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MAHAWELI : WHAT NEXT?

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Synopsis

The Mahaweli development programme is now at an important watershed. Expenditure to date has been massive and a large amount of finished construction stands in concrete and iron. A considerable amount of generated power is injected into the national grid. Although technical problems besiege some power projects the most disturbing issue is the deceleration of progress on irrigation and land development. The inadequacy of large scale financing and an overall dissynchronism in the project plan itself are at the root of this. The exacerbation of the ethnic conflict negates the hopes of successful future land settlement. On another front, the prospects of industrial growth through a market economy, also look gloomy. This situation now needs to be addressed as a totality and some difficult decisions made regarding the most rational course of action to follow from here onwards. The rational division of resources between downstream development and other economic activities such as industrialisation must be reconsidered in a state plan. The objective of this article is to explore some of these issues in respect of the future of Mahaweli development. Although in reviewing options some critical references to the Accelerated Programme become necessary, a systematic critique of the Accelerated Programme is not undertaken in the article.

Introduction

The UNDP/FAO Mahaweli Master Plan (MP) was finalised in 1969 and a leisurely course of development ensued in the first phase consisting of barrages and small power plant (Polgolla, Ukuwela, Bowatenna and Canyon) and Kalawewa (system H) irrigation. The subsequent Accelerated Mahaweli Programme (AMP) sought to complete five headworks, add 515 MW of electrical capacity, provide irrigation and institute settlement in 330,000 acres of new land and benefit 190,000 acres of developed land within a time span of about six years.

The AMP has now been close to eight years in implementation and a large part of the headworks and power development is complete and about 60,000 acres of land in the Mahaweli Command Area brought under cultivation. With the completion of work at Randenigala in 1987 and Rantembe in about 1989, and provided Kotmale does not turn out to be a chronically problematic site, the headworks and power development components will be completed within about 10 years of AMP initiation - a more realistic figure, even in respect of the more easily speeded up headworks, than the politically motivated original five to six year estimate.

Downstream development, however, is proceeding more slowly and its future is critically dependent on a number of uncertainties. A not unreasonable official estimate¹ is that about 22,000 acres of new paddy land will come under

the plough each year over the next decade. However, a number of contradictory issues and priorities arise in this respect.

Outlay on the project has been massive, in excess of Rs. 40 billion by the end of 1986. It is to be anticipated that the continuing demands of the as yet incomplete works will steadily push this figure towards a final ceiling in the region of Rs. 60 billion. The general belief that funding has been overwhelmingly in foreign grants and soft loans is misleading. Although so far these resources have contributed a major share of funds, budgetary provisions have also been significant. Furthermore, ratios of foreign grants and soft loans to budgetary provisions, including foreign loans raised at commercial interest rates, will reverse their quantitative relationships magnifying the latter in respect of future works. This is a consequence of the infrastructural and small-construction character of the majority of down stream developments awaiting implementation.

Not only the benefit to cost relationships in respect of the specific projects but also the effects of intensive commitment to one programme squeezing resource availability for industrialization and alternative power and irrigation projects are matters deserving critical assessment. The worsening debt-service ratio is the primary indicator motivating this squeeze. It manifests a condition that has already been created, and as sub caption Investments & returns will point out, the past lies as a heavy burden on the options for the future.

Strategic-Political Considerations

The economic motivations for the AMP were threefold; to curtail the large amount of foreign exchange used in the import of food, to overcome an acute shortage of power and to alleviate the problem of rising unemployment. There were also considerations of a more strategic and political nature which underpinned the direction of government economic activity. While the substantial economic aspects are taken up in the next section some remarks in respect of the second set of considerations are made here.

The present government committed itself in 1977 to a strategy of industrialization through private enterprise. Economic incentives to private capital formation, dismantling of restrictions on freeplay of internal and external market economic forces and the creation of a commensurate political climate were given high priority. There is now considerable debate between those who contend that the policy has been a dismal failure by its inability to attract adequate local and foreign investment towards capital formation and those who contend that a strong base for continued growth has been laid. For the purposes of this article it is possible to skirt round the central themes of this

debate and take note only of one aspect which is not likely to be a matter of contention. This is, that commitment to a political strategy which precluded large scale state investment and intervention in industrial and commercial development, pointed the economic activities of the state (and utilization of the large foreign resources it could raise) in the direction of infrastructure development and massive projects which were clearly outside the scope of private capital.

Secondly, the government gauged correctly that for ideological reasons it could mobilize a high degree of goodwill in Western capitals and that it would be able to translate this into cash terms. Whether at the time it miscalculated the scale of counterpart funding requirements and the weight of debt servicing is not possible to tell, but their subsequent magnitudes have been considerable.

The government also understood that the conversion of this goodwill into funding would require the identification of activities which would contribute to the relief of depressed sectors of the economy in the donor countries themselves. The construction sector was a prime candidate in this respect with the added advantage that agricultural and power developments are not export competitive with donor industries. Once again it is not possible to tell whether the significant inflation of construction costs when contract award is restricted to the donor country was foreseen. However, there is little doubt that this has occurred with contracts not subjected to international competitive bidding.

This introductory perspective suggests in summary that the formulation of the AMP was not exclusively determined by economic needs. Rather, the interaction of economic needs, a specific ideological orientation and the opportunities and limitations of preferred international linkages mediated a specific version of Mahaweli development.

Investments and Returns

Breakdown of costs, cash flows, external contributions and other details are available in official documents although it is not always possible to easily construct an accurate componentwise picture in respect of all projects. For example, it is not possible to disentangle from the body of official statistics, an estimate of to what extent the exchequer has been compelled to resort to foreign borrowing at commercial rates for meeting the budgetary cost components of projects by conversion of foreign funds to rupees.

The following table gives an approximate estimate of some important financing components for several projects. The estimates are approximate in that actual cash flows occur year by year (factor costs) but their meaningful

aggregation must refer to a common base, an exercise which has not been performed here. The conversion of foreign grants and loans to rupee equivalents should also be done preferably at the particular exchange rates prevailing at the relevant transaction dates of each tranche. Notwithstanding these limitations the table below does throw considerable light on certain issues.

PROJECT FINANCING ARRANGEMENTS (Approximate)

Project	(a)	(b)	Difference (a) - (b) Rs. M.	(a) - (b) as a % of (a)
	Estimated Total Cost Rs. M.	External Funding Rs. M.		
Victoria	8000	4800	3200	40%
Kotmale	8800	5800	3000	43%
Maduru Oya	2700	1500	1200	44%
Randenigala	4700	3600	1100	23%
Rantembe	1500	n.a.	—	—
System C	4500	3700	800	18%
System B (LB)	5700	4700	1000	18%
System B (RB)	4700	3000	1700	36%
Transbasin Cnl.	n.a.	2200	—	—
System G	300	25	275	90%

An AMP overall figure of about 28 to 33% for the portion of costs which have to be met from budgetary provisions is therefore a very reasonable estimate. However, in respect of anticipated commitments over the next five years, foreign assistance will fall to about 57% and governmental provisions rise to about 43%.

The government's (a) current account surplus (that is revenue less recurrent expenditure), (b) capital expenditure, (c) total external resources including grants, loans and commercial loans and (d) grants and project loans only, are tabulated below for the years 1982 and 1986.

Year	Rupees Billion			
	(a) Current A/c Surplus	(b) Capital Expenditure	(c) Total External Sources	(d) Grants, and Project Loans
1982	-2.3	18.7	8.8	6.6
1983	1.3	21.7	11.	8.6
1984	8.5	19.7	11	10*
1985	3.0	24.2	14*	10*
1986	4*	26*	15*	10*

* Estimated

The capital expenditure in (b) and grants and project loans in (d) are inclusive of Mahaweli. Since the current account surplus and external sources are inadequate for financing capital expenditure, domestic borrowing is resorted to. To conclude whether a part of the government's own contribution to Mahaweli capital formation should effectively be considered to have come from foreign funds raised at commercial rates would require the processing of more data than is currently available. The relationships in the above table are, however, suggestive that this is the case.

Computation of benefit to cost ratios may still be considered premature, but a word needs to be said in respect of the basis of computation. It has been suggested that where outright grants or soft loans have been employed computations should be made with corresponding small or nil allocations on the cost side in respect of these components. In effect, this basis of using an accounting rather than an economic opportunity cost basis for project evaluation is unsound. Although, admittedly, Western goodwill and support was not freely convertible to any form of capital formation whatsoever which Sri Lanka may have requested, it would nevertheless have been transferrable within a certain range of activities or within alternative structurings of Mahaweli development. Hence, irrespective of the actual grant or soft loan facility that may have de facto been provided, appraisal of Mahaweli projects must proceed on an opportunity cost basis.

The benefits to be derived from the AMP must be similarly valued on the basis of their real economic contributions. An indication of expected benefits of power and rice production are derived in the following paragraphs.

Mahaweli generated electric energy should similarly be valued as replacement for equal quantum of electricity generated at a modern coal fired conventional thermal power station which could have served as an alternative project. Falling oil prices have held world coal prices in check at about US\$ 40 per ton (1986) including transport, and price escalations in the medium term are likely to remain small. At an efficient (38.5%) modern station, a ton of coal produces 2.81 MWH of electric energy, translating as 1.42 c(US) per kWh. Capacity costs of thermal power stations have also held steady at about US\$ 800 per kW installed for unit sizes of interest here and assuming simple straight line 20 year capital defrayment, a 12% interests rate and a 70% plant load factor, the capital component of energy costs is about 1.44 c(US) per kWh. Adding 20% to the sum of fuel and capital charges for O & M and administrative costs, hydro energy replaces a thermal alternative costing 3.43 (US) or about 85 c (Sri Lanka) Per kWh at 1986 prices. The economic value of power from the principle AMP projects is then as follows:

<i>Project</i>	<i>Average Annual GWH</i>	<i>Annual value of energy Rs. Mill.</i>
Victoria	780	663
Kotmale	455	388
Randenigala	525	446
Rantambe	250	213
TOTAL:	2010	1710

Obviously for economic valuation as described here, rather than power planning, average energy and not the smaller firm energy (1610 GWH total) is the correct quantity to use. The pre-AMP Ukuwela and Canyon plant have not been included and a potential of 36 GWH at Maduru Oya and possibilities of Stage II extensions at Victoria and Kotmale have not been considered.

This Rs. 1.7 billion return on the previously tabulated overall project costs is not resoundingly attractive. Conversely, a 350 MW coal fired station at a capital cost of about Rs. 7 billion and with fuel costs of about Rs. 15 billion (discounted to 1986 rupees) spread out over a 20 year life span would have generated the same annual energy for this duration. It is true that apart from energy, capacity (MWs) too should be considered separately. Mahaweli hydro plants do indeed add a larger MW capacity to the system than the comparative thermal plant mentioned here. However, the Sri Lanka supply system is energy constrained not capacity constrained and therefore, the marginal utility of the latter is theoretically zero.

Clearly therefore the full justification of Mahaweli development leans on the multipurpose character of the programme and depends very much on substantial rice production. Of course in theory if 300,000 acres were opened for cultivation, 450,000 acres asweddumized in the two seasons and 460,000 mt (metric tons) of rice valued at between Rs. 2 and Rs. 3 billion (including freight) equivalent in rice imports substituted for, a major improvement in benefit to cost comparisons is depictable.

It is here that the first major difficulty occurs. The country is already near self-sufficient in rice — for example in 1984 only 38,000 mt were imported in comparison with domestic production of 1.69 million mt of rice. The increase in rice production has been sustained over several decades under the stimulus of improved production methods, provisions of irrigation facilities, use of high-yielding varieties and price incentives. Those critics of capital intensive irrigation investment, who feared that a more productive generalized emphasis which included small-scale and traditional sectors may be neglected in the rush towards large projects, have been proved more correct than they expected. The sustained general effort has turned the trick even before Mahaweli came on stream!

Rising population will increase rice requirements in the medium term while long term requirements will be affected by fertility rates and changing food habits. Rising productivity will continue to provide some of these additional needs leaving little justification for massive short term increases in rice production. The possibility of rice exports may be considered but if export promotion is the objective, rice is far from the ideal commodity.

Superficially, the need to maximize returns on the vast investments, that have already been made, motivates continuing rapid investment and the quick completion of down stream developments, but the possibility of gathering the fruits of these investments is complicated by the problematic reality outlined in the foregoing paragraphs.

Debt Servicing and Industrial Investment

Some further information on the national economy is relevant to some aspects of this conundrum. The debt-service ratio measures amortization and interest payment on external debts as a percentage either of gross export earnings of goods and services only, or alternatively of goods, services and transfers; the former is the more significant figure. In 1986, the debt service ratio stood at about 30% or 25% respectively on the two bases; its quantum about Rs. 11 billion. Mahaweli projects, of course, account only for a part of these charges on the external earnings but their importance will increase in the 1990s when the grace period on some of the large loans ends.

The Rs. 11 billion debt service in 1986 may, for order of magnitude purposes, be compared with the total cumulative private foreign investment actually contracted between 1978 and 1985, Rs. 12.5 billion, inclusive of GCEC and FIAC zones. The figures are not strictly comparable because they need to be deflated to the same base year, but the order of magnitude comparison is telling. This may also be compared with the shortfall in respect of merchandise imports and exports in the balance of payments (the trade deficit) which since 1982 has been in the region of Rs. 20 billion per annum, except for 1984 when it fell to Rs. 10 billion thanks to unusual export prices.

Improvement in export earning capacity and curtailment of further large capital intensive investment programmes will help to reduce the debt-service ratio, which otherwise looks dangerously poised to take off into the 35 to 50% range in the coming years. However, if commitments to the completion of Mahaweli headworks, downstream developments and other large infrastructure projects such as highways, communications and watersupply, are sustained the state will easily paint itself into the corner where its ideological antipathy to involvement in industrial expansion becomes a self-fulfilling necessity because

of its inability to admit new industrial investment options without further eroding the debt-situation. The paradox, however, is that only export oriented industrialization and upgrading of the traditional export sectors (tea, rubber etc.) can turn around the dismal balance of payments scene in the short-run.

The first set of difficult decisions regarding the way to proceed from the given situation now emerge.

- a) Abandonment of the simplistic and sanguine hope that a partnership of local and foreign private capitalists will achieve the requisite degree of national industrialization and abandonment of the ideologically motivated policies of non-intervention of the state in industrial enterprises with commercial orientation.
- b) A shift of policy towards balanced large scale state investment in industry, infrastructure, the traditional sector and large projects with a view to redressing the debt crisis, improving export performance, meeting domestic needs and acquiring technology — essentially the question of planning and broad basing the economic functions of the state.
- c) Specifically, in consequence of those changes, a more labour intensive, less foreign assistance dependent and decentralized democratized approach to downstream irrigation, land development and settlement in the remainder of the Mahaweli programme.

Land Development and Electric Power

Any shift in downstream development towards a more labour intensive, less foreign currency dependent technology raises most dramatically not the issue of technology per-se nor that of more problematic management, but that of popular participation. Mobilization of a popular mass base for tasks such as land clearing, irrigation extension at the small-end, irrigation development and final settlement is a technologically flexible modus. Organization can be flexibly matched to a range of technology levels which in turn will be determined by what technology can be procured with the permissible level of foreign resource use. Experience elsewhere has shown that unrealistic extremes of the notion of self-reliance are retrogressive but the notion of a degree of self-reliance is essential to such mobilization.

However, this calls for fundamental national organizational reformulations and the engendering of the necessary ideological motivation. For example, the creation of collective labour units which can clear and develop a land section, raise infrastructure and subsequently settle on the land requires a

new approach to labour organization. The distribution and management of Mahaweli water, within the scheme of things envisaged here, requires the co-operation of centralized and local (or possibly three levels) of activity and a corresponding devolution of power and democratization of procedures. It should be mentioned in passing that what is envisaged here has little to do with simple village self-help schemes or the restoration of traditional customs.

It is doubtful if these ideas can be translated into practical form without a major break with the prevailing get-rich quick free market ideology. Without a major revision of mass ideology and without the active involvement and participation of the national political leadership in these ideological mutations, the mass enthusiasm necessary to carry through this programme cannot be evoked. On the contrary, serious social conflicts between interest groups, including on the one side contractors looking for additional construction projects and their patrons and grass roots people's organizations on the other, are likely.

This change of strategy may to some degree slow down the progress rate in some of the phases of downstream development and settlement, but in a context where official estimates now speak of a mere 22,000 acres of new land coming under the plough each year and of a decade long implementation period, nothing is really lost and a great deal is gained. Already expensive structures are in place and though their power generation capacity can be tapped, their agricultural potential remains under-utilized. Capital intensive expenditure on the large canals and waterways merely augment this idle capacity until the decade long land settlement process reaches fruition. The removal of this dissynchrony by the organizational and technological shifts suggested above will release critical funds for industrialization without adversely affecting the actual, modest cultivation expansion targets.

That the Planning Ministry is turning a deaf ear to new project proposals for reasons of debt-service and counterpart funding difficulties, needs repetition at this point. Whether funding resources released in this way will be used for state supported industrialization is a larger question to which attention has already been drawn.

Returning to the question of dissynchrony between AMP component projects, the deferment in garnering returns to investment and the previous analysis that a particular version of Mahaweli development flowed from a combination of economic and strategic-political reasons, raises the question of whether a different sequencing of headworks and downstream developments would have been more desirable. In the light of the discussion up to this point it would be difficult to refute the view that instead of taking three major headworks in hand simultaneously and following up on the heels of this with the

fourth, a more staggered ordering of headworks and land settlement (the total number of families settled outside system H so far is only about 16,000) would have resulted in greater benefits.

To sustain this view, however, the urgency of the demand for hydro-generated electric energy would also have to be taken into account. This turns the discussion to the thorny issue of Kotmale which certainly was the most suitable candidate for rephrasing.

The hydro-energy capability of the CEB system without including any of the AMP projects, which came on line in 1984-86, is about 1500 GWH — actual hydro generation in 1983, a lean year, was 1220 GWH. In the same year oil fired thermal energy to the tune of 900 GWH was generated at opportunity costs in excess of a billion rupees. The previous four years was a similar period of chronic shortage and the total oil fired thermal generation (1980-84 inclusive) has been just over 2000 GWH at a cost in excess of Rs. 3 billion. The appearance in quick succession in late 1984 - early 1985 of AMP hydro generation sources made possible the curtailment of gas turbine and other thermal energy and the release of suppressed demand. However, this temporary surge of excess capacity — no large scale system augmentation will now be needed before 1989 — could have been profitably traded for an alternative which is more reliable and the first units of which could have come on line about two years earlier.

Kotmale was always known to have been a problem site due to adverse geological features. After long delays in contract award, investigation by expert panels, last minute design modifications to relocate the dam position, scaling down of the headworks by 30 metres after construction commenced and cost escalation from a June 1979 estimate of Rs. 5.6 billion to a current Rs. 8.8 and still climbing, the power plant was commissioned in 1985 only to be taken out of service again. The several problems that have been experienced at this site cannot be treated as unforeseeable bad luck that could occur on any major construction project however well planned. A reasonable charge of excessive haste can be laid.

A considerable amount of preparatory work had been done on the Samanawewa project long before work commenced on Kotmale designs. There is every reason to believe that Samanala generation could have been on the bus-bars two or more years before Kotmale finally made it, thus saving about Rs .2 billion in thermal generation costs in the early 1980s. It is very difficult to understand why this mix of Mahaweli and non-Mahaweli projects was not pursued.

Ethnic Considerations.

A discussion of the future of Mahaweli cannot be complete without some comments on its bearings on the ethnic conflict. That without a settlement of the racial conflict the colonization programme will be disrupted is a truism that needs little repetition. While similar remarks may be true of all economic sectors the factor of geographic coordinates invests the Mahaweli programme with a special urgency in this respect.

Two further extensions of this matter have to be given careful consideration. The first matter pertains to the question of devolution and decentralization which has already been raised. Structures of management and agricultural rationalization have to be worked into the political and constitutional settlements which will invest the Tamil people with administrative autonomy in their traditional homelands as a part of any foreseeable settlement. Decentralization of power to the grass roots level is a broader democratic necessity in any case and the ethnic conflict merely underlines its urgency. However, in a complex modern society decentralization has to go hand in hand with hierarchical mechanisms of coordination. That is to say questions of what crops are grown, when they are grown, technology, support and water management, require some up-down rationalization at local, regional and national levels. Grass roots, regional and central organs of agricultural management and decision making have to be formed and their powers worked out. The geographical overlap of Mahaweli, especially the wider expanse covered by the UNDP Master Plan to which attention may turn again in later decades, increases the importance of these considerations.

The second matter pertains to the "sharing of waters" — that is the concept of sharing of benefits. The lessons of the conflict between Punjab and her neighbours regarding the usage of the waters of the Sutlej and Beas rivers should not be lost to us. Given that the only realistic basis for the settlement of the ethnic conflict is the establishment of an autonomous Tamil region, whatever its name, and given that most of the headworks stand outside this region while a large part of the land to be developed is in or borders the Eastern Province, while ultimate extension as indicated by the Master Plan includes the Northern Province, the sober discussion of the apportionment of irrigation and power benefits between the two constituent units of Sri Lanka is by no means premature. Agreement now reduces irritation and conflict later.

These remarks, like indeed the whole body of this paper, is based on the assumption that the secession of the Tamil people can be avoided. What to do about Mahaweli, or for that matter anything else, in the alternative eventuality, is something far outside the scope of this discussion.

Conclusions

The article has reviewed the present status of the Mahaweli Project within the total context of the nations economic and political situations. The correct perspectives for the next phase of activity can be reached only through such an approach.

This approach has prompted the following conclusions.

- a) The State must broadbase its economic role and abandon the policy of exclusive faith in private industry as the instrument for expanding the industrial base of the economy.
- b) The debt-service ratio and the serious balance of payments situation, to which Mahaweli investments have contributed considerably, cannot be turned round except by a broadbased strategy.
- c) Capital intensive, heavily foreign investment oriented, contractor-lucrative technologies must be curtailed to the greatest extent possible in downstream development and a concerted effort made to utilize labour intensive alternatives and to enthuse popular participation.
- d) The reasons for the incorrent decisions made in respect of hydro-power expansion must be fully investigated so that such mis-planning can be avoided.
- e) In recognition of the achievement of near self-sufficiency in paddy, urgent consideration must be given to the possiblity of agricultural diversification in new land development.
- f) The management of water, rationalization of cropping and sharing of power and other benefits must be settled within the solution package of granting autonomy to the Tamil people as part of a lasting solution to the ethnic conflict.

The article has used statistical material and other inputs from several sources, mainly those listed below. At times there has been uncertainty regarding some specific figures but it is believed none so serious as to vitiate the fundamental arguments developed here. In any case data has always been rounded to two or three significant figures so as not to detract from basic concepts.

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