

# DOWNSTREAM DEVELOPMENT IN THE ACCELERATED MAHAWELI DEVELOPMENT PROGRAMME

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## Introduction

Besides the construction of a series of reservoirs with hydro electricity plants as envisaged in the Accelerated Mahaweli Programme, the complementary part of the works consist of the development of large extents of land in the downstream areas with irrigation facilities, establishment of new settlements and the agricultural development of these areas. For this Downstream Development the headworks provide the necessary waterstorage and riverflow regulation to safeguard watersupply to the subsystem's main reservoir all through the seasons.

Downstream Development focuses on the settlement of evacuees from the headworks construction-sites, settlement of selectees from wet-zone landless applicants and the resettlement of former inhabitants of the area now brought into command of the diverted Mahaweli waters.

Downstream development would include the following activities:

- \* construction of the necessary roads, canals, buildings and other structures as well as smaller reservoirs serving the storage and distribution of irrigation water in the development areas.
- \* Organisation of operation and maintenance of the irrigation and other infrastructure.
- \* Management of all other activities related to the agricultural and irrigation practices of the settlers.
- \* Provision of social infrastructure and services to the settlers (health facilities, schools, commercial areas, banks, post-offices, etc)

The combination of the above mentioned fields of attention and the fact

that they are simultaneously taking place over widespread areas cause this part of the Mahaweli Programme to be very complicated. Though the headworks may seem to require most technical skill and knowledge, the downstream development of a large scheme like Mahaweli not only proves to require very high capital expenditure but also a multi-disciplinary input of expertise to achieve the goals set at the start of the project.

The fields of attention featuring this downstream development, and the complexity and relative importance of this part of the works are discussed briefly below and the major problem areas pointed out.

## Description of successive activities

With the decision to bring the areas of System H, C, G and B under irrigation and to initiate agricultural production through settler-farmers a long process of planning and implementation starts. The basis for all activities is the information gathered through feasibility studies and Project Implementation Reports. The results include guidelines for layout-design and construction, information about soil types their locations, topographical maps of the area, sociological and other surveys on the pre-project situation.

After selective jungle clearing and rough land levelling the construction of tanks, canal network, roads and buildings is started. These activities are coordinated by the Mahaweli Engineering and Construction Agency (MECA) and predominantly executed by local contractors. Sometimes foreign contractors execute the construction work (e.g. part of System 'C' is constructed by a Japanese contractor and Canadians constructed the dam of the Maduru Oya Reservoir). In Zone 2, System 'C' part of the canal excavation work was done by worker-settlers; prior to the settlement of their families the farmers could in this way earn an extra income in their future home-land.



*An anicut in the downstream areas for regulation of water flows for irrigation*

When the construction phase has ended the management of the area is handed over to the Mahaweli Economic Agency (MEA). Both MECA and MEA operate under the Mahaweli Authority of Sri Lanka (MASL).

Settler families then move into the area and build a temporary dwelling on their 0.5 acre homestead. They are given a small subsidy for this purpose, as well as for the construction of a well and a latrine. On their 2.5 acre paddy-land plot only bund marking and rough levelling has been done prior to their arrival so that the actual bund formation and fine levelling of the basins has to be finished by the farmers before the first issue of irrigation water. The settler families are given World Food Program assistance until their first crop is harvested. For this first crop the plots are ploughed by the MEA and free seed paddy (high yielding varieties) and fertilizer is provided to them.

In the meantime agricultural services are organised by the MEA, as well as other facilities such as schools, health facilities, post-office, credit facilities, stores and the roads remaining to be constructed. During and after the first irrigated crop-production it becomes clear which farmers have difficulties in getting sufficient quantities of water, where drainage problems occur, at which places canal reconstruction is needed and which organisational problems need to be tackled.

Extension for staff and farmers is planned to improve agricultural practices and water-use efficiencies in the area, and also on subjects related to community development, hygiene education, income generating activities and financial management.

The commercial banks providing the settlers with cultivation loans keep a close watch on the recoveries of their loans and

do not provide new loans to defaulters. If a farmer sells his harvest to the Paddy Marketing Board the worth of the paddy is lowered according to the outstanding loan at the bank and the remainder is paid to him.

Maintenance of the systems (desilting, structure and canal repairs) is executed in the inter-seasonal periods. Minor repairs are given on contract by the MEA, major repairs are handled by MECA on request from the MEA. Protection of forest reserves, reforestation and soil management in order to prevent soil erosion and degradation are also co-ordinated by the MEA.

With the lapse of time the systems should become stable and high producing areas in which the MEA runs the maintenance and operation of the system with the profits made through agricultural production and related industries.

Through observations made in the Mahaweli Project some features of Downstream Development were identified which could constrain the development to its present stage as well as affect economic prospects in the longer term. The following section focusses on these features, which though not arranged according to their relative importance, are set out chronologically as related to the successive stages of development.

#### Constraints on Mahaweli Downstream Development

The interaction of physical and social factors in settler development and irrigation management make it extremely difficult to trace causes or assign blame. It is not the intention of this section to harm or accuse persons by mentioning these problems. An open discussion of development constraints is needed if one wishes to counteract them and is therefore of crucial importance for the successful completion of the programme.

#### Pre-construction period

Problems arising during the construction and post-construction period may find their cause in activities (not) undertaken in the pre-construction period.

Among such problems are:

- \* Illegal, large scale timber extraction before and during jungle clearing which results in unnecessary deforestation of areas outside the future settlement area, causing:
  - heavy erosion of upper parts of the area,

- degeneration of denuded soils by physical and chemical weathering
- future fuel wood shortages

- \* The production and use of inaccurate soil — and topographical maps of the area resulting in construction errors and unexpected soil-related problems.

Basic information with huge implications for future construction and irrigation design should be subject to strict quality control. Misplaced irrigation-structures causing insufficient water-inflows in canals, out of command areas in the area planned to be under irrigation and blocked canals because of non or uphill sloping canal beds are examples of mistakes made because of inaccurate pre-construction information gathering.

#### Construction period

A high quality of construction is a sine-qua-non for a smooth operation and maintenance of the system in the post-construction period.

With the boom in construction work due to the acceleration of the Mahaweli Project it became more difficult to be critical about the selection of contractors to execute all the works to be done. This was also reflected in generally poor quality control during construction.

A factor aggravating this situation is the role that non objective criteria could play in the assignment of contracts. Such non objective influences eliminates the prerequisite of a contractor's good reputation based on former successfully executed contracts and gives the contractor a free hand in deliberate quality reduction which renders them the profits of off-hand sale e.g. cement. In case a more remunerating contract is accepted simultaneously with one already in execution, labour and means are often extracted from the latter to serve the former, which may cause serious delay in e.g. maintenance and repairworks in which the time factor plays a major role.

With construction works progressing at a high pace in widespread areas of the project it becomes difficult to maintain a very close supervision of what is happening at the construction sites. A weak supervision could propagate the use of inferior materials or improper quantities of valuable materials and therefore has adverse effects on the quality of construction.

The fact that the system is handed over, from the first (MECA) to a second agency (MEA) once its construction has largely been completed creates problems especially for the latter organization. A

division of tasks is good in itself by should not result in lessened attention for the long term problems that might result from failing construction quality control.

A large scale income providing programme like the Worker-Settler-Programme is difficult to bring into practice successfully because of the effect it would have on the interests of local contractors who will therefore try to interfere and destroy the programme. Another factor obstructing a programme like this is the status-awareness of farmers, which hinders them working as labourers.

#### Post-construction period

The problems related to the technical infrastructure in this period can be grouped into two categories:

- \* Lack of maintenance of canals roads and buildings. Desilting of canals, repair works, reconstruction of wrongly placed and dimensioned or damaged constructions should be initiated by MECA and MEA in the inter-seasonal periods without delay. Delay causes malfunctioning and further degeneration of the system and suffering of individual farmers.
- \* Difficulties in the operation of the system. The layout of the canal network is based on serving the largest possible command area with water and therefore requires a minute control of the waterlevels in canals, tanks and levelcrossings in order to release enough water to each part of the system.

Difficulties in getting water in tail end canals and other parts of the canal network are determined by:

- construction errors
- soil problems and insufficient lining
- lack of maintenance
- improper operation of the regulation and measuring devices.

A proper assessment of the amounts of water flowing in all canals can only be made through an intensive measuring programme carried out during each season. Without flow measurement no equitable and guaranteed water supply to each individual farmer can be guaranteed, and a justifiable water-tax can hardly be imposed on the water users. Water availability is the key-word in irrigated agriculture but a profound analysis of the causes of unequal and insufficient availability of water is not possible in this article. However, some of the factors will be highlighted here. Upto the level of the Production Unit or Turnout in which 12 to 20 farmers have their allotment, along a collectively used field channel, the allo-

cation and distribution of irrigation water falls under responsibility of the project management staff. Below this level distribution among the individual farms is left, to the farmers through the person of a farmleader chosen by them for this purpose. Practice shows that as soon as the water-supply to the turnout becomes insufficient an equal distribution among farmers is in danger. Unfortunately situations of inadequate watersupply often occur especially during Yala-season (dry season) when severe water scarcity prescribes efficient use. These inadequacies are mainly caused by internal difficulties in the system's operation.

Although flow measurements are executed in the canal system these appear to be insufficient and inaccurate due to a limited amount of measurement structures of which many have been improperly installed. A proper assessment of flowrate in the canals is not obtained and therefore an equitable and guaranteed watersupply cannot be safeguarded and no justifiable water-tax can be imposed on the water users.

Present procedures rank rather low on formality, information and control and in addition they are severely enhanced by a slowly deteriorating infrastructure due to construction errors, lack of maintenance and disruption by discontented farmers.

The turnout problems start when so called tail-enders (cultivating a small number of allotments on the field-channel end) are deprived of sufficient water through top-end farmers adverse behaviour — scrambling for water, breaking structures, neglecting maintenance etc. — which can be explained by the way in which the upstream canal system is managed and the consequent uncertainty of supply.

Representative farmers, (being unremunerated, have little incentives to do any work and even less to attempt to confront) do not always take action against top-enders who take excessive water or persons failing to clean their section of the field-channel. They have no legal power to enforce decisions.

The preceding comments were mainly directed at problems relating to an improper infrastructure. These problems must not be underestimated, neither should their direct influence on the opportunities the settlers get to make a living in the first difficult years be overlooked. Unequal, insufficient or even lack of watersupplies to the irrigated areas have direct and severe implications on the well-being of the settlers and their families. The following comments deal with the above mentioned 'post-cultivation period' although they have no direct relation to the construction as such.

### Settlers position

A superficial look at the situation of the settlers in the Mahaweli Project gives an impression of bright prospects becoming reality within a short period after settlement. A 2.5 acre lowland plot, a homestead where additional food and cashcrops can be cultivated, a well to provide safe drinking water, a latrine for good personal hygiene and a subsidy for the construction of a temporary dwelling. All preconditions for a rapid development of the farmers towards surplus production, capital formation and a better standard of living seem to be available, including staff and services to guide them in all the necessary aspects of production and day-to-day life. However, a closer look at the situation reveals the hardships these families are facing. A hampered socio-economical improvement of their quality of life is directly reflected to the lowered and delayed benefits of the project as a whole.

It is doubtful if the provision of a Rs. 1,500 subsidy for the construction of a dwelling is the best approach towards good housing of the settlers. A large percentage of the settlers are living in huts that could collapse. Profits obtained from paddy cultivation do not seem to be sufficient in most cases to construct a brick house or even repair the temporary hut. The observations that some farmers are already inhabiting brick walled houses or possessing four-wheel tractors is rather misleading since the starting position of the settlers coming from the reservoir and dam areas (Victoria, and Kotmale) was far better than the one their colleagues were confronted with, since high sums of money have been paid to these evacuees for lost properties.

An observation of only several extremely well producing and prosperous farmers could be rather misleading since it will not reflect the average standard of living in the area rather it indicates the different starting positions of the three major categories of settlers and it illustrates that the original egalitarian set up of the Programme (each farmer 2.5 + 0.5 acres, same subsidies and assistance) does not work out in practice.

The evacuees, namely those with a more or less substantial compensation for their lost property are best off. This compensation serves as a useful and effective buffer with which these settlers can cope with the 'transitional' problems of settlement which are mainly of financial character. Moreover, this compensation may even suffice to serve as investment capital, which is a prerequisite for a 'take off' towards real agricultural capitalism.

The selected settlers namely those originating from various parts of the Island, are worse off. These settlers lack the capital backing and have to cope with what is made available to them in the settlement areas. Being formerly landless many of these settlers lack the experience of managing a farm on their own, which puts them at the mercy of what the extension services have to offer.

The resettlers, namely those who lived in these area, face their own specific problems of the necessity to adapt themselves to a newly superimposed irrigation system and community development. It is a heterogenous group of farmers ranging from experienced former colonisation-scheme-participants to tribal people deprived of their traditional chena-cultivation methods, and of course the latter need more attention and guidance than the former.

In spite of these differences in background financial capacity, etc. all participants in the downstream development are considered as equal and are treated as such. In this perspective scattered symptoms of prosperity in the form of brick-houses and four-wheel tractors may not be indicative of the average standard of living. (It merely indicates that some people make good profits in this system where there are also non-settlers. (e.g. private traders, shop keepers etc.)

Health of the settlers is of basic importance towards their ability to increase production and recover the investment made for them. Efforts to improve settler-health needs to be intersectoral and not solely handled by the Health Department. Health is related to all activities undertaken by the settler, including his irrigation and agricultural practices as well as his personal habits. Construction of a latrine is a good initiative but proves to be useless if its proper use is not guided by hygiene education.

Health problems in the process of settlement can be divided roughly into two stages:

In the initial stage of construction work and the arrival of new settlers, most health problems can be tackled by improving sanitary and hygienic conditions of the domestic environment and by distributing the necessary drugs. Bowel infections and respiratory diseases prove to cause the major health problems at this stage, since malnutrition is more or less effectively controlled by the provision of World Food rations (although these W. F. rations are often sold off-hand by settlers to generate some cash).

More structural and chronic problems arising from malnutrition (and the absence of proper Family Planning) are linked with the next stage of stabilization. The adverse effects of liberalised trade and the open economy on traditional households which are subjected to the increasing purchase of consumer items and commodities is reflected in the pattern of the settlers expenditure which sometimes show unlogic priorities. With the birth of a new child the mother tends to neglect her toddler since the new born required all her care and attention. Medical personnel and health volunteers find it difficult to convince these mothers of the usefulness of the concept of child-spacing. In such circumstances there is a possibility that settlers could head for a future in which the long term effects on health of a huge scale irrigation scheme will begin to surface. The exact impact of these effects are still unknown, but they probably could be caused either indirectly by processes of social differentiation or directly e.g. by the tremendous increase in potential vector-breeding habitats which is liable to increase the prevalence of vector borne diseases like Malaria. Obviously it will be insufficient to try to tackle these long term problems solely by medical treatment.

Questions could also be posed on the viability of 2.5 acre farms producing paddy (or other wetland crops), certainly regarding the statistical evidence of a crop failure occurring every 4 seasons and the inexperience of many farmers with capital intensive cultivation of high yielding varieties. Even assuming high yields the surplus production can hardly provide more than the income needed for day-to-day expenses of a family.

To create an independent class of middle peasants who are able to generate enough income from their agricultural production to overcome a crop failure, improve their standard of living and to invest profits in improvement or extension of local agro-based activities, a 2.5 acre plot is too small. This view is supported by some leading economists and agronomists and the issue has also been discussed among leading Mahaweli officials.

Because of the farmers' vulnerable position caused by factors such as the minimal means of production placed at their disposal, insufficient water supply, delayed input provisions, sickness, unadapted credit facilities and farmer's reluctance to sell paddy at guaranteed prices to the Paddy Marketing Board these factors can all have far-reaching consequences on their financial position and there is a fair chance that they could enter a "vicious circle" of indebtedness gradually but invariably leading to either renting and mortgaging their land or becoming sharecroppers.

The process of sharecropping may not seem that serious but it should be mentioned that sharecropping includes the sharing of risks between two economically unequal partners. With each crop failure or other serious set-back the tenant's economic existence could become more and more precarious. His needs for cash to buy the essentials may drive him into constant debt.

Despite their illegality the above mentioned practices of changing landownership appear to be widespread. It is always not known who is in fact cultivating land under a field-channel. Dealing with such a situation it becomes impossible to call those farmers to account, who neglect their part in maintenance work.

The quality and quantity of extension activities by the staff to improve, update and increase the farmer's knowledge on farm - water management, agricultural practices, financial management and hygiene education is of major importance for increasing production in the development areas. As a side effect intensive extension programmes promote contacts and mutual understanding between staff and farmers.

#### **Agricultural credit**

In the triangle of Commercial Bank, Paddy Marketing Board and private traders the latter appears to gain over the other two with respect to both credit-supply and paddy purchase; in spite of the fact that the private traders financial conditions of high interest and low paddy prices seems to be less attractive to the settlers. Some of the factors related to this phenomenon are given below:

#### **Commercial Banks:**

- \* The cultivation loans provided by the banks do not include a consumptive component. The character of rice cultivation, with the benefits coming at once and only twice a year, necessitates a detailed financial planning over the seasons. Many farmers fail in this planning, which forces them to buy consumptive goods on credit.
- \* C. B.'s do not provide loans to defaulters, not even during the first difficult transitional years after settlement. They only grant loans to persons who are backed by two guarantors, who have not defaulted themselves. The number of viable guarantors in the project area decreased rapidly in the first few years after settlement.
- \* Settlers are forced to insure their crop (for Rs. 300/=) before a cultivation loan can be granted to them.

#### **Paddy Marketing Board:**

- \* P. M. B. does not pay in cash. A cheque has to be cashed at the same bank at which the settler receives his loans. The settler's unrecovered debts are first subtracted from the value of the cheque and the balance is cashed.
- \* Farmers are afraid of tax-raising and therefore are reluctant to reveal their actual yield which will be registered if sold to the P. M. B.
- \* Sometimes farmers are forced to sell their paddy to private traders as fulfilment of their obligations to them after obtaining loans or purchasing goods on credit.

As soon as alternative loan-providing persons or organisations enter the Mahaweli areas a capital extraction from the project starts. Merchant capital, accumulated in the cities and business centres of the country is provided to indebted farmers by outside entrepreneurs. When they are paid back their loans plus interest either in money or in paddy the profits are invested in the business centre for the purchase of goods, in the worst case of imported goods. A quite fitting comparison with this process is the soaking of a (merchant capital) sponge in a fluid (local means or production) and squeezing it outside the bowl containing the fluid. This capital extraction process has severe consequences for local capital formation and related possibilities to invest profits in the farm to adapt more capital intensive agricultural practices or in the improvement of the settler's standard of living. Possibilities for local agro-based industries to develop and provide labour to the second generation are diminished.

The process is a drawback on the national-economic benefits of the project as the newly acquired means of production in the project are utilized for consumptive purchases of mainly imported goods. Thus these benefits miss their stimulating effect on agricultural and industrial development of the country.

#### **Management constraints:**

The field staff has to work under difficult circumstances in remote areas of the dry and intermediate zones. Only basic services can be provided and often the families of staff members are unwilling to reside in the project area. This situation has negative effects on motivation and job satisfaction of officers. Intensive communication with Colombo headquarters, regular visits of headquarter staff, job evaluation and supervision are important tools to cope with mismanagement.

Still as compared with the settlers the officers are living in much better circumstances. Their quarters are of good quality; jeeps and motor bicycles are available, their standard of living in all aspects are seen to be higher than that of any settler family. This difference could strengthen the mutual misunderstanding, create hard feelings among the settlers and possibly obstruct communication between the two groups.

A precondition for a good understanding of the problems arising at field level is therefore missing.

The basis for all policies initiated by the project staff should be the need to adapt the proposed measures to the needs and possibilities of the settlers. They determine the priorities to be chosen and the activities to be carried out by the project staff.

The acceleration of the project has aggravated the constraints caused by the management. A large number of staff are needed and the available group of senior, experienced and educated persons in the country is hardly sufficient to meet the present demand. The 'Brain-drain' to countries abroad offering better salaries aggravates the problem.

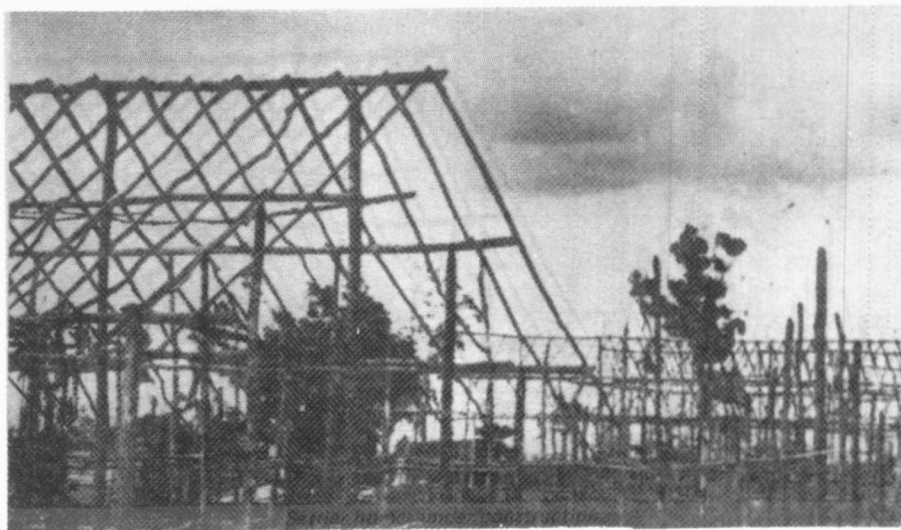
The giving out of contracts for maintenance and reconstruction works should not become a major activity for officers having the authority to do this as a part of their normal duties.

The Mahaweli Programme gives the impression of being mainly directed towards construction rather than actual settler development. The greater part of foreign aid is pumped into the hardware of the downstream works; and although plans for social infrastructure in all its aspects exist the real software of financial and agricultural extension and guidance seems to be mainly in the planning stage.

The enormous amount of foreign aid causes a situation in which there could be a tendency for money not to be considered scarce means. If this lack of sense of economy emerges it might easily evolve into a state of inactivity, which in its turn could bring about a lack of involvement in the effort to maintain an effective programme management. This process can have its effects down to the lowest levels of management and be enhanced by the inherent failure of policy — makers to produce positive impulses to lower management level either by compliments or criticism.



*Road construction with Local Labour in System "C"*



*Settler homes under construction*

Often the individual officer finds her/himself placed in a difficult position, due to:

- a low income in spite of a heavy burden of responsibilities
- the day-to-day life in a so called "difficult area", which they will not consider as a home as long as their family still lives in the urban areas.
- the frustration of sometimes working under a person who may hold the wrong position.

These factors could affect the well-being of the project staff and also the well-being of the settlers, since it enhances the temptation for officer to misuse or neglect their responsibilities.

#### **Conclusions**

The objective of this article was to show the complexity of problems arising in the Downstream Development of the Accelerated Mahaweli Programme. Each of the drawbacks observed can be effectively counterattacked once the underlying causes

have been studied in depth. Within the limits of the vast size of the area developing, existing political limitations on measures that can be taken, and the large number of staff and settlers involved in the development process, possibilities can be found to improve the observed situations and trends.

A precondition for improvement is the approval and encouragement for studies to be carried out that try to identify development constraints in further detail and maybe even more important, the frank discussion of these results at all staff levels. The increased awareness of processes going on in the project areas may then lead to adopt measures that can successfully tackle the problems observed.

The successful implementation of the Mahaweli Development Project will depend to a large extent on an open eye and mind of persons managing the Downstream Development this is one of the most challenging tasks to be executed in the Project.