

A LIVING ANGKOR IN THE MEKONG VALLEY

Regional Implications of Waterworks Restoration

TÖRÖK ISTVÁN (STEVEN J. TÖRÖK)

BANGKOK REPRESENTATIVE, THE ANGKOR FOUNDATION

INTRODUCTION

As an introduction it may well serve to outline what my interest in multi-objective water resources management is, and how a multi-objective formulation of the Angkor area water resources management problem might allow us to arrive at feasible projects for implementation to the benefit of all.

Multi-objective formulations explicitly recognize that different people are affected differently by any proposed outcome. Thus for an outcome to become feasible, all those participants who may have actual or potential influence on outcomes would have to be satisfied, according to their own preferences. If preferences are contradictory, then outcomes become infeasible: we have an impasse or deadlock with no solution in sight until the preferences of one or more of the participants change. Such changes can be stimulated through an "information strategy" (see Török 1992) that must be part and parcel of any development process, imbedded in education that is culturally and pragmatically inspired to achieve the well-being of participants in terms of values held by them. These values, however, may change as a function of outcomes, giving us an evolving open system.

THE ROLE OF ANGKOR IN THE MEKONG VALLEY

The Geography

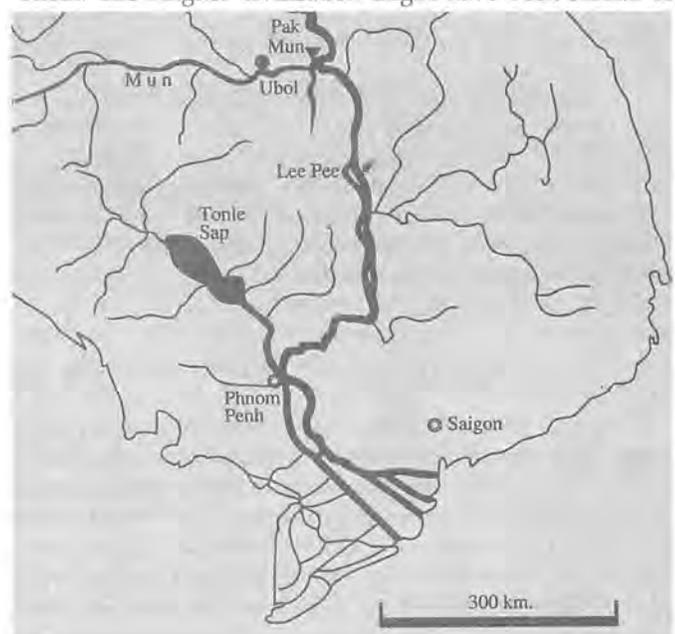
How does the above formulation allow us to approach the water resources management problem of Angkor Wat in an intelligent manner? First, let us look at the geography (Roberts 1993). The figure (right) shows a portion of the Mekong Valley, with Angkor Wat and the Great Lake of Cambodia (Ton Le Sap) prominently displayed. The significance can best be understood by quoting an early French author:

Cambodia lives, prospers, and owes a great part of its riches to a natural periodic phenomenon, the rising and falling of the Mekong River ... [T]his rhythmical move-

ment of the waters, regular as the respiration of a living organism, provides nearly all of the energy necessary to obtain the benefits from the country ... In Europe, flooding is an unforeseen event, unexpected and feared, often disastrous; in Cambodia it is foreseen, awaited, desirable, and always beneficial. (Barthelemy 1913, 363, quoted in Roberts 1993)

The Culture

Historically, a civilization based on the cultivation of fertile alluvial lands producing a food surplus that in turn could feed an army (needed to capture slaves to till the land) and could feed the many artisans engaged in building the splendid Khmer monuments has resulted from the rhythmical movements of the Mekong. Rulers of the empire channeled it into productive and protective uses around the cities and the rice fields, harvesting both rice and fish as seen on the murals of the Bayon at Angkor Thom. The Angkor civilization might have been similar to



earlier civilizations around major rivers: the Yellow River of China, the Nile of Egypt, the Tigris and Euphrates of Mesopotamia, and the Ganges of India. These were all slave-holding societies. The core civilization at the center was always supported by a highly organized, highly differentiated hierarchical structure that ensured that a larger effective demand was produced than mere self-sufficient hunting and gathering or primitive self-supporting agriculture could provide, and that all surplus production obtained as the "gifts of the river" (and the slave!) was utilized. Populations expanded and occupations became diversified; a cooperative game produced desirable outcomes for all participants (except, perhaps, the slaves; even the slaves may have been satisfied according to their own expectations, as Hindu caste systems transported from India to the Mekong may claim). The point is that as long as all participants were satisfied according to their own expectations and values, such systems were stable, sometimes for a millennium or more (Egypt). Eventually geological erosion (siltation?) and erosion of values (Buddhism with the compassionate smiles of the Bayon vs. the original harsh caste system of Angkor) have rendered the continued existence of these highly civilized societies no longer feasible.

Are we advocating the return of slavery? Pol Pot might have done so, but we definitely are not. What we may call post-modern societies may instead learn tolerance and compassion from the bittersweet smiles of the Bayon: there can be different expectations of different people satisfied without hostility (we hope) if the "information strategy" works and, at the same time, geological erosion is controlled to the degree necessary that meaningful surplus production in an environmentally-conscientious, sustainable development process (a much overused concept) can be maintained and distributed without envy. One example could be Cambodia: can we restore the necessary surpluses to render a tolerant Khmer society feasible again? The key to this may well be water resources management, and the test case could well be Angkor Wat.

Living Resources for Sustainable Development

In a 1994 paper Imre Csávás, a Hungarian ichthyologist working with FAO in Asia for the past couple of decades, has succinctly presented the case for increased aquaculture as an absolute necessity to feed the teeming billions of humanity in the next century. In a volume by the ESCAP Secretariat edited by the present writer (ESCAP 1992) a feasible foothold for fish-farming in the oceans is presented as a possible solution to the nagging recycling problem of offshore structures installed by the oil industry.

How is all of this relevant to the Ton Le Sap and proposed waterworks restoration at Angkor? Reports (*Bangkok Post* XLIX, 256, Sept. 13, 1994) show that there may well be problems looming in the fisheries management of this great "water-lung" of Cambodia due to increased siltation. While in geological time this might be the inevitable fate of alluvial lakes such as Ton Le Sap, in the medium term (say the next one hundred years) we may well see water levels rise due to the backup effect of a rising

sea level. Global warming—if trends are interpreted correctly and no other offsetting effects materialize—could result in higher water levels in the lake by as much as 50 cm in one hundred years or so. It is assumed that the Ton Le Sap is far enough up-river that no salt intrusion would take place. The problem is that we do not know this for certain; thus we may be unprepared for whatever happens.

Waterworks restoration in Angkor might, however, be designed in such a way that in addition to preserving the monuments, a sensitive gauge would be installed to obtain baseline data for water resources management. There is a precedent for this: the temples of Karnak on the Nile had such gauges installed that allowed the Pharaoh to know the timing and extent of life-giving floods down river, so that farmers were always prepared to take advantage of them, thereby producing the needed surplus crops for the Pharaoh. What is advocated here is something similar: by restoring the waterworks locally so as to safeguard the monuments, some fish hatcheries as well as sensitive measuring instruments might be installed to monitor both living and geological resources of the Ton Le Sap and by extension the whole lower Mekong valley.

SUMMARY

To summarize: a multi-objective approach to waterworks restoration of Angkor would result in a local, flexible system as much in tune with the original purpose and operation of the system as possible so as to safeguard the monuments, while at the same time providing both fisheries management and global warming monitoring services for the Ton Le Sap and the entire Lower Mekong valley. Such a project may thus attract Global Environment Fund contributions, while simultaneously serving as a rallying point for multi-objective value reconciliation for a revitalized Cambodia.

REFERENCES

CSÁVÁS, IMRE

- 1994 The status and outlook of world aquaculture with special reference to Asia. Paper presented at Aquatec '94, Colombo, Sri Lanka, 29–31 August. Bangkok: FAO Regional Office.

ESCAP

- 1992 *Waste recycling for sustainable development—the case of obsolete oil and gas production structures in Asia-Pacific waters* (Overview), vol. 1. Bangkok: United Nations.

ROBERTS, TYSON R.

- 1993 Just another dammed river? ... *Natural History Bulletin of the Siam Society* 41 (2) Winter.

TÖRÖK, STEVEN J.

- 1992 An information strategy for economic modernization. *Journal of the Siam Society* 80 (1).