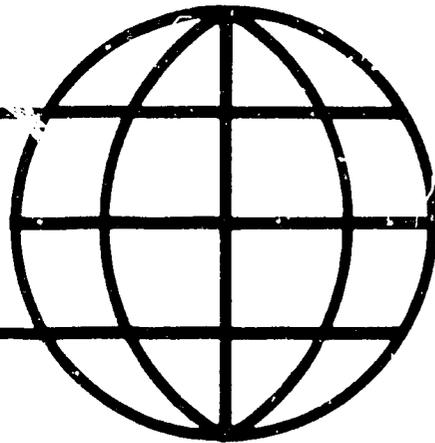


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**COOPERATIVE AGREEMENT ON HUMAN SETTLEMENTS  
AND NATURAL RESOURCE SYSTEMS ANALYSIS**

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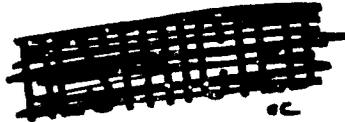
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**THE ACCELERATED MAHAWELI PROGRAMME (AMP)  
AND DRY ZONE DEVELOPMENT**

**REPORT NUMBER FIVE**



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## EXECUTIVE SUMMARY

### I. INTRODUCTION

The purpose of this series of evaluatory reports is to provide the Mahaweli family of agencies and U.S. AID with an independent and timely assessment of the strengths and weaknesses associated with the settlement component of the Accelerated Mahaweli Programme (AMP). While the AMP represents one of the most far-reaching and impressive land reforms currently under way in the world, and is characterized by such imaginative features as small irrigation turn-out units, at this time the settlement component is in serious trouble.

In 1981 we wrote that family members in the older Mahaweli settlement zones not only saw themselves better off than in their former homes, but also saw their situation improving on a yearly basis. We were also impressed by the apparent ease with which evacuees were adjusting, without suffering too many of the negative impacts that accompany programs of compulsory relocation. This upward trend for the majority has, at least temporarily, come to an end, in part because of the prolonged transition period between the end of the construction phase and the beginning of the development phase of the AMP. More specifically, this prolonged transition period is associated with a large number of problems (including deficiencies in the irrigation system, in land preparation, and in the provision of agricultural inputs) which adversely affect production and settler incomes.

Not only do such deficiencies adversely affect settler incomes but we suspect, for the first time, that they are also having an adverse effect on settler health, including mental health. For example, there appears to be an increase in stress-related deaths and in conflicts at both the household and community levels.

The focus of the current report is on the living standards of settler households in Systems H, C, and B and on employment generation. There is a close linkage between the two. Major multiplier effects of large-scale irrigation projects come not from agro-industry, but from the increased consumption by thousands of settler households of a widening range of locally produced goods and services. In other words, it is primarily the rising net incomes of thousands of farm families that is the primary fuel for accelerating and spreading the benefits of development. If net incomes remain at, or close to, the poverty level the potential of projects like the Accelerated Mahaweli Programme to generate further employment will not be realized. But if net incomes rise significantly over the years,

one can expect the increased demand of thousands of settler households to create employment opportunities for a still larger number of off-farm households.

In the early days of the AMP, employment generation may well have been the most important single goal of the government granted the President's emphasis on "Employment first, employment second and employment third." Yet very little systematic planning, let alone plan implementation, has dealt with either settler incomes or employment generation. Not only is poverty not being eliminated among the majority of Mahaweli settlers, but the potential of the AMP to generate employment has been consistently underestimated, while programs to increase off-farm employment have been neglected.

The major conclusion of our present assessment is that net incomes of the large majority of settler households in even the oldest Mahaweli settlement areas have not yet moved beyond the subsistence level. Indeed, in a significant number of cases living standards actually appear to be dropping at the very time in the settlement process they should be going up if the settlement component is to catalyze development.

Though the hour is late, we do not believe it is too late provided timely action is taken to correct current implementation deficiencies.

## **II. REASONS FOR STAGNANT OR DECLINING LIVING STANDARDS AND SUGGESTIONS FOR THEIR CORRECTION**

These include erroneous planning assumptions inherited from the early 1970s and more recent deficiencies associated with the Accelerated Mahaweli Programme.

### **A. Erroneous Planning Assumptions that Have Been Inherited from the Early 1970s**

#### **1. The Assumption that the Large Majority of Mahaweli Settlers Would Be Young Married Couples with Several Young Children**

The original assumption was that the large majority of allottees would be selected according to specific criteria from electorates throughout the country. Young married couples with several small children would be favored, hence delaying the onset of the "second generation" problem. Unfortunately this assumption was wrong. This is because the number of resettlers and of evacuees was seriously underestimated. All the evidence examined supports the conclusion that resettlers and evacuees make up a majority of settler households in all zones settled to date with the possible exception of the southern portion of System C. The relevance of this situation to

Mahaweli development is that the proportion of older children among resettlers and evacuees is much higher than among selectees from the various electorates.

The second generation problem already exists throughout the settled Mahaweli areas. Unless new job opportunities are created soon, first generation settlers will do what they have done in older Sri Lankan settlement schemes. They will subdivide their lands among their children. While this is a rational decision in terms of the welfare of the settler household, it is a decision which has adverse development implications due to increased emphasis on staple crop production for subsistence purposes, reduced sales, lower net incomes and less employment generation over the longterm.

**2. The Assumption that Only Family Labor Would Be Utilized on a 2.5 Acre Mahaweli Holding**

This assumption has been shown to be erroneous largely because the type of intensive cultivation of paddy and other food crops intended by Mahaweli planners requires, during certain peak periods, more seasonal labor than is available even to the larger families of resettlers and evacuees. Because the tight scheduling of farm operations on irrigated Mahaweli holdings requires settler households to carry out the same operations at the same time, the use of cooperative work parties that rotate their activities between fields has become increasingly uncommon. Conversely, the use of hired labor has become increasingly common, and can be expected to increase as more emphasis is placed on more labor intensive crops.

All the Mahaweli settler households in our sample hire labor at some point during both the maha and yala seasons. Though paddy is the least labor intensive of the major crops, our data would suggest that approximately 50 percent of all labor for paddy cultivation is hired, with the proportion being higher for maha than yala. With labor costs escalating in recent years up to 30/- per day without including food, hired labor has become one of the major expenses of the Mahaweli settler.

**3. The Assumption that a 2.5 Acre Paddy Allotment Would Allow Settler Households to Advance Beyond Subsistence**

Whereas all available evidence indicates that the first two assumptions were wrong, our conclusion that the third assumption is also wrong is still tentative. There are two reasons for this. First, current data on net incomes generated from the double cropping of paddy are insufficient. Second a significant proportion of settler households are still constrained from cultivating fully their 2.5 acre paddy holding.

Granted the fact that none of the first group of settlers in our sample have been able to crop their entire 2.5 acre holding on a regular basis, is it possible that they would be able to move beyond subsistence if their cultivation constraints were removed? Our tentative conclusion is "no." Currently it is unlikely that many families are netting over 10,000/- per annum from the double cropping of paddy. That is only 2200/- more than one agricultural laborer would make if employed for 260 days per annum with the differential being still less if the cost of food provided to that laborer was added. Furthermore, prices of inputs are increasing at a faster rate than are producer prices.

#### R. Corrective Suggestions

[1] Launch a major effort in the settled portions of the Mahaweli systems to enable settlers to fully cultivate their full 2.5 acre allotment. Only recently begun, such an effort in Zone 2 of System C already appears to be paying off.

[2] Obtain detailed data on the net income, under realistic Mahaweli conditions (as opposed to experimental conditions on research plots), of different production systems for settler households. To assess net incomes detailed data on all major sources of income and all major expenditures must be collected at weekly intervals. Only then can accurate estimates, for example, be made of the income generating potential of the double cropping of paddy. If that potential is insufficient to move a settler household beyond subsistence, then paddy cultivation should be integrated with other productive enterprises for the large majority of settler households.

[3] To increase net income at the household level, a major systematic effort should be made to diversify the settler production system not just in regard to crop agriculture but also in regard to animal husbandry (especially dairy production) and off-farm employment. Furthermore a wider range of production systems need be developed that move beyond the production of annual crops on a 2.5 acre holding. Possibilities include five acre irrigable holdings for dairy production, agro-forestry settlers on non-irrigable land, fishermen settlers and commercial tree crop settlers (cashew outgrowers, for example).

[4] Bearing in mind that employment generation is fueled by the increased purchasing power of settler households, a systematic attempt should be made to estimate the employment potential of the different settler production systems and the seasonality or permanency of the demand for labor.

## **C. Deficiencies Associated with the AMP**

### **1. Introduction**

The most serious deficiency is the continued inability of the Mahaweli family of agencies to carry out, in a systematic fashion, forward-looking planning for integrated development. Other deficiencies, which will be considered in turn, are poor articulation of the development phase of the AMP to the construction and recruitment phase, inability to facilitate the emergence of viable settler organizations for water management, inadequate attention paid to agriculture, uneven application to new systems of lessons learned, and insufficient attention paid to the needs and problems of settler households.

### **2. An Ongoing Inability to Carry Out Systematic Planning as It Relates to the Development Phase of the AMP**

This is a longstanding critique of the Mahaweli family of agencies which is as valid today as it was in the late 1970s. Today, planning within MECA (which has taken over the engineering functions of the now defunct MDB) continues to relate primarily to physical planning as opposed to planning for regional or integrated area development. Though the MASL has a planning and monitoring unit, the planning component has not been developed. Nor has a sophisticated planning capability been developed in either the MEA or within the Ministry of Mahaweli Development.

Lack of an integrated planning capability leads to plans that are presented as a shopping list of individual development projects. While some have exciting possibilities, the capacity to integrate them into a systematic plan for the future has yet to be institutionalized within the Mahaweli family of agencies.

Though inadequate planning capability can be generalized to all aspects of the development phase of the AMP, we are primarily interested in those inadequacies which reduce the potential of the AMP to raise settler living standards and to generate additional income.

#### **a. The Lack of a Systematic Approach to the Settler Household as a Joint Decision-Making and Production Unit**

This undercuts the development potential of the household in terms of income generation in a number of ways including the following:

[1] The role of women within the household as agricultural producers is deemphasized in spite of the fact that survey after survey has shown, first, that women play a major role in agricultural

decision making and production; second, that they want agricultural extension; and, third, that the present extension system -- aside from home development centers -- tends to ignore them as producers.

[2] The integration of crop agriculture, livestock management and nonfarm employment at the level of the settler household is still neglected by Mahaweli planners, although the current dairy development program and the emphasis on vocational training for the children of settlers are important steps forward.

**Discussion:** The scarcity of livestock within the Mahaweli settlement areas is particularly noticeable to the outside observer, such scarcity removing from settlers an important source of income and of food. While cultural factors must determine the nature of the livestock component of the household production system, it can no longer be argued that Mahaweli settlers have little interest in livestock management. On the contrary, the overall demand for dairy cattle and for day-old chicks far exceeds the supply.

The weakness of the current dairy program is that it is restricted to the better off settlers who can make cash payments for cattle. Yet those who need it most are the poorer settlers, most of whom will not be able to acquire dairy cattle without the type of credit program which is currently available for the cultivation of selected annual crops. What is needed is a credit program which relates to the needs of the settlers' household production system as opposed to the needs of one crop or another.

Looking to the future the current dairy development program may have the potential to move settler households beyond subsistence when combined with paddy production.

**b. In Spite of Some Important Exceptions, the Continued Inadequacy of Planning of Alternate Production Systems for Settler Households -- Or Where Plans Exist, Unnecessary Delays in Their Implementation**

Under systems still to be considered are agro-forestry settlers, while communities of fishermen settlers have been considered for System B, but not yet implemented. Tank fisheries generates significant additional employment. They also provide settlers with their cheapest regular source of animal protein. This is a major plus granted the low nutrition levels that have been reported from all the settlement areas. Yet the Mahaweli family of agencies has been a reluctant participant in fisheries development in spite of its major benefits. The integration of fishermen into the Mahaweli systems, and their social and community development has suffered as a result.

Though the potential and justification for agro-forestry settlers is considerable, the implementation of an agro-forestry component,

because of its novelty under Sri Lankan conditions, will require careful planning and management. In terms of potential, the emphasis should be on the household rather than the community since the results of community forestry elsewhere in South Asia have been rather disappointing to date. The benefits can be multifold. On the one hand, the number of settler households that can be supported by the AMP is increased. On the other hand, agroforestry may well be a better way to carry out programs of afforestation since the participating settlers have a self-interest in protecting farm forestry areas. And when their tree crops mature, agro-forestry settlers will be able to provide a source of forest products for other settlers who are trying to upgrade their housing as well as for carpenters who are already suffering from a lack of timber suitable for making household furnishings.

#### **c. Inadequate Planning for Employment Generation**

This planning deficiency relates to the longstanding inability of the Mahaweli family of agencies to address itself systematically to the question of employment generation as it relates not just to second generation settler children but also to farm labor and nonfarm immigrants to the Mahaweli settlements. While the thinking of most planners and politicians has been largely restricted to increasing the number of settlers, packing large numbers of settlers onto small holdings will actually reduce the longer term capability of a settlement scheme to provide employment if settler living standards do not rise beyond subsistence.

Over the longer term, the most successful settlement projects in tropical countries have been able to generate, for each farm family, two or more additional jobs for a farm household/nonfarm household ratio of 1 to 2 plus. While we doubt that Mahaweli small holdings have that potential, what potential is there will not be realized if the Mahaweli family of agencies does not provide the necessary land, infrastructure, incentives and development assistance.

#### **d. Inadequate Staff for Integrated Planning**

The Mahaweli family of agencies never has had adequate staff for integrated planning of farm and nonfarm production systems, let alone for regional planning to integrate the various Mahaweli systems with older settlements and townships in the vicinity. Recently there appears to have been a weakening of the ability of the Mahaweli agencies to carry out development planning at the very time that such planning is so crucial.

**3. An Inability on the Part of the Mahaweli Family of Agencies to Synchronize the Shift from the Construction and Settler Intake Phase of the AMP to the Development Phase**

The failure of the development phase of the AMP to commence immediately after the end of the construction phase in both System H and in the Southern portion of System C is a major reason why the living standards of many settlers are stagnating, or even dropping, at the very time they should be rising.

Important though they may be, WFP rations, wage labor, and contracting during the construction phase are temporary sources of support. If settler living standards are to improve subsequently, and if the increased demand of settler households is to generate additional employment, increased production from agriculture and from other activities must follow immediately after the end of the construction phase.

**4. The Inability to Date of the Mahaweli Family of Agencies to Facilitate the Development of Strong Settler Organizations for Water Management and Other Development Purposes**

While other government agencies are encouraging strong settler-run water management organizations at the turnout level and their federation at D-channel and project levels, the MASL and the MEA are moving in the exact opposite direction by putting project officials in charge of settler organizations, with adverse implications for economic development and community formation that are already apparent.

Currently there is no effective settler-run participatory action organization concerned with agricultural production issues within the Mahaweli systems. Granted the association of such organizations, and water user associations in particular, with increased productivity, we consider this to be a very serious deficiency. While the MEA and the MASL have stated the intention of eventually handing over the control of CDSs to settlers, there is no movement in this direction, nor do we consider the CDS an appropriate instrument for economic (as opposed to social and political) development purposes even if it was handed over to settler control.

The AMP is based on an irrigation system where the single most important development issue is water availability in the right amounts, at the right places, and at the right times. Once the "bugs" have been worked out of the irrigation system, its operation and maintenance becomes the key issue, and that is where strong water user associations at turnout, D-channel, and project levels have a key role to play. Such organizations should be based on irrigation units and not on residential units. And they should not be overloaded with functions.

## **5. Deficiencies Associated with Water Management and Agricultural Production**

Such deficiencies are dealt with in more detail in the 1984 Draft Report of the World Bank financed System H Evaluation Team, and in the 1982 and 1983 Diagnostic Analysis Reports for the older portions of H System. We hope that these reports receive from the Mahaweli family of agencies the attention that they deserve. Aside from problems associated with poor construction of the irrigation system itself and land preparation, these relate to a range of water management issues, a range of planning deficiencies, credit, availability on time of inputs, a growing weed problem in paddy fields (which is closely tied in with water management issues), and marketing. In this section we restrict our attention to the future of H System, planning inadequacies, and the weed problem.

### **a. The Future of H System**

For the past few years settlers in H System periodically have had to deal with inadequate water supplies. If a future of water scarcity is anticipated for the Mahaweli systems as a whole, won't this have a particularly adverse effect on System H, simply because when water is scarce the temptation will be to divert it at Bowatanne out of the Kala Oya basin, since water diverted into the kala Oya meets only the single goal of irrigation as opposed to the dual goals of irrigation and power generation for water diverted away from System H? If so, anticipatory planning for the future well-being of settler households in H System becomes all the more crucial.

### **b. The Absence of Systematic Planning for the Multicropping of Annuals**

Planning continues to be largely on a crop by crop basis. Such an approach is hardly in the interests of settler households since rapid increases in production tend to be associated with major price fluctuations. What is needed is a systematic approach to Mahaweli cropping systems which takes under consideration not just agro-ecological factors, water availability and management and national production goals, but also returns to the producer, integration of livestock into the cropping system, and marketing networks and policies.

### **c. The Absence of an Overview Toward the Agricultural Component of the AMP**

There is an absence of an overview toward the agricultural component of the AMP that relates, on the one hand, domestic production projections to import policies, and on the other hand, the various facets of production within each Mahaweli system.

In addition to the absence of an overview toward the agricultural component of the AMP, credit and marketing continue to be especially problem ridden. Concerning credit, we believe that one approach would be for the banks to increase their agricultural staff. We also suggest more attention need be paid to loans that meet the credit needs of the settler household production system as a whole. If the double cropping of paddy alone does not prove to be sufficient to significantly raise settler living standards, then efforts to diversify the production system through dairying, for example, will require a more comprehensive credit program if the large majority of settlers are to benefit.

Under marketing, we have been unable to ascertain what the marketing policy is of the Mahaweli family of agencies. According to at least one senior MEA official, this is because no clearout policy has been formulated. If this is true, then the development of a marketing policy for crops other than paddy deserves high priority.

**d. The Weed Problem**

For the first time a majority of settlers referred to a growing problem of weeds in their paddy fields. It would appear that a new and serious problem is emerging here which needs attention both in regard to the origin of the weeds and how to control them.

**6. Uneven Application of Lessons Learned in One System to Systems Undergoing Subsequent Development**

On the positive side, a number of development lessons learned in Systems H and C which have major implications for settler welfare are being systematically applied in System B. There are, however, lessons learned which have not been systematically transferred to the newer Mahaweli systems. One example relates to the health of settler households. A matter of concern for over a year now, the inadequate health facilities in System B are jeopardizing settler health. The increased incidence of malaria throughout much of the dry zone, and especially the increase of falciparum malaria, requires that the entire malarial prevention program be periodically reviewed and altered where necessary. We also believe that there is good reason to reassess the health needs of the settler population in all Mahaweli systems, including both mental and physical health components.

**7. Insufficient Attention Paid to Other Problems that Are Adversely Affecting Settler Welfare**

Under the pressure of meeting construction time tables and time tables relating to the physical intake of settlers, too little attention is being paid to settler welfare. Meanwhile stresses on the settler population are considerable and may be increasing to unacceptable levels in some areas.

#### D. Corrective Suggstions

[1] Land settlement is a distinct type of development intervention involving the pioneer colonization of frontier zones. Such zones are undeveloped frequently because they are problem prone. Their development needs careful planning and plan implementation. Unlike other types of development it can not be assumed that large capital inputs for increased agricultural production will be followed with major multiplier effects simply because such prerequisites as infrastructure may not be present. Hence it cannot be assumed, for example, that the growth of non-farm enterprises will occur "naturally" without some form of external assistance.

The planning inadequacies of the Mahaweli family of agencies are serious, so serious that their continuation will, in our opinion, undermine the AMP's capability to raise living standards and to generate employment. The logical approach to their solution is to establish within the Mahaweli family of agencies (and perhaps within the Ministry of Mahaweli Development) a planning unit that is capable of undertaking the type of forward-looking, systematic planning which is necessary. Such a unit should have appropriate funding, facilities, staffing and support.

[2] We believe that the nature and structure of settler organizations under the Mahaweli family of agencies needs rethinking in terms of (1) increasing settler participation and control; (2) relevance to settler needs during both the construction and development phases of the AMP; and (3) relevance to the operation and management of the irrigation system. Bearing in mind those goals, we believe a two-pronged approach has the most promise. The first "prong" would tailor the initial settler organization to the phase of construction and settler recruitment. It would only pertain to the initial years of settlement, starting with orientation. The second "prong" would be to convert that organization into a separate water users association, and if the settlers so desired, a separate community development society just prior to the first water issues.

[3] In dealing with settler welfare, we have four suggestions. These are, first, extending orientation to resettlers; second, slowing down the intake of new settlers to ensure that they receive irrigation water no later than the second maha season (and preferably during the preceding yala); and third, carrying out an assessment of the health of Mahaweli settlers which is broad enough to assess the mental health of settlers (including whether or not suicide rates are higher in Mahaweli areas than elsewhere) and which results in specific recommendations which can be, and are, implemented.

The fourth suggestion is that the Mahaweli family of agencies should seriously consider staffing a small unit whose prime responsibility is to identify, assess, and propose solutions to settler problems.

**THE ACCELERATED MAHAWELI PROGRAMME (AMP)  
AND DRY ZONE DEVELOPMENT**

**REPORT NUMBER FIVE**

**I. INTRODUCTION**

**A. An Ongoing Series of Evaluatory Reports**

This is the fifth in a series of reports assessing the settlement component of the Accelerated Mahaweli Programme (AMP). With the exception of 1981, reports have been issued on an annual basis starting with number one in 1979.

The assessment on which Report Number Five is based was carried out between August 26 and September 27, 1984, with two separate visits made to Systems H, C, and B during the periods August 30 to September 6 and September 13 to September 23. As in the past we met with settlers, officials within the Mahaweli family of agencies and other government ministries (including Lands and Land Development, Agricultural Development and Research and Fisheries), researchers in such institutions as the Agrarian Research and Training Institute (ARTI), the Marga Institute and the University of Peradeniya, and U.S. AID staff. We also reviewed recent documentation on the AMP. A more detailed description of our methodology can be found on pages 2-5 of the fourth report (November 1983). Though we found that many of our views were shared with others knowledgeable about the Mahaweli program, the responsibility for the content of this report is ours alone.

**B. The Purpose of the Series**

The purpose of this series is to provide the Mahaweli family of agencies and U.S. AID with an independent and timely assessment of the strengths and weaknesses associated with the settlement component of the AMP. As the emphasis of the AMP has shifted first in System H and currently in Zone 2 of System C from the construction phase to the development phase (a shift that invariably is problem-prone), it is almost inevitable that the tenor of our reports would become more critical.

We are concerned that our commentary, which is intended to be constructive, may be misunderstood by some officials within the Mahaweli family of agencies. We wish to repeat that we fully share the goals that have been set for the Accelerated Mahaweli Development Programme. As we have emphasized in the past, the concept of the AMP

is a grand one, which has tremendous development potential. For this potential to be fully realized, however, systematic and forward-looking planning and plan implementation is required. If that planning has not occurred, or if its results are not implemented, weaknesses will become more apparent as the emphasis of the AMP shifts from construction and settler recruitment to development. It is this shift in Systems H and part of System C that we are now assessing. And our assessment has revealed serious planning and implementation weaknesses, which we believe will curtail the development potential of the AMP if they are not dealt with now in a timely fashion. That is why we focus our attention on them in this report, and on suggested ways to correct them.

The AMP represents one of the most far-reaching and impressive land reforms currently under way in the world. The emphasis on small turnout units is also a pioneering, state-of-the-art approach. Furthermore, the recruitment of settlers has benefited thousands of poor households who now have land for the first time in their lives. The decisions to give priority to purana villagers and to encroachers who pioneered the settlement areas prior to the AMP, and to settle allottees of similar heritage in their own nucleated communities, are as sociologically sound as they are equitable. To assist the new settlers, the Mahaweli family of agencies has developed a number of outstanding programs under the management of dynamic and action-oriented project managers. There is no lack of ideas, some of the more recent being the Girandu Kotte Development Studies Centre (with a good news sheet and ongoing staff training using personnel from a range of non-Mahaweli agencies), the household-based dairy development program, new courses for men and women at the various Home Development Centers and Community Training and Home Development Centers, and the concept of export villages. In sum there is much to praise. Nonetheless, there are serious problem areas which are adversely effecting the settlement component.

### C. Focus of Report Number Five

The focus of the current report is on the living standards of settler households in Systems H, C, and B and on employment generation. Emphasis on living standards and employment generation is appropriate because it relates to two of the major goals of the AMP. Indeed, in the early days of the AMP employment generation may well have been the most important single goal of the government granted the President's emphasis on "Employment first, employment second and employment third", while the Minister of Mahaweli Development throughout has stressed the importance of the AMP as a mechanism for alleviating poverty and unemployment. We share these goals. Yet very little systematic planning, let alone plan implementation, has gone into their achievement. Not only is poverty not being eliminated among the majority of Mahaweli settlers, but the potential of the AMP

to generate employment has been consistently underestimated, while programs to increase off-farm employment have been neglected.

There is a close linkage between settler living standards and employment generation. This is because the major multiplier effects of large-scale irrigation projects come not from agro-industry, as was the prevailing view before the Asian research of such scholars as Mellor, Lele, Johnston, and Bell, but from the increased consumption by thousands of settler households of a widening range of locally produced goods and services. In other words, it is primarily the rising net incomes of thousands of settler households that is the primary fuel for accelerating and spreading the benefits of development. If net incomes remain at, or close to, the poverty level the potential of projects like the Accelerated Mahaweli Programme to generate further employment will not be realized. But if net incomes rise significantly over the years, one can expect the increased demand of thousands of settler households to create employment opportunities for a still larger number of off-farm households.

The major conclusion of our present assessment is that net incomes of the large majority of settler households in even the oldest Mahaweli settlement areas have not yet moved beyond the subsistence level. Indeed, in a significant number of cases in both H System and Zone 2 of System C living standards actually appear to be dropping at the very time in the settlement process they should be going up if the settlement component is to catalyze development.

Looking to the future, we forecast that a continuation of present trends will, in the short, medium and long term, keep the AMP from realizing its potential either for raising the living standards of settler households or for employment generation. Should that be the case, then future evaluators would find that the project has merely spread poverty over a wider area of the country, and in the process, has not realized its potential to catalyze a process of integrated rural and urban development reaching well beyond the Madura Oya, Mahaweli and Kala Oya basins. And that would be a tragedy since the AMP not only has that potential but may also be the last major opportunity for stimulating development within those basins.

Though the hour is late, we do not believe it is too late provided timely action is taken to correct current implementation deficiencies. Subsequent sections of this report will outline in some detail what these deficiencies are. Corrective actions which we believe can get the AMP "back on track" will also be outlined.

#### D. Acknowledgements

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Finally we wish to thank the members of the thirty-one households whose narratives about their experiences as settlers in the Mahaweli areas play a central role in our ongoing assessment of the settlement component of the AMP.

## **II. EVIDENCE THAT SETTLER LIVING STANDARDS ARE NOT MOVING BEYOND A SUBSISTENCE MODE OF PRODUCTION**

### **A. Introduction**

During the initial years of a major new lands settlement scheme, settler households are pioneers adapting to a new habitat, to new production technologies, to new neighbors and to an unfamiliar project management. According to the global experience with settlement, these are supposed to be the most difficult years. If the settlement project subsequently is to raise significantly living standards and generate employment, the majority of the settler population should begin moving beyond subsistence by the time the construction phase is over, with income from settler holdings replacing income from wage labor for construction contractors. Usually this transition occurs three to five years after the first settlers arrive. In the oldest Mahaweli systems it has yet to occur after eight years.

In System H, the first new settlers arrived in the mid 1970s, while the construction phase was over by the early 1980s. Unfortunately, however, there is little evidence that the shift to the

development phase has yet to begin, since most of the available evidence suggests that the incomes of the majority of settlers has either been stagnating at a poverty level during the past few years or falling.

The empirical evidence that settler living standards are not moving beyond subsistence in System H is based not just on our own interviews but also on surveys by other investigators. Some of these we quote in the sections that follow.

#### B. Evidence from Our Own Interviews

In the absence of detailed data on income and expenses (which to be reliable need be collected at weekly intervals), we use a wealth index which compares through time the living standards of the same families in regard to five categories. These are housing (including number of rooms and nature of building materials), household furnishings, productive equipment (including bicycles and sewing machines; plow animals, tractors and other motorized vehicles; and pumps and other agricultural equipment), lighting (bottle lamps, petromax lamps, etc), and water supply/sanitation. Improvement or deterioration in these indices through time is easily observed. The data collected is combined with information on family health, family attitudes, and other material collected on the household production system (including wage labor and a variety of such family enterprises as boutiques and other businesses) to determine whether or not living standards are going up, down or staying level.

Our sample in H System includes sixteen households spread over H 2, 4, 5 and 9. Though not a random sample, it includes the major types of Mahaweli settlers. Furthermore, it includes a greater proportion of leaders (including turnout leaders, as well as other types of community leaders) than the general population, and one would expect leaders, as a general rule, to have higher incomes. Nonetheless during the past two years the living standards of seven of our sixteen households (44%) appear to have deteriorated, while those of another three families have stagnated at a poverty level. In only six cases (38%) have living standards gone up, and in two-thirds of those the improvement is very slight. Moreover, in both cases where living standards went up significantly, this was not due to farming a Mahaweli allotment but rather due to off-farm income. As in the other systems such income came either from pre-settlement savings (compensation for evacuee households, for example), or from such post-settlement enterprises as boutiques or contracting.

Settler households have responded to this depressing picture in a variety of ways. Two of the sixteen families (both selected at land katcherries from outside electorates) have moved back to their "home" areas, having arranged for their land to be sharecropped (and) in their absence. Another two are seriously considering leaving. Though

the remainder of those whose living standards are not improving continue to hope that their fortunes will improve, if such improvement does not occur fairly rapidly we believe that they too will be tempted to subdivide, mortgage, lease out or even attempt to sell their land, or to bring in sharecroppers, with potentially undesirable results in terms of social equity (especially where wealthier settlers and mudalalis begin to accumulate larger holdings), production and employment generation.

In making the above point we wish to emphasize that the justification for bringing in others to cultivate one's land appears to have undergone a rather radical change in the past two years. Though sharecropping was not uncommon prior to that time, usually it was a temporary phenomenon to speed up the development of the allottee's land. Especially where a settler had access to insufficient labor for land preparation, share cropping sped up the process since the sharecropper had to level the land and prepare basins to get an adequate return. Once land preparation was complete, which was usually after several seasons, the tendency was for the owner to take back total control. But the situation by 1984 was quite different, with owners bringing in sharecroppers, etc not to prepare the land but to cultivate it on a more permanent basis while the owner sought opportunities for his own labor elsewhere.

While the situation in System C is better, this is partly because the construction phase continues in most areas, with opportunities for both permanent and temporary employment. And it is partly because an increasing proportion of settlers there have access to a more reliable water supply than is the case in System H. Warning signs are nonetheless present. Though seven of our system C households have had Mahaweli water since yala 1983, the living standards of only two have improved significantly since 1981. And in both those cases, as in our two most successful System H households, improvement has not come from the settler's Mahaweli holding but rather from nonfarm business enterprises. The other families were either just holding their own or, on the basis of incredibly hard work, bringing about a slight improvement in their living standards.

### C. Other Evidence

It is important to emphasize from the outset that other sources, with the except of a 1983 publication of Lund's, are not based on restudies. Rather they rely on surveys carried out at one point in time which are unable to identify trends in income levels because of insufficient time series data. Though they postulate higher incomes than we believe to be the case, virtually no evidence is presented that such incomes are being translated into higher living standards. On the contrary, these reports document in detail constraints which are interfering with settler earning capacity.

Perhaps the most negative assessment is Lund's. On the basis of research in 1978 and 1981 in a portion of System H, she concluded that "the material standard of living in the project area is generally static or even declining," while "only a small group of people have managed to improve their economy after resettlement." While Lund may have had unreasonable expectations about improvement in living standards during the initial years of resettlement, nonetheless her conclusion about "the deteriorating economic status of the majority of the settlers" by 1981 is alarming, especially since our data shows a static or declining situation since that time.

Other reports that we have used include the 1982 and 1983 Diagnostic Analysis Reports on portions of System H which were carried out in connection with the U.S. AID funded Water Management Synthesis Project, and the 1984 draft report of the World Bank financed Evaluation Team which carried out fieldwork in System H during 1982 and 1983. While these reports do not deal with living standard trends, the following quotes could be interpreted to indicate that many settler households are under pressure:

[1] "Less than 20 percent of the settlers in the project area have been able to complete the construction of their 'permanent dwellings'" (Evaluation Team assessment) in spite of the fact that our fieldwork indicates that settlers place a very high priority on improving their housing.

[2] "Many farmers had defaulted on low interest government loans, primarily due to crop failures in successive drought years, making them ineligible for future low interest loans. Because of this, many farmers borrowed considerable amounts from relative [sic], friends, or private traders." Indeed, "the majority of farmers requiring loans borrowed from private traders rather than from institutions" -- the probable end result being reduced net incomes and capital cash flow (1983 Diagnostic Analysis).

[3] Due to the decreased availability of fuel, "some families had resorted to purchasing firewood. . . . This additional cost may further strain the limited finances of the farm family" (1983 Diagnostic Analysis).

In sum, we believe that there is empirical evidence that a majority of the settler population in the older settlement areas are not moving beyond subsistence, hence postponing the arrival of the development phase of the AMP. In the sections below we outline possible reasons as to why this situation exists, along with suggestions as to how to improve the settlers' lives, raise their living standards, and increase employment generation.

### **III. REASONS FOR STAGNANT OR DECLINING LIVING STANDARDS AND SUGGESTIONS FOR THEIR CORRECTION**

#### **A. Introduction**

Viewed historically reasons for explaining why living standards have not been able to rise appreciably above a subsistence mode of production can be divided into those that predate the AMP and those that follow it. The former are based primarily on erroneous planning assumptions which the MASL and the MEA have "inherited." The latter relate to reasons for which the MASL, MEA, and the old MDB must take more direct responsibility. Both types of reasons are amenable to change so that the Mahaweli family of agencies does have the opportunity to offset their deadening influence on settler income generation and quality of life, and on employment generation.

#### **B. Erroneous Planning Assumptions that Have Been Inherited from the Early 1970s**

##### **1. The Assumption that the Large Majority of Mahaweli Settlers Would Be Young Married Couples with Several Young Children**

The original assumption was that the large majority of allottees would be selected according to specific criteria from electorates throughout the country. One criterion was age and marital status, with young married couples with several small children to be favored. Putting a premium on healthy young people to cope with the pioneering conditions to be faced in the dry zone, this criterion would also postpone the emergence of "the second generation" problem for nearly a decade.

Unfortunately the original assumptions about the origins and family status of the settler population were wrong. To date outsiders selected from without the Mahaweli systems are actually in the minority in each system settled to date. This is because the number of resettlers (including purana villagers, encroachers, LDO allottees and settlers on older, incorporated settlement schemes) and of evacuees (from the Kotmale and Victoria reservoir basins as well as from such areas as Bowatanne, the Transbasin Canal, the Wasgomuwa Sanctuary and the Madura Oya Sanctuary) was seriously underestimated. Although we have not been able to obtain exact figures on the different categories of settlers, all the evidence examined supports the conclusion that resettlers and evacuees make up a majority of settler households in System H, in the northern and perhaps the southern zones of System C, and in the initial settlement areas of System B (Zones 5 and 1 as well as the old Pimburetewa settlement scheme).

According to a senior MEA official based at Galnewa, the proportion of resettlers and evacuees in H 1 and 2 may well exceed 70

percent while their proportion exceeds 60 percent in the total area falling under the Galnewa-based RPM. In a 1983 randomized sample survey of 16 units in two blocks of System C's Zone 2, the MEA found that resettler households comprised 41 percent of settler households and evacuees 27 percent for a total of 68 percent. Though the proportion of resettlers is much lower in the northern zones of System C, in some blocks such as Megalewa practically all settlers are evacuees from Victoria, such other Mahaweli work sites as Ratkinda, and the new Madura Oya national park. As for the already settled areas of System B, resettlers and evacuees form a slight majority in Zone 5 while they constitute the overwhelming majority in those areas of Zone 1 settled to date. The population of the Pimburetewa Zone is comprised almost exclusively of resettlers. While the ratio of households will favor the former in those areas of System B still to be settled, the proportion of resettlers will also increase due to the larger number of purana villagers, encroachers, and others on either side of the railway line.

In sum, the available evidence indicates that together resettlers and evacuees will be in the majority once the recruitment of AMP settler households has been completed. The relevance of this situation to Mahaweli development is that the proportion of older children among resettlers and evacuees is much higher than among selectees from the various electorates, simply because resettlers and evacuees include the full range of family types. While it is true that children of resettlers and evacuees who were married at the time of the various land katcheries received their own Mahaweli holdings, their siblings who have married since that date have not received land. While there are no detailed figures on the numbers involved, two MEA sample surveys in three blocks of Zones 2 and 3 suggest that the numbers of recently married or soon-to-marry children are considerable. Hence 25 percent of the sample population in two blocks of Zone 2 were between the ages of 14 and 25 in 1983 while 15 percent of those in the Zone 3 block were aged 16 to 20 in late 1982. Referring back to System H, the field survey carried out by the World Bank financed Evaluation Team came up with the figure of 17 percent of the male population being between 15 and 19 years.

The preceding evidence is presented in some detail to illustrate the conclusion that the second generation problem already exists throughout the settled Mahaweli areas. Unless new job opportunities are created soon, first generation settlers will do what they have done in older Sri Lankan settlement schemes. They will subdivide their lands among their children. Indeed, some of those in our sample have already developed various management systems, including joint cultivation and subdivision, to incorporate their married children in the farming of their holdings. While this is a rational decision in terms of the welfare of the settler household, it is a decision which has adverse development implications. Recent research by Wanigaratne at Kaltota has reinforced the conclusion that there is a close

relationship between a rising number of adults dependent on a small holding and an increased emphasis on paddy cultivation as opposed to the cultivation of other food crops even where soil conditions may be less favorable for paddy. In other words, to survive the extended family places increased emphasis on meeting its subsistence needs through paddy cultivation. In terms of development, such a situation not only means less paddy may be available for the national market, but also that potential net incomes of settler households are reduced as is the potential for employment generation. Where such a trend continues, the expected result will be a downward spiral into increased poverty.

**2. The Assumption that Only Family Labor Would Be Utilized on a 2.5 Acre Mahaweli Holding**

This assumption has been shown to be erroneous for at least two reasons. The first, and least important, is that an unknown proportion of allottees have been joined in the settlement area by various relatives. The second is that the type of intensive cultivation of paddy and other food crops intended by Mahaweli planners requires, during certain peak periods, more seasonal labor than is available even to the larger families of resettlers and evacuees.

**a. Accompanying Relatives**

Where poor landless people receive land from the government, the global experience is that they attract equally poor relatives who join them at a later point in time as permanent settlers. While such relatives can play an important role in overcoming serious labor constraints during the initial years of settlement when the focus is on land preparation and house construction, their presence can also have negative impacts at the project level. This is especially the case where allotments are very small, and where overflow lands for subsequent settlement are unavailable. Both of these conditions apply to the AMP. If the selectees respond by subdividing their holding among relatives, then the results are similar to where holdings are partitioned among children -- increased emphasis on staple crop production for subsistence purposes, reduced sales, lower net incomes and less employment generation over the longterm. If selectees are unable or unwilling to incorporate such relatives into the management of their holdings, the latter may encroach on reservation areas (indeed they are apt to encroach on reservation lands irrespective of whether or not they receive a portion of their benefactor's land). Though we have seen no quantitative data on the extent to which married relatives have accompanied Mahaweli allottees, in our sample of thirty we have several such cases.

**b. Hire of Other Labor**

While we suspect that the proportion of households of relatives who have accompanied Mahaweli settlers on a permanent basis is still relatively low, the need for additional labor for certain agricultural tasks during both the maha and yala seasons characterizes the large majority of Mahaweli settlers irrespective of family size. Because the tight scheduling of farm operations on irrigated Mahaweli holdings requires settler households to carry out the same operations at the same time, the use of attam (cooperative work parties that rotate their activities between fields) labor has become increasingly uncommon as Mahaweli settlers have shifted their emphasis from clearing their homelots and building temporary houses, and from land preparation, to farming operations. Conversely, the use of hired labor has become increasingly common, and can be expected to increase as more emphasis is placed on more labor intensive crops.

All the Mahaweli settler households in our sample hire labor at some point during both the maha and yala seasons. For paddy production they hire labor for planting activities (including land preparation and transplanting and/or broadcasting), and for harvesting activities (including cutting the paddy, threshing, and winnowing). For other food crops, which tend to be significantly more labor intensive (as is the case with chilli production), labor is also hired for weeding activities which generally is the sole responsibility of the settler household in regard to paddy cultivation.

Though paddy is the least labor intensive of the major crops, our data would suggest that approximately 50 percent of all labor for paddy cultivation is hired, with the proportion being higher for maha than yala. This data does not seem inconsistent with other surveys. According to Wickramasekara, the percent of hired labor estimated by various surveys between yala 1978 and maha 1981/82 varies from a low of 30 percent to a high of 67 percent with the average of ten surveys being approximately 45 percent. With labor costs escalating in recent years to up to 30/- per day without including food, hired labor has become one of the major expenses of the Mahaweli settler.

**3. The Assumption that a 2.5 Acre Paddy Allotment Would Allow Settler Households to Advance Beyond Subsistence**

Whereas all available evidence indicates that the first two assumptions were wrong, our conclusion that the third assumption is also wrong is much more tentative. There are two reasons for this. First, current data on net incomes generated from the double cropping of paddy are insufficient. Second, a significant proportion of settler households are still constrained from cultivating fully their 2.5 acre paddy holding.

The unreliability of data on income and expenditures of settler households is a major example of an earlier statement made by Wimaladharmas that System H (and Mahaweli in general) is over-surveyed but under researched. Estimates on the number of bushels per acre that need be harvested to enable settler households to break even are not based on detailed farm family accounts relating to all major sources of income as well as to major expenses. Rather, they are based largely on short term surveys dealing with single crops, and with paddy and chillies in particular, an approach which tends to underestimate such essential household expenditures as interest rates on loans from private sources (as opposed to banks), and to ignore family expenditures on illness, court cases, and such rites of passage as marriages and funerals.

As already indicated, our own survey data suggests that the large majority of those settlers who have been present for at least five years have yet to move beyond a subsistence level of production irrespective of their cropping mix. However, in the majority of these cases, the settlers have been unable to crop their entire 2.5 acre allotment during both the maha and yala seasons. Reasons for this situation vary, with the most common relating to water shortages. Hence left bank cultivators in our sample have had to practice betma cultivation during the last two yala seasons while right bank cultivators received no water during yala 1983. In addition to cultivation acreages being cut back because of an expected insufficiency of water, some settlers have yet to receive a full 2.5 acre allotment while others are unable to cultivate their holding in its totality because of poor land preparation, water logging and salinity, and a range of technical problems relating to the construction of the field canal system. They have also been plagued by irregular or delayed water releases during the crucial early weeks of both cultivation seasons, as well as by a range of water management inadequacies at the turnout level for which the settlers have largely themselves to blame.

Granted the fact that none of the settlers in our sample for H System have been able to crop their entire 2.5 acre holding on a regular basis, is it possible that they would be able to move beyond subsistence if their cultivation constraints were removed? What evidence is available, and it is insufficient for reaching a firm conclusion, suggests that the answer may be "no" where the double cropping of paddy is involved. The evidence is both deductive and empirical. On the basis of deduction, the tentative conclusion is negative simply because prices of inputs (including material costs, machinery and transport costs and labor costs) are increasing at a faster rate than are producer prices. Furthermore, as the proportion of settler households utilizing low interest credit from the various banks decreases because of defaults on earlier loans and other reasons, settler reliance on higher interest loans from traders and shopkeepers is increasing.

Available evidence indicates that the majority of settlers sell their paddy to private traders at prices below the floor price of the paddy marketing board. They do this for a variety of reasons including pickup at the farm gate and lower quality control standards. Though little evidence is available, in the process some settler households may be becoming "bonded" to certain traders who have issued them credit so that they can take repayment in paddy at the time of harvest at rates which would be well below the floor price.

As for empirical data, according to the 1982 field survey in System H of the World Bank financed evaluation team, net returns per acre of paddy during maha 1982/83 were 3179/- per acre or 7946/- per holding excluding costs of family labor. That season is considered the best maha season to date. Since yala returns are significantly lower, it is unlikely that many families are netting over 10,000/- per annum from the double cropping of paddy. That is only 2200/- more than one agricultural laborer would make if employed for 260 days per annum with the differential being still less if the cost of food provided to that laborer was added.

### C. Corrective Suggestions

Because most of the corrective suggestions are elaborated in some detail in other section of this report, they will be summarized at this point in outline form.

[1] Launch a major effort in the settled portions of the Mahaweli systems to enable settlers to fully cultivate their full 2.5 acre allotment. Only recently launched, such an effort in Zone 2 of System C already appears to be paying off in that settlers in our sample indicated that some long-standing problems had either been corrected in the past few weeks or were in the process of being corrected. Problems are many. They include boundary disputes between settlers, survey errors resulting in plots less than 2.5 acres in size, construction flaws which leave certain fields or portions thereof with an insufficient supply of water (indeed with no water at all in some cases), inadequate land preparation, and waterlogging and salinity. Also included is poor water management which requires a renewed dedication to the emergence of strong water user associations.

[2] Obtain detailed data on the net income, under realistic Mahaweli conditions (as opposed to experimental conditions on research plots), of different production systems for settler households. Badly needed for planning purposes, such data would be collected in connection with the 12-month Employment Generation and Enterprise Development Research and Training Program proposed for the Mahaweli family of agencies, since the starting point of that program is the income generating potential of different settler household production systems. To assess net incomes detailed data on all major sources of income and all major expenditures must be collected at weekly

intervals. Only then can accurate estimates, for example, be made of the income generating potential of the double cropping of paddy. If that potential is insufficient to move a settler household beyond subsistence, then paddy cultivation should be integrated with other productive enterprises for the large majority of households involved. Such integration not only should make economic sense but it should also be feasible in terms of household commitments and labor availability. That is why the emphasis need be on the household production system as opposed to specific crops or other enterprises (dairy, for example, or carpentry) considered alone.

[3] To increase net income at the household level, a major systematic effort (based on the planning data collected under [2]) should be made to diversify the settler production system not just in regard to crop agriculture but also in regard to animal husbandry (especially dairy production) and off-farm employment. Furthermore a wider range of production systems need be developed that move beyond the production of annual crops on a 2.5 acre holding. A case in point is five acre irrigable holdings currently under implementation for dairy production in System B. But other possibilities, including agro-forestry settlers on non-irrigable land, fishermen settlers (as proposed by the RPM in System B) and commercial tree crop settlers (cashew outgrowers, for example) deserve more attention than they have received to date.

[4] Bearing in mind that employment generation is fueled by increased incomes at the level of the settler household, a systematic attempt should be made -- as outlined under the Employment Generation and Enterprise Development scope of work -- to estimate the employment potential of the different production systems for settler households and the seasonality or permanency of the demand for labor. Once data is available on this potential for on-farm seasonal and permanent labor, and for off-farm labor (carpenters, masons, metal fabricators, etc), then Mahaweli planners are in a much better position to realize that potential by implementing policies to attract the necessary labor force. While their tree crops are maturing, agro-forestry settlers, for example, may be able to supply much of the seasonable labor needed on 2.5 acre irrigable holdings for paddy and other crops. When a firmer estimate can be made of permanent off-farm employment opportunities, then allocation of homeplots for non-farm families, and provision of loans and other enterprise development assistance, can be improved.

#### **D. Deficiencies Associated with the AMP**

##### **1. Introduction**

Deficiencies associated with the AMP relate more to planning and implementation deficiencies than to the type of erroneous planning assumptions made by the Mahaweli Development Board in the early and

mid-1970s. Though all are serious, we believe the most serious is the continued inability of the Mahaweli family of agencies to carry out, in a systematic fashion, forward-looking planning for integrated development. Other deficiencies, which will be considered in turn, are poor articulation of the development phase of the AMP to the construction and recruitment phase, inability to facilitate the emergence of viable settler organizations for water management, inadequate attention paid to agriculture, uneven application to new systems of lessons learned, and insufficient attention paid to the needs and problems of settler households.

**2. An Ongoing Inability to Carry Out Systematic Planning as It Relates to the Development Phase of the AMP**

This is a longstanding critique of the Mahaweli family of agencies which is as valid today as it was in the late 1970s. Heaver, a former ODM employee who is now working for the World Bank, believes this major inadequacy dates right back to the November 1977 decision to accelerate the Mahaweli development program. The feasibility of acceleration, Heaver points out, was emphasized by senior engineers, one of whom subsequently became chairman of the Mahaweli Development Board. He makes a persuasive argument that having pushed the concept of acceleration from the start, the chairman of the MDB felt a major responsibility for implementing the construction phase on time. While achievements in this regard were exceptional, the engineering focus on accelerated construction was at the expense of forward planning for the development phase including the agricultural, settlement and employment generation components of the AMP.

Heaver's analysis relates to the first few years of the AMP and especially to the 1977-1978 period. Regardless of whether or not one accepts his explanation concerning the initial reasons for inadequate forward planning, this inadequacy has continued through time within the evolving Mahaweli family of agencies as we have consistently pointed out in each of our preceding four reports. Today, planning within MECA (which has taken over the engineering functions of the now defunct MDB) continues to relate primarily to physical planning as opposed to planning for regional or integrated area development. Though the MASL has a planning and monitoring unit, the planning component has not been developed, the unit being more involved in the monitoring of phenomena relating to construction and the physical intake of settlers. Nor has a sophisticated planning capability been developed in either the MEA or within the Ministry of Mahaweli Development.

Lack of an integrated planning capability leads to plans that are presented as a shopping list of individual development projects (export of gurkins and green chillies; export villages; cashew and sugar plantations; dairy production, marketing and processing by settlers; fishing settlements; vocational training; and so on). Some

are no more than ideas in the minds of their originators. While they may have exciting possibilities, the capacity to integrate them into a systematic plan for the future has yet to be institutionalized within the Mahaweli family of agencies. Nor is there even sufficient institutionalized capability to deal with specific systems in terms of utilizing such external inputs as the 1984 report of the Special Task Force on the Development and Settlement of System B.

Though inadequate planning capability can be generalized to all aspects of the development phase of the AMP, in this report we are primarily interested in those inadequacies which reduce the potential of the AMP to raise settler living standards and to generate additional employment. Examples include:

**a. The Lack of a Systematic Approach to the Settler Household as a Joint Decision-Making and Production Unit**

This undercuts the development potential of the household in terms of income generation in a number of ways including the following:

[1] The role of women within the household as agricultural producers is deemphasized in spite of the fact that survey after survey has shown, first, that women play a major role in agricultural decision making and production; second, that they want agricultural extension; and, third, that the present extension system -- aside from home development centers -- tends to ignore them as producers.

**Discussion:** The above statement is reinforced by the 1983 Diagnostic Analysis of System B where it is stated that "women participated in the majority of activities involved in crop production." Furthermore, decisions about the major production enterprise, the irrigated cropping system, "were generally made jointly, by both the husband and wife." Notwithstanding this important role, "extension and institutional services provided to women concerning agricultural and water management topics were generally non-existent. Field assistants primarily focused on males, often ignoring women who were performing the same activities. . . . Services oriented toward women, through Community Development Centers, did not include information and training about irrigated crop production." Yet, "the women interviewed expressed great interest in topics such as water management, crop varieties, and agrochemical use." Granted this we assume that extension and training more oriented toward women would be reflected in improved production and water management, and higher incomes.

The obvious solution to this problem is to recruit more female extension officers, and to focus training and extension programs relating to agricultural production (including home gardens and field allotments and livestock management) on the settler household as a

joint production and decision-making unit in which both men and women play a major role.

[2] The integration of crop agriculture, livestock management and nonfarm employment at the level of the settler household is still neglected by Mahaweli planners, although the current dairy development program and the emphasis on vocational training for the children of settlers are important steps forward.

**Discussion:** The scarcity of livestock within the Mahaweli settlement areas is particularly noticeable to the outside observer, such scarcity removing from settlers an important source of income and of food. While cultural factors must determine the nature of the livestock component of the household production system, it can no longer be argued that Mahaweli settlers have little interest in livestock management. On the contrary, the overall demand for dairy cattle and for day-old chicks far exceeds the supply. Within our sample, for example, several of our poorest farmers are struggling to acquire cattle by caring for those of wealthier settlers on an ande (sharing cropping) basis. In System H, one of our wealthier farmers stall feeds a milch cow in the backyard of his home plot, keeping it and its calf in a roofed shelter. In System C, the dairy component of the Draught Animal Programme has been so successful that production continues to increase, new routes are being added, and new dairy prototypes are being implemented in Zone 5 of System B. As for day-old chicks, staff of the Agricultural Development Corporation informed us that they are unable to meet the demand throughout H System.

Aside from the Draught Animal Programme, Mahaweli planners continue to ignore the livestock component of the Mahaweli systems, hence removing from settlers not only an important source of income but also, in the form of dairy products in particular, an important complement to currently inadequate diets. As for the draught animal program, its initiation was delayed well beyond the time that the MDB became aware of serious draught power shortages -- and pressure from donor agencies played a major role in its initiation.

Looking to the future, the current dairy development program (which grew out of the Draught Animal Programme as a result of the initiative of the program Consultant) has, we believe, considerable potential. The program was initiated in Zone 2 of System C early this year. In February, thirteen settler households were producing 13 liters of milk per day, with producers and output rising to 170 and 225, respectively, by July, and with monthly incomes per household averaging 300/-. At the time of our September field trips, two routes had been established, and a third planned, with the majority of the producers organized into settler-run societies which are responsible for daily pickup and delivery of fresh milk to the chilling and processing facility at Girandu Kotte. There curd, yogurt and ghee are made, with excess milk sold to local officials or to the

Dairy Board. Future plans are modeled on a Sri Lankan adaptation of the successful AMUL dairy cooperative union in Gujarat, whereby within a three-year period it is hoped that Mahaweli producers will be able to federate their primary societies into a union which can take over the ownership and management of the processing facility, hence enhancing the income earning capability of the members.

The progress of this program should be carefully monitored and evaluated. If, in fact, it continues to show potential, and the market for dairy products is there, we believe that dairy production, marketing, and processing could play a major role in moving settlers specializing in the double cropping of paddy beyond a subsistence mode of production. As at the lower end of the soil catena in H System and in extensive areas of Zone 2 in System C, the double cropping of paddy may well continue to be the most feasible cropping system for large numbers of Mahaweli settlers. If our tentative conclusion is correct that such a system may not advance settlers beyond subsistence, and will not play a major role in employment generation, the combination of paddy production with the management of two to three dairy cattle might make a major difference.

The weakness of the current dairy program is that it is restricted to the better off settlers who can make cash payments for cattle. Yet those who need it most are the poorer settlers most of whom will not be able to acquire dairy cattle without the type of credit program which is currently available for the cultivation of selected annual crops. What is needed is a credit program which relates to the needs of the settlers' household production system as opposed to the needs of one crop or another.

In addition to the integration of dairy cattle into the production system of Mahaweli settlers with 2.5 acre farm allotments, the Draught Animal Programme has also begun to implement a dairy program on 5 acre irrigable upland holdings in System B. Other possibilities include the combination of dairy production and care of draught animals with agro-forestry on larger holdings of non-irrigable land, and experiments with fodder production at the tail end of turnouts where water logging and salinity are proving to be a problem. All such experiments warrant trial, initiation on a pilot basis on settler allotments, and replication where warranted. Nor should they be limited to dairy alone, since poultry production could also play an important role in raising settler living standards, as might other forms of livestock management still to be identified as culturally and economically feasible.

**b. In Spite of Some Important Exceptions, the Continued Inadequacy of Planning of Alternate Production Systems for Settler Households — Or Where Plans Exist, Unnecessary Delays in Their Implementation**

**Discussion:** While the Mahaweli agencies have begun to move forward in the planning and implementation of alternate production systems for settler households, a wider range of opportunities should be considered. Under systems still to be considered are agro-forestry settlers, while communities of fishermen settlers have been considered for System D, but not yet implemented. Both systems not only have the potential to support additional settler households at adequate living standards, but also to meet the needs of other farm and nonfarm settlers in the process.

[1] Fishermen Settler Households. Because more information is available, the concept of fishermen settlers -- which has been advanced by the RPM in System B -- provides an excellent example of the additional employment potential of alternate production systems. With the active assistance of the Department of Fisheries, 98 fishing boats are currently operating on the Pimburetewa Tank, with each boat employing two men. Though one of the crew members is usually the boat owner, in perhaps ten to fifteen cases the owner does not fish so that the estimated number of those directly employed by the fishery would be approximately 210.

With average daily landings of approximately 2000 kg of fish which are sold on the spot at 5/- per kg, the average daily income per boat is slightly over 100/- per day, of which two-thirds goes to the boat owner and one-third to the laborer (or laborers). That provides an income to the boat owner that is at least equivalent to a Mahaweli paddy farmer cultivating twice annually a 2.5 acre holding while the daily wage of the average laborer approximates that of an agricultural laborer, with the exception that it is on a permanent as opposed to a temporary basis.

Such a fisheries also generates significant additional employment. Of the 2000 kg landed on a daily basis, 750 kg are sold to the Minneriya filleting factory which picks up the catch at the tank. This utilizes the factory's full production capacity, so that its 30 plus employees are full time beneficiaries of the Pimburetewa fishery. So are some 60 bicycle traders who purchase another 1000 kg direct from the fishermen. Buying perhaps 15 kg at 5/- per kilo, these traders sell locally at up to 9/- a kilo, hence making up to 60/- per day on a permanent basis. The remaining 250 kg are sold to traders (including the secretary of the fishermen's cooperative) who have approximately ten employees and who redistribute the catch as far afield as Colombo. Hence the Pimburetewa fishery provides employment for at least 310 people.

The fishery also provides for settlers in the vicinity their cheapest regular source of animal protein. This is a major plus granted the low nutrition levels that have been reported from all the settlement areas. Demand for fish in the Mahaweli areas is high, as illustrated by the supplies of tinned fish on the shelves of even the poorest boutiques, and the presence of dried and fresh sea food in such market centers as Manampitiya (System B) and Galnewa (System H). Tank fish, however, is a much better buy for settlers since it costs less than one-fourth the price for seer, and also provides a better quality, lower priced product than the small (less than one quarter kilo) tins of imported fish that sell for between 5/- and 10/- per tin.

Imports utilize scarce foreign exchange which could be saved by systematically developing the fishery potential of the Mahaweli areas. Yet the Mahaweli family of agencies has been a reluctant participant in this development in spite of its major benefits. The communities of fishermen have suffered as a result. While the Department of Fisheries has been able to provide them with boats, nets and other gear, their social and community development has been neglected by Mahaweli planners, with the result that fishermen on the Pimburetewa tank continue to live under poor sanitary and housing conditions along the reservoir margin. Granted their contribution to the economy and to the diet of the settlers, their poor living conditions could and should be greatly improved by incorporating them within the Mahaweli development program as participating fishermen settlers with the same benefits as settlers growing paddy and other food crops.

[2] As for agro-forestry settlers, the RPM System B is of the opinion that it might be possible to settle at least a thousand households on five to ten acre holdings of non-irrigable uplands within System B. Though the potential and justification for agro-forestry settlers is considerable, the implementation of an agro-forestry component for Mahaweli settlers will require careful planning and management. While the Mahaweli agencies, the Forestry Department and the Treasury have had difficulties in working out and funding a collaborative relationship, the technical problems are such that it may be too difficult for the Mahaweli agencies to proceed alone, especially in regard to planning the exact composition of the settler's production system. On the other hand, the Forestry Department itself has not had much experience with agro-forestry, so that the institutionalization of an agro-forestry cell within the Mahaweli family of agencies may make sense if such a unit can not be developed within the Forestry Department. The fact that the Forestry Department has had difficulties in carrying out afforestation programs within the AMP areas may be another reason for the Mahaweli agencies to develop their own capability, especially since the MEA has already hired its own foresters/environmentalists for work in Systems H and C.

In terms of potential, the emphasis should be on the household rather than the community since the results of community forestry elsewhere in South Asia have been rather disappointing to date. Emphasis on the household makes sense, however, for a number of reasons. First, whether the natural resources involved are fish, game or forest products, there is a growing realization among natural resource planners that local populations must be given an economic stake in the management of adjacent resources if they are to be maintained let alone enhanced.

While there is not much scope for agro-forestry in either System H or the northern portion of System C, the opposite is true in the southern portion of System C and throughout much of System B. Rather than plant non-irrigable uplands in pure stands as plantations it makes more sense to develop agro-forestry systems which, technically, economically and ecologically, are adapted to the agro-ecological zones involved. In India it has been shown that two hectares of waste land planted in a range of indigenous and exotic forest products (including nut and fruit trees, fuel wood, timber and fodder trees, grasses, fiber crops, botanicals and medicinals), plus one or two dairy cows, can support a family at an "above poverty line" standard of living once full production is realized.

During the years that the forest products are maturing there are a number of ways in which agro-forestry settlers can support themselves, provided the necessary government assistance is provided. During the initial years, interplanting of cereal crops, gingelly and chillies among the seedlings might be possible. An early introduction of fodder crops and dairying is another possibility as is employment on forest products and tree crop (cashew, for example) plantations which might be interspersed with agro-forestry settlements. Other possibilities include seasonable labor on other types of Mahaweli holdings, employment guarantee schemes whereby settler households receive a minimum wage while planting their holdings in the recommended mix of crops and forest products and various sharecropping schemes under which wages are paid during the initial years while profits subsequently are split between the settlers and the supervising agency or agencies.

The benefits of such an approach can be multifold. On the one hand, the number of settler households that can be supported by the AMP is increased. On the other hand, agroforestry may well be a better way to carry out programs of afforestation since the participating settlers have a self-interest in protecting farm forestry areas from encroachers, from illicit fellers of timber and collectors of fuel, and from elephants. And when their tree crops mature, agro-forestry settlers will be able to provide a source of forest products for other settlers who are trying to upgrade their housing as well as for carpenters who are already suffering throughout

most of H System from a lack of timber suitable for making household furnishings.

As for other alternate production systems, we hope that the Mahaweli agencies and the Cashew Corporation will incorporate settlers as partners to the maximum extent in the growing of cashews either through outgrowers schemes surrounding a core plantation or through small holdings along lines developed by FELDA for rubber and oilpalm in Malaysia and by a private sector/government joint venture for oil palm in Papua-New Guinea.

**c. Inadequate Planning for Employment Generation**

This planning deficiency relates to the longstanding inability of the Mahaweli family of agencies to address itself systematically to the question of employment generation as it relates not just to second generation settler children but also to farm labor and nonfarm immigrants to the Mahaweli settlements. Although employment generation has been stressed from the start as a major goal of the Mahaweli scheme, and especially of the AMP, the thinking of most planners and politicians has been largely restricted from the start to employment through selection of large numbers of settlers and through construction. In the latter case most of the jobs are only temporary. In the former case, packing large numbers of settlers onto small holdings will actually reduce the longer term capability of a settlement scheme to provide employment if settler living standards do not rise beyond subsistence -- an outcome that already threatens the AMP.

In trying to maximize the number of settlers on the land, the original Mahaweli planners picked a 2.5 acre field allotment as the maximum sized farm which they believed, erroneously as we have seen, could be intensively cultivated through the sole use of family labor. For this reason, they ignored the possibility that the Mahaweli scheme might attract large numbers of seasonal and permanent farm laborers -- hence increasing its employment generation potential. Nor did they consider seriously the employment generation potential of different cropping systems and of different net incomes in terms of nonfarm employment. As a result they may, inadvertently, have curtailed the ability of the Mahaweli program to maximize employment over the medium and longer term.

While AMP planners have paid more attention to the question of nonfarm employment, and have set aside one household allotment for nonfarm occupancy for every three to five farm household allotments, we believe that they too continue to underestimate the employment potential of a diversified production system on the current 2.5 acre farm allotment. Over the longer term, the most successful settlement projects in tropical countries have been able to generate, for each

farm family, two or more additional jobs for a farm household/nonfarm household ratio of 1 to 2 plus.

While we doubt that Mahaweli small holdings have that potential, we believe that they do have the potential -- if their production systems are diversified both within and between households -- of generating over a ten-year period employment for at least an equal number of households of farm laborers, craftsmen, and employees of a wide range of commercial, manufacturing, and service enterprises of different scales in terms of employment. This potential, however, will not be realized if the Mahaweli family of agencies does not provide the necessary land (such as house plots and enterprise development sites), infrastructure (such as electricity, schools and health facilities), and incentives and development assistance (including appropriate investment policies, credit, and assistance in overcoming major constraints -- such as the absence of timber for carpenters).

At the moment we believe that the Mahaweli family of agencies suffers from several constraints which must be removed before the AMP will be able to realize its employment potential. The first relates to the lack of data on just what the employment generation potential of the AMP actually might be in terms of the range of possible production systems. This data lack relates to both farm and nonfarm employment. Though most farm labor at present is seasonal, we are aware of some settler households that currently provide employment for several households on a permanent basis. Is it possible then that an intensification of production through improved water management and through production systems diversification at the household level might provide permanent employment for a significant number of farm labor households?

A second deficiency relates to a failure to plan and implement policies to provide for and attract the farm labor which every survey to date shows Mahaweli settlers need at even present levels of production. A third deficiency, already mentioned, relates to a bias within the Mahaweli family of agencies against certain types of diversification, including incorporation of livestock and fishing within the settler production system. A fourth deficiency is based on the pervasive but erroneous assumption that nonfarm employment will generate itself without assistance from the Mahaweli family of agencies. We find this assumption puzzling. Bearing in mind the ambitious program to assist farming households to develop through the provision of irrigation, extension, credit and a wide range of other services, why do Mahaweli planners think that the development of a large number of small scale nonfarm enterprises needs virtually no assistance, especially where the record in Sri Lanka and elsewhere illustrate that lack of assistance either delays the emergence of such enterprises for years or precludes their appearance entirely?

A case in point is carpentry. Though the MEA recently has completed a number of surveys of the existence of and need for nonfarming skills among the settler population and has initiated a vocational training program including the training of carpenters at various development centers, once trained these carpenters are going to need assistance in equipping their workshops and acquiring timber. Already the lack of timber for house construction and for the manufacture of household furnishings is a critical problem not just in some of the older settlements incorporated within H System and the southern portion of System C, but also in such newer settlement areas as H-4. We are aware of a number of cases where settlers, having stockpiled rock for foundations, burnt brick for walls and tiles for roofs, have had to stop attempts to improve their housing because of the nonavailability of timber.

We are also aware of cases where carpenters, with back orders for household furnishings for settlers, have stopped working -- again because of the nonavailability of suitable timber. This problem is a major one which is beyond the control of individual carpenters (and perhaps even of carpenters organized into cooperatives as is currently under MEA consideration), and which is getting worse each month. The Mahaweli family of agencies could facilitate employment generation here, as well as help settlers improve their housing and household furnishings, by stockpiling timber in areas like System B and System C where large amounts of irreplaceable timber (much of which is suitable for housing and household furnishings) is being lost to the settlement areas either through burning (the System C cashew areas) or export (via the Timber Corporation and Charlanka).

#### d. Inadequate Staff for Integrated Planning

The Mahaweli family of agencies never has had adequate staff for integrated planning of farm and nonfarm production systems, let alone for regional planning to integrate the various Mahaweli systems with older settlements and townships in the vicinity (the one qualified regional planner recruited by the MDB resigned because his skills were underutilized). Heaver, in his analysis, believes that staffing inadequacies are associated with the emphasis on engineering and construction that has dominated Mahaweli planning from the start. It is not so much that construction has been over-emphasized but that planning for agriculture, settlement, and employment generation has been underemphasized.

While we did not look into the staffing of the Mahaweli family of agencies in any detail during our 1984 assessment, we were given the impression that the staffing situation had actually worsened during the past twelve months as far as agricultural and settlement planning were concerned. During that time period both the Agricultural Consultant to the MASL and the Settlement Adviser to the Planning and Monitoring Unit (PMU) had resigned. The two Canadian advisers to the

PMU had also completed their UNDP-financed assignments during the year. None of these personnel had been replaced by staff with equal training or experience. Though we were unable to check out the details, people to whom we talked were of the impression that the most experienced economist in the MEA had also resigned, and they also mentioned the possibility of attrition among staff trained in agricultural economics. Apparently there has been a weakening of the ability of the Mahaweli agencies to carry out development planning at the very time that such planning is so crucial.

**Closing Statement:** Land settlement is a distinct type of development intervention involving the pioneer colonization of frontier zones. Such zones are undeveloped frequently because they are problem prone. Their development needs careful planning and plan implementation. Unlike other types of development it can not be assumed that large capital inputs for increased agricultural production will be followed with major multiplier effects simply because such prerequisites as infrastructure may not be present. Hence it cannot be assumed, for example, that the growth of non-farm enterprises will occur "naturally" without some form of external assistance.

The planning inadequacies of the Mahaweli family of agencies are serious, so serious that their continuation will, in our opinion, undermine the AMP's capability to raise living standards and to generate employment. The logical approach to their solution is to establish within the Mahaweli family of agencies a planning unit that is capable of undertaking the type of forward-looking, systematic planning which is necessary. In past reports and discussions we have suggested that such a unit be built up within the PMU of the MASL. We are no longer sure of the wisdom of that suggestion. As the AMP grows in size and complexity, the MASL becomes more and more involved, as it should be, in the coordination and monitoring of implementation. Under those conditions perhaps planning and policy making should be more the responsibility of the Ministry of Mahaweli Development.

Regardless of where the planning unit is housed, it need have appropriate funding, facilities, staffing and support. Support at the top is especially important since the Mahaweli family of agencies in the past has underutilized and eventually lost much of its best staff in such essential fields as regional planning, agronomy and agricultural economics, and development social science (including economics and sociology). Important also is the emergence of a capability to carry out in a systematic fashion the type of complex research for Mahaweli development that is outlined in the scope of work for the proposed employment generation and enterprise development research and training program. Whether located in the MASL, the MEA or the Ministry of Mahaweli Development that program, we believe, could play an important role in developing the type of planning unit for the AMP which we believe is so essential.

**3. An Inability on the Part of the Mahaweli Family of Agencies to Synchronize the Shift from the Construction and Settler Intake Phase of the AMP to the Development Phase**

The failure of the development phase of the AMP to commence immediately after the end of the construction phase in both System H and in the Southern portion of System C is a major reason why the living standards of many settlers are stagnating, or even dropping, at the very time they should be rising. Settlers expect to be pioneers during those initial years of settlement which tend to coincide with the construction phase. At the same time, aware of the hardships that settlers must endure at that time, settlement agencies attempt to ease their hardships in a number of ways. In the Mahaweli case, these include an effective pre-settlement orientation for selectees from non-Mahaweli electorates, an efficient transferral program to the new settlement areas, and the provision of World Food Programme rations for twelve months, with the flexibility to extend rations for a longer time period where circumstances warrant. During the construction phase settlers also have the option, which many choose, to seek wage labor with the many contractors or, in a small number of cases, to become contractors themselves, with the income received playing a major role in meeting family needs.

Important though they may be, WFP rations, wage labor, and contracting during the construction phase are temporary sources of support. If settler living standards are to improve subsequently, and if the increased demand of settler households is to generate additional employment, increased production from agriculture and from other activities must follow immediately after the end of the construction phase. For the majority of settlers in System H, and in Zone 2 of System C, however, this shift in resource exploitation has not occurred, with adverse impacts on large numbers of settler households. Not only are their incomes stagnating, or even dropping, but the state of mind of a significant number of settlers is becoming increasingly pessimistic. In our sample of sixteen H System families, for example, two families have already left the settlement area (with the head of household in one case taking up employment in the Middle East), while another two are thinking seriously of "selling out" and returning to their home area. All four households are outsiders; though some evacuees may be equally depressed, most of them, of course, no longer have the option of returning home. Yet as reluctant participants in the AMP their frame of mind is bound to have an effect on their work habits and attitudes.

**4. The Inability to Date of the Mahaweli Family of Agencies to Facilitate the Development of Strong Settler Organizations for Water Management and Other Development Purposes**

It is common knowledge among irrigation experts in Sri Lanka as elsewhere that strong organizations of water users, run by the

irrigation farmers, are associated with higher productivity. Well aware of this point, participants from the Ministry of Lands and Land Development (including irrigation project officers) and from the Ministry of Home Affairs (including Government Agents) emphasized at the September 10, 1984 Seminar on Integrated Management of Settlements (which was addressed by the Minister for Mahaweli Development and organized by the Project for Advancing Settlement Expertise) that settler-run water management organizations should not only be strengthened but should also be encouraged to federate at D-channel and Project levels. In contrast, the MASL and the MEA are moving in the exact opposite direction by putting project officials in charge of settler organizations, with adverse implications for economic development and community formation that are already apparent.

Though the Mahaweli agencies have always been hesitant about allowing water user associations to federate, in the late 1970s and early 1980s a major, and highly innovative, program was initiated in System H (and later in System C) to establish water user associations for every turnout. With government officials as advisers, settlers were encouraged to appoint/elect their own turnout leaders whose responsibility it was to supervise water issues, mediate disputes and organize maintenance activities. While this program had its weaknesses, some of which we have referred to in earlier reports, these were offset by its strengths. Hence in September 1981 we wrote that "we were impressed by the increased ability of turnout groups to allocate water since our last visit in July 1980. At that time, the organization of turnout groups was just getting under way and members were still uncertain of their functions. By September 1981, however, the majority to whom we talked told us of ways in which turnout groups had improved water distribution."

This gradual improvement of water user associations has not continued in recent years; indeed, their effectiveness has decreased. Participants in the 1983 System H Diagnostic Survey (which, like the 1982 survey, concentrated on the older settlement areas) found that "although turnouts were evident, the lack of effective farmer participation was obvious." Furthermore, "compared to all other practices, the farmer appeared to be least effective concerning the appropriate management of water." Though there were exceptions, we found a similar situation in September 1984 in regard to the twenty turnouts on which we have been collecting information in various parts of H-System (H-2, H-4, H-5, and H-9) and in Zone 2 of System C.

We believe that a major reason for the failure of water user associations at the turnout level to realize their initial potential has been the formation of Community Development Societies (CDS) by the Mahaweli project management. Influenced by settler organizations sponsored by Malaysia's FELDA, CDSs are based on residential units rather than on irrigation blocks or other water management units. They attempt to combine functions dealing with production and

community formation by bringing turnout leaders (at least some of whom, according to the System H Evaluation Team, are now appointed by MEA Unit Managers without proper consultation with other turnout members), youth leaders, leaders of women's organizations, etc into a single organization which is chaired not by an elected settler representative but by the unit manager himself.

While the situation varied from one Community Development Society to another, generally speaking we found CDSs to be ineffective organizations in both System H and System C. According to settlers, they rarely met (indeed some settlers were unaware of their existence) and when they did meet they were, for the most part, unable to deal with settler problems, including problems relating to the irrigation system and to water management.

Our assessment of the ineffectiveness of CDSs is similar to an earlier conclusion of the 1983 System H Diagnostic Survey which noted that "unfortunately, almost one-half of the farmers surveyed were not aware of the existence" of CDSs, and "of those who were, less than one-half regarded the organization as even 'somewhat' effective." Among our settlers households, not only did they consider CDSs to be ineffective government (as opposed to settler) organizations, but they also "blamed" them for undermining their own turnout organizations either by coopting them or by rendering them ineffective through lack of MEA responsiveness to their needs. On the issue of coopting turnout organizations, the previously quoted Diagnostic Survey noted, "in reality, farmers considered turnout groups to be an organization used by project management to communicate with farmers, rather than an organization used by farmers to solve their problems as participants." On the issue of increasing ineffectiveness, settler after settler noted the unresponsiveness of officials at the unit level (including the Unit Manager, the Engineering Assistant and the Field Assistant) to their problems, stating that the Unit Manager, in particular, rarely visited them at their fields.

Currently there is no effective settler-run participatory action organization concerned with agricultural production issues within the Mahaweli systems. Granted the association of such organizations, and water user associations in particular, with increased productivity, we consider this to be a very serious deficiency. While the MEA and the MASL have stated the intention of eventually handing over the control of CDSs to settlers, there is no movement in this direction, nor do we consider the CDS an appropriate instrument for economic (as opposed to social and political) development purposes even if it was handed over to settler control. We would like to elaborate these two points in some detail.

On eventual handing over of control to settlers of settlement agency functions, that has rarely occurred in settlement schemes around the world simply because it is very difficult for managers to

devolve their own responsibilities to others whom they consider less competent than themselves. The more centralized the settlement authority is, the more difficult "handing over" becomes since management is more interested in increasing its influence and authority than in decreasing it. A case in point is FELDA -- the very agency which has had such an influence on the attitudes of Mahaweli officials toward settler organizations. Though FELDA has been in existence since the 1950s, FELDA's own scheme managers still chair the scheme development committees which are the highest so-called settler organization in FELDA projects. Furthermore, as pointed out in recent (1984) World Bank evaluations, the issue of FELDA's handing over management responsibilities to other organizations (whether settler-controlled or government-controlled) continues to be one of FELDA's "burning issues." There is no reason to believe that the Mahaweli family of agencies will find it any easier to hand over current responsibilities of the Unit Manager to settler control at some undetermined future date.

Even if control were to be handed over to settler representatives, we still believe that Community Development Societies are not the most appropriate organization for AMP economic development. This is simply because, unlike FELDA projects, the AMP is based on an irrigation system where the single most important development issue is water availability in the right amounts, at the right places, and at the right times. Once the "bugs" have been worked out of the system -- in terms of design and construction deficiencies -- then the operation and maintenance (O&M) of the system become the key issue, and that is where strong water user associations at turnout, D-channel, and project levels have a key role to play. Such organizations should be based on irrigation units and not on residential units. And they should not be overloaded with functions. Rather they should address their sole attention during their initial years to O&M activities, expanding into other production-oriented activities only after they have shown their capability to distribute water fairly among members and to maintain those components of the irrigation system which are their responsibility. That is why water management functions should not be combined with such community development functions as sports societies and youth development as is currently the case with many Community Development Societies, some of which appear to be more concerned with carrying out social and political (as opposed to development) functions.

So long as the Unit Manager retains control, it is not sufficient to redirect the activities of the CDS more toward production as opposed to community formation. Recent evaluators have noted that Unit Managers are overloaded with work, with the result that they and their field assistants "have not been able to give of their best to the farming population" (1984 Draft Report of the System H Evaluation Team). Bearing in mind that most current recruits to the position of Unit Manager are recent university graduates with little experience in

rural development, it is unrealistic to expect them to have either the time or the interest that is needed for developing strong settler organizations. One result is that CDSs meet infrequently. Another is that they are seen as ineffective government instruments by the very settlers they are supposed to serve. And a third result is that they increase settler skepticism and even cynicism about MEA and MASL intentions.

In our 1983 report we stated our concern that settlers were becoming cynical about the intentions of the MASL and the MEA. Our recently completed field surveys have intensified this concern. Increasingly, settlers appear to be withdrawing from participation in both CDSs and turnout organizations because, as government dominated institutions, they see them as unresponsive to their needs. Furthermore, in an increasing number of cases they see officials at the unit level as actual threats to their well-being.

Settlers are well aware of known cases of corruption whereby Unit Managers and other local officials have been transferred or otherwise punished because of such infractions of the rules as selling supplies of foodstuffs and building materials meant for settlers, underpaying settlers for contract labor, taking over the cultivation of settler farm plots, or colluding in the involvement of others in such activities. As a result, when supplies of triposha or powdered milk or malarial pills are not available, settlers are apt to blame the Unit Manager and other local staff, speculating that they are selling the items in question for their own benefit. In other words, it would appear that settlers are increasingly inclined to see officials at the unit level as part of their problem. Hence they claim that the Unit Manager, as chairman or president of a CDS, bottles up settler complaints (rather than passing them on to the Block Manager) which he sees as critical of his career. The increasing frequency of such comments is unfair to those Unit Managers who are trying to do their job, since it undermines their rapport with the settler population by placing them in an adversary relationship.

There is a tendency in the MASL and MEA to see settlers as easily led astray by "outsiders." Even if such is the case, however, the attempt to dominate settlers through the CDSs is the wrong approach, since we found that during the past year settlers have been joining other types of organizations in order to realize both economic and political goals. This is understandable. Without exception we have found Mahaweli settlers to be well-informed about their needs and problems. If they believe these needs and problems cannot be met through organizations sponsored by the Mahaweli family of agencies they will search elsewhere -- as they are currently doing. Such a situation is in no one's interest. The Mahaweli family of agencies is in the best position to facilitate the emergence of strong settler-dominated water user associations which should be encouraged to federate up to the project level. Such associations are also an

excellent mechanism to keep Unit Managers and other Mahaweli officials on their toes. And if they effectively meet settler needs and problems they will reduce the need for settlers to seek outside support.

We believe that the nature and structure of settler organizations under the Mahaweli family of agencies needs rethinking in terms of (1) increasing settler participation and control; (2) relevance to settler needs during both the construction and development phases of the AMP; and (3) relevance to the operation and management of the irrigation system. Bearing in mind those goals, we believe a two-pronged approach has the most promise. The first "prong" would tailor the initial settler organization to the phase of construction and settler recruitment. It would only pertain to the initial years of settlement, starting with orientation. The second "prong" would be to convert that organization into a separate water users association, and if the settlers so desired, a separate community development society just prior to the first water issues.

The purpose of the initial settler organization would be to assist the settlers with house construction and to undertake construction articulating D-channels to turnouts, and construction and land preparation within the future turnouts themselves. Such an organization would actually combine aspects of three organizational modes already pioneered by the Mahaweli authorities. These are the "six man" self-help groups for house construction; the worker/settler groups for contract work dealing with D-channels, field canals, land preparation, and the drainage system; and the existing community development societies. These would be merged into a single organization to combine the strengths of both the Mahaweli authorities and the settlers to speed the transition from the construction phase to the development phase. During the first few months it might make sense for the Unit Manager to serve as chairman or president, since he would have the responsibility for orienting the settlers, for organizing them into small self-help groups for homelot development and larger units for irrigation construction and land preparation, and for supervising all activities. But settlers would be informed from the start that this mode of organization would be temporary, with settlers required to elect their own chairman and the Unit Manager required to step into an advisory position before the arrival of the first water releases.

To facilitate cooperative labor (attam), every effort would be made from the time of orientation to settle together those most likely to work together. Additionally, every effort would be made to provide neighbors with fields in the same turnout, so that home lot construction units would in time become turnout units while the irrigation and land preparation units would correspond to what would eventually become a union of turnout groups at a higher level within the irrigation system.

Where it was not possible to convert homelot construction units into turnout units, once house and irrigation system construction was finished emphasis would shift to organizing a new association of settlers first at the turnout level and later at the D-channel and project levels. Either way, settlers would be told to select their own representatives as office holders, with Mahaweli officials acting, from the start, in an advisory role so that associations of water users would not only begin with the initiation of irrigation but would be genuine settler participatory action organizations from the date of their establishment.

As for the current community development societies one of two possibilities might be followed, depending on the decision of a majority of the settlers. On the one hand, they might wish the organization to be disbanded, with its place taken by temple societies, funeral and other welfare organizations, youth and women's groups, and the various other organizations which settlers tend to form/join as they place more emphasis on building a community. On the other hand, they might wish the CDS to continue as an "umbrella" organization for community development purposes. In that case control would be handed over to settler representatives. And regardless the option selected, a distinction would be made and retained between water user associations based on irrigation units and community formation organizations based on residential units.

In closing this section, it is worth emphasizing again that strong settler participatory action organizations tend to be associated with higher productivity. In the Mahaweli case, the System H Evaluation Team also emphasized the need for strong settler organizations at the turnout level and for their federation at higher levels. They too regret that Community Development Societies are dominated by officials, noting that such societies "could easily have been the people's organization at the Unit level, thus laying the foundation for a truly grass-roots level organization of people." Looking to the future, the Evaluation Team Report then states that "efforts should be made to hand over power and responsibility to people's organizations. . . . The ultimate success of the Mahaweli Project would depend on the development of a self-confident, self-reliant population able and willing to take on responsibility for their own development."

##### **5. Deficiencies Associated with Water Management and Agricultural Production**

Though we have not allocated much space to these deficiencies in this report, this is not because they are of less importance than the other deficiencies mentioned. For they are not. Rather it is because problems associated with water management and with agricultural production are dealt with in more detail in the 1984 Draft Report of

the World Bank financed System H Evaluation Team, and in the 1982 and 1983 Diagnostic Analysis Reports for the older portions of H System.

We hope that these reports receive from the Mahaweli family of agencies the attention that they deserve for we do not believe that they exaggerate the extent of the problems described. Without exception, all of our sample households are trying to cope with serious production problems which need attention at the highest levels within the Mahaweli family of agencies. Aside from problems associated with poor construction of the irrigation system itself (in regard to both water access and drainage) and land preparation, these relate to a range of water management issues (for which both the Mahaweli agencies and the settlers must take responsibility), a range of planning deficiencies, credit, availability on time of inputs, a growing weed problem in paddy fields (which is closely tied in with water management issues), and marketing. In this section we restrict our attention to the future of H System, planning inadequacies, and the weed problem.

#### a. The Future of H System

For the past few years settlers in H System periodically have had to deal with inadequate water supplies. The Evaluation Team sums up the situation in the following quote: During yala, "the proportion cultivated has declined from 41% in 1980 to 22% in 1983 due mainly to the scarcity of water. The situation in H4 and H5 was even worse. The proportion cultivated amounted to only 16% in 1980, 26% in 1981 and 19% in 1982. In 1983 there was no cultivation at all."

When we discussed this situation with Mahaweli officials in 1983 they stated their belief that the drought had been largely to blame, and we suspect that this has, indeed, been a major factor. On the other hand, we were surprised to find that the Water Management Panel had advocated for left bank canal cultivators in 1984 a continuation of the *bettma* system that those settlers had used in 1983. While *bettma* (a system whereby half the land area is shared out among all the settlers, with each allowed to cultivate 1.25 acres) was an innovative approach under the drought conditions of 1983, it does have a negative impact on settler incomes and on the operation and maintenance of the irrigation system.

Granted the existence of very real trade-offs, we were surprised to find *bettma* also advocated for left bank cultivators in 1984. While we realize this decision was coupled with a decision to provide sufficient irrigation water to enable cultivators in H4 and H5 to crop their entire allotment, we would have thought that the exceptional heavy rains in early 1984 would have provided sufficient water for all of H System. If this was not the case, does that mean that System H must learn to live with reduced water issues as a general rule or was the Water Management Panel following too conservative a strategy at

the expense of a significant number of Mahaweli settler households?. Both explanations are disturbing. If there was in fact insufficient water, we wonder if Kotmale's completion will improve the situation, granted the relatively low storage capacity of its reservoir. And if a future of water scarcity is anticipated for the Mahaweli systems as a whole, won't this have a particularly adverse effect on System H, simply because when water is scarce surely the temptation will be to divert it at Bowatanne out of the Kala Oya System, since water diverted into the Kala Oya meets only the single goal of irrigation as opposed to the dual goals of irrigation and power generation for water diverted away from System H? If so, anticipatory planning for the future well-being of settler households becomes all the more crucial.

**b. The Absence of Systematic Planning  
for the Multicropping of Annuals**

Though there is an increasing recognition of the importance of crop diversification at the household level, planning continues to be largely on a crop by crop -- as opposed to a farming systems -- basis, resulting in a tendency to concentrate on whatever crop is being emphasized at the moment. First it was paddy. Now the emphasis is on chillies, with soya and sugar cane receiving increasing support. Such an approach is hardly in the interests of settler households since rapid increases in production tend to be associated with major price fluctuations. In the case of chillies, producer prices have already dropped 50 percent during the current yala season. Such swings reduce net incomes and employment potential. The September price of chillies (23/- per kilo), for example, probably is not very much above the breakeven point.

It is hard to justify such ad hoc crop-by-crop planning. What is needed is a systematic approach to Mahaweli cropping systems which takes under consideration not just agro-ecological factors, water availability and management and national production goals, but also returns to the producer, integration of livestock into the cropping system, and marketing networks and policies.

**c. The Absence of an Overview Toward the  
Agricultural Component of the AMP**

There is an absence of an overview toward the agricultural component of the AMP that relates, on the one hand, domestic production projections to import policies, and on the other hand, the various facets of production (water management, credit, inputs, storage and marketing, for example) within each Mahaweli system.

In yala 1981 producer prices for the first major crop of Bombay onions in H System, and for chillies, were adversely affected when major imports occurred just prior to and during the harvest season, while this yala 1984 we were informed (although we were unable to

crosscheck the information) that cowpea prices within System H were going to be adversely affected for a similar reason. These two examples illustrate the need for more careful coordination between import policies and national production policies.

While there is certainly more awareness today of the inter-relationships within the Mahaweli systems between the various facets of production than was the case in the late 1970s, members of settler households continue to emphasize to all investigators case after case where deficiencies in the irrigation system and land preparation are not corrected, water issues are delayed at critical times, credit programs are inadequate and inflexible (especially in the face of defaults over which settlers have little control as in the case of drought, floods, and weed infestation where the latter is associated with inadequate water issues), essential inputs are not available at the right time in the right amounts, and marketing policies are weak. Because of their interrelatedness, failure of any one of these facets can jeopardize returns to the farmer as well as the realization of production goals.

In addition to the absence of an overview toward the agricultural component of the AMP, credit and marketing continue to be especially problem ridden. In spite of ongoing efforts by the Mahaweli family of agencies to find a solution, institutional credit continues to be an intractable problem. A major difficulty has been to come up with an effective mechanism for rescheduling loans where settlers default through no fault of their own. Exceptional periods of drought and of heavy rainfall in the past few years have hit the pioneering settlers in System H hard, causing many of them to default -- with the result that the proportion receiving seasonal cultivation loans has tended to drop over the years. Not only is this an unsatisfactory situation for the banks, but it also requires more and more settlers to seek loans from moneylenders at higher rates of interest.

While solutions to such problems will not be easy to find (and current efforts by the Mahaweli family of agencies to encourage the banks to develop a more flexible policy for rescheduling loans, and by the banks themselves to experiment, as during yala 1984, are commendable), we believe that one approach would be for the banks to increase their agricultural staff. Though we were unable to meet this year with representatives of Hatton's National Bank, we were informed that their operation in H-5 continues to be the most satisfactory, in part because Bank staff with agricultural training have been able to visit a greater proportion of farmers than has been the case with the Peoples' Bank and the Bank of Ceylon. In the latter case, we were concerned to learn that there were no agricultural staff at the Bank of Ceylon's new Aralaganwila branch in spite of the fact that the first seasonal loans are to be issued to settlers in Zone 5 this mahala from that office. We also question the focus on loans for specific crops as opposed to loans that meet the credit needs of the settler

household production system as a whole. Those, of course, are more complicated and would require more staff time, which in turn would require more staff. But if the double cropping of paddy alone does prove to be insufficient to significantly raise settler living standards, then efforts to diversify the production system through dairying, for example, will require a more comprehensive credit program if the large majority of settlers are to benefit.

Under marketing, we agree with the H System Evaluation Team that "the poorly organized market facilities . . . discourage farmers from growing subsidiary crops." Furthermore we have been unable to ascertain what the marketing policy is of the Mahaweli family of agencies. According to at least one senior MEA official, this is because no clearcut policy has been formulated. If this is true, then the development of a marketing policy for crops other than paddy deserves high priority. If this is not true, then there is a need to make marketing policy more explicit to MEA officials in the field and to settlers.

#### **d. The Weed Problem**

For the first time a majority of settlers referred to a growing problem of weeds in their paddy fields. Though all had attempted to cope with this problem through the application of herbicides, only one settler claimed satisfaction with his efforts. Others showed us, or told us about, portions of their paddy fields which they had left entirely to weeds, having decided that increased efforts to control the problem were not worth the expected returns. Though settlers in System H were apt to blame inadequate water issues early in the season for increased weed growth, settlers in System C also complained about weeds and there the timing and amount of water issues were less of a problem.

Settlers informed us that several varieties of weeds were involved, some of which were new to them. The Evaluation Team for System H also reported that "large tracts of paddy lands are effected by new varieties of weeds." After identifying these, the Team noted that "some farmers also claim that they are unable to control certain types of weeds by applying available weedicides."

It would appear that a new and serious problem is emerging here which needs attention both in regard to the origin of the weeds and how to control them.

#### **6. Uneven Application of Lessons Learned in One System to Systems Undergoing Subsequent Development**

On the positive side, a number of development lessons learned in Systems H and C which have major implications for settler welfare are being systematically applied in System B. These include the Unit

Management System itself, the relocation of settlers in homogeneous communities, the concept of small irrigation turnouts, the system of health volunteers, the concept of development centers and the dairy and animal traction components of the Draught Animal Programme. Some lessons learned in System B such as the provision of tile roofing to new settlers have also been transferred to newly settled areas of System C. These examples are important; together they have major implications for settler welfare. There are, however, lessons learned which have not been systematically transferred to the newer Mahaweli systems, two of which we discuss below.

#### a. Health

One lesson learned which has been only partially transferred to System B relates to the health of settler households. In System H a number of medical problems have been identified -- including snake bite deaths, malaria, and low levels of nutrition. More attention has been paid to dealing with such problems in Systems H and C than is currently the case in System B, in spite of the fact that System B is less well served by peripheral hospitals. Settlers in System H have access to hospitals in Anuradhapura, Kekirawa, Eppawala, Galnewa and elsewhere as well as to a Mahaweli doctor. While settlers in the southern portion of System C have access to a district hospital in Mahiyangana (and will soon have access to a new hospital being finished in Girandu Kotte) as well as to their own MASL doctor. By way of contrast, the major health facility serving Zones 5 and 1, and the incorporated Pimburetewa Scheme, is the Aralaganwila rural hospital with no doctor, no nurse (aside from a midwife) and no anti-venom. As for the closest hospital with doctors, nurses and antivenom, that is in Polonnuruwa.

A matter of concern for over a year now, the inadequate health facilities in System B are jeopardizing settler health. During the last twelve months we know of three people, including the head of one of our sample households, who have died from snake bite. Where malaria is concerned, settlers from malaria-free zones including evacuees from Victoria and from such highland electorates as Nur Eliya are especially at risk.

In coping with these problems, we suggest that anti-venom be made available at all times at the Aralaganwila rural hospital and that the Mahaweli authorities do whatever is necessary to recruit a resident doctor for System B to replace the doctor who was recruited in January but stayed at his new post for only a few days. As for malaria, our concern is shared by the System H Evaluation Team which noted that "MASL authorities should realize the magnitude of the problem of Malaria." The increased incidence of malaria throughout much of the dry zone, and especially the increase of falciparum malaria (which has already become a killer of Mahaweli settlers), requires that the

entire malarial prevention program be periodically reviewed and altered where necessary.

We also believe that there is good reason to reassess the health needs of the settler population in all Mahaweli systems, including both mental and physical health components. Though only suggestive, our data indicates that the longer than expected transition period between the construction and development phases of the AMP may be having an adverse effect on the mental health of some settler households. As outlined in a following section, for the first time we found tensions between relatives who had moved together to Mahaweli areas leading not only to a severing of relationships between families but also to charges and suspicions of sorcery. We also accumulated information on a disturbing number of reported suicides. And we wonder, in terms of physical health, about the implications of the failure or abandonment, especially toward the end of the dry season, of a significant number of household wells, a concern shared with the System H Evaluation Team which also pointed up the dangers of pollution of well water. All these factors, plus the ongoing concern about nutritional levels among settlers, warrant, in our opinion, careful assessment by a broad-based medical team.

#### **b. Orientation of Resettlers**

The AMP is one of the few settlement schemes in which an orientation program has been developed for outsiders who have been selected as settlers. We believe this program should be duplicated for resettlers. There are at least two good reasons for this. The first relates to the general opinion of officials that generally speaking resettlers are not as hardworking and productive as outside selectees. Regardless of the merits of this opinion (and everyone agrees there are very significant exceptions), a systematic orientation program for resettlers could have positive development implications, especially if unit managers were able to redirect existing community organizations toward tasks relating to construction, land preparation, and, eventually water management.

The second reason for providing orientation for resettlers relates to their anxieties about their future status prior to, and immediately after, their incorporation within a Mahaweli system. Such anxieties were documented by Wimaladharmasiri in System H during the 1970s, and in recent years we have documented them in System B. They relate to all categories of resettlers, including purana villagers, LDO allottees, households associated with earlier settlements soon to be incorporated within a Mahaweli system, and encroachers. In the absence of a systematic orientation program, rumors, misinformation, and contradictory information are spread which cause future resettlers unnecessary anxiety.

In System B we have been visiting several purana villages north of the railway line since 1979. Up until 1984 when there was a land katcherrie which resulted in the large majority of married households being informed that they had been selected as Mahaweli settlers, these people did not know whether or not they would be incorporated within the Mahaweli program. A systematic orientation program, if implemented when the System B boundaries were first established, would have prevented much unnecessary anxiety. But now that they know their villages, their lands, and they themselves will be incorporated within the AMP, old anxieties have been replaced by new ones since they have yet to be provided with information on their responsibilities as Mahaweli settlers. In the meantime, an official whom they called a "forest ranger" (but probably was an employee of the Department of Wildlife trying to enforce environmental regulations relating to new elephant corridors and forest reservations) had told them that since their lands were now gazetted as Mahaweli lands they could no longer cut trees, grow tobacco, graze their cattle, and -- some were told -- even grow paddy. "How are we to live until the time Mahaweli waters come?" we were asked.

These concerns are major ones, especially since it is unlikely that they will receive Mahaweli waters within the next two years. Though in this case the RPM responded quickly, by instructing his new Block Manager to meet with the people, after we outlined the problem to him, no doubt other purana villages have similar concerns. Certainly encroachers from the mid-1970s and before who have yet to be told whether or not they qualify for land have been going through agonies of uncertainty for years. Again a systematic orientation program would alleviate their anxieties, and begin to prepare them as future Mahaweli settlers.

#### **7. Insufficient Attention Paid to Other Problems that Are Adversely Affecting Settler Welfare**

In an accelerated project as large as the AMP it is unrealistic to expect Mahaweli officials to be able to deal even with legitimate settler problems on a household by household basis. Nonetheless we believe that under the pressure of meeting construction time tables and time tables relating to the physical intake of settlers, too little attention is being paid to settler welfare. Meanwhile stresses on the settler population are considerable and may be increasing to unacceptable levels in some areas. We would like to document this point with a number of examples. Dealing chronologically with the settlement process our first example was mentioned in the preceding section. It relates to anxieties among resettlers prior to their incorporation within the AMP. Furthermore, we believe that too many potential resettler households are not getting Mahaweli lands even though they qualify for them. With a few exceptions, there is little evidence that this is intentional. Rather it relates primarily to selection depending on the proceedings at a single land katcherrie.

We are aware of case after case where qualifying settlers are passed over during the land katcherrie process. Though only a small minority in comparison to those who are selected, those who fail to receive land are usually the poorer members of the community -- in other words those who would most benefit from Mahaweli land and who are supposed to benefit from the AMP. There are several reasons why they lose out. One is that the head of household is sick at the time of the land katcherrie and there is no one else to represent successfully the interests of his household. Another is that the head of household is absent as a wage laborer at the time of the katcherrie.

Yet another reason (which we believe may apply to at least ten percent of the population, all landless, or some of the purana villagers in the northern portion of System B, and which also applies to various populations of encroachers which qualify for Mahaweli land) is because the marriages of the households involved have not been registered at the time of the katcherrie. While theoretically this possibility is allowed for by giving people ten days or so to register their marriages, the very poor with little or no land, and no job at the time, may not have the money to pay the necessary registration fee.

A fourth example relates to households who are told that they will get land, but who subsequently, for one reason or another, do not. A most glaring example relates to over forty families that we found living in one of the old worker/settler dormitories in Zone 4 of System C. Long-standing encroachers in the basin of the Ratkinda reservoir, they were told that they qualified for land and were moved to the worker/settler dormitories as a temporary move while the formal land selection process was being completed.

Ten months later these people had yet to be selected and were living under terrible conditions as "forgotten people" in the same dormitories. Because they were not yet official Mahaweli settlers, they had no land to cultivate and no access to WFP rations. Water issues had stopped (there was no associated well) so that they had to beg water from the wells of settlers who were becoming increasingly unwilling to provide access as the months went by. When we arrived no men were present since all were trying to support their families through wage labor. But school-age children were because, as non-settlers, they had been denied access to the local school. Clearly these people have suffered, with their situation worsened by their deteriorating relationship with the settler population who were beginning to accuse them of petty theft, prostitution, and other crimes.

Our second example deals with the length of the period of advance alienation. In spite of efforts to provide settlers with their first irrigation water no later than their second maha season, the arrival

of such water continues to be the exception rather than the rule in both System C and System B. While the Mahaweli authorities are well aware of the problems for settlers when the period of advance alienation stretches beyond a year, and are trying to better sequence settler intake to the construction timetable, accomplishments in this regard are still deficient with too many settlers arriving at too early a date.

A third example relates to settler stresses that follow rather than precede the arrival of irrigation water. These may well have more serious effects on settler well-being simply because during the initial period of settlement, settlers are prepared to be pioneers and to work hard under difficult circumstances to realize a better future for themselves and their children. But when that better future does not begin to materialize during the years immediately following the arrival of irrigation water, then the dangers of negative physiological, psychological, and social impacts on settlers may increase. We believe this may now be the case among a significant number of older settler households both in H System and in Zone 2 of System C, in which case the situation has deteriorated sharply in recent years.

In our 1981 report we stated our view that in general both men and women in System H not only saw themselves better off within the AMP zones than in their former homes, but also saw their situation improving on a yearly basis. We were also impressed by the apparent ease with which evacuees from Kotmale were adjusting, apparently without suffering too many of the negative impacts that accompany programs of compulsory relocation. As already noted this upward economic trend for the majority has, at least temporarily, come to an end, in good part because of the prolonged transition period between the end of the construction phase and the beginning of the development phase. More specifically, this prolonged transition period is associated with a large number of problems which adversely affect production, including deficiencies in the irrigation system, in land preparation, and in the provision of agricultural inputs.

Not only do such deficiencies adversely affect production but we suspect, for the first time, that they are also having an adverse effect on settler mental health. For example, there appears to be an increase in stress-related deaths and in conflicts at both the household and community levels. While interviewing our thirty-one households, we were informed of over twenty suicides among community members. While it was hard to date these in the time available to us, the majority appeared to have happened during the past twelve months, with the consumption of insecticide being the major cause of death. While most of the suicides were believed to be precipitated by family conflicts (which we suspect have increased due to difficult conditions within the settlement areas), some we were told were due to adverse economic factors.

One example related to a young husband and father who killed himself in H-4 at the time of our visit. A second generation Kotmale evacuee, he took his life, we were told, because he despaired of ever receiving Mahaweli land for even a homesite. Housing his family with his grandmother, he had refused to encroach on reservation land like some of his peers, relying rather on what he understood to be promises from various officials that a half-acre plot would in fact be made available to people like himself. This did not occur, however. And after available lands were either encroached upon or given to settlers from other electorates he killed himself. In System C, a somewhat similar situation occurred when a young laborer drowned himself after concluding that he could not obtain land. In reciting such examples, we are not suggesting that promises of land were actually made. Rather we wish to illustrate the point that people's perceptions of the magnitude of their economic problems have reached the point where some apparently commit suicide to escape them.

As for conflicts at both the household and community levels, for the first time we found cases where households within our sample were attributing such misfortunes as snakebite and illness to sorcery practiced by jealous relatives living nearby. Involving four of our thirty-one households, we recorded such cases in all three of the Mahaweli systems visited. In three instances, suspicions led to a complete break between the families involved; in the fourth case such a break had not occurred since suspicion had yet to be focused on a specific household. Such cases tend to increase when times are hard, and especially when high expectations are not being realized.

Though we can hardly generalize from four cases out of thirty-one, nonetheless we found this evidence of social conflict to be very disturbing since it suggests that the stresses of settlement may be weakening kinship relationships at the very time that social support systems are needed. At the community level, we also recorded cases of institutional collapse and conflict. Institutional collapse had occurred in several cases where funeral aid societies had stopped functioning, former members claiming that they were bankrupted by the number of deaths that had occurred recently. As for conflict, that was occurring within such community organizations as temple societies, leading in several cases to the organization splintering into two separate factions. While, again, we are hesitant to draw conclusions, the combination of suicide, sorcery accusations, and institutional conflict within settler communities is suggestive of a worrisome increase in levels of stress.

In dealing with the above problem areas, we believe that four approaches could prove useful, three of which have been briefly mentioned already. These are extending orientation to resettlers, slowing down the intake of new settlers to ensure that they receive irrigation water no later than the second maha season (and preferably during the preceding yala), and carrying out an assessment of the

health of Mahaweli settlers which is broad enough to assess the mental health of settlers (including whether or not suicide rates are higher in Mahaweli areas than elsewhere) and which results in specific recommendations which can be, and are, implemented.

Our fourth suggested approach is more tentative. Granted the number of serious problem areas that we were able to find in several weeks, and the numbers of settlers involved, we believe that the Mahaweli family of agencies should seriously consider staffing a small unit whose prime responsibility is to identify, assess, and propose solutions to settler problems. Solutions will of course vary with the problem. Some solutions will be fairly simple, such as waiving or paying for marriage registration fees so that very poor households can qualify for Mahaweli lands (an approach which the RMP in System B told us he had implemented successfully while RPM in System G).

Where an entire zone is afflicted by problems relating to irrigation system and land preparation defects, or to boundary disputes, a crash program to correct the situation -- as has recently been launched in Zone 2 of System C -- may not only achieve significant improvements but also have a positive impact on settler morale. Problems dealing more with health matters and stress will require a different type of approach. But regardless the problem or the approach, we believe that the ability to identify and deal with the wide range of problems afflicting settlers should be more effectively institutionalized within the Mahaweli family of agencies.