *Ecoscience* (San Francisco: W.H. Freeman and Company, 1977), p. 137.

[10] Somsak Sukwong, "Forest ecology," a handout in the seminar, "System Approaches to Environmental Research and Management," 1977, p. 132.

[11] Osvaldo Sunkel, "Styles of Development and The Environment," in R.P. Misra and M. Honjo, editors, *Changing Perception of Development Problems*, (Nagoya, Japan: Maruzen Asia, 1981), p. 256.

result of a variety of economic activities.[12] These activities include irrigation projects, logging operations, plantations, road construction, and cattle raising. Although these activities often generate high immediate economic profit to the people engaged in them, they also can lead to adverse ecological effects in the areas modified. These effects include loss of soil and organic matter, soil erosion, siltation of water courses, changes of hydrological quality and quantity, changes of the atmospheric circulation pattern, reduction or extinction of gene pools, and the development of some diseases.[13] The scale of these effects can be localized or pervasive. For example, while loss of soil and organic matter is localized, changes of the atmospheric circulation pattern resulting from the removal of large tropical forest areas is pervasive over much of the world.[14]

The ecological effects of these development activities, which can transform the forest ecosystem from the climax ecosystem to the disclimax ecosystem, are likely to follow the pattern described below.

1.3 The Effect on Flora and Fauna

3.1.1. The Changes in the Floristic Composition and the Loss of Forest Cover

Because activities such as selective logging modify the system gradually, the changes of the floristic composition from one seral stage to the next one or further can also be expected to be gradual. In this case the likely transition of the floristic composition has the following characteristics:

1) The closed canopy becomes more open and scattered as the intensity of the activities increase, since the canopy itself is cut down.

2) Since climbers, like orchids, ferns, and others, are attached to these tree canopies, they will be destroyed if the intensity of the activities increases.

3) More developed grass-herb layer in expected since this vegetation has a short cycle of regeneration compared to tree species in the closed canopy, which often take about fifty to a hundred years to reach their full growth, as in the case of teak.

However, if the purpose of the activities imposed on the system is to clear the forest land for use in such activities as cattle ranching, plantations, irrigation, land settlement, and highway construction, the expected outcome is the disappearance of all forest cover. Much of the forestland in the tropics has been cleared for agricultural development, in part to produce food for consumption in the country but frequently to produce export crops. In a stark example of destruction of tropical forests for export crop production, 20,000 square kilometers of Latin America's rain forest were converted into "cattle ranches that produce cheap beef for the North American and European fast-food industries."[15] Many other parts of the world's tropical forests, such as those in Barbados, Malaysia, and Indonesia, are cleared to develop large plantations for vegetable crops, tea, coffee, sugar, groundnuts, cotton, and rubber for export to the "developed countries." These agricultural development projects alone have meant the loss of at least 20,000 square kilometers of forest land into permanent agricultural land each year.[16]

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[12] Don Hinrichsen, "Kill the rain forest," in *Scanorama*, June, 1984, p. 59.

[13] Duncan Poore, "The values of tropical moist forest ecosystems," in *Unasylva*, Vol. 28, 1976, pp. 127-143; Nigel J.H. Smith, "Colonization Lessons from a Tropical Forest," in *Science*, Vol. 214, November 1981, pp. 755-761; and Norman Myers, "Deforestation in the Tropics: Who Gains, Who Loses?," in *Studies in Third World Societies*, Vol. 13 (Williamsburg, Virginia: The College of William and Mary, 1980), pp. 1-21.

[14] Poore, p. 128.

[15] Hinrichsen, p. 59.

[16] Ibid.

3.1.2 Reduction of Genetic Diversity

One of the major effects of the removal of vast areas of the tropical forest on vegetation in general is the reduction of genetic diversity. Duncan Poore claims the consequences of this include "loss of germ plasm of food-plants," "loss of germ plasm of medicinal and other essential non-food-plants," and "the loss of products yet to be developed."[17] He explains that the forest, especially the tropical forest, is the major poor of genetic variety which humans constantly use as a natural reserve to breed new plants for the development of a variety of products ranging from food to medicine to some synthetics. Destruction of the pool results in the degradation of the genetic varieties.[18] This degradation occurs in two ways: 1) genetic erosion as a result of harvesting good trees which should be preserved for desirable seedlings, and 2) the loss of many other species by removal of the entire population. Opening the site allows it to be invaded by undesirable species, such as *Imperata* grass and other plants, and thus creates an unsuitable environment for seedlings of many high value species.[19]

3.1.3 Changes of Faunal Composition

Although the number of native species may decrease, the total population of wildlife in in the modified forest does not always decline because not all species migrate or become extinct. As some migrate or become extinct, others survive and adjust themselves to the new environment, or even become pests on crops grown in that vicinity. A few other species move into the new environment. Thus, the faunal composition of the area changes. The population of species confined to the undisturbed forest decreases, while that of those preferring the opened forest increases.[20] Yong Hoi-Sen provides a clear picture of changes in the faunal population in his description of the change of the mammal population in the modified forest of Peninsular Malaysia.

> It has been demonstrated that the progressive destruction of the primary forest results in progressive elimination of the native mammal fauna... The total number of mammal species decreases as the degree of disturbance increases; the relative proportion of the total mammal fauna typical of open conditions, however, increases. The canopy mammals are the first to disappear, then the ground mammals are progressively replaced with commensals. Finally, complete elimination of the forest (i.e. scrub and grassland) causes almost complete elimination of the native mammal fauna.[21]

3.1.4 Reduction of the Number of Faunal Species

Destruction of the forest cover affects the wildlife residing there. Many studies show that one of the detrimental results of forset destruction is the reduction of the number of faunal species in the primary forest.[22] As a result of the habitat disruption and loss of their food niche, some mobile species, such as birds, migrate from the area while less mobile ones disappear.[23]

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[17] Poore, p. 138.

[18] Ibid.

[19] Jack Ewel and Louis Conde, "Potential Ecological Impact of Increased Intensity of of Tropical Forest Utilization" (Unpublished Report, 1976), pp. 37-38.

[20] R.P. Moss, "The ecological background to land use studies in tropical Africa, with special reference to the West," in *Environment and Land Use in Africa* p. 210.

[21] Yong Hoi-Sen, "Mammals of Virgin and Logged Forests in Peninsular Malaysia," in *Proceedings: Symposium on the Long-Term Effects of Logging in Southeast Asia.* BIOTROP Special Publication No. 3, 1975, p. 157.

[22] Yong Hoi-Sen, pp. 153-157: and Ewel and Conde, pp. 76-78; and Wendell L. Wilson. and Carolyn C. Wilson, "Primates in Undisturbed and Logged Forests in Sumatra and East Kalimantan," in *Proceedings: Symposium on the Long-Term Effects of Logging in Southeast Asia.* BIOTROP Special Publication No. 3, 1975, pp. 137-145.

[23] Poore, pp. 134-135; and Paul Raffaele, "Man's threat to his closest relative," a cover story in *Asia Magazine*, August 26, 1984 (Hongkong: Asia Magazines, Ltd.), pp. 5-6.

3.1.5 Other Effects

In addition to the direct effects of forest degradation on the flora and fauna of the forests, adverse effects may occur on agricultural production in lands adjoining the forests and on human health in the vicinity. Duncan Poore suggested that the loss of the habitat and food niche for most pollinators and for predators of agricultural pests would lead to lower production yields on cultivated lands near the modified forest.[24] Another common phenomenon resulting from clearing forests for rural economic development is the outbreak of new diseases that harm either crop or human health.[25] One such case occurred with Brazil's Transamazon development project, which included construction of highways through previously undisturbed forests of northeast Brazil and subsequent agricultural development along the highways. An unexpected effect of these highways, which were intended to bring "socio-economic development" to the area, was the spread of several fungi that seriously damaged crops along the highways. This led to reduced yields of cash crops especially pepper and banana) and a fall in the incomes of the settlers. On top of this, an outbreak of malaria in the area due to unsanitary conditions in the settlements greatly impaired the settlers' health and reduced their productivity, further reducing their incomes.[26]

3.2 Changes of Soil Characteristics and Nutrient Cycle

3.2.1 Changes of Soil Properties

Two major changes in soil properties result from utilization and conversion of forests. These are changes of physical properties of the soil and changes of the soil nutrient cycle.

Studies indicate the following damages to the physical properties of the soil: 1) the loss of existing soil structure or increased compactness of soil particles as a result of the impact of heavy equipment used in extracting trees in logging operations, or in conversion to a permanent road or settled agricultural use such as cattle raising and field crop production,[27] 2) higher value of bulk density,[28] 3) lower porosity, which reduces the water retaining capacity of the soil itself.[29] and 4) higher soil temperature due to more exposure to radiation.[30]

Secondly, soil nutrient content will be depleted by 1) the reduction of the organic matter content directly by reduction of biomass and indirectly by the reduction of soil microoganisms through clearing and burning and 2) the reduction of the inorganic matter content through erosion.

Since significant amounts of nutrients are stored in the tree biomass, the soil organic matter content derived from that biomass will decrease after clearing.[31] This loss will be more detrimental if burning is involved in the clearing process; that is, there is a more volatile loss of

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[24] Poore, p. 138.

[25] Ibid, pp. 138-39.

[26] Nigel Smith, pp. 755-761.

[27] Lawrence S. Hamilton, *Tropical Forested Watersheds: Hydrologic and Soils Response to Major Uses or Conversions* (Boulder, Colorado: Westview Press, 1983), p. 28; Ewel and Conde, p. 41; Kuswata Kartawinata, "The Environmental Consequces of the Removal of the Forest in Indonesia," in *Studies in Third World Societies*, vol. 13 (Williamsburg, Virginia: The College of William and Mary, 1981), p. 199; Pedro A. Sanchez, "Soils of the Humid Tropics," in *Studies in Third World Societies*, vol. 14 (Williamsburg, Virginia: The College of William and Mary, 1981), p. 373.

[28] Ewel and Conde, p. 41.

[29] Ibid; and Kartawinata, p. 199.

[30] Sanchez, p. 375.

[31] Ewel and Conde, p. 47.

nitrogen and carbon to the atmosphere.[32] In addition, clearing and burning also reduce the soil microorganism populations, such as nitrogen fixing bacteria, cellulolytic bacteria, and arthropods, thus reducing the rate of litter breakdown and the nutrient fixing cycle.[33]

This organic matter loss, though, does not last long. A study by de las Salas and Folster at Carare-Opon, Colombia demonstrated that the organic matter content of a 16 year-old pasture is about the same as that of the virgin forest; on the basis of this study, Sanchez indicated that the loss of organic matter content from burning is temporary.[34]

In spite of this example, it should be noted that not all depleted forests in the tropics have been left fallow long enough after utilization or conversion for the organic matter to be replenished. Without enough forest fallow period, it is doubtful that the organic matter content of the pasture area will be built up to the same level as that of the virgin forest.

Aside from the reduction of organic matter content, inorganic matter content of the soil will also decrease after clearing. Although burning the biomass after clearing helps increase soil fertility for the first 10 months after burning, soil fertility will decline after these first few months because of leaching.[35]

The reduction of both the organic and inorganic matter content after the removal of the biomass and its burning lead to nutrient loss not only to the soils but also to the entire forest ecosystem.

3.2.2. Soil Erosion and Nutrient Leaching

Due to the increased exposure to seasonal and climatic changes once the vegetative cover is cut down, the topsoil, already disturbed by the impact from the extraction process, will dry out rapidly, then erode away with the rapid surface runoff from the rains. In addition, loss of tree root shear (the power of the tree roots to hold soil) due to root decay following cutting will bring about sheet erosion, primarily on steep slopes (greater than 30 degrees), where there is utilization or conversion of the forests.[36]

The loss of soil resulting from different types of land uses varies according to types of vegetative cover and degree of disturbance the soil receives.[37] A study of sample plots of different types of land uses on a 25 percent slope in Mindanao, Philippines, where annual rainfall was 4,220 mm, found that ungrazed Imperata grassland had the least soil erosion (0.18 tons/hectare/year) of the four agricultural land uses, comparable to the erosion in an abaca plantation (0.19-0.27 tons/hectare/year). These were both much lower than the soil erosion rate in a 12 year-old corn swidden field, which had the highest rate of the plots; 2.88 tons/hectare/year during the period of intercropping and 54.44 tons/hectare/year during the 175 day cropping period.[38]

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[32] Sanchez, p. 375.

[33] Sanchez, pp. 375-377; and Ewel and Conde, pp. 52-54.

[34] Sanchez, Figure 4 on p. 379.

[35] Sanchez, p. 380. Please refer to pp. 377-382 and Figures 3 and 4 in Sanchez's article for a full discussion of the changes of chemical properties of the forest nutrients cited.

[36] Hamilton, pp. 38, 144.

[37] Hamilton, p. 17.

[38] Thess statistics are calculated from the unit of grams/sample/plot/day, from Table 7 in Hamilton, p. 17 for the purpose of comparison with the other statistics on soil erosion reported in units of tons/hectare/year.

It should be noted that the ungrazed grassland will not have the same soil erosion rate as the grazed one. The comparative study of erosion between the ungrazed grassland and the grazing grassland in the tropic of Australia shows that the latter has five times more erosion than the former. Hamilton 1983, p. 76.

The rate of soil loss in areas converted to agricultural fields, however, is considered low compared to the rate of soil loss in areas which are continuously disturbed. Examples of land use that result in extremely high soil loss are over-grazing in logged over areas, severe disturbance of the soil from construction or agricultural equipment, or road or civil construction.[39] For example, the estimated soil loss on a 15 degree slope planted to annual crops along the Transamazon Highway was about 100 tons/hectare/year.[40] Even greater soil loss occurred in some regions of the Malagasy Republic which were deforested and used either for slash-and-burn agriculture or had been overgrazed--losses measured as much as 250 tons/hectare/year.[41] Hamilton sums up the comparative soil loss from different land uses in favor of agricultural land use, claiming that

> (e) ven with the unstable from of shifting agriculture, the erosion consequences may be somewhat overrated, or it may be at least dwarfed by the erosion resulting from road construction, urban development, drainage outlets, and other civil engineering, rather than agronomic activities.[42]

3.3 Effect on Hydrological Regime

3.31. Increase of Ground Water Supply and Streamflow Quantity

Despite a cloud effect reduction which may result in the reduction of the total water budget in some forests, the water yield available to groundwater and the streams of most of the cleared forests generally increased due to the reduction of evapotranspiration and much lower interception of the tree canopies after cutting.

Reduction of transpiration and evaporation from the tree conopy will lead to more water being retained in the soil and the groundwater supplies. These supplies will also be augmented by the increased rainfall reaching the forests floor and infiltrating the soil, raising the level of soil moisture and ground water supplies.[43]

At the same time, more thoughfall also results in more surface runoff, thus providing more streamflow quantity. After reviewing different studies, Ewel and Conde, and Hamilton agreed that there is an increase in streamflow quantity following canopy reduction.[44]

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[39] Concerning the issues of erosion in the settlement area, G.W. Olson and G. Haufmann, "Some Implication of Soil for Civilization" in *New York's Food and Life Sciences*, vol. 4, no. 4, (Oct-Dec 1971), pp. 11-14, give a good analysis of soil erosion of an ancient urban settlement.

[40] Nigel Smith, p. 757.

[41] Hinrichsen, p. 60.

[42] Hamilton, p. 128.

[43] Hamilton, p. 30.

[44] Hamilton, p. 30, pointed out, "Almost every well-designed experiment has shown increased water yield as a response to forest cutting, and in general the increase is proportional to the amount of canopy removed. The increase declines as full forest returns to the site. The most recent review of catchment experiments has been undertaken by Bosch and Hewlett (1982). In assessing the results from 94 catchments, they have added the results of 55 experiments to those assessed by Hibbert (1967) and come up with the same conclusion: no experiments in deliberately reducing vegetative cover (e.g., by logging) caused reductions in yield. Moreover, they even suggest some predictive generalizations as follows:

-- Coniferous and eucalypt cover types have approximately a 40 mm increase in water yield per 10 percent reduction in cover.

-- Deciduous hardwoods have approximately a 25 mm increase in yield per 10 percent reduction in cover."

3.3.2 Change in the Timing of Flow

The increase of water budget for ground water and streamflow increases the annual streamflow. After cutting, the streamflow tends to increase throughout the year, especially during the low flow season : that is, the number of the low flow days decreases.[45] The high flow also increases several fold after cutting. Hamilton, in reviewing many catchment studies, indicates the positive result of cutting on the availability of the water in the low flow season.[46]

Nevertheless, large scale deforestation can bring about flooding in the high flow season season and lower the water table and cause drought in the low flow season.[47] Flooding and a very low water table in China were the result of large scale forest degradation in the nineteenth century, according to Rhoads Murphey.[48]

3.3.3 Siltation

Besides flooding and drought, another effect of deforestation on the water regime is higher sediment deposit in the streambed.[49] This includes eroded soil and an outflow of nutrients coming with the surface runoff. In measuring the sediment yield, the percentage increases of sediment (which is the same as the erosion rate) varies according to the types of land use.[50] At the same time, the percentage of nutrient solution in the water course also increases. The amount of nutrient deposit can, at times, be harmful to the aquatic community and exceed the health levels recommended for drinking water.[51]

3.4 Effect on the Climate

3.4.1 Increased Temperature

Since bare soil absorbs and transfers heat differently than does the tree canopy, the local temperature will increase after cutting. In research in the dry tropical forest of Thailand, the temperature of the shaded forest area was found to be at least one to two degrees Celsius less than in the adjacent open area.[52] In addition, the intensity of the incident radiation on the shaded ground was only obout a tenth of that on the unshaded ground.[53] Once there is no tree canopy, the first immediate effect of deforestation on the local climatic condition is the increased temperature of the ground and the air near the surface.[54]

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[45] Hamilton, pp. 35–37.

[46] Ibid.

[47] Hamilton, pp. 125–127 ; and Poore, p. 140.

[48] Rhoads Murphey, "Deforestation in Modern China," in *Global Deforestation and the Nineteenth-Century World Economy*, Tucker and Richards, editors (Durham, North Carolina : Duke Press Policy Studies), pp. 122–128.

[49] Hamilton (table 6, p. 17, and p. 43) gives data showing the sediment measured in streambeds increased after cutting.

[50] Hamilton, table 6, p. 17.

[51] Hamilton, pp. 46–47 ; Poore, pp. 86–87.

[52] Robert F. Dickinson, "Effects of Tropical Deforestation on Climate," in *Studies in Third World Societies*, Vol. 14 (Williamsburg, Va.: College of William and Mary Press, 1981), p. 415.

[53] Ibid.

[54] Henderson-Sellers, "The Effects of Land Clearance and Agricultural Practices on Climate," in *Studies in Third World Societies*, vol. 14 (Williamsburg, Va.: College of William and Mary Press, 1981), p. 476.

Without the tree canopy, the heat transferred to the atmosphere by evapotranspiration of the tree leaves--latent heat--decreases; whereas, the heat transferred to the atmosphere by direct ventilation--sensible heat--increases.[55] In addition, the intensity of the direct incident solar radiation to the forest ground increases. Thus, both the ground temperature and the local air temperature will increase.

3.4.2 Changes of Rainfall Patterns

While hydrological studies indicate there is little or no relationship between deforestation and local rainfall pattern, except in some high elevation and coastal areas which lost their "cloud effect," (the ability to capture and condense atmospheric moisture in adding some moisture to the area),[56] meteorological studies show that the reduction of the tree canopy not only affects the pattern of heat fluxes but also affects the pattern of local precipitation.[57]

However, the direction of changes following deforestation is still controversial. First, Lettau et al., from the experimental model on Amazon Basin, found ten percent increase in rainfall after deforestation.[58] Meanwhile, Potter et al. showed in their experiment, an eleven percent decrease in rainfall after deforestation.[59] In addition, Henderson-Sellers, from her simulation model of deforestation in the Brazilian Amazon, found that the amount of local rainfall will increase for a short period of time following deforestation. It will then decrease because of drier air and less moisture locally.[60]

3.4.3 The Effect on Regional and Global Climatic Conditions

Although there is as yet no report of the actual effect of deforestation on regional and global climates, Dickinson and Henderson-Seller have presented possible changes of these climatic systems which would result from large-scale deforestation in the tropics.

First, the regional hydrological cycle--"frequency, amount, and location of tropical cloudiness and rainfall"--can be affected by the changes in the ratio of sensible to latent fluxes.[61] Second, the carbon dioxide content in the atmosphere can increase due to the reduction in carbon dioxide uptake by local vegetation.[62]

The degree of changes mentioned depends on the scale of the disturbance (the area of clearance), the geographical location and local environment of the deforestation site, and the synoptic atmosphere pattern.[63] Most of the time, although these effects have a significant impact on local climatic condition, the changes of moisture, temperature and the carbon dioxide content are usually diluted by atmospheric motion,[64] or they cause only slight fluctuation in the regional climatic regime.[65]

The above discussion can give some general idea about the changes of the forest ecosystem as a result of forest utilization and conversion under some economic development projects. Nevertheless, the process of how a particular activity can actually affect the forest community is still unclear.

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[55] Dickinson 1981, pp. 417, 424.
[56] Hamilton, p. 124.
[57] Dickinson, p. 427; and Henderson-Sellers, p. 476.
[58] Dickinson, p. 427.
[59] Ibid.
Please refer to Dickinson's and Henderson-Sellers's articles for a detailed discussion concerning these two studies.
[60] Henderson-Sellers, p. 476, and Figure 1, p. 446.
[61] Dickinson, p. 417; Henderson-Sellers, pp. 445, 458.
[62] Dickinson, 436; Henderson-Sellers, 445.
[63] Dickinson, 425; Henderson-Sellers, 458.
[64] Dickinson, 425.
[65] Henderson-Sellers, 476.

4. Political and Economic Effects of the Development of an Export Economy in Pre-Capitalist Societies

The introduction of an export economy in non-western precapitalist societies led to sweeping changes in their political and economic structure. Though the types of changes differed according to the particular historical conditions and the unique political and socio-economic organization of each society, enough common changes occurred in all the societies to enable scholars to formulate theories about the effects of an export-based economy on the development of a region. Some theorists praise the export economy for hastening the economic development of the region, while others criticize its detrimental effects on the local economy.

In this section, I discuss various theories of the major political and economic changes caused by an export economy. A brief description of the earlier, pre-capitalist political-economic structure opens the section. This is then followed by a discussion of changes expected in these societies by the introduction and promotion of an export economy.

4.1 The Political-Economic Structure of Pre-Capitalist and Pre-Colonial Societies

European colonialism, beginning in the 16th century in the Americas, Asia, and parts of Africa, and covering most of the world by the end of the 19th century, planted the seeds of dependent export-based, commercial economies in almost all the societies of the world. Before then, these areas were more on less politically and economically independent. Each society, whether a band of nomadic hunters and gatherers, a society of primitive farmers and pastoral nomads, or a settled non-industrial civil society, had its own social, economic, and cultural system and was self-reliant. They had their own technologies to acquire foods and material needs and their own systems of political authority to determine the duties of the members of the society and to allocate and distribute among the members the goods produced and extracted by them.

4.1.1 Forms of Pre-Capitalist Organization

The political-economic patterns of these early societies have been differentiated and classified by scholars in various ways. Polanyi divided them according to the patterns of production and distribution, into reciprocity, redistribution, and householding systems.[66] The reciprocity system is characterized by gifts (either goods or services) given between individuals or small groups of equal status, usually kinsmen and close friends. It is dominant among people of subsistence-level economies such as hunters, gatherers, and primitive farmers, and it provides them a means of social security and equitable redistribution of goods among all members of the society.[67] The redistribution system was described by Polanyi as existing in societies under a common chief or ruler with a definitive territory and a clear division of labor. Goods and services are conveyed to the central authority and then redistributed to the other members of the society by that ruler, who kept a large portion of the goods for his own use.[68] Lastly, he described a householding system, in which members of a household or any self-sufficient unit (such as a village) produce and store all the goods to meet their needs.[69] Societies could use more than one of these systems.

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[66] Karl Polanyi, *The Great Transformation* (Boston: Beacon Press, 1975), pp. 47-53.

[67] See Peter B. Hammond, *An Introduction to Cultural and Social Anthropology* (New York: The Macmillan Company, 1971), pp. 132-138.

[68] Polanyi, p. 47. According to Polanyi's categories, this would have been the most common political-economic form of society in Asia and much of the rest of the world at the time of colonial penetration, since it covers everything from tribal societies to the most complex non-industrial civil societies with a class of aristocratic rulers controlling the process of redistribution.

[69] Ibid., p. 53.

In contrast, the critical theorists beginning with Marx classified the pre-capitalist political-economic organizations according to their class structures and systems of production, as primitive or communal, Asiatic, Antique or slave-owning, and feudal. These forms of political-economic organization, known more precisely as modes of production in Marxist terminology, attempted to explain for the first time the progress of history in terms of the material and technological basis of economic production and the social relations between people which enabled such production.[70] All but one of the modes described the predominant economic and political relations in major epochs of European history. The exception was the Asiatic mode, used initially by Marx to determine what in the organization of advanced non-European societies kept them from evolving into the capitalist mode of production characterizing industrial societies.

Primitive communalism is supposed to be the earliest form of social organization. Small, classless communities control the land, which is the most important means of production for all pre-capitalist societies, and individuals have access to the land as members of the community.[71] In the Asiatic mode, a ruling class takes surplus agricultural production as tribute from the self-sufficient village communities in the territory under its control. Land and other resources (including the population) are considered property of this ruling state, but it is not involved in production except to provide some infrastructure and take the surplus. This system is considered to be static because changes in the tribute-taking state do not affect the structure of the largely self-contained rural society.[72]

In the antique or slave-owning mode of production characteristic of ancient Greek and Roman societies, there is private ownership of both land and the slaves who work the land. Slavery is absolute, unlike the debt slaves in many other societies. Slave production frees the landowners from attachment to the soil and enables them to live off the profits, whether in the cities of the ancient civilizations or the mansions of the pre-Civil War U.S. South.[73]

A major distinguishing characteristic of the feudal mode of production is the social relationship tying the class of peasant producers, or serfs, to the land they till and to the class of lords who own parcelized, virtually self-sufficient and self-ruled feudal estates. The serfs owe their lords a tribute payment of a portion of their produce and other services and labor, in exchange for the protection of their land and continued right to use the land. The lords, a hereditary warrior class, were themselves granted the land by higher ranking nobles in exchange for tribute payment of knight-service.[74]

In recent decades many critical theorists have studied the political-economic organization of non-western societies. They found that Marx's modes of production, and the evolutionary character of the modes, were inadequate or misleading in the analysis of the non-western world. Instead, the pre-capitalist modes of production have been adapted, altered and amended as descriptive tools to understand the characteristics of most societies of the world before their contact with

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[70] Robert C. Tucker, ed. *The Marx-Engels Reader*, 2nd ed. (New York: W.W. Norton and Co., 1978), pp. 4-5.

[71] Ibid., p. 666.

[72] Perry Anderson, *Lineages of the Absolutist State* (London: New Left Books, 1974; Verso, 1979), p. 483. This mode has been used by some theorists to describe societies as diverse as Mayan, Chinese, Indian, Islamic, and more contemporary Asian and African societies--in other words, almost every society that does not fall under one of the other modes.

[73] Perry Anderson, *Passages from Antiquity to Feudalism* (London: New Left Books, 1974; Verso, 1978), pp. 18-28.

[74] Marc Bloch, *Feudal Society*, trans. by L.A. Manyon (Chicago: the University of Chicago Press, 1961). pp. 115-16, 160-66, 443-44.

capitalism. Amin, for example, differentiates the structure of pre-capitalist societies into four major forms of production: the primitive-communal, tribute-paying, slave-owning, and simple commodity modes.[75]

Amin's primitive communal modes of production, the claims of which "are many and various, being determined by natural conditions," are essentially the same as the primitive-communal mode described by earlier critical theorists.[76] The slaveowning society of Amin's is also the same as the slaveowning mode described above. The tribute-paying mode, in contrast, is a very broad classification which includes the earlier categories of Asiatic and of feudal societies. In his own evolutionary scheme of world history, Amin states that Finally, the simple commodity mode "is

> the tribute-paying mode of production is the form that most normally succeeds the communal mode; it is the rule.... This mode of production, sometimes inaccurately called the "Asiatic" mode, has existed in four continents... in Asia, America... The feudal mode of production appears as a "borderline" case of the tributary mode, in which the community is especially degraded....[77]

marked in its pure state, by equality between free petty producers and the organization of commodity exchange between them."[78] The simple commodity mode and the slaveowning mode existed only in limited spheres, whereas the various primitive-communal and especially the many forms of tribute-paying modes are the common major pre-capitalist formations.[79]

4.1.2 General Characteristics of Pre-Capitalist Societies

Regardless of the system of categorizing pre-capitalist societies, all scholars tend to agree on several major characteristics of these societies. To begin with, the pre-capitalist societies can be separated into two major types: classless societies and those with distinct class divisions. The reciprocity system of Polanyi and the primitive-communalism of the critical theorists are both descriptions of the structure of the classless pre-capitalist societies. These tend to be small-scale societies which existed prior to various class societies and were the basis for their development.[80] All the others are societies with clear class divisions between the rulers and the ruled. Certain fundamental political-economic characteristics of these pre-capitalist societies--the power in allocating and distributing goods and services in the society, and the organization of labor--changed significantly in the evolution from classless to class-based society, whereas other characteristics, such as the market mechanism (usually insignificant), retained similar basic characteristics in most pre-capitalist societies until the introduction of capitalist trade in those societies.

4.1.2.1 Control Over Allocation and Distribution of Resources

Of first importance to this study is the power to allocate and distribute resources in these two main categories of pre-capitalist societies. How the resources are allocated, and who has the power over the allocation, differ according to the system of resource ownership set up in a society. In the classless primitive communal society of kinsmen and clans, the society was stratified by sexual organization of the family or clan, or by the structure of the extended family. That is, age

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[75] Samir Amin, *Unequal Development*, trans. by Brian Pearce (New York: Monthly Review Press, 1976), p. 13.

[76] Ibid., p. 14.

[77] Ibid., p. 16.

[78] Ibid., p. 15.

[79] Ibid., p. 20-21.

[80] Eric Hobsbawm, Introduction to *Pre-Capitalist Economic Formations*, by Karl Marx, ed. Eric Hobsbawm (New York: International Publishers, 1964), pp. 27-32-33.

or sex, or both, were major determinants of social hierarchy.[81] In such a society, natural resources, tools and other goods did not belong to individuals. All resources belonged to the community as common property. Each individual could gain access to resources and goods only as a member of the community.[82] The headman, who was usually an elder related to the others in the community, or a group of headmen, had the highest authority in allocating resources and distributing goods and produce among the members of the society. Despite this authority, the headmen did not accumulate wealth, not just because they like others in the society were propertyless but also because they had very limited exploitative power over the rest of the community. Status as leaders often was maintained by the ability to give away any goods they and their community accumulated, either by reciprocal exchange with other communities or by some system of redistribution of wealth within their own community.[83] Thus, in the classless society the headman's authority to allocate and to distribute resources is used for the benefit of the other members of the society, who at this level of social organization are also members of the headman's kinship group or clan.

In contrast, the class-divided pre-capitalist societies had a greater variety of forms of control over resources because of the diversity of types of political-economic organization in this general category of society. What was common to all, whether a simple tribal society or the most advanced pre-capitalist civilizations of China, Egypt, etc., was that resources and goods never belonged to the entire community but were controlled by the distinct and separate class of rulers who often accumulated for their own benefit the wealth derived from the resources. In some cases, the resources belonged to both the village community and the ruling state. At the village level, characteristics of the classless society remained and the community still claimed communal rights over the goods its members produced and over the resources within its area. Nonetheless, the state, as ruler, had ultimate right of possession and use over resources and goods in its territory, including the goods and resources shared communally at the village level.

In other cases, such as the feudal societies of Europe, resources belonged entirely to the individual ruler. Regardless of any claims of the village community over resources, the feudal class of rulers had full rights to mobilize, allocate, and distribute all resources in their territory. They had control over the technological and economic system through control and ownership of productive goods.[84] Their political and economic status, then, was not maintained by a redistribution of goods and assets, as in the reciprocity system of the classless society, but instead was maintained by the ruling class through their accumulation of wealth and the concentration in their hands of the control over resources and goods.[85]

According to Amin, this pre-capitalist accumulation of wealth was accomplished mainly through a system of tribute payments, in which the rulers of the land appropriated surplus produce and labor from the other members of the society.[86] The hierarchical order of tribute payment depended on the nature of the separation of classes in that society. In the simplest form, a chief had control over resources in an area and the members of the society he ruled paid him tribute through tax of goods or labor. In more complicated forms, the immediate rulers received tribute from their people; these rulers, in turn, paid tribute to higher ruling authorities. Depending upon the complexity of the society and the levels of hierarchy, this tribute payment continued up the

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[81] Amin, p. 14; Polanyi, p. 47; and Frederick Engels, *The Origin of the Family, Private Property, and the State* (New York: International Publishers, 1942), pp. 42-43.

[82] Hobsbawm, p. 69.

[83] Hammond, p. 202.

[84] Ibid., p. 202-03.

[85] Ibid., p. 202.

[86] Amin, p. 20.

hierarchy--lower nobles paying tribute to their immediate superiors, with each level keeping much of the tribute they received for their own use--up to the highest authority of all, the king or emperor. While most pre-capitalist accumulation of surplus goods and labor was scant when compared with later capitalist accumulation, as most pre-capitalist economies operated at a near-subsistence level, the wealth and control over resources and goods fell clearly into the hands of a few members of the society who were thus able to maintain their political and economic power over the territory they ruled and over the other members of the society.[87]

4.1.2.2 Division of Labor in Pre-Capitalist Societies

As the political economic structure of societies changed from a classless to a class society, labor became divided not according to the sex and age of workers, but according to their specialization and class position. According to Engels, the division of labor in the small-scale primitive communal society was differentiated between sexes at the household level: men found or hunted for food and other necessary goods and they protected the family, while women were responsible for house-keeping and caring for the family, including raising the children.[88] In addition to individual household responsibilities, members of the society also had collective responsibility to their community. Some of the roles in the communal activities were determined by age, with village elders in positions of leadership. Participation in the collective activities and ceremonies confirmed social prestige as well as access to common resources. Thus, members of the community had a social and economic interest in remaining a part of the group, rather than risk becoming outcasts.[89]

In contrast, labor in class societies was allocated and organized according to the class positions of the members of the society and the specialized skills of the workers. A class of rulers --tribal chiefs, slave-owners, feudal lords, nobles, or some other ruling group--controlled the resources, including manpower. The laborers, whether slaves or serfs or freemen, worked and produced for the rulers as well as for themselves and their own families. Major differences did exist among the various pre-capitalist class societies, according to the organization of production, the division of labor and the means of appropriating the surplus labor and product of the workers by the ruling class. Differences between, for example, feudal and slave-owning precapitalist societies are extremely important. Nonetheless, all specialized class societies share the basic characteristics in which the rulers have control over the resources and the ruled are obliged to produce for the rulers. As Barrington Moore wrote, "No matter what the means of ensur (ing) an adequate labor force for working the soil and (creating) an agricultural surplus for consumption by the other classes, (it is those) at the bottom who suffer severely..." [90]

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[87] Engels, p. 144.

[88] Engels, p. 144.

[89] Polanyi, pp. 46-47.

[90] Barrington Moore, Jr., *Social Origins of Dictatorship and Democracy* (New York: Penguin Books, 1966), p. 434. See also Anthony Leeds, "Mythos and Pathos: Some Unpleasantries on Peasantries," in *Peasant Livelihood: Studies in Economic Anthropology and Cultural Ecology.* Edited by Rhoda Halperin and James Dow (New York: St. Martin's Press, 1977), pp. 232-33, 237-38; Karl Marx, *Pre-Capitalist Economic Formations.* Edited by E.J. Hobsbawm (New York: International Publishers, 1964), pp. 70, 121-128; and Max Weber, *The Theory of Social and Economic Organization.* Edited by Talcott Parsons (New York: Oxford University Press, 1947; The Free Press, 1964), pp. 233-236, 241-45, for descriptions of the division of labor in various pre-capitalist and peasant societies.

4.1.2.3 Insignificance of the Market in Pre-Capitalist Economies

Despite significant differences between the classless and the class-divided pre-capitalist societies, one characteristic common to both was the insignificance of the market. International trade did exist, but it was a trade in luxury goods; and even those societies benefitting most from the trade (such as ancient Rome, Renaissance Venice, or imperial China) depended on an essentially localized self-sufficient economy for their existence. Almost all goods consumed by the common people of these societies were produced locally, while the non-luxury goods and many of the luxury items of the elite were accumulated through local tribute payments. Since local trade of goods and services was usually by barter, the market mechanism played a very limited role in the economy.

In the classless primitive-communal society, the members hunted, gathered or grew foods and produced other materials they needed, either individually, collectively, or by some form of reciprocal labor. In the primitive societies that have been studied, people's produce was usually divided into two portions, one for the family's and community's consumption and the other portion for reciprocal exchanges.[91] The exchanges were usually of two types, each with its own purpose: 1) the barter exchange of surplus goods by barter for scarce goods between communities with different environmental or technological conditions and thus the ability to produce different type of goods, or 2) the ceremonial exchange by village headmen or chiefs to enhance the community's social prestige through its ability to present to other communities large amounts of surplus produce.[92]

A great deal of exchange of goods occurred in the class-divided, pre-capitalist societies because, as has already been noted, the clear division of labor meant that goods produced by one group of specialized workers had to be exchanged for the goods produced by other groups of specialized workers in the society. Most exchange, however, took place through a system of tribute payments and redistribution under the control of the ruling class. This was true even for societies in which currency was used for some tax payments, officials' salaries and limited market exchanges.[93] Farmers and other producing members of the society still divided their produce into two portions: one for their own use, and the other as tribute payment to the ruling authority.

> We find...the process of redistribution forming part of the prevailing political regime, whether it be that of tribe, city-state, despotism, or feudalism....The production and distribution of goods is organized in the main through collection, storage, and redistribution, the pattern being focused on the chief, the temple, the despot, or the lord.[94]

In the class societies, some barter exchange still occurred between villages or among villagers of different specializations but it was subordinate to the tribute-paying system.

Thus, though markets did exist especially in luxury goods on an international scale, the market did not play a significant role in the economic lives of the bulk of the population of the pre-capitalist societies. Only with the introduction of a capitalist economy did the market begin to play an important and profound role in the economic, social, and political lives of all members of the society.

4.2 The Role of an Export-Based Economy in the Political and Economic Transformation of a Developing Region

By no later than the early 16th century, a major ecomomic transformation started that continues to have immense reprecussions throughout the world. This was the rise of capitalism,

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[91] Polanyi, p. 48.

[92] Hammond, p. 134.

[93] Polanyi p. 51.

[94] Ibid., p. 52.

which emerged out of the decline of feudal society in Western Europe. The lack of a centralized administrative, political and economic system in the feudal society allowed for the development of independent cities that were the centers of trade and commerce. With the development of international trade, a long period of mercantile activity began which led directly to the rise of capitalism.[95] Scholars still debate the cause of this transition to capitalism. Some claim the development of extensive international trade as the major cause while others give greater importance to the internal weaknesses of the feudal society.[96] Both factors were necessary for the transition.

The mercantile system developed rapidly and spread through much of the world during the 16th and 18th centuries.[97] The rise of the merchant class and the scope and speed of the accumulation of merchant capital were important elements in the transition.[98] The character of international trade also changed considerably. Before the 16th century, long distance trade was used mainly for trading rare and exotic goods between centers of pre-capitalist cultures. It quickly became a system that enabled the massive gathering of wealth by European merchants.

> In Western Europe, mercantile accumulations were particularly large, and, what is of considerable significance, highly concentrated. This was partly due to the geographical location of the Western European countries which gave them the possibility for an early development of navigation, and with it of a rapid expansion of maritime and riparian commerce. It was caused secondly--paradoxically enough --by Western Europe's being in terms of natural resources poorer and in terms of its economic development at the relevant time in many respects more backward rather than more advanced than the parts of the world which were the objects of its commercial penetration. Hence the drive to procure tropical products of all kinds... that could not be obtained nearby, hence also the effort to import valuable products of Oriental skills..., and hence finally the wild scramble to bring back precious metals and stone that were in short supply at home. The resulting far-flung trade, combined with piracy, outright plunder, slave traffic, and discovery of gold, led to a rapid formation of vast fortunes in the hands of Western European merchants.[99]

Long distance trade alone did not bring about the political-economic changes throughout the world, since it was at first a very marginal activity for most societies in which they exchanged only the surplus goods left after the community met its own consumption needs. However, once the mercantile class of Western Europe emerged and broadened the basis of accumulating wealth to include trade by force, with the military backing of the home countries, by plunder, and by

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[95] Amin, p. 55. This period of mercantile activity has been referred to by some authors, notably Frank and Wallerstein, as "mercantile capitalism," because they see the development of international trade and markets and the accumulation of wealth as a necessary part of the development of industrial capitalism. However, as Amin points out, the capitalist mode of production cannot be said to have existed until the Industrial Revolution; so this period of transition from the 16th until the 18th centuries cannot really be called "capitalism." Amin, p. 31.

[96] This debate on the transition from feudalism to capitalism began with and is still best exemplified by the debate between Sweezy and Dobb, with contributions from other scholars, published in the *Monthly Review* in the 1950's. It has been published recently as a book, Paul Sweezy, Maurice Dobb, et al., *The Transition from Feudalism to Capitalism.* Introduction by Rodney Hilton (London: Verso, 1976).

[97] Amin, p. 156.

[98] Paul A. Baran, *The Political Economy of Growth* (New York: Monthly Review Press, 1957), p. 138.

[99] Ibid., pp. 138-39.

any other means possible to obtain the other continents' produce and resources at the lowest possible cost, the existing pre-capitalist political-economic structures of the non-European societies were disrupted and at times destroyed. Following the Industrial Revolution, the introduction throughout the world of cheap merchandise produced in the Western countries further disrupted the economic and political structure of the non-Western societies, resulting in changes that affected all the population of those societies.

The penetration of capitalism into the pre-capitalist societies can be divided into three stages: 1) penetration into the exchange sphere by simple trade, 2) penetration into the production sphere either with the promotion of export crop production or the introduction of imported merchandise and the expansion of the market economy, or both, and 3) the integration of the peripheral (initially pre-capitalist) economy into the world capitalist economy. These economic stages are associated with corresponding sequences in the political structure as the society undergoes the transformation from a pre-capitalist political-economy system to a component of the world capitalist system: 1) the introduction or expansion of the money economy, with minimal changes in the existing ruling structure, 2) changing patterns of production, administration, and political control, and 3) the political and economic dependence of the developing regions on the Western capitalist societies.

4.2.1 The Introduction of the Money Economy

In the period of European mercantilism, the European traders had few goods from their own countries that were of interest or value to the ruling elite of the Asian societies with which they traded. At this stage, international trade remained in Asia the preserve of the ruling elites, who were mainly interested in purchasing luxury goods in exchange for the surplus produce of their own societies. The main items the Europeans had to trade were gold and silver which they acquired by plunder from the New World.[100]

This cycle of trade was made possible with the destruction of the indigenous societies in the Americas, and it led to the accumulation of immense wealth and the subsequent transformation to capitalist society in Western Europe. Yet the effects of the trade on Asian societies was minimal at this stage. The existing pre-capitalist relations of production in Asia enabled the local rulers to appropriate from their populations the goods desired by the European traders. The traders depended so much on the local Asian rulers to control production and provide goods for trade during this period that the Europeans supported the existing pre-capitalist societies in Asia, rather than disrupt or destroy them as was done elsewhere in the world.[101] For this reason Frank believes no transformation of the modes of production occurred in Asian societies during the stage of mercantile trade, or what he calls "mercantile capitalism."[102]

Nevertheless, some intervention in the political structure as well as some changes in the economic sphere did occur. Furnivall points out that the European traders, with the active backing of their countries' governments and military, helped maintain relations of production that benefitted their trade by supporting or even helping bring to power local authorities who were more willing to trade. The European merchants were thus able to manipulate local rulers and obtain from the societies more easily the goods they wanted for trade.[103]

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[100] Andre Gunder Frank, *Dependent Accumulation and Underdevelopment*, p. 19.

[101] Marie-Helene Collion, "Towards a Theoretical Framework to Understand African Agrarian Societies." Working Papers in Planning No. 57 (Ithaca, N.Y. Cornell University, Department of City and Regional Planning, 1981), p. 67.

[102] Frank, p. 18.

[103] J.S. Furnivall, *Colonial Policy and Practice: A Comparative Study of Burma and Netherlands India* (New York: New York University Press, 1956), p. 277.

While the actual relations of production may not have changed, the purpose of production altered to include making (or growing or gathering) goods for external trade in addition to local consumption. In some of the societies the development of long-distance trade led to the introduction of a limited money economy among the rulers and others involved in the trade.[104] In most Asian societies, however, money was already used in a limited sphere. The inflow of precious metals with the growth of external trade led to an expansion in the use of money, though still restricted largely to the ruling elite and to the merchants in the trading centers.[105]

4.2.2 Changing Patterns of Administration and Production

With the Industrial Revolution and the development of capitalism, the relationship between the Western industrial countries and the Asian societies with which they traded, changed drastically. The pattern of trade shifted from the simple mercantile exchange of precious metals for Asian goods to a system in which crops and raw materials required by the capitalist countries were exported from Asian societies while finished industrial goods from the West were imported for sale. The entire political economic structure of the Asian societies was transformed, as resources, land and labor came to be mobilized very differently for the purposes of capitalist production in the industrial countries.

With few exceptions, such as Afghanistan, Japan and Thailand, the non-Western countries penetrated by capitalism were colonized by the major European industrial countries or later, by the United States. Furnivall differentiated the patterns of colonization into direct and indirect rule, explaining that the pattern depended upon the local "economic environment" and the strength of the local colonial ruling authority.[106] "Direct rule" meant a colonial system in which the Western principles of law and economics were imposed fully on the pre-capitalist society, replacing the traditional political and economic principles. The colonial system of "indirect rule" maintained the traditional principles of custom and authority, while the colonial government had political control over the indigenous local authority. Through this control the colonial power was able to impose upon the pre-capitalist society the economic system it desired.

Direct rule was appled most of the time in those areas where Western merchants required rapid and profound changes in the local society in order to open the areas as outlets for Western goods, as well as to promote the production of particular export crops they desired. This was done through a system of "native enterprise," with the local population converting their subsistence agricultural economy to a money economy in which they grew export crops that the European merchants would buy. The money they earned was then used to purchase goods produced by the industries in the home country of a colonial power. Another case in which direct rule was needed was when the colonial power required control over most of the land in an area, thus necessitating the use of its laws of property and business.[107] The traditional system of authority was totally abolished to set up the new system of direct colonial rule, as was done in India and Burma. The new local authorities who had control over the allocation of resources and labor were then solely the officials of the colonial government. The colonial state was also broken up into new administrative units which did not follow the communal or tribal units of the traditional system. This both prevented the local population from uniting against the colonial authorities, and also promoted among the local population the development of individuals with fewer traditional cultural and social ties and with stronger links to the colonial state's political and economic system.[108]

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[104] Polanyi, p. 58.

[105] Frank, p. 18.

[106] Furnivall, pp. 277-78.

[107] Ibid., pp. 277, 293.

[108] Ibid., p. 297.

In contrast, the system of "indirect rule" described by Furnivall was imposed when slower changes were likely to be more beneficial to the colonial power, as in the long-term development of certain export crops or the extraction of other raw materials in the home country's industries. Local labor, land and resources could be exploited most easily and at the lowest cost through the use of some of the traditional patterns of authority and customs.[109] Furnivall described Java in the early 19th century as an example of indirect colonial rule, in which the structure of the traditional system of authority was maintained by the colonial power. While the structure of traditional authority was maintained under indirect colonial rule, the power and over the traditional local rulers over their people and resources was weakened considerably. They depended on the colonial government for legitimacy and for any ruling authority. The colonial government had the ultimate power and control over the population and resources.[110]

Under both types of colonial rule, the political superstructure which controlled resource allocation was altered drastically in order to open the way for the accumulation of wealth by the colonial power's merchants and traders. According to Rey, at this stage the original rulting classes had to be displaced and the indigenous societies re-organized by the colonial powers so the (often forced) penetration of capitalism could occur. "Direct military and administrative coercion was used to recruit workers and to compel villagers to plant, harvest and sell cash crops..."[111] This is in clear contrast to the previous stage of mercantile trade, when the original political-economic structures were maintained to aid with the accumulation of goods for trade. According to Rey, this new mode of production - - for it is certainly no longer the original precapitalist mode of the society - - is not capitalism but another pre-capitalist mode imposed by the colonial powers.[112]

With the penetration of capitalism and the transformation from the traditional pre-capitalist political-economic structure, the objectives of resource mobilization changed in these societies. The factors of production - - land, labor and natural resources - - were converted or their use altered to facilitate the needs of the capitalist production of the colonial powers. In this stage of capitalist penetration, where the traditional mobilization patterns could be maintained, the colonial powers were able to 1) recruit people to work in export crop production and in public works, 2) gain access to land for conversion to plantations, and 3) exploit natural resources.[113]

One fundamental political-economic change under both "direct rule" and "indirect rule" assured a major transformation in the structure of the colonized societies. By substituting monetary taxes for the traditional taxation in kind and corvee, the colonial rulers prompted people to 1) grow export crops desired by the colonial power, in order to earn money to pay the taxes, and 2) encroach on public lands, the use of which had been prohibited or at least controlled by traditional law or custom, in order to expand the area of cash crop production.[114]

Concurrent with the rise and expansion of export crop production was the decline of home and local crafts. As people spent more time producing cash crops, they had less time for handicrafts and for making other needed goods. At the same time, the colonial powers imported from the "home" country cheap industrially produced goods such as cloth and metalware to substitute for the local products. With their cash crop production, the people had the money to buy the imported goods, thus increasing the role of the market in commodity circulation. Baran graphically described this transformation of the traditional Asian and African societies :

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[109] Ibid., pp. 293-98.

[110] Ibid., p. 302.

[111] Anthony Brewer, *Marxist Theories of Imperialism : A Critical Survey* (London : Routledge and Kegan Paul, 1980), p. 186.

[112] Ibid., p. 187.

[113] Furnivall, p. 300.

[114] Ibid., pp. 293-98.

> By breaking up the age-old patterns of their agricultural economy, and by forcing shifts to the production of exportable crops, Western capitalism destroyed the self-sufficiency of their rural society that formed the basis of the pre-capitalist order in all countries of this penetration, rapidly widened and deepened the scope of commodity circulation. By outright - - in many countries, massive-seizure of peasant-occupied land for plantation purposes and other uses by foreign enterprise and by exposing their rural handicrafts to the withering competition of its industrial exports, it created a vast pool of pauperized labor.[115]

To summarize, major transformations in the political-economic structure of Asian pre-capitalist societies during this stage of the penetration of (and confrontation with) capitalism:

1. Resources came to be utilized for purely economic reasons rather than for traditional or customary purposes. Resources were often exploited for export to the industrialized countries instead of local use.

2. In many areas, the production of export crops replaced traditional self-sufficient agriculture. As with other resources, the crops were often grown for export to the industrialized countries rather than for local use.

3. Traditional ruling and administrative institutions were either replaced or forced to adjust considerably (and usually involuntarily) by the Western colonial powers. The changes allowed the Western capitalist unrestricted access to the resources of the subjugated societies.

4. The traditional patron-client organization of labor began to be broken down and replaced by wage relationships between workers and employers or between native civil servants and the government.

5. Along with the breakdown of the ruling institutions and of the patron-client relationship, reciprocity and the tribute-paying systems of redistribution became replaced by market mechanisms.[116]

4.3 The Political-Economic Effects of Export Trade

4.3.1 Benefits of Export Trade: The Classcical Economic View

With the political economic changes described in the previous section, the Asian countries penetrated by European capitalist (and almost all colonized by the European industrial countries) became an integral part of the world capitalist economic system. The Asian societies exported their raw materials, natural resources and agricultural produce to the industrial countries and in exchange imported from the latter cheap industrial goods.

According to classical economists from Adam Smith and David Ricardo to contemporary proponents of export-based economic development, this trade was expected to be economically advantageous to both the industrial countries and those supplying the primary products. A country, in Adam Smith's view, should export goods above what it utilized for its own consumption as a means of exchange for products which it could not grow or manufacture.

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[115] Baran, p. 143.

[116] This is not a complete summary of the fundamental changes in political-economic structure that are said to have occurred with the penetration of capitalism into pre-capitalist Asian societies and the colonization of these societies by the Western industrialized nations. I have chosen to mention a few fundamental changes which are most significant for regional economic development and for the theories of development discussed in subsequent sections of this chapter. It should also be mentioned that the transformations described here did not occur everywhere in Asia to the same extent. Some parts of Asia certainly felt the effects of Western colonial rule less or later than others. However, all were eventually touched by the spread of capitalism and underwent to some degree the major changes listed.

> When the produce of any particular branch of industry exceeds what the demand of the country requires, the surplus must be sent abroad, and exchanged for something for which there is a demand at home.[117]

Thus, every country participating in this foreign trade is expected to benefit from it, as Smith explains:

> The importation of gold and silver is not the principal, much less the sole benefit which a nation derives from its foreign trade. Between whatever places foreign trade is carried on, they all of them derive two distinct benefits from it. It carries out that surplus part of the produce of their land and labour for which there is no demand among them, and brings back in return, for it something else for which there is a demand. It gives a value to their superfluities, by exchanging them for something else, which may satisfy a part of their wants, and increase their enjoyments. By means of it, the narrowness of the home market does not hinder the division of labour in any particular branch of art or manufacture from being carried to the highest perfection. By opening a more extensive market for whatever part of the produce of their labour may exceed the home consumption, it encourages them to improve its productive powers, and to augment its annual produce to the utmost, and thereby to increase the real revenue and wealth of the society.[118]

David Ricardo emphasized the importance of foreign trade even more, by showing how the exchange of goods between two countries will result in "comparative advantage" to both of them. According to Ricardo, countries should trade even if they both can produce the same goods, when there is a difference between the two in the relative cost and labor efficiency of producing these goods. One country can produce, for example, one unit of cotton cloth in five labor hours and grow one unit of rice in one labor hour. The second country produces a unit of cloth in eight labor hours and a unit of rice in two. In the first country, the ratio of relative efficiency in producing cloth to rice is 5/1, while in the second it is 4/1. In these terms, the first country produces rice comparatively more economically, while the second produces cloth comparatively cheaper (though in absolute terms, the first country produces both goods cheaper than the second. According to Ricardo, the first should export rice in exchange for cloth from the second, and vice versa, and both will benefit so long as there is free trade between the two. As a result of the trade, prices become balanced so that people in the first country can purchase cloth for less than the five units of rice they used to pay (but for no less than the four units of rice paid by the people in the second country), and those in the second can buy more rice for their cloth, at a cost less than 1/4 the unit of cloth they used to pay but no less than the 1/5 unit of cloth previously paid for by the population of their trading partner. Thus, according to Ricardo, both countries should concentrate on producing those goods for which they have a comparative advantage and trade for the other goods, leaving both better off than if each produced all the goods itself.[119]

Clearly, the arguments of the classical economists supported the policies of free trade of the European industrialized societies which contributed to the expansion of the capitalist system and colonialism throughout the world in the 18th and 19th centuries. According to these economists, the pre-capitalist societies were expected to benefit substantially from the commercial trade and

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[117] Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations* (Chicago: The University of Chicago Press, 1976), p. 394.

[118] Ibid., pp. 468-469.

[119] Paul E. Samuelson, *Economics*, 10th Edition (New York: McGraw-Hill Book Company, 1976), pp. 670-673.

contact with the industrial societies, by providing the industrial societies with those goods they had or produced in abundance (and relatively more efficiently) and by purchasing from the industrial countries manufactured goods which the former could not produce at all or could not produce as cheaply (whether in real or relative terms) as did the industrial societies. For the classical economists this would be true even if the pre-capitalist societies were brought into the world capitalist system by force, as was usually the case, and colonized by one of the capitalist industrial nations, in order to trade "freely" with its colonial ruler alone.

In the two decades after World War II, most colonized countries of the world gained their independence. It was clear by then that the many decades of colonial rule did not lead to economic progress for these countries, for their populations were among the poorest of the world. But other countries that were not colonies such as Thailand, Liberia and Afghanistan, or that had gained their independence for over a century as with most Latin American nations, also had a similar lack of economic development. For the classical and neo-classical economists, then, colonialism is not often considered to have been an inhibition to development, and the colonial relationship is rarely mentioned as a factor contributing to the underdevelopment of most of the world.[120]

Instead many of these theorists view development as an evolutionary process which occurs in all societies. According to these thorists, the process started in England, spread to other Western European countries and the U.S., and proceeded in other societies at different rates and at different levels of development.[121] The hierarchy of economic development was first described by Adam Smith in his discussion of the "natural progress of opulence" :

> According to the natural course of this, therefore, the greater part of the capital of every growing society that had any territory, it has always, I believe, been in some degree observed. Some of their lands must have been cultivated before any considerable towns could be established, and some sort of coarse industry of the manufacturing kind must have been carried on it those towns, before they could well think of employing themselves in foreign commerce.[122]

These stages, from an agricultural economy to the development of coarse industry to an industrial economy involved in world trade and hence in the accumulation of wealth, have since been considered the natural path of development. Mainstream development economists, led by W.W. Rostow, have used a similar progression in describing what they believe are stages of economic growth to be followed by all societies. According to Rostow every society must go through five stages along its path to economic development. These are :

1. traditional society, in which a high proportion of the resources are devoted to agriculture ;

2. the pre-conditions for take-off, which is characterized by a more active mobilization of capital, mainly in 1) investments in transportation, communications, and the production or exploitation of raw materials for foreign trade, and 2) investments to develop basic, modern manufacture and to expand the scope of commerce. However, these are accomplished using "traditional low-productivity methods" and under "the old social structure and values ;"

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[120] For example, neither Albert O. Hirschman, in his extremely influential work on development, *The Strategy of Economic Development* (New Haven : Yale University Press, 1958 : New York : W.W. Norton and co., 1978), nor Paul E. Samuelson, in his book *Economics*, the most widely used economics textbook in the U.S., refer to colonialism in their analyses of the causes of underdevelopment.

[121] Hirschman, pp. 45-57 ; Samuelson, pp. 766-67.

[122] Adam Smith, p. 405.

3. the take-off, characterized 1) by the growth of new industry and of a class of entrepreneurs and 2) by the use of new, though still relatively simple technology in both agriculture and industry.

4. the drive to maturity, characterized by extended ranges of complex and mature technology in which a shift also occurs from heavy industries to the production of machine tools, chemicals, and electrical equipment;

5. and finally, the stage of high mass-consumption, in which the economy shifts from the production of durable goods and services to the provision of goods and services on a mass basis.[123]

With the same goal of evolutionary, economic development of a region, Douglass North used the historical development of the Pacific Northwest of the United States to propose another means of attaining the higher states of development. Rather than follow Rostow's pattern of stages of development, a region with certain features common to the Pacific Northwest could develop rapidly through the promotion of a resource-based export economy. The export economy would bring prosperity by the in-flow of capital, and it would lead to the subsequent development of the region.[124]

According to North, those areas for which his theory of development is most appropriate are the relatively underdeveloped, but resource-rich regions of larger capitalist societies. The sparse populations of the less developed regions consist largely of the same sort of people in the broader capitalist society who will respond to profit maximization opportunities. With their rich natural resources, the process of development can start by depending on the production of exportable commodities, which are mostly staple goods, or on the export of extractive resources. This will be the trigger that starts the economic growth of the region.

> It is evident that this growth is closely tied to the success of its exports and may take place either as a result of the improved position of existing exports relative to competing areas or as a result of the development of new exports.[125]

Either the expansion of an existing export or the development of a new export good in the relatively undeveloped region would bring in outside funds from the more developed regions as people invest in the new or expanded industry, as well as in supporting industries, the construction industry (especially for the construction of new residences), and other services that must now accommodate the expanding businesses and population in the "nodal center" of the newly developing region. This then creates further multiplier effects -- the establishment of even more industries, businesses, and services --leading to the rapid economic development to the region.[126] Once the export economy is adequately profitable, a part of the profits that had been earned from abroad would be reinvested in the region and would also provide foreign exchange for the purchase of import commodities. In addition both existing and new industries would create more employment

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[123] W.W. Rostow, *The Stages of Economic Growth* (New York: Cambridge University Press, 1960), pp. 5-5-11.

[124] Douglass C. North, "Location Theory and Regional Economic Growth," in *Regional Policy Readings in Theory and Applications*, John Friedmann and William Alonso, eds. (Cambridge, Massachusetts: The MIT Press, 1975), pp. 332-47.

[125] North, p. 340.

[126] North, p. 340; and Hervey Perloff and Lowdon Wingo, Jr. "Natural Resource Endowment and Regional Economic Growth," in *Regional Policy Readings in Theory and Applications*, John Friedmann and William Alonso, eds. (Cambridge, Massachusetts: The MIT Press, 1975), p. 316.

for the existing labor force and induce in-migration as the job market expands with the growth of the export industries. These new jobs are expected to create even more income which 1) will broaden the internal market by creating new demand for consumer goods and services and 2) will result in an increase in local savings which should create a pool of local capital for further investment in the region, in addition to the capital invested from outside the region.[127]

Through this development process, North saw that the young region would benefit by:

1. the creation of employment opportunities with the development of skilled labor and enterpreneurship as a result of the experience gained in the export economy and other related activities;

2. capital formation and the accumulation of foreign exchange for investment in the region, including investment in technological development;

3. urban development influenced by the major export activities and their support activities;

4. the improvement of existing export activities (technological and economic improvements) and/or the creation of new export activities which will generate further multiplier effects in the economic development of the region;

5. and finally, income equality among the regions (what had been the more developed and the young, less developed regions) in the long run.[128]

Many of the concepts of North's export-based theory of regional development have been adopted for use in the development efforts of the underdeveloped countries. Instead of regions in a relatively homogenous society, separate countries are the units of economic exchange. Capital is to be invested from the richer to the poorer countries, to develop the export economies of the latter. In particular, there will be investment in the production or extraction of export goods desired by the richer countries. This investment and growth of the export economy is expected to lead to the same pattern of development in the poorer countries as was described above in North's regional development theory, with increased GNP, capital accumulation, growth of support industries and services, increased employment, technological development, and further multiplier effects, including the development of import-substitute industries and of new export-oriented industries.[129] This export-oriented approach to economic development has become prevalent in developing countries in recent years, with success being claimed for several countries in East and Southeast Asia, notably South Korea, Taiwan, and Singapore.[130]

4.3.2 Exploitation, Underdevelopment and Dependency: A Critical Economic View of Export Trade

The economic relationship between the advanced and the underdeveloped countries has been viewed by the critical political-economists as one of dependency in which the underdeveloped countries, penetrated by capitalist trade and economy, have become economically dependent on the advanced countries. This dependence can be seen in all aspects of the economies of the underdeveloped countries, in both the production and the circulation spheres. In contrast to the mutual benefits expected for both trading partners in Ricardo's theory of comparative advantage, the critical economists see trade between the advanced and the underdevelop countries as one in which the latter are at the a "comparative disadvantage" to the former. The terms of trade, the control

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[127] North, pp. 344-45.

[128] North, pp. 340ff.

[129] John Friedmann and Clyde Weaver, *Territory and Function: The Evolution of Regional Planning* (Berkeley: University of California Press, 1979), p. 99.

[130] Ibid.

over capital and technology, and even the means for the underdeveloped countries to pursue the development of any sector of their economies, are all concentrated in the hands of the advanced industrialized countries to the detriment of the underdeveloped countries. Thus, according to the critical theorists, an underdeveloped country which adopts export promotion or import substitution strategies of economic development will not be able to attain the higher stages of growth envisioned by the classical and neo-classical economists, but it will instead maintain and perhaps even strengthen the close economic links that make it dependent on the advanced countries and that keep it underdeveloped and stagnant.

For critical theorists such as Immanuel Wallerstein and Andre Gunder Frank, the world capitalist economy is divided into two major groups: the center (the advanced, industrialized countries) and the periphery (the underdeveloped countries that make up the majority of the world). The center, with its capital accumulation and with its industries supplied by raw materials and agricultural commodities from the periphery, is where economic growth can be generated. The peripheral countries, which must sell their raw meterials to the advanced countries and must purchase industrial goods in return cannot develop independently because, as Theotonio Dos Santos explains:

> By dependence we mean a situation in which the economy of certain countries is conditioned by the development and expansion of another economy to which the former is subjected. The relation of interdependence between two or more economies, and between these and world trade, assumes the form of dependence when some countries (the dominant ones) can expand and can be self-sustaining, while the other countries (the dependent ones) can do this only as a reflection of that expansion, which can have either a positive or a negative effect on their immediate development.[181]

The asymmetrical relationship has also had a major effect on the political and economic structure of the undeveloped countries. With their integration in the world economy, the level of self-sufficiency of the underdeveloped countries became reduced as the production of raw materials for export and the import of the advanced countries' surplus industrial goods came to have a significant role in their economies. People in the underdeveloped countries became involved in the world economy first as producers of agricultural goods and extractors of raw materials and minerals needed in the advanced countries. At the same time they became consumers of the industrial countries' surplus goods, using the cash they earned from the sale of their agricultural and other primary produce, or from their salaries as workers in the resource extraction industries, to buy the cheap industrial goods such as cloth and cooking utensils imported then mainly from Europe.

This new economic relationship led to the destruction of the pre-capitalist social organization in the underdeveloped world, as the traditional authorities lost their control over the resources of their society and thus over its economy. The European imperialists became the new economic and political rulers during the period of colonial rule, while in recent years the underdeveloped countries' economies have come under the control of the multinational corporations (MNCs) based in the advanced countries of the center. In both phases of capitalist control, the center has had control over the underdeveloped countries' commerce, finance and technology. Under imperialism, the colonial countries controlled the economies of their colonies mainly through their political control, including that over the local authorities who had access to local economic resources, while at the same time monopolizing the trade and thus the economic production of the colony. With the end of colonial rule, the center has maintained its control over the periphery through the multinational

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[181] Theotonio Dos Santos, "The Structure of Dependence," in *The Political Economy of Development and Underdevelopment*. Charles K. Wilbur, ed. (New York: Random House, 1973), p. 109.

corporations which have a virtual monopoly of the finance capital and technology needed for economic development.

Over the years, the underdeveloped countries have increased the degree of narrow specialization in exporting a few basic commodities. With cash income dependent upon these few commodities, the structure of production in the countries has become characterized by rigid specialization and by monoculture in agriculture.[132] This specialization further assures their dependence on the advanced countries in several ways. Obviously, the underdeveloped country's economy is now almost fully dependent on the purchase of its commodities by the advanced countries. As has already been pointed out, most consumer goods must be imported by the peripheral country, usually from the center. Furthermore, any goods required for the peripheral country's export production or import substitution industries which are not among the few goods already produced in the country must be imported, and the market for these goods and raw materials is under the monopoly or oligopoly control of the MNCs of the advanced industrial societies. Finally, the export of goods by the underdeveloped countries is restricted by the trade policies of the center, with political interventions such as trade regulations, quality and quantity control, tariffs, and quotas giving the MNCs of advanced countries even more control over the economic development of the periphery. As Paul Baran pointed out, the advanced countries will also use political and even military force to assure their MNCs' economic control over the periphery:

> A giant corporation not only often confronts a small and weak nation as the sole buyer of its exports or an important source of its imports (and/or credits): it is able alone or by main use of its own government's appropriate facilities to intervene actively in that country's internal politics, to buy, to install, or to depose its administration, to make or to break its politicians. And when need be, the military potential of the imperialist country can be used to assure "freedom" to the activities of the monopolistic business.[133]

In addition, ever since colonial rule the underdeveloped countries have depended heavily on financial and technological support from the advanced countries in the development of local capitalist, industrial economic enterprises. Financial capital, accumulated by the advanced countries because of their excess of export earnings over import spending, has been invested by the advanced countries in the underdeveloped world as direct investments, as loans or under the guise of financial aid, It is used to develop the export production desired by the advanced countries, or to improve the communication and transportation networks in order to facilitate the investment in the export economy. As Baran pointed out, most of this investment relies heavily on imported materials, equipment and appliances and personnel from the country where the capital originated, thus funnelling money "invested" in the underdeveloped country back to the country of origin, often with additional profit.[134]

Furnivall provided a striking and clear, though by no means unique, picture of the nature of foreign investment and aid in the British colonies. He pointed out that 35 percent of the British Colonial Development Fund, or 75 percent of the interest-bearing loans, were spent on development of the communications and transportation networks mainly required for trade purposes.[135] Imported materials, equipment and machinery required to build these networks were purchased from the United Kingdom or from companies based in the United Kingdom, and the technicians sent to

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[132] Dos Santos, p. 111

[133] Paul Baran, *The Political Economy of Growth*, p. 115.

[134] Ibid., p. 180.

[135] Furnivall, *Colonial policy and Practice*, pp. 314-320.

build them came from the United Kingdom.[186] A brief review of recent loans and grants from the World Bank and other international and bilateral development funding agencies shows that little has changed over the years. Many of the loans and direct investments are still being used to develop infrastructure for trade.[187] Furthermore, the funding agencies of every country providing loan or grant money require (with varying degrees of strictness) materials to be purchased from its country's companies and a majority of the technicians and consultants on the projects to be its own nationals.

As for the technology, it has almost always been invested and developed in the advanced countries; like financial capital, it is owned and controlled by the advanced countries. The underdeveloped countries depend on the expertise of the owners and controllers of the technology to learn how to use it. In addition, access to information about the technology -- how to use, develop and improve it -- is limited by those who control it.[188]

Most of the technology used for industrial development in the underdeveloped countries is transferred from the advanced countries, and has been monopolized by the owners of the technology in those countries (more often than not multinational corporations) through patents and through prohibitions in the use of the technology, particularly for export production, once it has been transferred to the underdeveloped countries.[189] The use of patents by companies from the advanced capitalist countries to control the use of technology in the underdeveloped world is pervasive. Using data from a 1964 United Nations study, Barnet and Muller pointed out that more than 89 percent of all outstanding patents in India, Turkey, the United Arab Republic, Pakistan, and Trinidad were foreign-owned. Furthermore, 80 percent of the contracts transferring technology by multinational corporations to these countries included clauses prohibiting the use of the technology in the production of exports.[140]

Under these conditions of economic dependence and foreign control, the underdeveloped countries have little control over financial accumulation for further investment, the development of technology and research for their own economic development, and even over their own politics. Thus the critical theorists expect that the effects of an export economy on the development of most of the underdeveloped countries will be very different from those suggested in the regional development theory promoting the export of natural resources and the expected subsequent development of related secondary and tertiary sectorial activities. Instead of inducing regional economy development, there is strong evidence that the prevailing economic system in which the underdeveloped countries export raw materials actually hinders their economic growth. The critical development theorists see instead the prevailing economic spstem as the cause of the "development of underdevelopment," or the uneven pattern of development that has allowed the advanced capitalist countries to continue developing while the underdeveloped countries remain backward. All the effects experted by the classical development theorists -- the multiplier effect, forward and backward linkages, trickle-down effect, and the like -- have not occurred in the underdeveloped regions to the extent anticipated.

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[186] Ibid., p, 320.

[187] See any listing of projects published by the World Bank, the Asian Development Bank, USAID, or any other development funding agency, for an overview of the types of projects currently being implemented. A major portion is for infrastructure development, especially of roads, ports, and other transportation facilities, and communication systems.

[188] Ronald Muller, "The Multinational Corporation and the Underdevelopment of the Third World," in *The Political Economy of Development and Underdevelopment.* ed. Charles K. Wilber (New York: Random House, 1973), p. 126.

[189] Ibid., pp. 126-127; Richard J. Barnet and Ronald E. Muller, *Global Reach: The Power of the Multinational Corporations* (New York: Simon and Schuster, 1974), p. 163.

[140] Barnet and Muller, pp. 140 and 163.

Instead tha critical theorists show the following effects on a region of an underdeveloped country that has an export-based economy, particularly one that is dependent on the export of natural resources or other raw materials.

-- The exploitation of resources through export restricts local access to it and also leads to depletion of that resource before local technology is adequate or the local population is allowed to use the resource. For example, in colonial Vietnam, the development of state forest enterprises supposedly for the benefit of the people actually led to a drastic restriction of access by villagers to the resource.[141] Futhermore, Baran provided evidence from the experience of resource base export production that shows clearly that the flow of resources from the underdeveloped regions or countries almost always leads to the depletion of those resources.[142] This limits the availability of the resources for local exploitation once the local population is capable or allowed to do so for their own benefit.

-- The development of the export industry or of the import-substitution industry generally does not provide as many jobs or employment opportunities as might be expected. Contrary to the theories advocating the development of an export-based economy, there are fewer jobs available as a result of the industry than the number of people in the labor force. Unemployment or underemployment remains high and wages paid local labor can be kept low. Those hired by the industry from the local labor force tend to be unskilled or minimally skilled, low paid workers who can hardly be expected to develop new skills or become enterpreneurs who develop new local industries. Managers and skilled workers are frequently brought from outside the region.[143] There is also strong evidence that no matter how many jobs have been created from the development of the export-based industry, they are far from adequate to compensate for the loss of exployment that came with the collapse of traditional local industries and handicrafts after the influx of cheap industrial goods from the advanced countries.[144]

In fact, the problem of unemployment and the resource-based export economy becomes accentuated over time. As the resources available for local eploitation are restricted and eventually depleted, the traditional rural economy collapses. To escape rural poverty, people migrate from the countryside to the cities where jobs are expected from industrial development. While some employment is available, it is insufficient in numbers of jobs available, in pay, and in the development of new skills. Unemployment or underemployment remains a serious problem at the same time resources which might have been used for local development have been depleted by the advanced capitalist countries.[145]

-- There is no massive direct reinvestment in the region to stimulate further economic development, as is expected in the regional development theories advocating an export economy. Instead, most of the profits from the industry tend to go back to the advanced capitaist countries that made most of the initial investment. In addition,

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[141] James C. Scott, *The Moral Economy of the Peasant: Rebellion and Subsistence in Southeast Asia* (New Haven, Yale University Press, 1976), pp. 136-37.

[142] Baran, pp. 186-87.

[143] Ibid., pp. 180 and 182.

[144] Amin, p. 194; Ian Roxborough, *Theories of Underdevelopment* (London: the MacMillan Press, 1979), p. 35.

[145] Amin, pp. 353-54.

there is only limited expansion of the internal local market and low local savings (with most profits going overseas). As a result, most of the accumulation and reinvestment of the capital derived from the export industry tends to occur in the advanced capitalist countries.

While it is true that there could be additional foreign investment in the local economy, the limited expansion of the internal local market provides few incentives for investment. Most of the equipment and other materials used in the initial investment to develop the export industry are usually imported, thus limiting the opportunity for development of local support industries to provide the epuipment and materials. At the same time, the low pay of local workers and the limited economic opportunities for most of the rest of the local population assure that their purchasing power remains low. There is little demand for consumption goods other than basic commodities already available in the region or the few inexpensive imported industrial goods. This leads to a very limited expansion of the internal local market, thus reducing incentives to invest in new industries.[146] Amin claims that the only opportunity to develop the internal local market comes from the limited demand for relative luxury goods by the small local high income group. He points out, though, that the development of industries to produce these durable consumer goods would require the use of much capital and scarce resources. This would shift the pattern of resource allocation in favor of these luxury goods for the wealthy and block investment in the production of mass consumer goods that would be available for the bulk of the population.[147]

Along with the outflow of profits to the advanced capitalist countries and the limited inflow of new foreign investment from those countries, there is only very limited local capital accumulation. As Baran pointed out, the major part of profits from the inital predominantly foreign owned investment is sent back to be accumulated in the country of origin, while only a small part of the profits is spent to pay local workers' wages or for other productive purposes.[148] Moreover, local savings are low as the majority of the local population hired by the industry are in low-paying unskilled or low skilled jobs. Their incomes usually barely cover subsistence expenses, but even when they earn enough to have a slightly better living standard they have hardly anything left for savings. There is neither a demand for new consumption goods, nor the savings to invest in the production of those goods if there were a demand for them.[149]

The heavily foreign controlled export based industries have not been established to provide services or welfare to the local population, whether directly or through taxes paid to the local government. Instead, only improvement in local infrastructure and services is done to facilitate the foreign enterprises. Baran pointed out that investments by the export enterprises in such "auxiliary facilities" as power plants, irrigation systems, transportation facilities and networks, harbors, and city development are made to facilitate the operation of the industry and to ease the transport of the goods for export. Any benefits derived by the local population are simply

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[146] Baran, pp. 180-184; Brewe, p. 154.

[147] Amin, pp. 193-94

[148] Brewer, pp. 149ff.

[149] Baran, pp. 182-83.

consequential, not intentional.[150] Because economic dependency tends to result in a large degree of political control over the underdeveloped countries by the advanced capitalist, states, the local government revenues gained from taxing the foreign controlled industry will often be spent for infrastructure development that will benefit the industry more than it will benefit the local population.[151] Whatever benefits the local population may gain, they are at the expense of the depletion of their resources for exploitation and economic gain by people from other regions and countries.

--It cannot be denied that some wealth is accumulated, by local capitalists and others, that some supportive activitives are developed and that some benefits are gained by the local population from the development of the resource-based export industry. However, the wealth and other benefits are very limited and unevenly distributed: the few people involved directly in the exploitation and export of the resources will benefit while the vast majority of the population in the region where the resource is extracted gain little or nothing and remain as impoverished as ever. Even if national or regional aggregate incomes rises a result of the export industry, the income distribution can remain very uneven. Amin pointed out that there is a tendency among the underdeveloped countries for the income gap to be greatest in those countries with the highest aggregate income.[152] In Brazil, for example, most of the economic growth that took place between 1967 and 1973, when there was a remarkable 9 percent annual growth rate ended up benefitting the top 20 percent of income earners, with the gap between the wealthly and poor becoming even wider than before.[153] The major share then, of local wealth accumulated and benefits gained from the resource-based export industry belongs to a minority of the population with higher incomes, while the majority of local workers and population get only a minor share.

Clearly, the critical development theorists believe the promotion of a nutural resource-based export economy, such as the teak industry in North Thailand, will not lead to the economic development of the region as expected by the traditional theorists mentioned in Section 1.4.3.. 1. Instead, the promotion of a foreign-capital dominated export industry will jeopardize the local economy and lead to greater dependence on the advanced capitalist countries by the underdeveloped country. An analysis of the political-economic effects of any wood industry for a long period should help solve this controversy by showing the extent to which the region did or did not develop, and the local population did or did not benefit from such industry.

1.5 Summary

The economic development activities, and specifically forest and other natural resource-based export industries that have been reviewed, will affect the area where they are implemented in both ecological and political-economic ways. These two aspects are also connected in a cause-effect relationship. The more economic development activities based on the exploitation of resources such as forest products are imposed in an area, the greater the ecological effects expected. The ecological effects will have a variable impact on the further economic development of the locality depending on their nature. For example, if the economic development results in negative changes

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[150] Baran, pp. 192-194.

[151] Brewer, p. 154.

[152] Amin, p. 351.

[153] Roxborough, p. 37.

in the local ecosystem and a depletion of the resource, further economic development using the resource will be prevented while at the same time the damage caused to the ecosystem will put greater strains on the economy. In constrast, economic development that does not damage the local ecosystem will allow long-term development, using the local resources while not harming the livelihood of the rest of the local population.

Ecologically, the forest resource-based export economy will in theory affect the existing ecosystem altering the composition of the flora and fauna, reducing their genetic diversity, changing the soil characteristics and the nutrient cycle, altering the hydrologic regime, and to some extent affecting the local climate. The changes are less noticeable as the scope of the ecosystem being studied becomes larger. In any case, conservatively and ideally, these changes are expected to be slightly more negative than positive ecologically with the exploitation of forest resources, while the local population would benefit from higher incomes and a better living standard. The other extreme would be the destruction of the ecosystem with no positive effects, and little or no ecomic benefit to the local population.

Whether changes have been beneficial or not to the local population, the development of the resource-based export economy has had a number of political-economic effects. In some cases the major transformation from a classless to a class-divided society has occurred as the system of production, redistribution, and accumulation of resources and goods changed. Whether the society affected was originally classless or class-divided, other major changes occurred in such aspects of the structure of the society as the political-economic power of allocating goods and resources, the organization of labor, and the role of the market in the economy. These transformations can be separated into three stages: the introduction of money economy, the changing pattern in the structure of production and administration, and the recent political-economic effects on the people of the region. The first two stages were discussed by reviewing various theories on the changes from pre-capitalist to capitalist society, especially the changes in the underdeveloped world. In the discussion of the last stage, of the recent political-economic effects, two conflicting approaches to development were presented: the classical development theorists who favor stategies like resource-based export production as a means to economic development and the critical theorists who believe the economic policies encouraged by the classical theorists will be largely detrimental to the people in the underdeveloped countries.

With such controversy over both the ecological and the political economic effects of a resources-based export economy, a study of an existing resource-based industry would help resolve at least a few of the theoretical conflicts. A regional analysis of the actual ecological and economic effects of a resource-based industry in a developing society could then be used in planning the further development of the industry in that region.

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Social Forestry, Fishery, and Links to Natural Resources Management

Jacgues Amyot

1. Background

Social forestry, (some prefer the designation community forestry), generally refers to any situation which intimately involves local people in forestry activity. The establishment of woodlots, growing trees at farm level, processing of forest produce at household, artisan, or small industry level to generate income, and so on. As opposed to industrial forestry, social forestry activities are small scale involving individuals, households or, at most, local communities who take prime responsibility for planning and managing the activities. Production is primarily but not exclusively for local consumption. The nature and end use of production is dictated by short term planning horizons in relation to local need: small timber and poles for buildings and fences, fuelwood, leaves for fodder and organic fertilizer, fruit for food, etc., and of course the need for income from the sale of produce.

The benefits of people's involvement in forestry activities are enhanced by integrating them with other sectors of rural development, drawing on the complementarity that exists among them. This is particularly so between forestry and crop and livestock agriculture which are closely intertwined through the management of land and water resources for maximizing their overall contribution to development. For this reason, most would also include agroforestry under the umbrella of community forestry. This land use technique involves the deliberate use of woody perennials (forest and/or fruit trees) on the same land management unit as annual agricultural crops and/or livestock, either sequentially or simultaneously, with the aim of obtaining greater outputs on a sustained basis. An excellent example is the type of integrated farming promoted by grass-root promoters of rural development in Northeastern Thailand, one of whom was visited by the writer in Surin Province. His contention (not documented but plansible) is that this land use management pattern is traditional and was prevalent under earlier conditions in Thailand before rice monocropping became dominant in response to the world and national market economy conditions. The validity of his integrated farming approach under contemporary conditions is strongly validated by his annual integrated farming earnings of 100,000 baht. This far exceeds the average for the region.

A wide variety of mixes is possible in relation to either the relative proportion of the land management unit utilized for each purpose or the variety of trees, crops or livestock produced on it. One can combine agriculture and forestry (agrosilviculture) intercropping, say maize or pineapple with trees either randomly, in rows, or using trees to border the crop plots. Another possible combination is forestry and livestock raising (silvopastoralism). In this case, the livestock (cattle, sheep, goats, etc.) can be made to graze in the tree plantation if the trees are properly selected and spaced and if the floor of the forest in planted in guinea grass and other forage plants to improve grazing. Finally, it is possible to combine all three (agrosilvopastoralism) with proper precautions of course to assure that the livestock do not consume the crops for sale or home consumption.

Other types of activity can be grafted on to an agroforestry system to increase its productivity, apiculture, for example, if pollen-bearing species of trees are included in the tree plantation, (Calliandra calothyrsus, fruit trees, sunflowers, etc.). Another example is sericulture, possible with the introduction of the mulberry tree. Aquaculture can be practiced in village/farm ponds and reservoirs from which water is drawn for crops, trees, and livestock. Finally, the processing of agroforestry produce, the making of charcoal for example, offers a whole new range of opportunities.

The practice of social forestry in suitable in many different contexts. Environmental conditions permitting; it is not more difficult to introduce tree farming in an area where agricultural production predominates than it is to introduce agricultural practices in a forested area. In Thailand however, the promotion of social forestry and the selection of its target population are closely related to the history of forests, forestry and forest policy in the last fifty years.

2. The National Forest Policy Context

As early as 1938 a Protection and Reservation of Forest Act provided for the reservation of about 50 percent of the total area of the country as forestland with crown property status. Forest policy on the disposition of this forestland was further elaborated in subsequent forest acts and Cabinet decisions on forestry. Specific guidelines and targets for forestry policy implementation were provided according to prevailing conditions by the National Five Year Economic and Social Development Plans from 1961 onwards.

On principle, all forestland was placed under the jurisdiction of the Royal Forest Department who following standard forestry approaches at the time perceived their main mandate in forest policy implementation to be forest protection, reforestation of degraded forest land, and the enforcement of regulations concerning the felling of trees. Their efforts met with little success. The rate of deforestation resulting from illegal exploitation of the natural forests for logging, cash crop production (e.g. maize, cassava), subsistence farming by small landless farmers, as well as from natural causes proceeded at an alarming rate. In 1961, natural forests covered 53 percent of the area of the Kingdom. In 1982, this was down to 30 percent. In the Northeastern Region it was only 15 percent.

Of particular relevance here is the legal status of forestland in Thailand. It is "land which is unowned according to the Lands Act", public land therefore to which a private ownership title may not be acquired. This definition continues to be applied to all designated forestland, whether it be actually forested or not. It is a legal fiction in most cases. As a result of encroachment, vast tracts of "forestland" are in fact treeless and have been occupied, in some cases for generations, by rural people who migrated there in quest of land to till. Even officially gazetted national reserved forests are often badly degraded by the same process. The occupying population claim their holdings as their own. In the eyes of the law however they are illegal squatters subject to eviction at any time. As of 1982, 65.4 percent of the Northeastern Region was titled land owned according to the Lands Act. The remaining 34.6 percent was technically "forestland" for the most part.

Although the main thrust of the forest policy has been forest conservation and control for environmental and economic reasons, the government has not been insensitive to social considerations arising out of increasing population pressure on the land and the need to attend to the plight of landless and poorer rural populations. There has in fact been a growing trend in this direction. In the early 1960s, the area of designated forestland was reduced from 50 to 40 percent of the total land area. A number of land settlement projects on disturbed forestland were authorized by Cabinet decisions from the 1960s onwards. These include those of the Department of Public Welfare

(Self help Land Settlement Division), the Agricultural Cooperative Promotion Department (Land Settlement Cooperatives Division), and the Agricultural Land Refrom Office. Such programs were implemented on degazetted forestland, jurisdiction over which had been transferred from the RFD to the implementing agency concerned. This remained public land however. The beneficiairies were granted usufruct rights, not outright ownership. Some of these projects had a forestry component. For example, Some land settlements in the South were organized in the context of tree crop plantation : rubber, oil palm, etc. Land Reform Areas in degazetted forestland were transferred to ALRO jurisdiction with the proviso that 20 percent of the Areas be set aside for reforestation. Their main thrust however was agriculture, not forestry.

The use of the forest or agroforestry village approach to involve rural population in reforestation which at the some time providing them with land to cultivate was pioneered by the Forest Organization of Thailand (FIO) in their own logging concessions from 1968 onwards. According to this scheme, the FIO workers engaged in reforestation were given the right to use 10 rai (1.6 ha) of plantation land a year on a rotating basis to produce their own crops by intercropping with plantation trees while they were still immature. The Fifth National Plan (1981-1986) established the creation of forest villages as a national policy with a target of 100 new villages for the planning period. By ministerial ordinance, the RFD was directly involved in the implementation of this policy. A distinguisting feature of the RFD forest villages is that members are given usufructuary rights to 15 rai (2.4 ha) holdings in designated agricultural land set aside for permanent cultivation within the village territory. One of the main purposes of this land licensing scheme which became known as the STK program after the Thai acronym of the usufructuary title was to legitimize the status of the forestland encroachers.

The RTG requested help of the FAO under a UNDP technical assistance program to design and implement a social forestry based reforestation and socio-economic development model for the RFD forest village program, and to provide related training to the RFD staff. After 2 years of preparation. The social forestry pilot project was executed from October 1981 to September 1986 in Khao Phu Luang National Reserved Forest (Nakhon Ratchasima Province) in conjunction with the RFD and other cooperating agencies. The project area measured 96 km^2, 40 percent of which was earmarked for reforestation and 60 percent for agricultural development in an agroforestry context. In 1985, the area was inhabited by 1,560 households in 23 villages.

The project was by far the most serious, intensive, and comprehensive effort to implement a social forestry based development strategy in Thailand. Most of the comments that follow are based on its well documented experiences in the general category of agroforestry and of agroforestry related practices. Its lessons are of relevance to the promotion of agroforestry in other contexts as well.

3. Prospects and Problems in Aroforestry

3.1 Forest tree farming

The reference here is to forest tree planting by the people in the village area as opposed to routine planting by foresters for purposes of forest regeneration. The planting can be done by farmers individually on their own holding or, in the case of the establishment of a community woodlot, on village public land, as part of a group effort. Its intended benefits are to provide a source of essential fuelwood and timber when it is lacking in a village area or, as a forest protection measure, to provide an alternative to encroaching on natural forests to obtain these materials. Private tree plantation is also promoted as a source of income from the sale of unprocessed or processed mature trees. Finally, the planting of trees in an intercropping format is promoted to increase the productivity of a farm holding.

All forest tree species promoted in the Pilot Project area were fast growing varieties selected for their value as a source of fuel and lumber and for their potential in relation to agriculture. Although there were others, the main varieties promoted were Eucalyptus camaldulensis and Leucaena leucocephals. In bee raising areas, Calliandra calothyrsus and Eucalyptus deglupta were also promoted as a source of pollen. Seedlings were supplied to the farmers and instruction was provided in the planting and care of trees. Schools were a focus of this activity and teachers were involved. Some project staff taught agroforestry and the school children planted trees on the school ground. Demonstration plots, e.g., leucaena hedges intercropped with maize, the main crop of these farmers, were established.

Response to these forestry extension efforts was lukewarm at first. As the practice of drawing on the natural forest for fuelwood, however illegal, was tolerated for lack of other sources, there was no critical shortage of fuelwood in the area, hence little perceived need to plant trees for this purpose. As in the past forest law enforcement officers had always impressed upon the people that it was illegal to fell trees in a reserved forest area, they remained distrustful and the attitude persisted, wrongly in this case, that even if they planted trees, it would not benefit them. The very concept of intercropping with trees was alien to these maize farmers who felt that to plant trees in their fields was not only not beneficial but a hindrance as it interfered with tractor plowing. Gradually however interest in planting trees began to gain momentum. By 1985, about 60 percent of the farmers were planting leucaena hedgerows around their home plots and 50 percent had started planting eucalypts. Only 3 percent however had ever at any time participated in establishing village woodlots. Silviculture as such however had not yet become a source of income and this presumably was a counterincentive to engaging in this activity. Some farmers did indeed market some of their trees but the income generated was so insignificant that they lost all motivation to continue.

A market study conducted at this time confirmed that farmers in Nakhon Ratchasima Province producing such trees for sale currently faced many problems. There were only two significant buyers, a pulp and paper mill and a plywood industry. Prices received were low (450 and 600 baht at farm gate and factory gate respectively) in relation to production and other costs : transportation, brokerage fees, etc. The conclusion of the economic analysis however was that in spite of initial difficulties, in the longer term, the net profit per unit of land used for tree plantation would be high compared to its use for other crops. The study's projections anticipated greatly increased demand over the next 15 years for trees for housing and furniture, pulp and paper production, fuelwood and charcoal. In order for the benefits in terms of income of this increased demand to reach the producing farmers however other conditions need to be met such as the provision of low interest loans to tide farmers over the period before trees reach maturity and the promotion of more wood consuming industries in the Northeast. Marketing assistance would certainly be required however before unsophisticated farmers could tap such sale outlets.

3.2 Charcoal production

While the idea of planting trees for sale to wood-based industries might have been viewed with scepticism by the project area people, the alternative of transforming the trees into charcoal for their own use or for sale would appear to be more immediately attractive because they had considerable understanding of the economic value of trees used for this purpose and they were familiar with the process of making charcoal. There was widespread use of charcoal for home cooking in the project area because it was readily available, cheap and more convenient to use that fuelwood. Most of the charcoal consumed was produced from local forest wood by the people themselves using very simple and inefficient earthmound kilns. The activity was illegal by existing forest legislation and consequently, the charcoal trade has always been viewed with suspicion by

the RFD as being related to the illegal felling of trees as its source. On the other hand, charcoal is an essential commodity in Thailand, especially in rural areas where alternative sources of energy for cooking use are unavailable or too expensive and there is therefore a crying need to normalize its production.

The approach selected by the Pilot Project was to get local charcoal producers to shift from dependence on natural forests for their industry to the use of plantation tree species established by themselves, and to improve the technique of charcoal production by the introduction of more efficient but inexpensive technologies. A minimum objective was to meet local domestic demand for charcoal on the basis of this legitimate enterprise. Eventually this could be expanded into a substantial source of income by catering to the considerable demand for charcoal by households, restaurants and selected industries throughout the country. In early 1986, a dendroenergy expert was recruited by the Project. He recommended the promotion of the mud beehive kiln as being the most appropriate for the area. It was twice as efficient as the earthmound kiln currently used by the farmers and family labor was the only investment required to build it. Seven kilns were built in as many locations for purposes of training and demonstration. Demonstrations were conducted using locally grown eucalypts and samples of the charcoal produced were given to users of the area so that they could see for themselves that it was in no way inferior to the product currently in use. Fourteen farmers were trained in mud beehive kiln construction with the expectation that these would later train others.

A small survey of project area farmers was conducted to determine their willingness to build the kiln. The response was less than enthusiastic but inconclusive because based mainly on inaccurate perceptions, e.g., of the legality of the kilns, and they feared it would get thems into trouble with the RFD. There could have been more subtile reasons for the resistance however. As mentioned, charcoal is used extensively in the project area and there is sufficient illegal production to meet the demand. This illegal production can also be a good source of income for a producer : in the order of 20–30 thousand baht a year. It is moreover almost impossible to control and old habits tend to be persistent.

3.3 Community woodlots

As the history of encroachment and degradation of the Khao Phu Luang forest is relatively recent, enough of the natural forest still remains for its encroachers to still have access to convenient sources of fuelwood and consequently have little motivation to plant forest trees for this purpose. A more usual situation in the Northeast however is that of critical shortage because the natural forest has long been depleted. In some areas, the villagers have to take time off, hire a truck and travel considerable destance to gather, say, a month's supply of the essential commodity. A solution which has been supported by USAID in conjunction with the RFD of recent years is the establishment of community woodlots using extotic, fast growing tree varieties, eucalypts predominantly. Results have been very uneven.

Case studies of community woodlot projects point to the importance of village organization as being fundamental for success and to the need for external technical support in various stages of project implementation. Good management is critical and agreements have to be reached among all concerned in relation to the initiation of the project, the maintenance of the plantation, and the equitable disposition of the benefits. For example, a site needs to be selected, usually public pasture land, which is suitable in relation to size, convenience of location, safe from encroachment by people or animals, etc. There is need to agree that the use of this land as a woodlot is the most appropriate among several options. Agreements are needed with respect to contributions in cash, kind, and labor by all concerned for the establishment and maintenance of the plantation. Finally, clear understandings are required as to who will be given access to which share of trees and on which basis.

Generally speaking, the projects that have been most successful are those in which communities as a whole were involved in all phases of the projects, for only thus is there true sense of proprietorship and full commitment. The least successful were those dominated by officials of the implementing agency with little real involvement of the people. Typically, project sites are selected without consideration of convenience for the people e.g. they are several kilometers away from the villages. Plantations are established using hired labor and no clear plans are formulated as to how the people will benefit from the project. The people for their part consider that, as the plantation was established by the government, the trees belong to the government also, not to them.

Alternatives to the establishment of community woodlots away from villages need to be explored. One is to get the farmers to plant trees on their own land. In one village in Si Sa Ket (Ban Nong Lung), the villagers are self-sufficient in fuelwood because they plant a native tree species, *ton sio* (Phyllanthus potythyllus) on their paddy bunds. Another alternative is to plant trees for this purpose on school and temple land. This land is usually quite large and there always would be somebody to tend the trees. There are many "forest monasteries" in the Northeast in which the priests and their lay members are actively involved in growing trees in and around monastery grounds for purposes of conservation and improvement of quality of life. Such forests provide a model of what a forest should look like in the eyes of the people and perhaps also of how it can be established.

3.4 Silvopastoralism

Silvopastoralism is a particularly attractive concept for farmers in a forested area because it is remunerative and makes no demands on their own holdings which can be used for other types of agricultural production. It can be engaged in even by small and landless farmers. Silvopastoralism moreover is fully compatible with forest development and protection as it makes no demands on the forest. The reforestation program of the Social Forestry Project provided considerable scope for the promotion of silvopastoral activity in tree plantations. The project supported this activity by allowing the farmers to graze their cattle in tree plantations under controlled conditions. This was mutually beneficial as it contributed to weed control. Forest plantation grazing areas were planted in guinea grass and other forage plants to improve forest grazing. Cattle droppings provided the only fertilizer needed to keep this growth healthy, improving the soil for the trees in the process.

Surveys conducted at the inception of the project had little to report on cattle raising. Although silvopastoralism was not the only factor responsible for the development, by mid 1986, there was evidence that cattle raising had become a rather important activity. Herds of 40-50 head of cattle were not unusual and a few farmers had as many as 200. Government services, e.g., training in breeding and veterinary services for the treatment of animals, were made available to the farmers in the context of the project to assist them in all livestock raising.

3.5 Fruit tree plantation

The project also gave support to the planting of fruit trees and the establishment of orchards. As in most rural areas in Thailand, local people were already growing some fruit trees and did not need to be convinced of the usefulness of planting them as had to be done for forest trees. Fruit tree seedlings were distributed to the formers at the onset of the project as a goodwill gesture. Early on, 28 farmers and two project staff were trained in plant propagation and the farmers were supplied with grafting material from good varieties of mangoes to do their own propagation. In addition, the project supplied some four grafted mangoes of popular varieties to most households to grow and use as a source of grafting material. Many farmers subsequently produced their own grafted trees and could be self-supporting in the development of fruit orchards.

As of April 1986, the area in fruit orchards was estimated to be 590 ha. Many different kinds of fruit as well as other tree crops such as coconut, cashew and edible bamboo shoots were grown. The most popular fruits were mangoes, jackfruits, custard apples and sweet tarmarinds, but others were also produced: papayas, bananas and limes.

By 1986, several farmers who had planted fruit trees at the beginning of the project period were deriving an income from them that could be as much as 40,000 baht. Such visible benefits are probably responsible for the considerable enthusiasm for orchard plantation that was generated. Some were planting all their land in fruit trees. The rationale was that they could not grow maize indefinitely without exhausting the soil and there was more security in fruit trees.

3.6 Apiculture

Apiculture was considered promising in the project area and arrangements were concluded with Khon Kaen University to provide an apiculturist to assume responsibility for its promotion. In March 1982 eight farmers were given a one week training covering basic knowledge of bee keeping and the production of boxes for bee hives. Each was loaned three bee hives with colonies and bee keeping on an experimental basis using the European bee Apis mellifera commenced in early April in the project area. Seedlings of Calliandra calottyrsus and sunflower were supplied to interested bee keepers to provide bee forage during the dearth period from May to September.

During this period the project apiculturist visited the bee keepers and provided advice on seasonal management of honey bee colonies, methods of feeding the bees, bee keeping equipment construction, methods of prevention and control of pests and diseases, and planting honey bee flora. In addition, assistance was given to the bee keepers to increase the number of their honey bee colonies and to extract the honey.

1984 was the take-off year by for then, the growth of the industry became a self-sustaining process. Other farmers were trained by those already trained. New bee colonies were formed from existing colonies. Even bee keeping boxes and frames were produced by local farmers for sale to fellow farmers interested in bee keeping. By March 1986 the number of bee keepers had reached 41 and the number of colonies, 350. Interestingly, although the training in bee keeping had been given to men, it came to be practiced more by women who acquired the skill from their menfolk.

The profitability of bee-keeping clearly contributed to its popularity. Production of honey from October 1985 to March 1986 was about 3,000 kg. The price varied from 70 baht per kg at the peak of the production period in January-February to 100 baht after the end of March. One better organized bee-keeper netted 75,100 baht over a 20 month period from the sale of honey, wax, bee colonies, and queen bees.

4. Inland Fishery

Fish has always been an important component in Thai diets, especially in the Northeast where it is eaten more than elsewhere. It is eaten either fresh or preserved in the form of fermented fish paste *(plara)*. Obvious sources of fish are lakes, rivers and streams. During the rainy season fish abound in flooded paddy fields. Toward the end of this season, farmers dig pits in their fields th trap the fish as the water recedes from the fields. The surplus is sold to traders and be a fairly important source of income.

Several projects have been implemented in the Northeast to introduce the element of fish raising as opposed to fish catching or trapping to provide a more reliable source of fish. An interesting innovation supported by IDRC combines elements of the paddy field and pit trap approach into a configuration making fish raising possible. A trench is dug along the inner side

of the paddy bund, and the whole plot becomes effectively a closed fish pond in which recommended species of fish can be introduced, fed and raised to maturity in the trenches, even after the paddy harvest has been completed. An interest of the approach is that it requires no modifications of the farmers' work habits and combines both rice agriculture and fish farming.

A village fish pond project supported by USAID in 1979–1981 and implemented by the Fishery Dept. was successful enough for the implementation of such projects in poorer areas to be included in the Fifth and Sixth plans as national policy. The main purpose was to address the problem of malnutrition in such areas. The elements of the project were to rehabilitate village ponds to make them suitable for aquaculture, organize village groups to catch fingerlings to place in the ponds (a traditional practice) and to care for them until maturity. The element of modernity was provided by the Fishery Dept. site team who instructed and supervised the villagers on the feeding of the fish and the maintenance of the pond.

A recent evaluation of this activity concludes that as the food intake of the population affected was not documented, it is not known to what extent its nutrition status improved. What is recorded is that village development funds were considerably augmented by the sale of fish harvesting rights, mostly to outsiders. As a result of training and demonstration by the Fishery Dept. officers, many villagers started their own individual fish ponds (and hopefully ate the fish). Finally, the water of the village fish pond was used to grow dry season crops along its borders.

The Nong Han Fresh Water Fishery Cooperative (Khon Kaen Province) is a more sophisticated project, distinctive among other reasons because it was initiated by the people rather than by a government agency. At their request, an allocation of 290,000 baht of Rural Employment Generation Program funds was made through the Tambon Council in 1980 to two villages bordering on a large pond. The purpose was to establish a fish hatchery to produce fish fry and fingerlings to release in the village pond and in other village ponds in Nong Han District. This involved getting technical assistance–provided by the Udon Thani Fishery Station–, and digging 8–9 smaller ponds–done with the cooperation of the Land Development Dept. who charged only the cost of fuel for the use of heavy digging equipment. The project was placed under the responsibility of the Headman of one of the two villages who established a committee of 10 to be trained by the Fishery Station personnel. The activity was successful and 25,000 baht was earned from the sale of fish harvesting rights in the first year.

In 1982, the local MP, a native of Nong Han District, became interested in the activity, encouraged the villagers to set themselves up as a coop, contributed 250,000 baht ($ 2,500) of his allocation of development funds to put up a building, dig more fishponds, bring in electricity, and generally acted as a facilitator to implement the new development. The nucleus of the cooperative group was a committee of 10 village leaders from several villages of the District. A campagne to recruit members resulted in 245 joining up. The registration fee was 50 baht and shares were sold at 100 baht a share. For efficiency of operation members were organized into individual village groups comprising 20–40 members each. The stated objective of the cooperative was fourfold:

1. promotion and dissemination of knowledge and techniques about fresh water fishery;
2. assistance to purchase inputs at lower price;
3. marketing assistance for the sale of fish;
4. loans for pond excavation, pumps, fingerlings, fish food.

There were several cooperating government agencies: the Cooperative Promotion Department, The Fishery Department, and Land Development Department, in particular. Funds for the revolving fund used for loans to the coop members were provided by CIDA, the Cooperative Promotion Dept. and the MP's development fund.

Although there were problems, the project appears to have been successful and to be a good model for other agricultural cooperatives. It made it possible for small farmers who otherwise could not afford it to engage in fish farming, and, because of good technical inputs, the yields were such that farm fish ponds provided not only fish for household consumption only as is usually the case but also a surplus generating income. Given this success, the cooperative was contemplating the implementation of two new ventures: an animal feed factory and an integrated fish/hog farming project.

Although there has been some success in fresh water prawn culture in the South of Thailand, it is not considered appropriate for the Northeast at this time because it is very capital intensive, the technology is complex, and it requires more abundant water than is usually avaible.

Training in fish farming was given to groups of farmers in the Social Forestry Project area at the Pak Chong Fishery Station but the practice was not commonly adopted for several reasons. Firstly, fish was readily available from village water reservoirs provided by the project as a source of water for household and agricultcral use. They were all planted in fish by the Fishery Station. Substantial commercial fishing was practiced in a large irrigation water reservoir at the edge of the project area. Small fish traders on motor cycles regularly visited all villages to sell fish, travelling on the road network established by the project. Secondly, because of budgetary and staff constraints, the Fishery Station could not provide any training follow-up at the village level. It is known however that at least one farmer developed a strong interest in aquaculture. He spent much time on his own at the Fishery Station getting additional instruction and advice, dug several fish ponds on his land to raise both herbivorous and carnivorous fish, a much more sophisticated operation, and was in fact quite successful, thereby proving at least that it could be done.

5. Conclusions

The Social Forestry Project had four basic components: (1) infrastructure development: roads, small-scale water resources; (2) reforestation; (3) socio-economic development; (4) staff development. Comments of the paper covered only the agroforestry related activities of the socio-economic component. There were others, e.g., land allocation, crop diversification, agricultural credit facilitation. An overall measure of the usefulness of the approach as a development model is provided by the fact that mean net household income almost quadrupled during the life-time of the project going from about Baht 7,500 in 1981 to Baht 29,369 in 1985. The potential for enhancing income of some of the agroforestry practices introduced was clearly established by the successful demonstration by the farmers themselves. Private forest plantation and intercropping cash crops with trees hopefully will prove important in the future but more time and more forestry extension are needed to establish the economic profitability of forest tree farming and to make the transition from multiple commodity production to genuine integrated farming.

Any proposals to redevelop degraded forest-land must take into consideration the fact that this is not vacant land but is occupied by a substancial rural population claiming the land as their own by right of occupation and exploitation, in some cases over several generations. Land-lessness in traditional agricultural areas of Thailand has indeed resulted in an influx of rural migrants to Bangkok and other urban centers. There is evidence to believe that still more have gone to the forests by preference to seek a livelihood.

These populations naturally resist reforestation activity that deprives them of their means of livelihood and leads to their expulsion. Recent RTG forest policy and Fifth Plan guidelines accepted the principle that forestland development should be consistent with the social and economic

conditions of the country. Concerning the economic utilization of forestland, the alternative of agriculture should also be considered since land is a limited and valuable resource which should be utilized for maximum social as well as economic benefit. The social forestry approach described provides an excellent model for the implementation of this policy. It is also consistent with environmental requisits.

Current proposals to expand the commercial plantation of eucalypts in degraded forestland in the Northeast gives cause for concern and appears to be a reversal of the forestland for the people policy. It is politically explosive as evidenced by the violent protest of some 2,000 farmers expelled from their villages in a Buriram Province reserved forest to make room for eucalypt plantation in March 1988. It is not clear when and how this greening process will benefit the landless farmers affected and what happens to them in the meantime. If past experience is a guide, the greater likelihood is that urban based entrepreneurs will be the main beneficiaries, not the rural people. If this process is to proceed, it needs to be better informed, better planned.

Although there are reports of individual farmers establishing eucalypt plantations (e.g. in Ayutthaya Province–on problem soils in this case) in replacement of annual crops, the tree is not generally popular with farmers because of lack of demonstrated cost effectiveness. Much preferred are fruit trees, rubber trees, oil palm. The only firm that has been purchasing eucalypt logs in some quantity in the Northeast, a pulp mill in Khon Kaen Province (Phoenix), has been in financial difficulty since its beginnings some 15 years ago.

Although this can be avoided by good tree plantation management, the indiscriminate propagation of the eucalypt has been questioned by the King in early 1987. Although well suited for certain purposes, e.g., protection of vital watersheds, prevention of erosion, greening of unproductive soils, its use on soil suitable for cropping is considered inappropriate. Given the water thirsty and soil nutrient hungry characteristics of the eucalypt, not to memtion its powerful root system, the soil it is planted on becomes quite useless for any other cultivation. At an international meeting held in Thailand in November 1987, forestry specialists from several Asian countries made the point that the introduction and propagation in the area of exotic fast growing trees such as the eucalypt is a mixed blessing as it also contributes to the introduction of hitherto absent new exotic plant diseases. There is a trend now to reexamine the potential of indigenous species which are fully adapted to the environment and pose no such threat.

Social Forestry Extension : A Look on Its Constraints

Vitoon Viriyasakultorn

1. Introduction

A large number of rural development programmes, with different strategies and concepts, have been implemented during the last few decades. Their purposes have been the upgarde the quality of life for the rural poor, who are the majority of people in the developing countries. These development strategies and concepts have been changing due to new development trends and/or preceptors designed to meet the needs of each country. Blair noted that

> "Since the second World War, the focus of development was mainly on the industrial and urban sectors. By the early 1970 s., the agricultural emphasis had began to pay off, but at the same time the benefit of agricultural growth had not 'trickled down' very far to rural society." (Blair, 1988 : 3)

Westoby discussed the evolution of development concepts which began in 1969 when "Agents of Change' was first published. Since then, many development concepts such as stages of growth, institution-building, grassroots approaches, integrated rural development, community development, village level projects and forests for people have emerged. (Westoby, 1987 : 305-307) According to Blair

> "Deforestation is one of the factors that brought forestry project into the development realm in the less developed countries. Another factor was the successive oil shocks that inspired concerted efforts to find alternative sources of energy." (Blair, 1988 : 3-4)

Many forest-based development projects in the developing countries, in order to cope with the problems of deforestation and food and energy shortages, have been implemented under different names and practices, e.g., village forestry, farm forestry, social forestry, and community forestry, and so on which have sometimes confused both readers and field development workers. Burch divided forestry practices into five categories : commercial/industrial, protection, community, farm, and subsistence forestry. (Burch, 1984 : 12) The last three categories, i.e. community, farm and subsistance forestry are under the so-called social forestry scheme.

Social forestry, although it is not new to many developing countries, is relatively a new rural development approach for both rural farmers and development workers. Encouraging farmers to participate in social forestry projects is, therefore, a challenging task for change agents, extension workers, or community development workers.

The purpose of this paper is to describe the problems of forestry extension and to suggest some possible solutions for its implementation constraints by investigating into the structure of forestry extension work. The following discussions will be on social forestry and its extension problems, and suggestions and recommendations for more effective extension strategies.

2. Social Forestry and Its Extension

To achieve a successful extension of social forestry, extension workers must fully understand what social forestry means. The term social forestry has been defined in various ways and with different points of views. Some examples are given here :

> "Social forestry is any situation which intimately involves local people in a forestry activity. It excludes large-scale industrial forestry and any other form of forestry which contributes to community development solely through employment and wage, but it does include activities of forest industries enterprises and public forestry activities at the community level". (Rao, 1983 : 5)

> "Social forestry is divided into two components, community forestry is the growing of trees by local organization (which may or may not be governmental in origin), on some kind of common land (village commons, government reserve land given over for the purpose, etc.), along more or less egalitarian lines. Farm forestry, on the other hand, consist of landowners cultivating trees on their own land, whether the land be a field that would be otherwise grow foodcrops or a household compound." (Blair, 1988 : 11)

> "Community or social forestry, first, covers the use of forest products in a largely non-monetized sector of the economy; second, it involves the direct participation of the beneficiaries and third, it would require, in most instances, a change of approach by the forester who would now no longer be viewed as a protector of the forest against the depredations of the people but would have to work with them in growing trees (whether individually or in groups)". (Noronha, 1982 : 2)

According to the above definitions, social forestry possesses three characteristics. Firsty, it involves local people and/or local organizations in a forest-activity. Second, it does not include large-scale commercial and industrial forestry. Last, it needs a new kind of foresters who are able to work closely with local people. Social forestry, in fact, means more than what are given in the definitions. Forestry extension workers need to know more about social implications rather than the general characteristics of the projects.

The overall objectives of forestry extension are : disseminating information, providing technical forestry skills, encouraging local participation, and meeting a project's physical target (Falconer, 1987 : 2). To fulfill these objectives, extension workers must know what social forestry really means, and what it really wants to achieve. It is, nevertheless, not an easy task for forestry extension workers since social forestry is a relatively new concept and still in its developing stage.

Forestry extension, in fact, has its roots in agricultural extension and also employs many similar methods. Both forestry and agricultural extension have rural farmers as their target. They, however, do have some differences in terms of project time-length and strategy. A forestry extension agent in Nepal (Pelinck, 1982) indicated that forestry projects take longer periods of time than agricultural ones before they can provide benifits. Secondly, successful forestry projects, especially community forestry, require a concerted effort of the entire community whereas agricultural extension can be implemented in a small group of farmers. Forestry extension, compared to agricultural extension, has a shorter development history due to its new orientation towards a service role in forestry rather than a protective one. This service role in forestry is now an essential element of forestry extension. Most of the articles use "forestry extension" in the broad sense which includes the extension of community forestry, farm forestry, agroforestry, and the other types of forestry projects (FAO : 1982, Stymne : 1982, Pelinck : 1982, Falconer : 1987). The discussion of forestry extension, in this paper, will be limited under the scope of social forestry.

As the numbers of forestry projects have increased in developing countries, extension services become essential. The past experiences in forestry extension indicate three major constraints namely, forestry extension organization and management, change agents or extension workers, target groups or rural farmers.

2.1 Forestry Extension Organization and Management

Part of the success or the failure of forestry extension depends on its organizational structure and management which includes administrative units, policies, and extension approaches. In some countries forestry extension department has not yet been established, For example, in Thailand The Royal Forest Department (RFD) is placed under the Ministry of Agriculture and Cooperatives. There are many divisons, under RFD, which perform conventional forestry funcions but not extension services. Forestry extension activities are currently carried out by agricultural extension workers who are already overloaded with their own job and probably know nothing or very little about forests. There is an argument if the central-level organization for forestry extension should be placed under agriculture of forestry. A consideration for problems of forestry might be overshadowed by agricultural problems, activities, and limited budget it it is placed under agriculture. But having a separate administration, working with farmers might be difficult because of an over-emphasis on forest-protection role a forestry of traditional attitude and practice (Stymne 1982). However, it is suggested that forestry extension division would probably be best to be under forest administration due to the following reasons :

- The traditional roles of forester have been changing to a service one
- The forestry administative unit will be able to recruit and train their own extension staffs through their own process
- There will be less budget competition with the agriculture work

Without a clear-cut policy on how government views the national forest resource, implementation of forestry extension might be more difficult. In the past many countries viewed their forest resource as a national property which need to be protected from people's exploitation. The government does not reorient this policy, it might discourage people's participation in social forestry projects. In addition to the people-oriented policy, a strong political commitment is also needed for a successful policy implementation (Westoby, 1985 : 106).

Policies and approaches to forestry development designed by the central organization are another constraints of forestry extension. Many forestry development projects place emphasis on physical improvements rather than local people's needs. Morever, the extension approach designed by the top-level administrators or planners tends to be top-down which creates one-way instead of two-way communication (Falconer, 1987 : 3-5). Perhaps there is a need for a reorientation of forestry administrators and planners. An application of social science in planning for forestry extension, which will add social aspects to the project, might be helpful in redirecting project measurement. Rapid rural appraisal might as well be considered as an appropriate tool for this purpose. According to Falconer, bottom-up approach can help examining the real needs of rural people and the constraints placed on them by their physical and social environments (Falconer, 1987 : 7). It is, however, important for both planners and extension workers to understand rural development and extension concepts so that they are able to identify people's real needs and apply the appropriate extension techniques.

2.2 Forestry Extension Workers

Among all constraints concerning forestry extension, extension worker is said to be the most important one. Extension workers are in between the administrators/planners who make policies and rural farmers to whom the extension workers have to implement the policies. Many

literatures viewed forestry extension workers as important part because they help change the role of forestry development from protecting forest to serving rural people (FAO 1982, Falconer 1987, Blair 1988, Nair 1985, Pelinck 1982). However there is a problem among the extension workers themselves as FAO pointed out as fellows :

> "A major constraint in most extension activities is the difficulty of getting extension agents to really listen to rural people, take what they say seriously and work with them". (FAO. 1985 : 105)

It is not overstated that foresters or forestry extension workers now become the focus of forestry extension, even though the forestry extension activities in many countries still heavily rely on agricultural extension workers. As well, the number of well-trained forestry extension workers are still very limited. For example, in Thailand a five-day training on community forestry was provided for a numbers of agricultural extension workers at village level in 1984. They were expected to play dual roles, both forestry and agricultural extension. To my knowledge, some agricultural extension workers in Thailand are responsible for more than ten villages. Increasing more forestry activities may discourage them and limit their work-performances. In addition forestry activities might be thought as a "low priority" job rather than a top one.

Problem of forestry extension personnel is not the shortage of extension workers alone. A lack of well trained or skillful forestry extension workers is considered a larger problem. Turner described the role of extension worker as identifying the knowledge, needs, and attitudes (frame of reference) of others (farmers) and thus talking and acting in the manner which will result in mutual benefit and satisfaction (Turner, 1966). In the past, foresters have hardly involved in this kind of extension activities due to their traditional roles trained by forestry schools or universities. Ruangpanit noted that :

> "In Thailand, forestry training is mainly in the fields of forest production, protection, conservation and utilization of forest products. The forestry curriculum tended to isolate the foresters from the people instead of training them to deal with rural institutions that need the forest resources to develop their communities". (FAO, 1985 : 372)

For this reason it is not surprising that why foresters prefer working with trees instead of working with people. This type of forestry curriculum not only ignores the social aspects of forestry but also creates forester's negative attitudes toward rural people who utilize the forest resources. It is noted that :

> "The attitudes of the extension worker often affects his ability to relate to people he is working with. A successful relationship is based on respect for each other's values and ideas." (World Neighbours, p. 12)

Pelinck also indicated that :

> "The development of proper attitudes through a staff training and extension was the key to success in forestry project," (Pelinck, 1982)

On the other hand, a wide cultural differences between extension workers and farmers may hinder effective communication. The change of role from traditional forester to forestry extension worker is still in to transitional period. The recruitment and training processes play an important role in preparing and equipping the new generation of foresters. The academic qualifications obtained in an urban situation has been a main criteria in recruiting process. This, often, creates a gap between forestry extension workers and rural people due to the lack of understanding in socio-cultural environment of rural communities. It is suggested that priority should be given to candidates whose cultural background is similar to the environment in which they will be expected to work. Forestry curriculum in universities, technical schools, and forestry institutes should be revised and reoriented

(FAO, 1982). The curriculum should include rural sociology, social anthropology, forestry extension techniques, and of rural development. FAO also recommends that for technicians and field workers, the following subjects must be emphasized : human relations, communication techniques, extension teaching methods, rural organization, group dynamics and social change management, community forestry programme analysis and planning at the local level.

In fact, such suggestions and recommendations are very valuable. But it might be too optimistic to beleive that such recommendations will be easily implemented. Although most universities have already realized the role of social science in forestry. What seems to be the main problem is that the numbers of faculty who really specialized in social forestry are still very small.

2.3 Target Groups or Rural Farmers

Target groups of forestry extension are obviously rural people who involve in forestry activities. In social forestry projects, target group might be individuals, groups or the whole community depend on what type of project they are participating, e.g. farm forestry, agroforestry, or community forestry. The level people's participation varies by the nature of the projects. For example, it might be easier to convince people to participate in farm forestry than community woodlot project because the former project require more individual interest than concerted effort of the whole community. Lack of people participation in forestry project, nevertheless, arises mainly from their beliefs, attitudes, and other cultural constraints. Studies on sociological aspects of forestry reveal that attitudes toward women, trees, and species preference in a particular cultural context are factors making extension work more difficult. Beliefs and attitudes toward women's roles and responsibilities are a good example. It has been noted that one of the reasons for unsuccessful woodlots project is that forestry services direct their attention mainly to male members of the village (Hoskins, 1982). Women are not included in the forestry project whereas they normally have more responsibilities than men in forestry activities. A study of Kenya Woodlot Development Programme (KWDP) by Chavang also indicated that social taboos play a very important role in preventing women from growing trees so that they will not be able to claim ownership of land (Chavang, 1985). It is apparent that women lack of channel to participate or to make decision relating to the adoption of forestry projects due to not only the project design which does not allow women to participate but also the farmers' beliefs that women should not participate.

Farmers' beliefs and preferences of trees can also obstruct the promotion of forestry projects. Farmers are more likely to plant trees which they are familiar and yield direct benefits. Promotion of foreign trees which does not match their preferences or against their beliefs and taboos might lead to unsuccessful project. Eucalyptus is a good example of a questionable plant for community woodlot projects. Many farmers doubt if Eucalyptus was harmful to the soils and environment, while governments believed that Eucalyptus is appropriate for reforestation. As a result, farmers avoide participating in Eucalyptus planting projects; more seriously some even demolished the tree nurseries (Walsh, 1989).

Another major constraint of forestry extension is the difference in perceptions of forestry problems between farmers and forestry extension workers. Farmers seldom perceive problems in the same way as extension workers. For instance, farmers, in Malawi, felt that there was little urgency in planting trees for firewood while the government were very serious with this problem (French, 1986 : 532). For an effective communication and extension, it is essential that forestry extension workers understand farmers' perceptions of the project. Moreover farmers must be convinced that all projects are created for them so that they will realize the problems and be willing to participate. The greater the people perceived the problems, and the more effective the solution perceived, the more likely is adoption.

3. Conclusion and Recommendations

Social forestry has become a popular and promising alternative rural development strategy in many developing countries due to its economic, social, cultural, and ecological benefits to the rural poor. Owning to the fact that social forestry is a relatively new concept for both implementators and adopters, many social forestry projects have not been successfully implemented. Social forestry extension, therefore, becomes essential for assisting rural farmers to understand and adopt social forestry practices. Forestry extension methods themselves, however, have not been fully developed and still heavily rely on agricultural extension. The major areas of constraints of forestry extension are identified as forestry extension organization and management, forestry extension workers, and rural farmers. Forestry administrative units, national forest policies, and extension approaches are the issues of administrative structure. In many developing countries, there is a lack of forestry extension department, and the roles of forestry extension worker are played by the agricultural one. The national forestry policies which support commercial forestry rather than forest for people might discourage people's participation in social forestry projects. Top-down extension approach also makes the assessment of farmers' real needs more difficult due to its one-way communication nature. Issues of constraints on forestry extension workers are concentrated on the overlapping of extension work between forestry and agricultural extension workers, and the lack of skillful personnel caused by recruitment and training processes. More importantly, the attitudes of traditional foresters toward farmers and their understanding of rural culture are the critical factor for forestry extension activities. The shortcomings of forestry extension attributed to rural farmers are their attitudes, beliefs, and cultures which cause a discrepency in the perception of problems. Identification of farmers' real needs is the most difficult part in extension work, because extension workers and farmers rarely perceive needs and problems in the same way.

To cope with the constraints of forestry extension, the following startegies are recommended :

For Forestry Extension Organization and Management :

1. A department forestry extension should be established, and their activities be constituted as a separate functioning unit from law enforcement.

2. Bottom-up approach should be employed to motivate two-way communication so that the extension workers are able to identify the farmers' felt needs and problems.

3. The national policies concerning forest resource must get along with forestry projects designed to have impacts on farmers in order to encourage people's participation.

4. Top-level administrators/planners of forestry extension should be provided some sociological concepts of forest through seminar and workshop. Moreover, they should also be encouraged to do field visit as time allows.

5. When possible, top-level administrators/planners should encourage and convince the government to emphasize more on the sociological aspects and social impacts of forestry projects.

For Extension Workers :

1. There should be a change in forestry curriculum in universities and other training institutions. The sociological aspects of forest as well as the traditional forestry practices should be emphasized.

2. The recruitment process of forestry extension workers should emphasize not only on the academic requirement but also the personality and attitudes of the applicants.

3. The number of female extension worker should be increased so that they are able to work with female participants in the situation that women have cultural restriction in working with men.

4. Workshops and seminars on social forestry as well as extension techniques should be periodically provided to extension workers.

5. A close supervision, monitoring, and evaluation of extension workers' performances are needed in order to help them work more effectively.

6. Incentives in terms of money, promotion, or rewards are also necessary for their morale support in order to enhance their work performances.

For Rural Farmers

1. An equal opportunity of project involvement should be provided to farmers so that they be able to access project benefits.

2. Sense of belonging must be promoted so that they will perceive the problems more collectively and are more willing to participate in forestry projects which need a cencerted effort from the whole community.

3. If possible, an excursion to successful forestry projects in the same cultural environment should be arranged for target groups so that they can see and learn more about social forestry. This might be useful in altering their attitudes and beliefs which may lead to the adoption of projects.

4. Rural farmers should also be trained as local extension workers so that they will be able to work with their community after the project is withdrawn.

5. Where appropriate, forestry extension workers should discuss about attitudes and beliefs toward forest and trees with farmers, and try to encourage positive attitudes to them.

The above recommendations may be used as an outline for the development of forestry extension strategies. The major idea of these recommendations is that forestry extension problems may not be solved by focusing on just one factor. A good and well trained forestry extension worker might not be able to achieve the project goals himself. He also needs supports from the office and cooperation from people. All factors affecting extension activities must be closely examined, and priorities should be set out for implementation. The problem solving strategies for all factors should be undertaken step by step according to their urgency and nature of problems. It is important to keep in mind that local people must play a principle role in social forestry projects while extension workers play a supporting role at local level, and the forestry organization supports social forestry in national and regional development plans.

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