

Unfortunately, there is another side to the dam-building coin, a side which is rarely shown to the public. It portrays a picture of massive ecological destruction, of social upheaval, disease, and impoverishment.

The first victims of dams are the thousands of people who are displaced due to the flooding of their villages and homes. Invariably these "development refugees" are resettled in marginal inhospitable areas with little hope of rebuilding their previous communities. The resistance of local people to forced evacuation is sometimes met with official violence as in the Chico dam project in the Philippines (Drucker, 1986). In large scale water projects vast areas of agricultural and forested land are lost to submergence. In Ghana, a land area the size of Lebanon was submerged behind the Volta dam causing very serious problems of resettlement (Graham, 1986). In Sri Lanka the construction of the Victoria Dam submerged one of the most productive, densely settled agricultural valleys in the central highlands (Alexis, 1986). The Narmada Valley project in India will uproot a million people and submerge about 350,000 hectares of forest lands and 200,000 hectares of cultivated land (Alvraes and Billorey, 1987).⁸ Dams also take their toll in the proliferation of diseases such as malaria and schistosomiasis. Gilbert White believes that the invasion of irrigation schemes by schistosomiasis is so common that it is now the rule rather than the exception.⁹ After the building of Aswan the infection rate from schistosomiasis in some communities reached 100 percent.¹⁰ The most serious problems associated with dams and irrigation are the loss of cultivable lands due to salinization and water logging. Perennial irrigation raises the water table; in some areas this is due to seepage from irrigation channels. Lining miles and miles of channels is expensive; so it is rarely done in Third World countries. Irrigation schemes in dry lands invariable affect the delicate water-salt balance in adverse ways. According to the FAO at least 50 percent of the world's irrigated land now suffers from salinization. Rapid sedimentation of reservoirs which reduces the useful lifetime of dams is another serious problem. Dogra (1986) claims that in most Indian dams the rate of siltation far exceeds official rates; in one instance 60 percent of storage capacity was silted in forty years. The siltation problem in Egypt has a double-edge—not only are the rates of siltation behind the high dam excessive, but the lower Nile suffers from the lack of beneficial siltation effects of the annual floods resulting in a staggering bill for chemical fertilizer. Larger-scale dam projects are economic only if the land can be farmed in capital-intensive ways. Moreover, the project has to earn foreign exchange to repay the loan taken to build the project in the first place. Therefore, peasants producing food for local consumption are not important actors in the "superdam scene."

Goldsmith and Hilyard (1984a, p. 220), who have surveyed a number of dam projects throughout the world, have concluded:

⁸A detailed description of the Narmada project appears in Kalpavriksh, 1985, and a description of popular resistance to the scheme is in Esteva and Prakash, 1991.

⁹Quoted on p. 6 of the briefing document on dams.

¹⁰Quoted on p. 6 of the briefing document on dams.

[If] . . . dams were only built when they could be certain to provide water on a sustainable basis and without incurring intolerable social and ecological costs—then very few, if any, would be built.

Why, then, do dam projects continue to be funded? The answer is that dams are very much a part of the hegemonic idea of development. Again to quote Goldsmith and Hilyard (1984b, p. 231):

[there is an] entrenched belief that large-scale water development schemes are an essential part of the process of economic development—a process which we have been taught to see as the only means of combatting poverty and malnutrition, . . . To challenge dams is to challenge a fundamental credo of our civilization.

Dams are also an integral part of pork barrel, politics, bribery, corruption, and a means for the private appropriation of public funds.¹¹

The launching of the Green Revolution and the construction of dams contributed to the rate of growth of GNP in several countries, but that did not necessarily lead to the eradication of hunger and poverty. In fact, the examples I described were directly implicated in the creation of poverty. Economic activities are too often evaluated by the quantity of commodities they generate. As we have seen it is important to look at production from a holistic viewpoint taking into account technological, social, ecological, and cultural relations of production activity.

THE MAP AS PART OF THE PROBLEM

The map of GNP per capita must be viewed in the context of an uncritical intellectual milieu where the hegemony of developmentalism reigns supreme. Although the problem is by no means cartographic, the map makes its own contribution to the perpetuation of uncritical reasoning along the lines argued by Harley (1988) of map as ideology. The map, as part of the ideology of development, is used widely in books and reports in extending that ideology.

In the map of GNP per capita, the basic unit of analysis, representation and comparison is the nation. Treating the nation as a homogeneous unit of discourse conceals the destructive aspects of national development by ignoring the plight of “development refugees”—Amazon Indians and rubber-tappers, displaced peasant farmers, urban immigrants, resettlers from dam projects, victims of urban renewal and slum clearance, and so on. Using the nation as the basis of discourse helps strengthen the ideology of a “national interest” which is used by elites to implement policies that serve their own narrow interests as we have already seen in the cases of the Green Revolution and the construction of super dams. To oppose such projects is to stand in the way of progress, modernity and the national interest.

Great care must be exercised in the use of maps to avoid falling into reductionist,

¹¹For example, in the Mahaweli dam project in Sri Lanka nearly a third of all aid money may have gone into bribes.

ahistorical, superficial modes of spatial reasoning. The map of GNP helps to construct intellectually the notion of a Third World and represents it as a contiguous group of nations lying between the two tropics. It was undoubtedly the suggestive power of spatial reasoning that persuaded Harrison (1990) to title the first chapter of a popular book on the Third World. "The Cruel Sun: The Curse of the Tropics." He has written:

Let us do a little map reading. If you open any decent atlas at those nice, blotchy maps on temperature, rainfall, soils and vegetation, you begin to notice some very curious things. Very roughly speaking, the problems of underdevelopment appears to be confined to the tropics, between thirty degrees north and south of the equator (p. 21).

By problems of underdevelopment Harrison meant of course the state of those countries with low per capita incomes. Harrison continued with his cartographic logic:

A schoolboy could be forgiven for taking one look at the map and proclaiming the theory that an average annual temperature of 20 degrees or over was the cause of underdevelopment. Would he be very far from the truth with his little discovery? (p. 22).

Harrison goes on in the book to suggest that the schoolboy's conjecture is not far from the truth (Figure 1). Harrison's ahistorical, spatial reasoning would have gone unchallenged in the 1940s, but is definitely inexcusable in the 1980s when it continues to reappear in his popular book on the Third World that has gone through six reprints already. I shall not digress to comment on Harrison's thesis of climatic determinants of poverty other than to say schoolboys may have such thoughts because they are socialized to do so by adults who have succumbed to reductionist modes of superficial map reasoning.

Still another way in which the map of GNP per capita contributes to the myths of poverty and development has to do with the anti-dialectical mode of map reasoning (Harley's "silence by omission"). Since hungry malnourished people live in Bangladesh it is easy for us to conclude that the problem must be physically located within the boundaries of that nation. We equate Bangladesh with the problem because we can obviously see that this is where the starving people are. By contrast the geographic space of the First World, with its capital and know-how, is the realm of "the non-problem" and the locus of the "solution." The map helps to confirm this static, ahistorical, dualistic conceptualization of the world. What the map does not show is the evolution of the historical geography of the global system of capital where the hegemonic imperial powers developed the production forces in the colonies and incorporated them to meet their domestic needs for raw materials, food, and markets. In the colonies food cultivation had to compete with the production of commercial export crops (Stavrinos, 1981; Wallerstein, 1987). Kept active by local elites and multinational corporations, the circuits of surplus extraction continue to function today through a series of mechanisms like deteriorating terms of trade, terms of investment, and charges for debt service. Through the "silence of omission" we are not taught to see poverty as a "relation"—between First and Third World

nations, and between classes within a Third World nation.¹²

The map of GNP per capita also illustrates what Harley has called “representational hierarchies.” The main purpose of the map of GNP per capita is to compare nations, i.e., rank them according to the size of income per capita. The use of this ranking principle also helps us define a group of nations as the Third World, behind the First and Second, which the map formalizes by giving the Third World a concrete geographic location. The exhortation made to Third World nations to catch up with living standards of the west is patently irrational. Consider a few statistics: a citizen of an industrialized nation consumes in six months as much energy as a citizen in a poor country does over his entire life; North America, Western Europe, and Japan with a quarter of the world’s population use three-quarters of the world’s 10,000 million kilowatts of electricity; the US with 4 percent of the world’s population produces 24 percent of the global carbon dioxide emissions; the number of cars in the world have risen from 50 million in 1946 to 386 million in 1986 and production is increasing by 3 million every year with large sales going to the cities of the Third World.¹³ Urbanization, air pollution, water pollution, destruction of forests, chemical contamination of soil, water, and food, destruction of agricultural land, migration to unhealthy, bloated cities, and poverty—these are essential consequences of development.

The idea that nations need to catch up because they are backward helps to foster a sense of ethnocentric condescension towards all people of the Third World. When Harley’s principle of hierarchical representation of space is applied to the ranking of nations, there occurs an interesting cultural transformation from the nation to the individual, whereby people themselves become ordered giving rise to the firmly held belief that residents of the Third World are traditional, backward, and in dire need of modernization and development. This is one reason why we discount the indigenous techniques of Third World farmers, and view non-consumerist simpler lifestyles with disdain or with condescending sympathy.

CONCLUSION

The world map of GNP per capita is widely used in textbooks and reports because it is considered a basic “fact” of economic geography. What do we really communicate when we use this map?: that it is reasonable to compare whole nations to each other according to the exchange value of commodities; that developed countries are advanced because they have a higher GNP per capita; that underdeveloped countries need to expand their GNP rapidly if they hope to solve the problems of hunger and poverty, and catch up with the rest of the advanced world. But growth in GNP has no necessary relation to the eradication of hunger. In fact, as the previous examples from the Green Revolution and dam construction showed modern forms of poverty are a direct result of activities that are carried out in the name

¹²For a description of this history in Bangladesh see Hartman and Boyce (1988).

¹³All of these statistics are taken from Goldsmith, Hilyard, Bunyard, and McCully (1990), pp. 241-271.

of development. To suggest that the poor of the Third World need to develop and catch up to profligate, energy-intensive modes of living is ecologically irrational, culturally insensitive, socially irresponsible, and academically absurd. But the hegemony of development reigns supreme among academics, policy makers, and politicians. This is because development is an ideology, and part of the power apparatus in the elite exercise of authority over people and domination of nature. But unlike other modes of domination, the idea of development is culturally subtle because domination is exercised with the full acquiescence of the dominated. As Harley has argued maps are a part of the nexus of ideology, knowledge, and power; the map of GNP per capita is an excellent example. The routine use of this map by teachers and other academics is most unfortunate. I hope this paper will stimulate readers to think about what this map really means and serve as a warning against its uncritical use.

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