

# THE THREE GORGES PROJECT IN CHINA

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## Introduction

In China, the idea of constructing a major dam on the mighty Yangtze (Changjiang) River (Figure 1) dates back to the early part of this century when Dr. Sun Yat-sen, the founding father of the Chinese Republic, first suggested the feasibility of this project. Present plans under consideration in the People's Republic of China call for the construction of a mega dam 1 924 metres long, the installation of twenty-six 500-megawatt turbines and the creation of a gorge-type reservoir that will extend some 600 kilometres upstream from the dam. When completed, the Three Gorges Dam with a proposed generating capacity of 13,000 megawatts (about equal to all the generating capacity of Phase I of Canada's James Bay Project) will be the largest single hydro project in the world. Apart from the generation of electricity, the purpose of the dam is to control flooding downstream in the most densely populated region of the middle Yangtze and to improve navigation in the gorge area upstream of the dam site.

The proposal to construct a dam of such magnitude in one of the most scenic and historically important reaches of the Yangtze, with so many unknown environmental and social costs and at the huge expense of some U.S.\$12 billion, has generated a great deal of controversy both within China and internationally. To allay the suspicions of many that the feasibility studies conducted by the Chinese authorities may have been biased in favour of the project, the Chinese government invited international agencies to conduct their own independent feasibility studies. In 1986, a Canadian consortium, CIPM Yangtze Joint Venture (CIPM), was

commissioned by the World Bank and the Canadian International Development Agency (CIDA) to conduct a fifteen-million-dollar feasibility study of the Three Gorges Project (TGP). The final reports, prepared by both the Chinese and the Canadian team, were submitted to the Chinese government in 1988. The Chinese government announced plans for commencing work on the dam in 1992.

## Resettlement

Depending on the dam height selected, the area inundated by the TGP varies from 335 square kilometres for a 150-metre dam to 737 square kilometres for a 180-metre structure. The population to be resettled ranges from 539,000 for the former to 1.2 million for the latter. In addition, ten to thirteen county seats and 400 to 600 industries will be displaced. While this type of resettlement is not new in modern Chinese history, the scale involved surpasses that of major

reservoirs constructed in China at Sanmenxia, Danjiangkou, Wujiangdu, etc. Given the numerous problems, many still unresolved in these other projects, it is questionable whether the fate of the displaced population will be any better this time. Moreover, not only is the life and livelihood of thousands of resettled families involved, there are also hardships imposed on the host population already living in the area targeted for resettlement; a situation of extreme stress and potential conflict between the two groups is always present.

It is disturbing that of the studies and proposals focusing on the project, Chinese or foreign, none present any evidence that the people affected by the scheme, as opposed to local authorities, have been or ought to have been consulted in any way about the impact the move will have on their lives. In fact, perhaps with a few exceptions, virtually none of the authors opposed to the TGP



PHOTO: JOSEPH WHITNEY

Fig. 1: The Three Gorges Project site on the Yangtze River in China

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cited population displacement as a major argument to support their opposition to the project.

In the TGP proposal it was suggested that the displaced population can migrate upslope, so that even though they have to abandon their hometowns or villages, they can remain in the same county (Tian and Lin, 1989). On paper, this may seem feasible, but when the conditions in the upland areas are examined, it becomes obvious that this scheme is not likely to be successful. Fundamentally, the problem is that the best land in the reservoir area is located in the valleys which will largely be inundated; the remaining land upslope is of much inferior quality. Apart from the steeper slopes, the soils in these upland areas are infertile and productivity is many times lower under natural conditions. Currently, this upland area has a per capita cultivated land of 0.07 hectares and per capita grain production of 340.5 kilograms. Relative to the national average of grain production, Chen (1987) suggested that this area is already fifteen percent overpopulated. Thus, increasing the population density is not viable. Moreover, although the CIPM report indicates that the amount of "claimable" land far exceeds that inundated (CIPM, 1988-9: 11-19), the aerial survey upon which this assessment was made was confined to only 43 "typical" *xiang* (rural districts) out of a total of 600. As the CIPM report admits (CIPM, 1988-9: 7-7), there are discrepancies in the definition of "claimable" in the Chinese reports; it is by no means clear how the "typical" counties were selected. A proper method would have chosen the *xiang* in a random fashion, since there is always the chance that unconscious biases may be present when "typical" examples are selected.

The project proposal emphasized integrating resettlement with resource exploitation (Tian and Lin, 1989), but the availability of capital for development and suitable resources for exploitation are questionable (Chen 1987). For instance, the development of salt mines may have to face stiff competition from well established facilities in Sichuan. The development of tourist industries will be

in conflict with the establishment of certain types of industries that will cause serious pollution problems.

One important aspect of resettlement is the impact on land degradation in the resettled areas (Wang, 1988). Detailed research on this topic has been conducted by Professor Shi and his colleagues at the Nanjing Institute of Pedology (Shi, et al. 1987). It was suggested that to replace the 400,000 *mu* (1 hectare = 15 *mu*) of prime agricultural land inundated, new land up to 2,000,000 *mu* had to be provided. This is because of the lower productivity of the upslope areas. The clearing of new land and demand for firewood fuel will lead to an additional sediment production of four to seven million tonnes per annum. In addition, other activities, including mining and extraction of building materials, will yield at least another five million tonnes. This total erosion of ten to twelve million tonnes, assuming a sediment delivery ratio of 0.5, will add some six million tonnes of sediment per annum to be deposited in the reservoir, an increase of fifteen percent over current rates. The actual increase may be much higher.

According to the CIPM report, after the construction costs of the dam,

resettlement costs come second at 34 percent of the entire project if the dam is built to a height of 160 metres — the alternative favoured by the CIPM consortium. High as these values are, it is not apparent that they cover the full costs of relocation. This is revealed in the following considerations:

- (1) According to the CIPM report (CIPM, 1988 9: 7-10), one half of the claimable land is situated at elevations above 800 metres where development is potentially more expensive due to the cost of access and the fact that cultivation is limited to a smaller range of crops than at lower elevations. It is not clear that these additional costs have been included in the estimates.
- (2) As many as 30 percent of the urban population residing in the inundated area belong to the so-called "floating" population, that is, illegal residents who have come to the cities from the countryside in defiance of government regulations restricting such moves. The government does not want to "reward" these illegal residents by bearing the costs of their resettlement (Fearnside, 1988), which

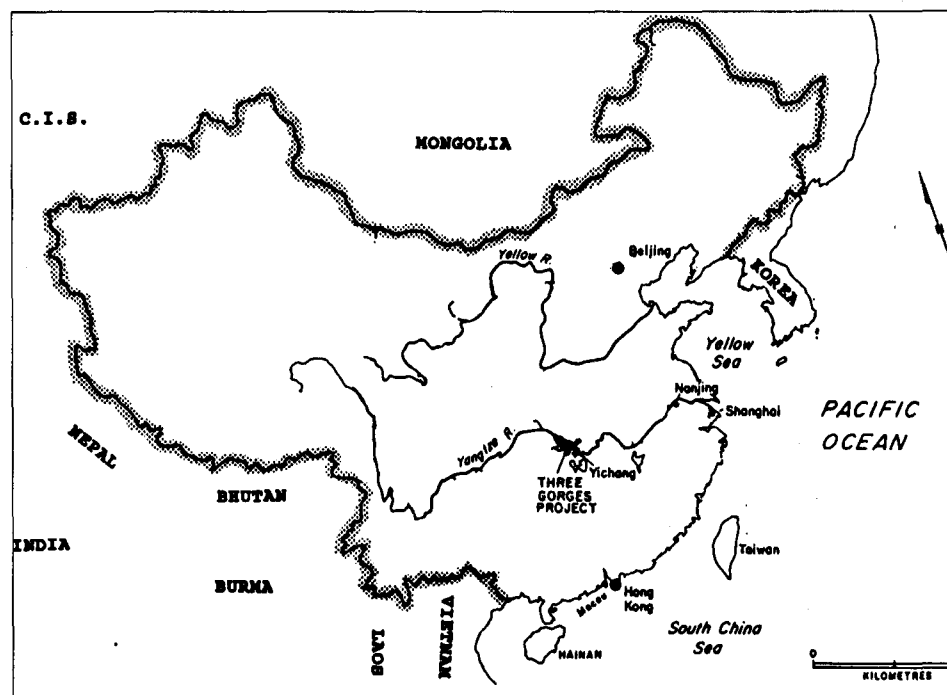


Fig. 2: The Three Gorges Project

have not been included in the cost estimates.

- (3) The additional costs of erosion control, brought about by the conditions described above, have not been included.
- (4) The cost of relocating cities and towns has almost certainly been underestimated. The CIPM report estimates (CIPM, 1988 1: 17-19) that the cost of relocating urban areas is about 3.1 billion yuan per square kilometer, or approximately the same per unit area cost as the rebuilding of Tangshan, a northeastern city totally devastated by an earthquake in 1976. However, as Fang and Wang point out (1989: 85), the latter city was built on level terrain compared to the rugged terrain in which nearly a dozen county seats and scores of towns will have to be relocated together with their infrastructure of roads, water supply, etc.

### Conclusion

Despite the major investment of time and effort by Chinese and foreign experts in determining the feasibility of the TGP, serious conceptual, informational and moral shortcomings remain, particularly with respect to the problem of resettlement. From the cursory cost-benefit study that was made (Luk and Whitney, 1988), it is by no means clear that the benefits of the TGP outweigh the costs. The large number of potential costs that have not been acknowledged or evaluated in the resettlement proposal must be included in any adequate evaluation of the TGP. These will undoubtedly make the scheme even less economically attractive than its proponents maintain.

There is also the human rights question. Should hundreds of thousands of people be moved against their will and with inadequate compensation to less attractive and economically inferior upland areas? Specifically, should they be moved when most of the benefits derived from the flooding of their ancestral lands and towns will be allocated to people in distant provinces downstream?

Despite these objections there is, as is often the case with large projects in other parts of the world, the symbolic benefits of a large dam which has a nonmonetary value perceived to exceed all other costs. Such may be the case in China and the dam will be constructed regardless of the monetary, environmental and human costs involved. ■

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Papers are now being invited on these issues, but other areas could also be considered. Submission date is now extended to July 30, 1992.

### Procedure

A 200-word abstract should be sent to the editor by end of June '92 and the deadline for submission is July 30, 1992.

The paper length may not exceed 15 pages (double-spaced).

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