

PN-AAU-642

THE ACCELERATED MAHAWELI PROGRAMME (AMP) AND DRY ZONE DEVELOPMENT:  
SOME ASPECTS OF SETTLEMENT

Thayer Scudder

California Institute of Technology  
and  
Institute for Development Anthropology

September 1980

## CONTENTS

INTRODUCTION.....	1
THE EARLY YEARS OF THE MDB (1970-1972).....	1
Introduction.....	1
Flexibility in Planning.....	1
The Overemphasis on Irrigation Command Areas.....	2
The Relationship between Water Management and Land Use.....	2
Changing Conditions as They Relate to the Size of the Farm Holding.....	4
Changes in Staff Continuity, Cooperation, Coordination, and Balance Within the MDB.....	5
SETTLER SELECTION.....	6
Introduction.....	6
The Need for a National Set of Settler Selection Criteria.....	6
Interviewing Both the Prospective Settler and His Wife as a Joint Production Unit.....	7
Selecting for Settler Skills as They Relate to Crop Diversification and Intensification.....	8
1. Children of Dry Zone Settlers.....	9
2. Intensive Farmers.....	10
3. Sarvodaya Trainees.....	10
MAHAWELI AND COMPULSORY RELOCATION.....	10
The Need for a National Policy on Compulsory Relocation.....	10
The Nature of Compulsory Relocation.....	12
The Opportunity Provided by the AMP.....	15
FINANCIAL COSTS.....	15
Settlement Is Expensive.....	15
Looking at Financial Costs from Different Perspectives.....	16
Regional Planning as a Means for Cutting Settlement Costs.....	17
1. Introduction and Historical Background.....	17
2. The Mahiyangana Case.....	18
Phasing Infrastructure.....	20
THE INITIAL MONTHS OF THE MAHAWELI ECONOMIC AGENCY.....	21
Introduction.....	21
H-5.....	22
System C.....	23
FIVE BASIC ISSUES.....	25
Introduction.....	25
National Policies as They Relate to Dry Zone Development.....	25
MDB Handing Over to the MASL and MEA.....	26
Nonfarm Employment.....	28
Turnout Units.....	29
Size of the Homesite Allotment.....	31
APPENDIX 1: CENTRE FOR SETTLEMENT STUDIES AND TRAINING.....	32
FOREWARD.....	33
INTRODUCTION.....	34

THE SCOPE OF THE CENTRE.....	35
A. Geographical Scope.....	35
B. Conceptual Scope.....	36
THE PHYSICAL LOCATION OF THE CENTRE.....	38
A. The Urban Headquarters.....	38
B. The Rural Headquarters.....	39
THE RESEARCH PROGRAM.....	40
A. Introduction.....	41
B. The Centre's Own Research Program.....	41
1. Introduction.....	41
2. Long-Term Comparative Research.....	42
3. Topical and Problem Oriented Research.....	43
a. Settler Selection.....	43
b. Security of Tenure in Both Old and New Settlements.....	44
c. Settler Participation in Settlement Management.....	44
d. Encroachment.....	45
e. Increasing Nonfarm Employment.....	45
f. Phasing of Physical and Social Infrastructure...	46
g. Rehabilitation and Redevelopment of Existing Commercial Centers and Townships.....	46
h. Regional Development.....	47
i. Reservoir Relocation.....	47
C. Contract Research.....	47
HYPOTHESIS TESTING, POLICY FORMULATION, AND DEMONSTRATION.....	48
TRAINING.....	49
A. Coursework.....	50
B. Training in Research.....	50
C. Internships.....	50
COORDINATION, DOCUMENTATION, AND PUBLICATION.....	51
STAFF.....	51
THE GOVERNANCE OF THE CENTRE.....	52
THE FINANCING OF THE CENTRE.....	53
COLLABORATION WITH OTHER RESEARCH AGENCIES AND INSTITUTES IN SRI LANKA AND ABROAD.....	53
A. The Use and Importance of Seasonal and Permanent Labor..	53
B. The Integration of Livestock into Systems of Mixed Farming.....	54
C. Net Income to Farm Families.....	54
D. Optimal Farm Size.....	55
APPENDIX 2: SRI LANKANS, TOURISTS, AND NATIONAL PARKS.....	56
INTRODUCTION.....	57
WORKING WITH THE LOCAL POPULATION RATHER THAN IN CONFRONTATION WITH THEM.....	57
CONFRONTATION TACTICS.....	59
KUMANA AND YALA EAST.....	59
THE GAL OYA SITUATION.....	61
A. The Fishermen.....	61
B. The <u>Chena</u> Cultivators.....	63

/ 1 ~

**THE ACCELERATED MAHAWELI PROGRAMME (AMP) AND DRY ZONE DEVELOPMENT:  
SOME ASPECTS OF SETTLEMENT**

**INTRODUCTION**

This report and its two appendices addresses itself to a number of questions and issues which arose during my first and last week in Sri Lanka during my current visit (July 4 to August 17, 1980). At those times I participated in discussions with officials in the Mahaweli Authority of Sri Lanka (MASL), the Mahaweli Economic Agency (MEA), the Mahaweli Development Board (MDB), the Ministry of Lands and Land Development, the Ministry of State, and U.S. AID. Many topics were discussed, so this report must cover considerable ground at the expense of in-depth analysis.

Thirty days were spent traveling in the field. During much of that time, Kapila P. Wimaladharmas and I traveled together, discussing at length the various questions and issues dealt with in this paper. Appendix 1 is coauthored with K. P. Wimaladharmas, and I wish to acknowledge with gratitude his contribution to the rest of this report as well.

**THE EARLY YEARS OF THE MDB (1970-1972)**

Introduction

The purpose of this section is to examine current policies of the MDB, MASL, and MEA against the early history of the MDB. My underlying assumption is that the way in which the MDB was formed, its early organization, and the nature of the planning process at that time (and the assumptions which underlay that process) can help explain current strengths and deficiencies in the planning process. I concentrate on the planning process since at that time the MDB was primarily a planning organization in terms of settlement — implementation dealing mainly with the major engineering works of Stage I of Project I. My source of information is largely the minutes of the early meetings of the MDB's Settlement Planning Panel and other committees. These make fascinating reading; they are also most informative in shedding light on the topics that follow.

Flexibility in Planning

Even though the organizations responsible for the planning and

implementation of the AMP have increased in complexity and have moved from planning to implementation of settlement, the willingness of the planners to ask questions, to question assumptions, and to base new policies on previous experience and on the results of a wide range of surveys is exceptional by international standards. Nonetheless, certain early deficiencies have yet to be effectively corrected, while certain planning assumptions have not been sufficiently scrutinized as the conditions on which such assumptions were based have changed. Also, the wide coordination, continuity of staff, and use of university personnel is less evident today than during those early years, while the shift to implementation from planning has gradually increased the dominance of the engineering staff of the MDB over the settlement planning staff, hence creating the need for redressing the balance — a need which has been met through the creation of the MEA.

#### The Overemphasis on Irrigation Command Areas

In my opinion, the greatest single weakness of Mahaweli planning is the longstanding tendency to focus on separate areas under irrigation command (the Mahaweli Systems) as opposed to the integrated river basin and interbasin development of larger areas. Though the MDB has a broad representation of disciplines, the MDB itself grew out of the Department of Irrigation where it first occupied quarters. There are many other examples in the tropics where river-basin development authorities have grown either out of departments (or ministries) of irrigation, or of hydroelectric power. The Jonglei Commission (Jonglei Canal) in the Sudan is one example; other examples are the Federal Power Board (Zimbabwe-Zambia) and the Niger Dams Authority (Nigeria). Such origins tend to be correlated with a primary emphasis on water management for both power generation and irrigation purposes rather than on the integrated regional development of human, land, and water resources.

I suspect that this type of background is a major reason why the MDB tends to think in terms of single irrigation systems. If so, this helps explain why neighboring towns like Kekirawa (System H) and Mahiyangan (System C) tend to be ignored in the development plans since they lie outside the area under irrigation command. I also consider the above historical background at least a partial explanation why mention is made of regional planning in terms of relating the various systems to each other, to older settlements, and to the major townships but that little systematic planning is in fact carried out. The importance of regional planning will be discussed in more detail under the section Regional Planning as a Means of Cutting Settlement Costs.

#### The Relationship Between Water Management and Land Use

In the late 1960s when the UNDP/FAO feasibility studies were carried out, the relevant Sri Lankan Ministry was Lands, Irrigation,

and Power. Agricultural development accordingly was linked to water management from the very start, which gives Sri Lanka a comparative advantage over most other countries in which I have worked. The Committee to Co-ordinate Agricultural Research Work in the Mahaweli Project Area was formed in 1967. Two members — M. S. Perera (then Director of Agriculture) and Dr. C. R. Panabokke (then head of the Ministry's Land Use Division and now Director of Agriculture in the Ministry of Agricultural Research and Development) — later were starting members of the Settlement Planning Panel of the MDB which first met on August 13, 1970, so that there was continuity and coordination in those early years. Other starting members of the Settlement Planning Panel were the Land Commissioner and Mahi Wickremaratne (then head of Agricultural Development).

Though the Committee to Co-ordinate Agricultural Research Work was supposed to evaluate both crop (including subsidiary crops) and livestock enterprises, by the early 1970s animal husbandry had been deemphasized. In the words of the MDB chairman, "Principally, the Mahaweli Development program is a program for growing agricultural crops, and animal husbandry should come in as a supplement to the needs of the agricultural program." Though there was some disagreement with this statement, the consensus was that development of animal husbandry should be deferred to "the relevant stage of development" though when that should occur was not defined.

At the time, there was the assumption, perhaps influenced by the government's interest in cooperative farms, that agriculture would be increasingly mechanized. At the same time the government's emphasis was on milk production rather than draft animals, with the UNDP livestock proposals dealing with the coconut and upland zones rather than the dry zones. Though the changes in petroleum prices and the escalating increase in prices of tractors themselves have changed the conditions on which the original assumption was based, corrective action has yet to be taken in regard to developing a livestock program for the Mahaweli areas and building that into the preparation of blocking out plans.

Though crop agriculture was well integrated in the original planning under the MDB for System H, planning was much less thorough for agro- and other industries — and, as already mentioned, existing commercial and town centers were left out entirely unless they happened to fall within the command areas as was the case with Eppawela in System H. Various checklists of possible industries were mentioned and some preliminary work was carried out but I am unaware of detailed planning studies. This was in spite of the fact that planners were well aware that settlement schemes in Sri Lanka to date "have failed to generate a secondary growth of cottage and small-scale industries." But since the concern appears to have been more with the employment of the second generation of settlers rather than with the early generation of nonfarm jobs, studies lagged.

### Changing Conditions as They Relate to Size of Farm Holdings

During the early years the planners surveyed purana villages in System H, set up pilot projects for settlers with different sized holdings and different farming systems at Maha-Illupallama and Pelwehera, and considered in additional detail a range of farming systems and farm sizes in order to help them reach a decision on the size of the lowland holdings. On one 100-acre pilot project on the M.I. school farm, for example, nineteen farm types were tested. By June 1971 a decision had been reached that the net income for farmers should be about Rs 6000/- per year, with enough lowland allocated to achieve that income. The figure Rs 6000/- came from a Hunting Technical Services Survey carried out on Uda Walawe during the late 1960s where 4 to 4.5 acres was sufficient to produce the target income. This was comparable to the income of an urban white collar worker. It seemed a good standard to achieve not just for that reason but also because an assessable income of over Rs 4800/- was taxable and if settlers could, on the average, produce more than that they could contribute to the national revenue. However, 4 to 4.5 acres of lowland seemed to be too large an acreage since research at M.I. showed that family labor generally was insufficient to cultivate a 5-acre lowland holding. Since a policy goal was to do away with seasonal and permanent wage labor as much as possible, a smaller acreage seemed desirable. Although it is not clear exactly how the 2.5 acre figure was selected for presentation in the 1972 feasibility report, it had been pointed out that with the new HYVs (which were not used at the time of the Hunting work in Uda Walawe apparently) yields of 100 bushels were possible as opposed to the old guideline of 68 bushels. On that basis alone the acreage could be cut to less than 3 acres.

Conditions of course have changed greatly since 1972. In addition to changes in the comparative advantage of buffalo versus tractors noted previously, prices of inputs to the farmer seem to have increased significantly relative to farm gate prices of produce, which would negatively affect the settler's net income. Along these lines it is interesting to note that preliminary results from Wimaladharmas 1979-80 research at Minneriya suggest that the last few years are seen by many settlers as being disadvantageous to them in comparison to the preceding period, although ecological factors — including the 1978 cyclone — are part of the explanation for this situation.

Not only have some conditions changed, but some earlier assumptions have been shown to be wrong. Hence, labor peaks require the use of seasonal hired labor on many 2.5 acre paddy holdings even if they are not intensively cultivated, while 1 acre of intensively cultivated subsidiary crops requires the use of seasonal hired labor for certain operations. Furthermore, policy priorities have also changed so that today far more emphasis is placed on employment generation than was the case in the early 1970s. For all those reasons, the 2.5 acre lowland allotment need be reevaluated as each new system is developed. The danger is that 2.5 acres become in the

future insufficient to generate enough income for the settler to support active commercial and service sectors, hence adversely affecting the generation of nonfarm employment. As for on-farm seasonal and permanent wage labor, that too needs be evaluated not only in terms of on-farm needs for different farming systems but also in terms of increasing employment. To date the existence of both seasonal and permanent farm wage laborers in the older settlement schemes like Minneriya has been relatively ignored by planners in terms of services and social infrastructure — so that they remain a rather hidden and underprivileged class, with few opportunities for economic and social mobility.

Just as the 0.5 acre size of the homesite holding has been recently reevaluated and raised to 1 acre to bring it in line with changing conditions and priorities, so too should the size of the 2.5 acre lowland holdings be periodically reevaluated. In advocating this, I am not suggesting that its size be increased. According to Professor Randolph Barker, who attended the August 1980 ADC/ARTI/U.S. AID Conference on Mobilizing Local Resources for irrigation, 2.5 acres is a fair sized holding by Asian standards. But such a reevaluation would provide important information on the profitability of such a holding under different farming conditions today (information which is badly needed to evaluate, for example, whether or not rural-urban terms of trade are deteriorating for the farmer) and the need for seasonal and permanent farm labor.

#### Changes in Staff Continuity, Cooperation, Coordination, and Balance Within the MDB

In the early 1970s one is impressed by the interdisciplinary expertise of the planning teams for Stage II of Project 1, their wealth of experience, and their continuity over time. One is also impressed by the decision to use university faculty to carry out surveys, the results of which played an important role in policy formulation. For example, the work of the Study Group of Purana Villages led to the decision to give purana villages priority in resettling System H and to use resettlement as a mechanism to consolidate their holdings into a single lowland farm unit. This research and other surveys by MDB and Sogreah sociologists also led to the decision to switch from a ribbon pattern of settlement to a nucleated pattern based on the gangoda neighborhood in existing purana villages.

Through time, however, continuity, cooperation, coordination, and balance within the MDB and between MDB and other agencies has weakened. In part this is because such characteristics are hard to maintain at a high level as organizations mature and grow, and as their mandate changes from a planning operation involving small groups of highly skilled and experienced officials and scholars to a large-scale implementation operation. When I first came to Sri Lanka in January 1979, the use of Sri Lankan University and other settlement

expertise outside the MDB had decreased while the use of expatriate consultants had increased. Most of those involved in the early planning stages were no longer involved, although subsequently some senior staff have been brought back in connection with the establishment of the MASL and the MEA. At the same time, the influence of the engineers within the MDB has increased as emphasis has shifted from planning to construction. Not only has it increased, but it has increased at the expense of settlement planning both within systems, between systems, and within the basin and interbasin area as a whole.

## SETTLER SELECTION

### Introduction

Influenced partly by the experience of the Federal Land Development Authority (FELDA) in Malaysia, the MDB in the early 1970s developed a point system which stressed a number of desired characteristics relating to the nature of land holding (if any) and agricultural experience, other skills that could be utilized on settlement projects, education, age, and family size. Such a point system makes excellent sense. To increase its effectiveness, however, it should be continually rethought as time goes on and new knowledge and experience are obtained. FELDA, for example, has continually reformulated its point system, which may well be the best used in connection with settlement projects in the tropics and subtropics.

### The Need for a National Set of Settler Selection Criteria

The Ministry of Lands and Land Development, the MASL, and the MEA should rethink the whole question of settler selection in order to formulate a national set of criteria not just for Mahaweli but for other dry zone settlement schemes. In addition to considering the type of characteristics mentioned above, special attention might be paid to the following topics which are especially relevant under Sri Lankan conditions: (1) interviewing both the prospective settler and his wife as members of a joint production unit; (2) selecting for settler skills as they relate to crop diversification and intensification; and (3) selecting for families who must be compulsorily relocated because their present place of residence is needed for national development purposes.

Once a set of national criteria have been worked out, then they could be sent to all government agents who would be responsible for the initial selection. Consisting of perhaps twice as many applicants than allotments, this listing could then be passed on to the relevant M.P. for final selection by a predetermined date.

Interviewing Both the Prospective Settler  
and His Wife as a Joint Production Unit

All too often settlers are interviewed as if they did not have wives or families, with no attempt to learn if other members of the family wish to move and, if they do, whether or not they have the type of skills which will increase their chances for developing a successful family farm. In his short paper on the Potential for Employment Creation, Nimal Gunatilleke suggests that Mahaweli planners should bear in mind that nearly half of Sri Lanka's 1.14 million unemployed between the ages of 15 and 59 are female. Granted this fact, surely it makes sense to choose settlers' wives who share their husband's desire to settle on new lands and who have an interest in and aptitude for agriculture (including animal husbandry) and other economic activities — especially since a decision has been made to increase the homesite holding from 0.5 to 1 acre to allow, among other things, the wife to obtain her own cash income from a home garden, livestock and/or other small enterprises. Here it must be borne in mind that on settlement projects the social and economic position of women is often lower than in the villages from which they come, with undesirable effects both on family life and productivity. Though this situation has not been carefully researched in Sri Lanka, Lund's 1978 Survey on Women's Working and Living Conditions in a Mahaweli Settlement Area reports for H-1 and part of H-2 a number of ways in which the position of women has deteriorated since settlement. Removed from kin who have remained behind in the "home village," women are more isolated in the settlement. Though they work longer hours than before, they have less economic power since sources of income from previous activities are less available.

Special planning is needed to correct this situation. As a starting point, only families could be selected as settlers in which both the husband and wife want to become settlers. Otherwise, too many families will be chosen in which the husband wants to pioneer new land but the wife does not. In effect, she is "a reluctant pioneer" who at worst sees the move as a compulsory one carried out only because her husband desires it. Here planners need to pause and ask how many of their own wives would be willing to leave a secure home in Colombo or Kandy for an outstation in the dry zone. Though educated mobile men may not think much of moving about, we know that such moves are often stressful for their wives and children. The same is often true for settlers' wives and children unless pioneering appeals to them as well.

In her report, Lund also points out that in pioneer settlements, women often are more involved in daily agricultural activities than in their home village even though their economic influence often is less. As a result, agricultural extension work among women is needed in settlement projects.

The MDB has already set a precedent for including the settler's wife in the point system even though only one question was

asked — and that did not relate to agriculture but to whether or not the wife belonged to a women's organization. The myth that women are not interested in agriculture still persists in Sri Lanka in spite of contrary evidence. For example, following a training course on subsidiary crops for both men and women at the Pelwehera Pilot Project in the early 1970s, women were asked during a subsequent evaluation what kind of courses they would prefer. Rather to the surprise of the interviewers, those who replied showed virtually no interest in domestic science and nutrition but rather desired courses in general agriculture.

Since influencing the MDB's point system in 1972, FELDA has once again revised its own point system. Currently both husband and wife must attend the interview, with approximately one-third of the total points reserved for the wife. Since questions dealing with family size are asked of the husband even though obviously they relate also to the wife, the difference in emphasis is less than suggested by the one-third to two-thirds ratio. Questions to both husband and wife concern health, education, and agricultural and other skills. Similar questions could be asked of both spouses in Sri Lanka also, along with questions concerning the willingness of both to move.

#### Selecting for Settler Skills as They Relate to Crop Diversification and Intensification

A major goal of the MDB, the MEA, and the MASL is crop diversification and agricultural intensification. In traveling through Sri Lanka during the past thirty days I have been impressed both by the variety of agro-ecological zones in the country and the variety of cropping systems, some of which already are quite intensive. A national resource, this agricultural diversity and expertise could be more systematically built into dry zone settlements. In some cases the actual crops and techniques can be literally transferred. Where they can't because of different agro-ecological conditions, presumably experience with diversification and intensification can be utilized for experimenting with other crops and techniques.

Such experienced farmers could be selected from a particular village or cluster of neighboring villages and moved as a unit to a settlement project where they would be encouraged to experiment with new crops and techniques and to act as a demonstration community to their neighbors. During our recent trip, Wimaladharm and I looked at three types of farmers which we believe could carry out this role. They are (1) children of settlers on dry zone settlement projects -- both major and minor -- who are familiar with the cultivation of subsidiary crops and eager to farm on their own; (2) intensive vegetable farmers from Upper Uva and intensive subsidiary crop cultivators on the Jaffna peninsula; and (3) Sarvodaya trainees from the Development Education Institute, Tanamalwila. These categories -- taken from different parts of the country -- are for purposes of

illustration; no doubt other examples exist.

1. Children of Dry Zone Settlers. Perhaps the most important category are the children of settlers since their experience with subsidiary crops relates to the dry zone. Furthermore, they are committed to farming, many either working their parents' holdings or having moved to other settlements or dry zone areas as allottees or as encroachers. Especially during the mid-1970s, a significant minority of farmers on schemes like Minneriya began to cultivate subsidiary crops because of favorable rural-urban terms of trade arising from increased prices and the temporary cessation of imports. The experience of these farmers is especially relevant to Mahaweli and other contemporary settlement projects.

In contemporary Malaysia, geographers often talk about three types of Malaysians: urban Malaysians, rural Malaysians, and FELDA scheme Malaysians. The latter form a new rural middle class, some of whom have begun investing outside agriculture. To a degree one can say the same about subsidiary crop farmers at Minneriya and, no doubt, other dry zone settlement projects. As such, they form a rather different type of middle class than has been used unsuccessfully in the past to diversify and provide leadership for what were otherwise peasant schemes. First in India and then in Sri Lanka, an attempt was made to recruit middle class settlers to whom larger holdings were given. The hope was that they would not only be productive and provide leadership, but also reduce the costs of settlement by using their own capital. In his Pioneer Peasant Colonization in Ceylon, Farmer is very explicit about how both the Punjab and Sri Lankan middle class settlements failed. Referring to clusters of middle class settlers at Kopakulama, Minneriya, Tabbowe, he wrote that "such settlers have as a rule not been particularly satisfactory from the Government's point of view." Often absent from their farms (in 1951 thirty-two of thirty-six settlers at Kopakulama were not in residence), they did not make very good farmers nor did they provide much leadership. At Minneriya their failure to cultivate caused the government to first take back the land and then reallocate it.

Though they may well have rural middle class incomes, the children of Minneriya and other project subsidiary crop cultivators are a rather different type of person. First, they are farmers with experience with intensification and with diversification. Second, they tend to be better educated than most rural residents, with a significant proportion of both men and women having "O" level education. Quite possibly they could realize both the economic and sociopolitical goals set for middle class farmers in the past. In Egypt, the wives of farmers with agricultural degrees have often provided valuable leadership to women's groups as well as filling rural posts as nurses, teachers, and other social service personnel. It should be possible to select this type of farm family from existing settlement schemes.

2. Intensive Farmers. Upper Uva farmers are intensive cultivators of vegetables on holdings that average, in all probability, one acre or less. Jaffna farmers are intensive cultivators of vegetables and other subsidiary crops; in a minority of cases they are also dairy producers. Settled in small demonstration communities, they might well have disproportionate impact over the years, the latter being settled, for example, in the relevant areas to be brought under command in System B.

3. Sarvodaya Trainees. Village recruited trainees at the Sarvodaya Development Education Institute, Tanamalwila attend first a six-month course in agriculture during which there is considerable work in the fields on the 500-acre Institute. Both men and women are recruited for this course and they receive roughly similar training. After that is completed they move as groups to farm blocks under lift and gravity irrigation where they are encouraged to farm for two seasons. Currently, a number of those who have been through this training are being recruited as Sarvodaya staff but in years ahead an increasing number will be available for assignment elsewhere. Indeed, Sarvodaya already is anticipating that some may become Mahaweli settlers and is trying to replicate at the Institute land use conditions that replicate certain features in the Mahaweli system. On a pilot basis, an attempt to relocate a group of these young farmers as a gangoda within a Mahaweli block might prove to be an excellent extension technique. Like the farming children of the better paddy farmers on major and minor dry-zone settlement schemes, these farmers have valuable experience. Especially during the early years when large numbers of young and relatively inexperienced extension agents are being recruited by both the Department of Agriculture to implement the T and V system and by the MEA as Unit Managers, such farmers could play a valuable demonstration role.

## MAHAWELI AND COMPULSORY RELOCATION

### The Need for a National Policy on Compulsory Relocation

When I first came to Sri Lanka in January 1979, I did not see compulsory resettlement as a major problem in the country even though that topic has been my major research interest over the past twenty-five years. Like others, I knew that the large majority of those who will be moving into the Mahaweli development areas under the Accelerated Programme (AMP) would be eager applicants for new lands. They would be volunteers, and if they were selected they would be fortunate indeed.

This situation of course remains the case. However, during my second visit in September-October 1979 and my current visit I have become increasingly aware of the tens of thousands of Sri Lankan citizens who are required to move — not because they wish to but

because the land on which they live is needed for national development and conservation projects. Both purana villagers and encroachers are involved. Let me give some examples. From the Kotmale reservoir basin approximately 2,500 families must give up their homes, with 372 moved by July 23, 1980. From the Victoria reservoir basin approximately 3,500 families will have to move, while smaller numbers of families have already been moved in connection with the Polgolla and Bowatenne projects. Others are in the process of being moved in connection with the Trans-Basin Canal.

The above families are being moved in connection with the AMP. But other rural families must be moved for other reasons. For example, the purana village of Kumana must be moved from the vicinity of the Kumana bird sanctuary in Yala East National Park in order to meet conservation goals within an internationally important park. The Department of Wildlife Conservation would also like to move another purana village of some 120 families from close to the boundary of Gal Oya National Park. This is Badululuwela Village, nineteen of whose families have shifted their place of residence to encroachments within the national park boundaries.

Then there are tens of thousands of encroachers who will be forced to move in order to make way for afforestation projects which are critically needed in upper catchment basins. Often enterprising pioneers, most of these people encroached because they had no land in their home village. In Badulla District alone there are some 29,000 encroachers occupying land which falls within areas to be planted in trees by the Forest Department. Some are fine farmers, intensively cultivating vegetables in terraced fields. Many more examples could be given on a district-by-district basis (including those who have encroached on irrigation reserves and on areas set aside for access roads, grazing lands, and other community facilities), so I would suspect that the total number of people involved in Sri Lanka as a whole would exceed 500,000. If required to move, these people will be compulsory relocatees because the move is instigated by the government and not by the people themselves, the majority of whom can be predicted to prefer to remain in their present homes even if offered land in the AMP areas.

A national policy to deal with these people is needed for a number of reasons. First, their numbers are many. Second, compulsory relocation is very stressful for many of those involved, especially the elderly, women, and children. Thirdly, the AMP presents the last major opportunity to relocate a significant number of these people so that in the long run they may be better off than is currently the case. Others could be relocated on other projects like Kirindi Oya.

Starting with the 1979 Encroachment Survey, it should be relatively easy for Government Agents to compile listings of encroachers and purana villagers who must leave their homes in order to make way for national development and conservation projects. Since the total number may well exceed the number of places available on

certain present and future settlement projects, priorities need be set so that the most critical situations can be dealt with first. Hence ancient purana villagers could be given preference, for example, over those who had encroached within a reserve within the past few years.

A national policy for resettlement and rehabilitation is needed to standardize a set of humane procedures for dealing with compulsory relocation rather than separate policies being worked out on a case-by-case basis. Generally speaking, relocatees' main need is land and water for cultivation and job opportunities in their new homes. They also need to be relocated as communities if they so wish and provided with potable water and physical and social infrastructure. Though housing is also important, it is less important than development plans which will insure the relocatees' economic and social well-being. Though the AMP is an exception, all too often governments put their primary emphasis on replacement housing, the plan being to move people even before the land is ready to support them. A better policy is to prepare the tanks, irrigation channels, and lands first — along with potable water, access roads, improved health services, and schools. Let the people build their preferred form of permanent housing later, government help being restricted to helping them put up temporary housing by providing access to building materials and transport. Improved housing is of little use to relocatees unless they are self-supporting. Hence economic and social priorities exceed housing priorities.

### The Nature of Compulsory Relocation

Any national policy on compulsory relocation must be based on an understanding of the stressful nature of such relocation. It must be based on an awareness that in the short run the relocatees are sacrificing their well-being to the meeting of national interests. Even where the landless are given land in connection with the AMP it is important to consider the special needs of the Kotmale, Victoria, and other compulsory relocatees (including purana villagers moved from one place within a Mahaweli system to another) apart from the settlers who apply on their own initiative for AMP holdings.

I suspect that at this point most readers will believe that I am exaggerating the stressful nature of compulsory relocation. But they should remember that they are educated and mobile people, whereas the large majority of compulsory relocatees will be uneducated people with strong ties to their place of birth, to the burial grounds of their ancestors, and to the surrounding environment. This is especially true for those who have not traveled much in the past — and that is the case with many women and most children. It is also true for many elderly. Here it is important to remember that in most overpopulated areas where applications are made for receiving settlement lands, applicants are actually a minority. They are often the more enterprising members of the community who have worked as seasonal laborers in places like Minipe and Minneriya and therefore

know what to expect if they move. But the more conservative members of the community do not apply nor do the elderly. They prefer to remain in their home community. It is important for planners to remember that the same often applies to their own families in the case of transfer to an outlying area.

The best studies of compulsory relocation have been carried out in connection with dam construction in the United States, Latin America, Africa, the Middle East, and Asia. What follows applies to all of these studies with hardly any exceptions. In all cases the majority of people do not wish to move. At first they may say they are willing to move, and even prefer to move, but that is usually because they really do not believe that such a move will be necessary. Rather they are trying to please government officials by saying what they think the officials want to hear. But as the date of removal draws closer and people realize that in fact relocation is imminent, a survey of their attitudes can be expected to show an increasing desire not to move. This can be illustrated by two major Sri Lankan examples. When the first Kotmale survey was carried out, 85 percent of the potential relocatees stated a preference for relocating to system H rather than to remain within the reservoir basin by relocating on estates that would not be flooded. Today 55 percent prefer to remain as close as possible to their own homes rather than to receive Mahaweli lands. As for Victoria, today 57 percent wish to remain in their homeland while the rest have stated a desire to go to Mahaweli.

All studies of compulsory relocation show that removal is stressful during a period of transition. This period begins as soon as the first rumor of removal begins. Rumors of imminent removal often begin to circulate at least ten years before the actual relocation. At that time the people become uncertain of their future, and uncertainty is stressful. At Kotmale, potential relocatees in the Kadadora Bazaar reported in 1972 that they had known about the possibility of relocation since 1967/68. Thereafter they had held up development of their community, land, and homes -- some even cutting down their homesite garden trees in anticipation of a removal that did not begin until over ten years later. At Kumana in Yala National Park, the people became aware of the possibility of eventual relocation as early as 1942 -- while their land was formally gazetted for acquisition with the official beating of tom-toms in the 1950s!

Under such conditions of stress and uncertainty, communities do not grow and develop. People do not build new houses and make major investments so that at the time of final removal the people are actually poorer than would otherwise have been the case. But evaluators do not know this when compensation is calculated -- and even if they do, how do you put a price on stress and mental anguish?

Following removal, the stressful period of transition lasts for at least two years for the majority. It ends only when they once again economically get back on their feet and when they come to feel

at home in their new habitat both in terms of the physical environment and their new neighbors. Though this period can end two years after removal, it may also last for much longer.

The transition period is characterized by multidimensional stress. This stress has three interrelated components. One is physiological stress. For a number of reasons, rates of illness and even death rates usually go up during the years immediately preceding resettlement and immediately following it. The elderly in particular are apt to die earlier than would be the case without relocation. But illnesses among children are also apt to increase, especially immediately after removal. I suspect, for example, that this is the case with the Kotmale reservoir relocatees who have been moved to a higher altitude on the Rothschild Tea Estate within the basin, where the people were complaining of the cold and many of the children had colds and respiratory ailments.

A second component of stress is psychological. This component has two aspects. One has been called "grieving for a lost home" — and it affects especially the elderly as well as many women. The other aspect relates to uncertainty about the future. Between the two of them, these aspects can hasten the death of some elderly people.

The third component is sociocultural. In a new home some old farm techniques, customs, and institutions are no longer pertinent and the relocatees miss them. Other customs they do not practice because they fear the ridicule or other negative reaction of their new neighbors and government officials. Often such customs relate to crucial periods in a person's life cycle such as marriage, childbirth, and death. These rituals give comfort and hence if they are temporarily or permanently stopped after relocation, stress is increased. Compulsory relocation also undermines local leaders and local institutions since they were not able to stop removal. As a result the people can lose faith in their leaders, institutions, and beliefs at the very time they most need them. They all too often become apathetic and dependent on the government that moved them, hence making their eventual rehabilitation more difficult.

I hope in these few paragraphs I have made the case about compulsory relocation being stressful. Indeed, it is hard to imagine a greater shock to the people than requiring them to leave their familiar lands, communities, and homes. For this reason the stress accompanying compulsory relocation has been compared to the grief that follows the death of a loved family member. During the period immediately following a death the survivors need support and familiar surroundings. It is the same with compulsory relocatees. During the transition period they cling to the familiar. That is why the transition period is not a good time for trying to introduce all at once many new production techniques, institutions, and behavioral practices. Indeed, attempts by the government to make such early introductions can actually increase the degree of stress and the length of the transition period.

As in the case of grief over a deceased family member, in time the period of stress for most relocatees passes. Then they may be more susceptible to innovations through the introduction of more productive techniques and institutions than if they had remained in their old homes. Awareness of the stages associated with compulsory relocation can therefore improve the chances for subsequent social and economic development. At least two stages need be distinguished: the resettlement and the development stages. During the resettlement stage, the goal of government should be to shorten the stressful transition period as much as possible by helping the people get back on their feet as soon as possible. This must be done wisely so that excess dependency is avoided. Meanwhile, during the resettlement stage the basis for increased production during the subsequent development stage can be laid through proper land and water development; provision of access roads and bus service (to cut down isolation); and better medical and educational services. An improved extension service should also be developed so that once the difficult period of adjustment (during which the majority tend to behave conservatively) is over more rapid growth will occur. In that sense relocation can become an opportunity, although it must always be kept in mind that during the transition period some stress is inevitable — so a humane as well as a developmental approach is essential.

#### The Opportunity Provided by the Accelerated Mahaweli Programme

The current AMP presents the best opportunity to deal humanely and productively with whatever compulsory relocation is or will be required through the implementation of a number of nationally important developmental and conservation policies. This is simply because the most important need for compulsory relocatees is for economic and social viability following removal — for land, water, and community. Since the Accelerated Mahaweli Programme can best meet this need, the selection of settlers from the various electorates should address itself, as one priority, to communities — both purana and encroacher — which may have to undergo compulsory relocation for one reason or another during the immediate future. Careful planning here can help solve problems in the sending areas as well as aid development in the Mahaweli areas since in the long run compulsory relocatees can be as productive as other settlers from different communities.

#### FINANCIAL COSTS

##### Settlement Is Expensive

During my talks with MDB officials we discussed at some length the rising financial costs of new lands settlement in the Mahaweli basin, which have risen from approximately Rs.15,000/- per acre developed (social infrastructural costs included) for System H to

Rs.46,000/- for System C. While such an escalation is an understandable cause for concern, attempts at cost cutting should be very carefully thought through before they are implemented so that in the long run they do not hinder the long-term growth potential of well-planned and well-implemented settlement. New land settlement involving irrigation is expensive throughout the world. Furthermore, initial financial cost estimates tend to be unrealistically low. Hence in connection with the major river basin development projects of Africa (including Kariba, Volta, and Aswan), final financial costs for the resettlement of future reservoir basin residents were three to four times the initial estimates. Granted this situation, it is best to attempt to justify high costs by using new lands settlement not just to develop the settlement areas but also to facilitate regional development in the dry zone and to solve pressing national problems outside of the Mahaweli systems, hence spreading the benefits of the AMP.

#### Looking at Financial Costs from Different Perspectives

A major weakness of new lands settlement projects throughout the world is that they are planned and implemented as agricultural production schemes, often focusing on a small number of crops rather than as projects to foster the integrated rural and urban development of river basin and interbasin areas. This weakness exists in Sri Lanka, also, and is reinforced by emphasizing the costs of bringing one acre under irrigation rather than looking, for example, at the costs of creating an additional job. Those jobs will not just be for settlers. Though it is very hard to calculate the extent to which Mahaweli development will create nonfarm employment, there is no doubt in my mind that the nonfarm component is being underemphasized in the planning process — both in regard to seasonal and permanent agricultural labor and in regard to nonfarm families in commercial, service, and industrial occupations. Obviously if employment generation can be increased, then high costs per acre developed are more easily justified. I will return to this question in a later section.

Another way to present high development costs in a better light is to use the AMP as a mechanism to solve pressing national problems through a carefully designed settler selection program as already described. If for example Mahaweli, as well as other major projects like Kirindi Oya, is used to remove purana villagers and encroachers from areas which must be reforested to protect upper catchment basins, that spreads considerably the benefits of AMP. This is not a minor point since the achievement of national conservation and development goals will require the compulsory relocation of hundreds of thousands of Sri Lankan citizens. Mahaweli presents the last opportunity, really, to shift these people in such a way that in the long run the large majority can be better off. If such a policy is systematically carried out, that too will present high settlement costs in a more favorable light.

## Regional-Planning as a Means for Cutting Settlement Costs

### 1. Introduction and Historical Background

It is hard to overemphasize the importance of broadening the planning context for Mahaweli to a national and regional level granted the importance and magnitude of this project. A key factor at the national level is policies relating to rural-urban terms of trade, a topic which will be dealt with separately in this report. At the regional level, what research has been done on settlement projects to date (and it is not very much — see section on nonfarm employment) strongly suggests that positive multiplier effects from successful agricultural settlement in terms of both employment generation and economic development outside of the agricultural sector require multisectorial planning at the regional level. This point has been made over and over in connection with the need for regional planning in Sri Lanka, especially in the dry zone. Rather than repeat the arguments yet again, I would like to emphasize a specific example of how regional planning at the intermediate level could be reasonably expected not just to lower costs but to increase the multiplier effects of Mahaweli and dry zone settlement through job creation and economic and social development. My example deals with Mahiyangana in Badulla District, but before discussing it some historical background about regional planning within the dry zone is needed.

It is unfortunate that a long-standing interest within the MDB in regional planning has been partly constrained by calling the relevant unit a physical planning unit. While I have not been able to trace the history of this unit in any detail, it was conceptualized by the Colonization Board as a irrigation systems planning unit in 1968, with the members of the MBD's Settlement Planning Panel taking a broader view in the early 1970s. As the members of the Colonization Board saw the unit, it would consist of the following personnel: an irrigation engineer (planning), a soil chemist, an agronomist, an agricultural economist, a sociologist, and a rural planning architect. Though to be located in the Irrigation Department, this unit was to be supervised by a subcommittee of the Colonization Board consisting of the Additional Land Commissioner, the Deputy Director of Irrigation (planning), the Deputy Director of Agriculture (extension), and the Head of the Land Use Unit.

In 1970 the base of the unit was transferred to the Land Commissioner's Department and its scope was expanded. The MDB's Settlement Planning Panel felt that physical planning for Stage II had been inadequate. Defining physical planning as the optimal utilization of land, water, labor, and capital resources, panel members broadened the conceptualization of the unit — although still its scope appeared to be primarily restricted to irrigation command areas with existing townships serving those and other areas, but outside of the irrigation system boundaries, ignored. However, the interdisciplinary base of the unit was expanded to include a rural

industrial planner, first on a part-time basis and subsequently on a full-time basis.

Located within the Land Commissioner's Department, the Physical Planning Unit was supposed to serve not just Mahaweli but also Uda Walawe and other major settlement schemes. Though some staff were appointed to work with the unit they remained attached to their own departments, and for that and other reasons the unit never really became functional.

Subsequently a Physical Planning Unit was established within the MDB, but it was more narrowly conceived as an architectural unit for designing physical infrastructure. While a major attempt was made in 1978 to expand the unit's focus by bringing in a director trained as both an architect and a regional planner, he subsequently resigned. In effect, though the need for regional planning is frequently mentioned, it has not been institutionalized in an operational fashion within the MDB to date. Nor has it been so institutionalized within either the MEA or the MASL.

Though no regional planning for the Mahaweli basin and interbasin areas is currently under way, the conceptualization of what it should be has been broadened still further by concerned Sri Lankans working together with expatriate consultants from Acres and Hunting and, more recently, with Randy Cummings of U.S. AID. Currently an informal group including Chandrananda de Silva, Percy Silva, M. W. J. G. Mendis, Lochi Gunaratne, and Kapila P. Wimaladharm, with Cummings as rapporteur, has been meeting in order to draw up a proposal for funding. In spite of its independent origins, this working committee has similarities to the ad hoc committees that were set up in the early 1970s to carry out survey research for the MDB.

During its initial meetings in the early 1970s, the Settlement Planning Panel decided to appoint ad hoc teams to study a range of topics on which information was badly needed for planning purposes. The most important of these teams made a study of purana villages in System H which had a major effect on subsequent decisions to incorporate purana villages within System H settlement plans (hence avoiding problems which arose at Uda Walawe when some purana villages were left out of the blocking out plans) and to use System H development as a mechanism for resettling them on consolidated holdings — hence eliminating the problems associated with land fragmentation and subdivision. This and other study committees included not only government officials but also university researchers, including Professors Jogaratnam and Percy Silva. Perhaps the ad hoc working party on regional planning could also be used in this same fashion while a regional planning capacity was being built up within the Ministry of Lands and Land Development and perhaps also within the Mahaweli Authority of Sri Lanka. Attached to this paper as Appendix 1 is a position paper by Kapila P. Wimaladharm and myself conceptualizing in further detail the Ministry of Lands and Land Development's proposed Centre for Land Tenure and

Settlement/Centre for Settlement Studies and Training which has already been approved in principal by the government. This center would be a logical organization in which to place the Ministry's regional planning capacity which would be available for old and new settlements, and the regions in which they exist. While the Centre would also be a logical institution for formulating a set of national (but flexible) criteria for settler selection, these criteria are needed now so that some other mechanism within the Ministry would have to be used.

## 2. The Mahiyangana Case

On the right bank of the Mahaweli, Mahiyangana is the most important commercial and service center in its area. Currently within Badulla District, plans are under consideration which may make it the future headquarters for a new district by the same name. On the edge of Soraboya Settlement Scheme, Mahiyangana, along with Hasalaka, also serves the Minipe Settlement Scheme -- which is one of the most successful in Sri Lanka. It also is adjacent to System C, being located no more than twelve miles from the expensive new town of Girandukotte.

In 1960 a redevelopment plan was drawn up the Town and Country Department for Mahiyangana, with redevelopment starting in 1965 when the old town was relocated in order to enlarge the sacred areas around the nationally significant thupa and monastery. A district hospital was established and other government buildings, but in recent years the redevelopment program has slowed down, partly because of lack of funds.

The AMP could be used as a mechanism to enhance the development of Mahiyangana as a secondary center to serve both old and new settlements in the surrounding areas. Yet, like Kekirawa adjacent to System H, it has been ignored by Mahaweli planners, with no capital allocated for its development. Regardless of the reason (and I assume it is because Mahiyangana lies outside the System C irrigation command area), ignoring existing centers like Mahiyangana cannot be justified.

Should the development of Girandukotte continue as if Mahiyangana did not exist, the end product may well be a lack of growth for both centers -- with reduced AMP multiplier effects. Certainly the potential for Mahiyangana to become the secondary center serving the areas is much greater than that of Girandukotte.

What I am arguing here is that by facilitating the development of existing centers like Mahiyangana, the AMP can have the best of both worlds since, on the one hand, it can save costs and time by deemphasizing the construction of costly infrastructure in a new town and, on the other, it can increase the growth potential of the surrounding areas. Let me give just two brief examples of how with relatively small capital inputs Mahiyangana can be made a more

attractive and productive place to live for settlers, agricultural laborers, and nonfarm families alike. These examples should not be taken too literally since we did not have time to more than superficially examine the Mahiyangana situation. They should be seen as suggestive only.

When we asked a small number of government officials at Girandukotte what would make the System C area more attractive for them, and increase the probability that they would bring their families to join them, they answered a first-rate school system along with an efficient bus service to transport the children to and from school. Good medical facilities were also mentioned. While Mahiyangana has an "A" Level secondary school, the curriculum apparently is only adequate in commerce and arts. Yet, with special financial incentives (paid by the MDB) it should be possible to attract to this school first-rate teachers in commerce, science, mathematics, and English language medium -- turning the school into one of the better schools in Sri Lanka at a relatively small cost in personnel, equipment, and infrastructural expansion. To accomplish this goal, an experimental, flexible, and imaginative approach would be necessary. At the Mahiyangana district hospital there is already a doctor in residence from the Philippines. If it was hard initially to attract first-rate Sri Lankan teachers to this rural area, overseas volunteers in the relevant disciplines could be recruited with the MDB topping up their salaries. Again, this precedent already exists since at least one overseas volunteer is teaching in a training institute in Badulla. As the school's reputation grew, and as the planned residential area within the township began to grow, it should become progressively easier to recruit Sri Lankan teachers.

The other example needs only brief mention, in part because it is more speculative and liable to error. Anyone driving through Minipe soon notices that parts of the settlement area contain a local brickmaking industry. Furthermore, next to Mahiyangana is a tilemaking factory which we were told was producing under capacity. It would appear that the construction boom at Girandukotte has not greatly benefited this local industry, probably because it has underutilized it. Hence at Girandukotte we noticed the installation of prefabricated housing imported from Indonesia, when presumably more employment could have been created within the region at lower costs by making better use of the local construction-materials industry.

### Phasing Infrastructure

Another way in which costs can be initially reduced is phasing infrastructure so that certain types are constructed at a later date. Though the actual sequencing need be carefully thought out and adapted to Sri Lankan conditions, a few generalizations may help in establishing relative priorities. It is becoming increasingly clear that the first two years of settlement are especially crucial. During that time the new settlers are adapting to new conditions. This is

stressful and successful adaptation requires time and energy. During that time period it is unrealistic to expect settlers to rapidly expand their productivity. After all, they are adapting to a new physical and biotic environment; to new neighbors; and, in many cases, to different agricultural techniques. At the same time they must construct temporary housing. As noted above, all these activities require time and energy.

To aid the settler during this difficult initial period, it is crucial that land be properly prepared by the MDB for the first cultivation season under irrigation and that irrigation water be available at the right time in the right amounts. Study after study of Sri Lanka settlement projects show that improper land preparation and problems of irrigation water availability and water management have plagued settlers time and again.

Access roads are also crucial from the start for bringing in inputs and marketing crops. They also help relieve initial isolation since a good access road system will hasten the development of boutiques and a bus service.

Also crucial during the first two years are potable water and malarial control, along with operational schools. Other types of infrastructure can either be provided on a small scale initially (sub-post offices, for example) or delayed for a few years. The needs of project officials are initially greater than are those of settlers, agricultural laborers, and other nonfarm families, although with social and economic growth the latter can be expected to grow rapidly. But these greater initial needs of officials can at least partially be met by upgrading banking, postal, and telecommunications services in existing townships rather than creating expensive and underutilized new facilities.

One final point here. The actual phasing will not necessarily be the same from one area to another. Hence the initiation of the laborer/settler system in System C requires a different phasing than used in System H. Since the laborer/settlers will be involved in preparing lands and making irrigation channels in turnout areas that they will subsequently be cultivating, their need for potable water and malarial control will obviously predate their need for properly prepared and watered land.

## THE INITIAL MONTHS OF THE MAHAWELI ECONOMIC AGENCY

### Introduction

The record to date of the Mahaweli Economic Agency in H-5 looks good. Similarly the first laborer/settlers in System C appear to be doing a fine job during their first month of work. The unified approach of the MEA to extension work, and to rural development work in general, is excellent -- as is the pragmatic and experimental

approach of the MEA and its current capacity for flexibility. Hopefully these characteristics will continue to be stressed as the agency continues to grow. Senior officials in the MEA, as well as in the MASL, also appear to be well aware of the danger of confusing a unified approach to Mahaweli development with a paternalistic approach that takes away from the farm family the decisionmaking capacity which is essential for the growth of economically viable farming systems. Without overloading them with tasks, it is terribly important, in my opinion, to facilitate the internal organization of both turnout groups (which will be discussed in a later section) and laborer/settler groups and to allow them to increase their responsibilities. The antithesis of local farmer initiative is the dependency relationship which all too often rises between settlers and government agencies in government sponsored settlement projects around the world. The MEA, partly because of a recent trip to Malaysia and various FELDA projects by senior officials, is well aware of these dependency risks which can be best avoided by encouraging settler initiative through laborer/settler organizations and turnout units.

#### H-5

The MEA took over operational management of settled portions of H-5 on March 17, 1980. Currently 2,450 settlers are present with another 3,200 to be settled. Staff are being recruited, and by July 13 one foundation course and four follow-up sessions had been given to the staff. Twenty-five Unit Managers have been recruited, providing one for every 100 settlers as planned (this staff/settler ratio will be altered to 1/250 for System C). Advised by technical assistants (engineering, agricultural, marketing, and community development), these Unit Managers constitute a dense unified extension service. Though a diploma in agriculture is stressed, training in water management and community development is also considered desirable. As for turnout units, they have been constituted and leaders selected/elected by members, with decisions being unanimous in the large majority of cases apparently. Instruction for these turnout leaders is supposed to begin this September.

Staff/settler contact obviously will be intense, with Unit Managers supposed to attend at least some of the turnout leader training sessions. At the same time, the project manager (Mr. Samarasinghe) wants the Unit Manager to bring extension directly to the farmers by meeting with them on an ongoing basis in the field and by encouraging the internal organization of the turnout units and the residential hamlets. This two-way approach via classroom and field extension makes sense and should reduce the danger of turnout leaders seeing themselves, and being seen by other irrigators, as minor government officials rather than as genuine farm leaders.

Already the MEA has shown a capacity to experiment and innovate. For example, in June the MEA bought up the farmers' gingerly crop and marketed it. During Yala 1979 they have shown

further capacity to innovate. Hattons Bank has exclusive lending rights in H-5. Though willing to give credit for subsidiary crops, they wanted those crops to be insured because of the risks involved when water releases were delayed until May 15 because of a shortage of irrigation water. Crops are pulses rather than chillies and onions, and H-5 has apparently become one of the first, if not the first, areas to experiment with subsidiary crop insurance. Since the premiums are required in advance, these are deducted from farmers' loans before they are paid in kind.

The MEA also plans to extend assistance to farmers to raise buffalo for agricultural work, the goal being to get 50 percent of the farmers to participate in the rearing program. As for the MEA's unified approach to development, this includes operation and maintenance of the tertiary canal system, with the MEA building up its own maintenance unit.

While it is, of course, too early to evaluate just how successful the MEA approach will be, the agency is off to a good start and should be given every possible encouragement. My major caution at this point is beware of attempting to do too much for the farmer initially -- both in terms of causing dependency and in terms of creating possible resentment if the MEA has to, subsequently, reduce services. It is best to start off cautiously and do well a few basic things which can be subsequently continued. In the case of gingerly, the MEA practically purchased at the farm gate by using lorries equipped with scales. Since they offered more attractive prices than did local traders and mudalali, this gave them a comparative advantage. However, because of higher costs, the MEA is now thinking of replacing such a mobile system with permanent purchasing centers which will require the farmers to come to the MEA rather than the MEA to the farmer. Pulling back in this fashion is to be watched very carefully for the reasons noted above. If the farmers come to expect a lot from the MEA and then services are reduced, the farmers may then switch to mudalali because they are farm-gate purchasers, even though they offer lower prices.

### System C

Here the first laborer/settlers began work on June 19, 1980. From Alutherama G.S. Division, which is the most densely populated division within System C, they are working out from their own villages and homesteads (to which they return each night). Though the recruitment program is running a bit behind schedule it is hoped to bring in the first of some 650 compulsory relocatees from the Trans-Basin Canal area and the Victoria reservoir basin later this September, with 150 laborer/settlers to follow from densely populated Passara Electorate in Budalla District. Dormitories have been set up to receive them, and when we visited one area finishing touches were under way. However, it is also important to ensure that potable water of good quality and sufficient quantity is ready before this first

group of laborer/settlers arrives. It is easy to forget that the experiences of the first arrivals will influence the attitudes and expectations of those to come subsequently, since news can be expected to travel rapidly. Just as the first two years of settlement have a disproportionate importance, so too does the first phase of settling an area. Every effort should be made to provide the minimal essential infrastructure before the settlers arrive.

Though we only interviewed one laborer/settler group, its activities to date were impressive. The group consisted of forty-two members, most of whom were LDO allottees and encroachers. Before starting work on cutting 1,500 feet of D-Channel, the group formed a committee of four from whom a group leader was selected/elected. A retired Land Development employee, this man impressed us with his leadership ability and experience. Knowing that they are working the area which they will eventually farm, this group wants even more responsibility in preparing lands that they will farm and irrigation channels that will bring water to those lands. Indeed, they (at this point about twenty-five people were listening in to the discussion) wish to secure a contract to construct all the D and feeder channels and to do the land preparation in their area. In this regard, their leader pointed out that within the group's membership there were masons, carpenters, drivers, and other skilled artisans. Such initiative should be encouraged. Though increased use of such laborer/settlers requires careful supervision, it also can definitely contribute to better channel layout and land preparation. Already the group leader told us that they had brought the attention of the staff to what they thought was a defective alignment. Resurvey showed them to be correct.

This experiment is of tremendous importance and should be given every opportunity to succeed so that it can be extended throughout System C and other systems. It is important to remember, however, that these first groups are not living in hot, sheet metal dormitories but rather are returning every night to their homes and families. Also, it is easier to provide a small number of such groups with proper supervision and WFP food allocations than will be the case when the number of laborer/settler groups increases significantly. It must also be remembered that the current laborer/settler program is a variant of advanced alienation. Now, as in the past, the idea is a good one: allow future settlers to prepare the land and the irrigation facilities they know they will be using in the future. But now, as in the past, the success of this program will depend on the work continuing on schedule so that the period of dormitory residence and of nonsettler status is kept to the minimum. If it extends beyond one year, the risks of failure increase significantly.

It is also important to keep the laborer/settlers fully informed of policy and of scheduling. The group that we interviewed did not know that a decision had been made to increase highland allotments to one acre. Some members had two to three cattle and several buffalo, and they are worrying about land for grazing and

tethering such stock since they were convinced that 0.5 acre highland would be insufficient. They wanted to make sure that communal pastures would be set aside and handed over to the group for communal management. In this way they believed they could keep the problem of future encroachment under control, and they well knew the extent of this problem, some of them having been encroachers themselves. In instances like this the MEA should not only keep the laborer/settlers up to date on plans and policies, but it should have the institutionalized capacity to listen to the laborer/settlers and to learn from them.

On site MEA staff in System C was seventy in mid-July, including laborers. Senior staff were six and had been present for approximately one month. One staff member is the second in charge of the MEA's Development Centre, the senior staff of which will combine agricultural and sociological expertise. An outgrowth of the Hunting Technical Services System C report, this center is a pioneering facility which the MEA has wisely decided to pursue and to manage. It will have a training and demonstration farm. (A similar center would also make sense for System B, granted its rather different agroecological conditions.)

## FIVE BASIC ISSUES

### Introduction

I would like to end this report by briefly commenting on five basic issues. These are national policies as they relate to dry zone development, MDB handing over to the MASL and the MEA, nonfarm employment, turnout units, and size of the homesite allotment.

### National Policies as They Relate to Dry Zone Development

While stressing the importance of regional planning, it is important also to assess the implications of certain national policies as they relate to AMP and dry zone development. Particularly important are policies which influence rural-urban terms of trade. Terms of trade favorable to the settler are of crucial importance to provide incentives for increasing production and for maintaining a satisfactory net income. The small amount of research which has been done strongly suggests that the multiplier effects of multifactorial planning go up with increases in farm family net income -- in particular, the ratio of total employment to agricultural employment goes up. Conversely, should net income not grow, or should it go down, multiplier effects will be reduced. Currently this appears to be the case with the large-scale Khashm el Girba Project in the Sudan (second in size to the Gezira Project), with both businessmen and farm laborers beginning to seek out business and job opportunities outside the scheme -- the growth of which has at least temporarily stopped.

Recent research by Kapila P. Wimaladharm and his associates at Minneriya suggest that the terms of trade may have deteriorated for farmers there over the past four years. The same situation may also apply to Minipe and other large-scale settlement projects in the dry zone. This is only an initial impression. The situation is complicated by a number of natural disasters which have adversely affected settlers during the same time period, including the 1978 cyclone, brown hopper infestation of rice, and disease in buffalo. However, a majority of farmers also claim that in recent years the cost of inputs has gone up relative to the sales price of their produce, the implication being that their net income is growing at a slower rate than in the past. They were particularly critical of the price of paddy and fluctuating prices for chillies, onions, and other subsidiary crops. Since the local price for rice is below the world market price and since the renewal of chillies and onion imports has indeed had a depressing effect on farmgate prices, the farmers' complaints deserve very careful consideration at the national policy planning level; otherwise the growth potential of the AMP could be adversely affected. In the absence of hard data it is hard to say more than this, but potentially the situation could be very serious since an equitable price to the farmer is as essential a condition as any for sustained agricultural growth and for achieving the multiplier effects associated with that growth.

#### MDB-Handing Over to the MASL and the MEA

The present section should not be considered as a critical attack on the MDB, which has an impressive record of achievement to date. Rather, it is based on observations in other countries as well as in Sri Lanka. The problem that I will be referring to is a generic problem which affects most large-scale irrigation projects where construction of the irrigation projects and water releases from the headworks are carried out by one organization (or set of organizations) while agricultural operations, and downstream maintenance and water delivery, are the responsibility of another organization (or set of organizations). In the operational phase the problem usually is between a Department of Irrigation and a Department of Agriculture — with each blaming the other (or both blaming the settler) for shortfalls in production. The solution to this problem is effective consultation, coordination and cooperation — such as occurred prior to the Yala 1980 season in working out a schedule of water releases from the major tanks to cope with the effects of the drought. Looking to the future, the MASL should be in a good position to coordinate the activities of both the MDB and the MEA, although the problem of cooperation with the Ministry of Agricultural Development and Research remains.

In this section, however, I wish to touch on a different topic. This is the handing over of recently developed blocks and systems from the MDB to the MEA. By handing over I do not mean in any legal sense since my understanding is that in that regard the MASL

will be the responsible government agency. Rather I mean the handing over that is involved when the agency responsible for operations and maintenance (the MEA) takes over from the agency responsible for construction (the MDB including its subcontractors). In Sri Lanka as elsewhere, poor land preparation, faulty tertiary channel alignments, and defective irrigation structures at the turnout and field level create serious problems for settlers during their first years on the land (and in some cases throughout the entire project life). Though these problems cannot be entirely eliminated, it is essential that they be kept to the minimum possible to reduce the stress on the farmer during the critical initial years. In other words, every attempt should be made to present the settler with properly prepared and watered land for the first irrigation season. At the Debera Ara Wewa Scheme in Thanamalwila, which is under the management of AgroHope, the farmers suffered seriously during the first seasons (with a significant number falling into debt at the worst possible time) because the agency responsible for construction of the spillway did not hand over on schedule. In System H (left bank) greater attention has been paid to the operation and management of the irrigation system by creating a separate Water Management Division within the MDB. In spite of this organizational setup, it has not yet been possible for this division to correct after three to four years certain defects that persist from the construction period. Indeed, over the years irrigation problems, most of which are related to faulty construction and land preparation, have increased -- with 48 percent to 61 percent of the farmers (the proportion varying from area to area) stating that they have water management problems. To check out these farmer complaints, the Water Management Division carried out during 1979 a survey of irrigation problems in the Galnewa Region where irrigation water had first been provided for Yala 1976. The results of the survey showed that 33 percent of field turnouts needed to be either improved, reconstructed, or newly provided while 32 percent of field channels had problems (bunds needed to be improved, lining provided, and so on). As for turnout area drainage, 46 percent of the 558 turnout areas inspected needed attention, including improvements and excavation.

In System H (left bank) the MDB was responsible for both construction and maintenance. But in the future, maintenance and operations will be the responsibility of the MEA. If the MDB has a difficult time correcting its own constructional defects, it follows that the MEA -- which will not have equivalent staff -- will have a still harder time unless mechanisms are carefully worked out and formalized through institutionalization (1) to keep the original proportion of defects as low as possible and (2) to correct the inevitable defects which are bound to be discovered after handing over. In the second instance, the MEA could have the authority and funds to hire whatever assistance is needed after handing over to correct defects if their own staff resources and the resources of the settlers' own turnout units are not sufficient to do the work.

Though the quality of land preparation and tertiary canal

construction could improve in System C and B under the laborer/settler system, I believe a formal system of handing over and a capability to correct defects is still necessary. Furthermore, a new problem arises in these systems which is the timely handing over of recently prepared areas to the settlers and the MEA for the commencement of irrigation activities. I have mentioned earlier the importance of laborer/settlers receiving on schedule their holdings so that they do not have to live too long under bachelor conditions in relatively crowded and uncomfortable (in terms of heat) dormitories. In System H it is possible to slow down settler intake if construction falls behind schedule, and the MEA has already shown the flexibility and willingness to adjust inflow of settlers to land and water preparedness. But in System C, the laborer/settlers will already be on location so that any delays will directly affect their well-being and motivation. Under these circumstances one faces a difficult trade-off. Is it better to hand over a somewhat incomplete system to allow laborer/settlers to get on with irrigation on schedule or to delay handing over until land preparation and the construction of tertiary works is further along — even though more short-term hardship occurs for the laborer/settlers? Possibly, one option will be best in one case and the other in another. But if the first option is chosen, that again emphasizes the need of the MEA to have the financial capability to ensure that final preparatory work and defect correction is promptly attended to — and should the overall scheduling fall behind, then the MASL should have the flexibility to adjust the intake dates for laborer/settlers accordingly.

### Nonfarm Employment

Only recently has the realization grown that new lands settlement projects throughout the tropics and subtropics have not realized their potential for employment generation and for economic development. A major reason for this failure has already been stated — settlement projects are planned and implemented as agricultural production schemes, while the planning for irrigation settlement projects is usually restricted to the irrigation command area. Yet, what little research had been done suggests the employment generation and multiplier effects that can be expected to accompany successful agricultural development are not realized primarily because of the absence of multisectorial planning on a regional level. Mr. Wimaladharma has brought to my attention a key source here — which is R. Weitz, D. Pelley, and L. Applebaum's Employment and Income Generation in New Settlement Projects (Working Papers, World Employment Programme Research, Geneva: ILO, 1978). After surveying sixty-three settlement projects in thirty countries, the authors concluded that (1) positive multiplier effects require intersectorial planning in the agricultural, industrial, and service sectors and (2) a rising ratio of total employment to agricultural employment is correlated with an increasing number of farm holdings, on the one hand, and a higher settler net income, on the other. This and other recent sources on the same topic should be carefully studied by

Mahaweli and settlement planners in Sri Lanka. During the next few months I will be developing a small annotated bibliography on this topic, including reference to research done in Malaysia by the World Bank (which is more aware of the importance of nonfarm employment on settlement projects than other development agencies) on the Muda Rice Scheme and on FELDA projects.

Actually the simple dichotomy between farm and nonfarm families should be expanded to include three categories. These are settlers, agricultural laborers who are not settlers (this category including both seasonal and permanent laborers), and nonfarm employees and employers. There is a tendency to forget the agricultural laborer category, partly for ideological reasons which emphasize the goal of the family farm on which only family labor is employed. While FELDA has come the closest to realizing this goal, this is for reasons which are nontransferable to the Sri Lanka dry zone since they relate specifically to the cultivation of two perennial wet-zone crops: rubber and oil palm. Since successful dry zone farmers must employ labor, it's best to plan for this by providing for the needs of seasonal and permanent farm laborers along with other segments of the population.

#### Turnout Units

The current organization of turnout units in System H is tremendously important and should be encouraged. As Radosevich, Montgomery, and others have pointed out, there appears to be a close correlation between effective local level water user associations and increased agricultural production. The government of Sri Lanka, the MASL, the MEA, and the MDB are committed to active, ongoing settler participation in the development process. Coward, in particular, has stressed in his trans-national research that for irrigation projects the critical unit for water management is not the residential community but the water user community (although, of course, the two may sometimes be the same).

Against this background it is crucial that turnout units in Sri Lanka succeed. To date the emphasis has been on the training, in a classroom situation, of two leaders selected/elected by each turnout unit (in the future only one such leader will be selected/elected in areas under MEA management). This training has been of a high quality involving officials from the different divisions of the MDB and the MEA who have worked together not only learning more about each others' perspectives and problems but also about the settlers' perspectives and problems as expressed by their turnout leaders. Looking to the future, I would like to briefly mention four further points.

First, it is now also important to concentrate on the internal organization of the turnout unit and to bring turnout organization into line with the suggested amendments to the Irrigation Ordinance which are currently receiving parliamentary consideration. These

amendments, for example, suggest a minimum of three leaders per turnout unit so as to represent the needs of bottom enders and middle enders as well as top enders. While this recommendation relates to turnout units with fifteen or more members (and hence slightly larger than most H System turnouts), it nonetheless emphasizes the need for developing the internal organization of the turnout unit. Without this there is the danger that the water users within each turnout will not see the turnout unit as their own farmer organization but will rather view the single leader as the government's man at the turnout level, even though they have selected/elected him themselves.

Second, in the enthusiasm generated by this turnout experiment it is important not to overload the turnout unit with too many functions. During the first few years a strong case can be made for restricting the turnout units' functions to those relating to water management (water allocation and maintenance of turnout structures, canals, and drainage areas) and conflict resolution (tied in with water courts as presented in the Amendment to the Irrigation Ordinance). Subsequently other functions could be added on a phased basis, such as receiving credit (including guaranteeing loans for members). But turnout units should not be seen as a replacement for residential unit organizations which are needed for carrying out other tasks (including catering for the needs for participation of women and youth).

Third, it is crucial that complaints and problems that surface during training sessions for turnout leaders be dealt with promptly wherever possible by senior project personnel who MUST periodically put in an appearance at training sessions in order to participate in the dialogue between field officers and turnout leaders. There is already evidence in System H that turnout leaders are becoming skeptical about MDB commitment and capacity to deal with the problems that they have identified and discussed with field officers. There is also already evidence that field officers themselves have been embarrassed by their inability to act on settler problems. Senior project officials in the MDB (and now in the MEA in H-5) are of course incredibly busy. But a sense of perspective is essential here. The main risk-takers in any settlement are not the officials but the settlers. And the success of the settlement in the long run depends on the settlers, who are the key resource. If they get discouraged and even cynical during the early years about government intentions or capability to deliver on intentions, then serious development problems could follow. It is essential that the MDB, MEA, and MASL carefully select their priorities and then follow through on each one -- especially during the first critical years of settlement.

The existence of laborer/settler groupings in System C (and subsequently in System B) presents an excellent opportunity to federate turnout units as the D channel level soon after they are formed since the larger laborer/settler units to an extent correspond to larger irrigation units.

### Size of the Homesite Allotment

A recent policy decision has been made to increase the size of the homesite unit in System C and System B. It is important to follow through on this decision for a number of reasons which have been mentioned in earlier reports, including my June 1979 report. Viable farming systems usually include three components: the crop, the livestock, and the nonagricultural (which can include wage employment of one or more family members, some of whose earnings may be reinvested in agriculture and in on- and off-farm enterprises -- including room rental, cottage industries, and other small businesses). The larger homesite acreage is needed to facilitate the diversification and intensification of the agricultural activities (through the planting of tree crops, vegetables, and so on, and the care and feeding of buffalo, cattle, and other livestock), as well as the development of the nonagricultural component. Much of the activity on this land will be associated with the women of the farm, especially when lowland rice production reaches the point where the activities of the wife are restricted more to the homesite plot. Sufficient space to support her economic activities there is needed not just to increase family production but also to maintain the woman's social and economic status within the family, through increasing her own earning capacity and ability to contribute to family finances and economic decisionmaking. The larger acreage is also needed for social purposes -- not just for the privacy of the wife who will spend so much of her time there but also for providing extra rooms and housing for children as they grow up and marry.

APPENDIX 1

CENTRE FOR SETTLEMENT STUDIES AND TRAINING  
Ministry of Lands and Land Development

Thayer Scudder  
and  
Kapila P. Wimaladharma

Colombo  
July 1980

**FOREWARD**

Like all preliminary efforts, this position paper is spotty, overstressing some topics and understressing others, while still others may be inadvertently omitted. Its main purposes are to sketch out first the scope and justification of the proposed institute and second its institutional structure. In pursuing the ideas set forth, and translating them into a form for which Cabinet and Parliamentary approval can be sought, we believe that the next stage is to form a working committee some of whose members should include future Steering Committee Members.

CENTRE FOR SETTLEMENT STUDIES AND TRAINING  
Ministry of Lands and Land Development

INTRODUCTION

Throughout the tropics and subtropics, agriculturalists have successfully developed both national and international research stations and institutes which have had a major impact on agricultural policies and development. More recently public health has been advanced through university teaching hospitals and international medical centers of excellence. A major assumption behind this position paper is that regional development in rural areas can benefit greatly from a similar approach by bringing together the relevant disciplines in the social sciences through the establishment of policy oriented research and training centers that focus on the farm and nonfarm development of the major agroecological zones in the tropics and subtropics. These are the savanna woodlands (incorporating the dry zone of Sri Lanka), the humid tropics, and both arid and semi-arid lands.

Unlike the international agricultural institutes, it is suggested that these centers of excellence would be national institutions with international relevance. Unlike most institutes for rural development and social and economic research, they would come under a particular ministry (rather than being part of a national university), although they would be governed by a more broadly conceived steering committee, with their progress periodically reviewed by an internationally recruited advisory committee which would include national representatives.

It is suggested that the current intention of the Ministry of Lands and Land Development to establish a Centre for Settlement and Land Tenure Studies and Training provides an opportunity to establish the first such research and training center. As outlined below such a center not only would have major policy implications for regional development in Sri Lanka but also for a much larger number of countries in the tropics and subtropics. For this reason, a second assumption behind this position paper is that such a center could attract both international finance and international research personnel and students who would contribute their own experience to the Centre and profit from it.

## THE SCOPE OF THE CENTRE

### A. Geographical Scope

It is suggested that at least initially the Centre focus on the dry zone. This suggestion arises from the following considerations:

1. Major colonization schemes are the dominant farming system in the dry zone unlike the situation in the transitional and wet zones. For this reason they would allow the Centre to take a broader approach which would attempt to optimize the potential of new lands settlement for regional development as opposed to more narrowly conceived criteria of agricultural production and employment generation. To date settlement schemes in Sri Lanka and elsewhere have not realized their potential for regional development. More specifically they have not fostered broadly conceived farming systems with crop, livestock and off-farm components; and they have not spun off nonfarm employment through the development of rapidly growing urban centers and townships.
2. By expanding its focus to deal with major settlement schemes as the prime mover for a regionally based multisectoral program in rural and urban development in the dry zone, the Centre would reduce the risks of replicating the research and training activities of the Agrarian Research and Training Institute (ARTI), the National Agricultural and Diversification Authority (NADSA), and the newly established Institute of Plantation Management.
3. By focusing its attention initially on the dry zone, the Centre could play a more active role in the formulation of policy for the Accelerated Mahaweli Programme. More specifically, it could carry out contract work for the Mahaweli Authority of Sri Lanka (MASL), the Mahaweli Economic Agency (MEA) and the Mahaweli Development Board (MDB) on a wide range of important issues — some of which are outlined in the sections that follow.
4. By focusing on the dry zone initially, the Centre would have increased its specific relevance for other countries carrying out settlement projects in savannah woodland and semiarid lands of seasonal rainfall. Such countries would include, for example, India, the Sudan, Nigeria and most other African countries, Mexico, and the northeastern portion of Brazil. By focusing on the dry zone, the Institute would have more to contribute to such countries, and would be in a better position to learn from their experience through foreign associates than if it tried to cover more superficially several major agroecological zones from the start. By increasing its international relevance in this way, the Centre should be in a better position to attract international finance and personnel.
5. It is easier to expand into the transition and wet zones at a later date than to have to cut back on what started out as too

diffuse a research and training program. Furthermore, certain key research topics present a natural avenue of access from the dry zone to the transitional and wet zones. A case in point relates to land tenural studies which will be included within the scope of the Centre for Settlement Studies and Training. For example, how can settler selection for the dry zone facilitate land consolidation and rural renewal in the wet zone? And can new forms of land tenure be developed in the AMP areas which can then be gradually expanded into the older colonization schemes and from there into the transitional and wet zones?

## B. Conceptual Scope

The intention of the Centre is to carry out a broad range of policy-relevant research and training which complements that of other agencies and institutes. Based on research, experimentation and demonstration, the Centre will help formulate policies designed to maximize the local, regional, and national potential of both old and new settlements. Experimentation and demonstration will be carried out on the Centre's main rural field station. Policy recommendations arising from such work and from the broader research program will then be passed on to such agencies as the Department of the Land Commissioner, the Department of Agriculture, the MASL and the MEA, since the Centre will not be an implementing agency. Training of both national and international personnel will be carried out primarily on the grounds of the Centre's complementary urban and rural research and training stations.

The long range goal of the Centre is to pursue a program of research and training which will regionalize the economic and social impact of new lands settlement. At the turnout, neighborhood (gangoda) and community level, the goal will be to foster the farm family as a socially cohesive production and decision-making unit in which a higher standard of living becomes possible through the development of the crop, livestock, and nonfarm components of the farming system. By stressing economic diversification, emphasis will be placed on resiliency and productivity. Resiliency is important to enable the farm family to cope with adverse terms of trade arising from changes in the international economic order, in national policy, and in the availability of inputs such as tractors and fertilizers which must be imported from without the settlement project. It is fostered by diversifying the family income, with the nonfarm component becoming increasingly important for settler children who cannot be absorbed on the farm. It is also fostered by working out a balance between food and commodity crops for local, national, and international consumption, and between the on-farm use of buffalo and mechanized equipment.

At the settlement level, the goal of the Centre will be to foster the multiplier effects of agricultural development through the formulation of policies designed to maximize the multiplier effects of

successful farming systems through the generation of nonfarm employment. In the past, few new lands settlement projects have realized their potential for nonfarm employment simply because they have been planned and implemented primarily as agricultural production schemes focusing on a few crops rather than on farming systems and regional development. Before this potential can be realized, however, more research is needed on the production, income generation, and employment implications of different farming systems for farm families themselves, for seasonal and permanent farm labor, and for nonfarm families living in farm settlements and in service, commercial, and industrial centers. Since new lands settlements throughout the world appear to pass through a series of developmental stages before they reach their full potential, further research is also needed on the phasing of physical and social infrastructure needed for productive reasons and for making settlements more attractive for residents, including government officials whose motivation on settlement projects is often far too low because of lack of incentives and a low level of social services.

At the regional level, the goal of the Centre will be to foster the integration of both new and old settlements into a regional socioeconomic system. To generate policy to achieve this goal, a wide variety of research is needed. Throughout the world, settlement planners tend to view new settlements as if they existed in a vacuum with the responsibility of settlement planning ending at the physical boundaries of specific settlements or settlement systems. As a result, new and old settlements are not integrated into a single system nor are both types of settlements integrated into a regional economy. New towns often are planned in the middle of new settlements with no attention paid to existing commercial centers which lie a few miles outside of the settlement area, and with minimal attention paid to commercial and service centers within the settlement area. All too frequently the result is that neither new nor old centers capture the development potential of the settlement for commercial, industrial and service development.

In Sri Lanka not only is new lands settlement the principal farming system throughout much of the dry zone, but major settlements like Minneriya date back to the 1930s. Kantalai, Kaudulla, Minneriya, Giritale, and Parakrama Samudra settlements lie adjacent to several systems to be developed through the Accelerated Mahaweli Programme, while Minipe and Sorabora are adjacent to System C. A major task of the Centre will be to pursue a program of research which will aid MASL planners develop policy which will maximize the potential of both old and new settlements and relate them to existing townships like Kakirewa, Hingurakgoda, and Mahiyangana and such larger urban centers as Matale, Kandy, Anuradhapura, Trincomalee, Polonnaruwa and Batticaloa.

## THE PHYSICAL LOCATION OF THE CENTRE

The Centre will have two main headquarters -- one located in a major urban area and the other in a rural area with easy access to both old and new settlements. These two headquarters are conceived as constituting a single entity. They would be developed in tandem, with permanent research personnel rotated between them. As a rough guideline, research staff would be expected to spend approximately three months out of every year at the rural headquarters and/or in the field. During that time they would be actively involved in the Centre's longitudinal and comparative research program, its topical research program and in its program of contract research. They would also be available, where appropriate, to participate in the experimental, demonstration, and training activities of the rural headquarters. During the remainder of the year they would be based at the urban headquarters where their responsibilities would include research design; analysis and write up of research results; participation in workshops, conferences and the Centre's formal training program; and policy formulation.

### A. The Urban Headquarters

It is suggested that the urban headquarters be located in Kandy with enough space set aside for administrative and office blocks, classroom facilities, and some housing, especially for foreign associates and trainees. There are a number of reasons for locating the Centre in Kandy of which three appear particularly important.

1. Location in Kandy will enable the staff, foreign associates and trainees to have ready access to the University of Peradeniya (and especially the Post Graduate Institute for Agriculture, the various social science departments, and the medical school) and to the headquarters of the Department of Agriculture. It will also provide educational and other facilities designed to recruit and retain first rate staff, a consideration which is basic to the functioning of the Centre.

2. As opposed to location in Anuradhapura or Polonnaruwa, which have also been suggested as possible sites for the urban headquarters, Kandy has the advantage of being more centrally located not only in regard to access to Colombo, but also to the various systems being developed under the Accelerated Mahaweli Programme and to both old and new settlements stretching from Uda Walawe, Gal Oya, and Minneriya to Rajangana.

3. Location in Kandy serves as a reminder that the Centre is a national as opposed to a local facility, and that although its initial focus will be on the dry zone, its research and training program also have relevance for the transition and wet zones. Location in Kandy will obviously facilitate future cooperation with NADSA and with programs in rural renewal through improved forms of

land tenure and through land consolidation.

### B. The Rural Headquarters

The rural headquarters is not just an adjunct or appendage attached to the urban headquarters, but is a vital component of the Centre under the direction of the deputy director, who should reside at the rural headquarters so as to provide an example for staff and to oversee the field research program.

The rural headquarters differs from the urban headquarters in that it is also a field research station which incorporates under its jurisdiction several farming neighborhoods with their associated distributary channel(s) and feeder canals (turnouts). Agricultural research stations have been more successful in developing varieties and packages of inputs for the production of specific crops than they have been in developing whole farming systems. A major reason is that breeding operations and trials are carried out on the research stations which seldom incorporate pilot farms that develop farming systems relevant to local residents, and that even more rarely incorporate farming neighborhoods as part of the research station. At the very least the rural headquarters of the Centre should include one distributary channel and one farming community (composed of several neighborhoods) under its jurisdiction.

Though incorporation of a farming community within the rural headquarters is a relatively novel concept when viewed internationally, precedent already exists in Sri Lanka in regard to the joint MDB-Hunting project in block 404 of H-4. This project, however, is more concerned with water management than with the development of diversified farming systems that integrate crop, livestock, and nonfarm components and which form the core of a community of farmers and nonfarmers.

Though a number of places would appear to qualify for the location of the rural headquarters, special consideration should be given to Mahiyangana for the following reasons.

1. In the 1960s Mahiyangana became the focus of a major attempt to redevelop and renew an existing township. The temple sanctuary was enlarged and the old town moved to a new site a short distance downriver.
2. Currently Mahiyangana is the major service and commercial center for the Sorabora settlement project as well as one of two major centers for the Minipe Settlement Project.
3. It is also the closest existing township to System C lying only a few miles from the System C boundary.
4. Adjacent to major old settlement projects as well as to a

major system undergoing development in connection with the AMP, Mahiyangana appears better located, for example, than Hingurakgoda and Polonnaruwa since it is within two hours travel of Kandy as well as having access to System B and System G.

5. Located within the township area, the Rural Headquarters possibly could be laid out in such a way as to incorporate a portion of the Sorabora Project which lies immediately adjacent to the township.

6. At the same time the Rural Headquarters would be within only a few miles of Minipe which is probably the best studied old settlement scheme in Sri Lanka as well as being one of the most successful.

7. Mahiyangana is within easy commuting distance of the MEA's Development Centre in System C which can both contribute to and profit from the activities of the Rural Headquarters of the Centre for Settlement Studies and Training.

## THE RESEARCH PROGRAM

### A. Introduction

It is mandatory that the Centre design and execute its own research program as well as carry out contract research for national, bilateral, and multilateral agencies. The balance between the two must be carefully thought out and sufficient financial support secured, so that the latter does not grow at the expense of the former.

Because of financial stringency, all too often research stations lose their capacity to fulfill long-range research and policy goals, becoming primarily agencies for carrying out a variety of projects contracted from without which seldom have any relationship to each other. If it is to serve the long-term interests of settlement planning and evaluation, the Centre for Settlement Studies and Training must have the means for avoiding this fate.

### B. The Centre's Own Research Program

1. Introduction. It is suggested that the Centre launch a systematic program of long-term comparative studies of a carefully selected sample of old and new settlements which should be restudied at fixed intervals. Though fundamental such research has major policy implications. On the one hand, it will improve general knowledge of the strengths and weaknesses of new lands settlements as they evolve through time, knowledge which can then be translated into policy in the planning and implementation of new settlements and the rehabilitation of old ones. On the other hand, such research will

identify problems as they arise so that solutions can be formulated before they reach crisis proportions. It is also suggested that the Centre simultaneously carry out a program of problem-oriented research, the primary purpose of which is to formulate policies for dealing with a range of basic issues.

2. Long-Term Comparative Research. To better realize the productive and labor absorptive potential of new lands settlements, and to ensure their economic and social viability for farm and nonfarm families alike, an ongoing program of monitoring and evaluation through long-term comparative research is crucial. Two reasons are especially important in this regard.

First, successful settlement projects are dynamic. As they evolve, new opportunities and new constraints continually arise. If these are not identified in a timely fashion all too often the opportunities remain unutilized while the constraints form bottlenecks which slow down progress or, at worse, reduce the economic and social viability of the settlement. A case in point are the settlements of Minneriya and Minipe which are probably the two most successful major settlement schemes in Sri Lanka. Rightly or wrongly, a significant number of settlers on such schemes today believe that their position has deteriorated in recent years. Some claim that growth rates have been reduced, while others claim that growth has stopped entirely. Recent research, both in Sri Lanka and abroad, suggests that there is some truth in these claims in which case corrective action is crucial. Reasons given by settlers, all of which need careful assessment, include natural disasters since 1976 (brown hopper infestation, high mortality of buffalo because of disease, and the 1978 cyclone), deteriorating rural-urban terms of trade, and rising costs of inputs.

A second reason why an ongoing program of long-term comparative research is necessary is simply because national policies and international conditions change, hence changing the assumptions on which planning is based. And as knowledge accumulates, the justification of other planning assumptions loses its validity. Planning for Mahaweli development provides an excellent example of how assumptions may change over a ten-year period because of new knowledge, changing national priorities, and changing international conditions. Such changes have major policy implications since they affect, for example, net farmer income and hence settler satisfaction, and since they alter the comparative advantage, for example, between draft animals and tractors in regard to land preparation. New knowledge also gives rise to new assumptions and is corrective of old ones, examples being the growing realization that settlement planning in Sri Lanka and elsewhere, on the one hand, has neglected the nonfarm component of settlement development and, on the other hand, has been based on faulty assumptions about the need for and use of seasonal and permanent labor on even small settler holdings as production intensifies and diversifies, and as settler aspirations change.

All too often settlement planning is based on static thinking -- with assumptions which may or may not have been justified at one time taking on an immutable character for all time. Planning figures relating, for example, to desirable net income, size of paddy holding, and village size and lay out also become fixed. As for policy oriented research, all too often it is neither systematic, long-term, or comparative. This situation applies throughout Sri Lanka. The location of innumerable surveys, System H, for example, is over-surveyed but under-researched. Here an aggregate of surveys have been carried out in different areas at different times that have little relationship to each other.

On the other hand, Sri Lanka is exceptionally fortunate in that its settlement experience has been carefully (though incompletely) documented by a number of social scientists. Where possible the Centre should build on this tradition of research by including within its sample of settlements those which have already been studied and surveyed. A case in point is the 1967-68 survey of nine colonization schemes carried out by Jogaratnam, Schickele, and associates. Other cases include Abayaratna's 1970 study of Rajangana and Muthu-Iyan-Kaddu-Kulam colonization schemes; Amarasinghe's 1971-72 surveys of Minipe and Wanigaratne's 1976 research on the same scheme; and Wimaladharmasiri and associates' 1979-80 research at Minneriya. In the latter case Wimaladharmasiri effectively incorporated Jogaratnam's 1968 random stratified sample into his own sample, reinterviewing 118 of the 129 households in the original sample. This approach has proved to be especially effective in monitoring the development of a major settlement scheme, and has special relevance for designing the research program of the Centre. Because of its broad scope which includes allottees, seasonal and permanent farm labor, and nonfarm employees and employers, other aspects of the methodology of the Wimaladharmasiri research also have applicability to the Centre's long-term, comparative research program.

Long-term comparative research is especially useful for studying the various stages through which settlement projects appear to evolve and for assessing the policy implications of each stage. All too often planners are unaware of such stages, hence attempting to create an instant success by pursuing all their goals during the first five years. A phased approach would not only be cheaper but also likely to have a greater chance for eventual success. During the initial stage, for example, emphasis would be placed on providing the minimal essential physical and social infrastructure to facilitate the settler family's acceptance of and adaptation to a new habitat, and to enhance their productive capacity.

While the actual selection of settlement projects for long-term comparative research should be the task of the Centre's Steering Committee, as should be the final selection of research topics, the sample of settlements should include both old and new schemes, large and small schemes, and schemes under the jurisdiction of both the Ministry of Lands and Land Development and the Mahaweli Authority of

Sri Lanka. Some longitudinal research should be carried out on the settlement communities incorporated within the Centre's Rural Headquarters while other research sites should be developed at outstations for the Rural Headquarters on which limited housing might be set aside for researchers and trainees.

3. Topical and Problem Oriented Research. There are a wide variety of special topics which need further research, of which a small number are outlined below. These are designed to illustrate the variety of research topics that the Centre should have the capacity to study.

a. Settler Selection. How can settlers be best selected to achieve two goals, the first being to facilitate the emergence of economically and socially viable settlements and the other being to alleviate congestion and extreme land fragmentation and subdivision in the sending areas. Evidence is mounting on a worldwide basis that settlers are more apt to cooperate during the difficult early years of settlement if they are recruited from the same neighborhoods, communities, and districts in which case settler selection could well be combined with a program of rural renewal through land consolidation in the sending areas.

The most successful system of settler selection to date may well be carried out in Malaysia under the Federal Land Development Authority where points are allocated to both men and women, with the point system including land resources and agricultural experience as well as nonfarm skills. The inclusion of points for women appears to have been particularly successful since if only men are interviewed and selected the focus from the very start is on a single individual rather than on farm and nonfarm families as socially cohesive production and decision-making units. Such a system, however, need be adapted to Sri Lankan conditions rather than imported wholesale — while the whole system of selection need be carefully thought out in terms of the type of agricultural experience and occupational diversity desired for dry zone settlement areas, the need for rural renewal in the sending areas, and the political realities involved in the actual selection process. In terms of agricultural experience, for example, it is probable that more effective use can be made of the children of settlers on major and other Ministry of Lands and Land Development settlements, especially in regard to the cultivation of subsidiary crops. Could not special attention be paid to recruiting neighborhood units from second generation settlers with experience in the cultivation of tobacco, pulses, chillies, and onions? Carefully scattered through new settlements such neighborhoods could well have a major demonstration effect on other settlers whose main agricultural experience relates to paddy cultivation and plantation crops. Such second generation settlers exist on a variety of old settlement schemes, some of which have also provided settlers and their children with experience with other forms

of irrigation, including lift and well irrigation. Similarly, could not better use be made of the agricultural intensification skills of vegetable farmers in Nuwara Eliya and on the Jaffna peninsula?

The above examples are not recommendations but rather are meant to be suggestive of the type of topical research which might be carried out by the Centre in reference to settler selection.

b. Security of Tenure in Both Old and New Settlements. In his 1979 report on the Strategy and Structure of the Ministry of Lands and Land Development, West raised once again the issue of a registry of deeds, as currently maintained, versus title registration. In concluding his discussion, he recommended the "introduction of title registration for the State grants in the Mahaweli program and a feasibility study of the stage-by-stage extension of registration of title over the whole country."

The research program of the Centre should reassess the whole question of land tenure in settlements both as it relates to settler security (and hence willingness to make permanent improvements), credit worthiness, and land inheritance to spouses, children and other blood and affinal relatives. Policy recommendations arising from such research might first be tried out in new settlement areas and then gradually extended elsewhere as suggested by West.

c. Settler Participation in Settlement Management Based on Turnout and Larger Water User Associations, Local Corporations Composed of Laborer/Settlers (as currently under trial in System C), and Neighborhood and Larger Residential Groupings. A major problem with government sponsored settlements throughout the tropics is the lack of involvement of settlers in project management. It can be argued that no settlement is completely successful until routine operations such as tertiary canal maintenance and water allocation and conflict resolution at the turnout and distributary channel level are handed over to settler management, while responsibility for other types of ongoing activities are taken over by other local organizations and by the local officials of the various government ministries and parastatal organizations.

The MASL is especially aware of this failing of settlement projects with its attendant risks of settler passivity, noninitiative, and dependency which are diametrically opposed to the type of local economic and social initiative which is required to ensure settler success. In System H a major program is under way to organize and develop turnout groups, while in System C the first groupings of laborer/settlers from purana villages and encroachers currently living in the most densely populated areas (Alutherama G.S. Division) have been formed. These experiments with local participation need be carefully monitored and evaluated, as do other

attempts by both governmental and nongovernmental agencies to facilitate local involvement of men, women, and youth at the community (residential) level. In the case of turnout units, for example, what type of internal organization will ensure broad-based support and participation among group members? Is reliance on a single leader a wise decision or should at least three leaders be elected with two drawn from the middle and bottom end of the turnout unit as presented in the 1980 Amendment to the Irrigation Ordinance? What functions should be undertaken by the turnout grouping, and how should their introduction be phased in time? Maintenance and water allocation tasks are obvious functions, but should other functions such as individual and group credit (with the turnout unit guaranteeing repayment in the former instance) be added? If yes, at what point should such additional functions be introduced so as to not overload the turnout unit with too many tasks to its detriment and possible collapse?

Research into such questions as they relate to local participation through water user associations, residential associations, and such other organizations as cooperatives clearly falls within the scope of the research program of the Centre.

d. Encroachment. While encroachers present serious problems in the form of degradation of upper catchments and irrigation and forest reserves, and occupancy of settlement areas set aside for access roads, communal grazing and other essential community purposes, they also represent an underutilized human resource. Encroachers are pioneers who in the face of considerable uncertainty over their future open up new lands and businesses. Some have had considerable previous experience relevant to national development goals. Such is the case with the children of settlers on the major settlement schemes who encroach as pioneer farmers and small business operators both within and without major schemes. Some of the more successful mudalali in these schemes are also encroachers who first built small boutiques along the roadside and then gradually expanded their business interests.

The initiative of encroachers is a valuable resource which should be more effectively channeled into nationally acceptable activities that contribute to rather than detract from national development and conservation goals. The Centre could well carry out research directed toward this goal.

e. Increasing Nonfarm Employment. Already touched on elsewhere in this position paper, increasing nonfarm employment is especially important in Sri Lanka both in regard to current levels of unemployment and in regard to the employment of the second generation in settlement areas currently under development. Successful land settlement schemes provide a major opportunity for the employment of nonfarm families which is all too frequently down played by planners

because of their primary concern with crop production. While irrigated land settlement in the long run can generate more off-farm employment than farm employment, poor planning can preclude the realization of this potential.

In the dry zone of Sri Lanka the ratio of nonfarm to farm employment is low, although it is higher in successful schemes like Minneriya than in purana village areas. The reasons for this low ratio are only partially understood, and even less is known about mechanisms for raising the labor absorption capacity of the nonfarm sector. Clearly there is ample scope here for further research with very important policy implications.

f. Phasing of Physical and Social Infrastructure for Farm and Nonfarm Families, and for Government Officials Serving New Settlements. As costs per acre developed escalate, mechanisms for cost cutting without sacrificing long-term development goals become increasingly important. In terms of productivity it would appear that inadequate water management and inadequate feeder roads and marketing facilities are the principal constraints at the project level (while adverse rural-urban terms of trade as they relate to farm gate prices would appear to be the major constraint at the national level). For the early adjustment of settlers and officials, health services (including potable water and malarial control), schools, and local transport appear to take priority. If this is so then it would appear that too much money is being expended on housing and a wider range of social services, and too little on upgrading local schools, health facilities, and transportations. Such conclusions are tentative, however, and require more careful research as well as experimentation.

g. Rehabilitation and Redevelopment of Existing Commercial Centers and Townships. In the AMP area, much money is being spent on the development of new townships within the middle of the various systems while no funds are being spent on upgrading existing (and potentially more viable) commercial centers and towns outside system boundaries. Cases in point are Kekirawa (adjacent to System H) and Mahiyangana (adjacent to System C). Is this the best approach, or would use of Mahaweli funds to upgrade, for example, the teaching of commerce, science, mathematics, and English at "O" and "A" level schools (and the provision of improved bus services to such schools) be more cost effective in attracting the families of officials than the construction of expensive housing which all too often is occupied by a single official who returns to his family in Kandy or Colombo at weekends?

Because it has been virtually ignored, the rehabilitation and redevelopment of existing commercial and urban centers as means for increasing the attractiveness of new settlements is a logical subject for research for the Centre.

h. Regional Development, Including the Rehabilitation of Existing Schemes Through Their Integration with AMP Systems. Since the regional planning capacity of the MASL, the MEA, and the MDB continues to be inadequate, the Centre could play a major role by developing its own regional planning capacity as it relates to maximizing the potential of new lands settlement for the integrated rural and urban development of the dry zone and the articulation of this zone to the rest of Sri Lanka.

i. Reservoir Relocation with Special Reference to Kotmale and Victoria. Reservoir relocation presents special problems which require special solutions. Unlike settlers, the majority of reservoir relocatees the world over do not wish to move. In this sense their relocation is compulsory. Governments therefore have a moral responsibility to provide reservoir relocatees with special assistance since, after all, their well-being is sacrificed in order that national development goals can be achieved. This generalization certainly applies to Kotmale relocatees and no doubt also applies to Victoria. When the first preliminary survey was carried out in the Kotmale Basin in 1971, the research officer-in-charge noted that residents had become aware of the possibility of relocation as early as 1967. Thereafter they had stopped reinvesting in the areas' development, even cutting down trees in anticipation of eventual removal. There can be little doubt that uncertainty about future relocation has slowed down local development that would otherwise have occurred in this area and has depressed the standard of living of its residents. Furthermore, although at first people said they would be willing to resettle anywhere within Sri Lanka, as the date of resettlement grew closer and closer, the proportion wishing to remain in the lake basin gradually increased until today over a majority wish to remain as close as possible to their old homeland. The relocatees behavior in this regard resembles that of people who are required to move elsewhere in the world and indicates the involuntary nature of their move and the extent of their sacrifice for Sri Lankan development.

This brief discussion should show that the Kotmale situation is a special one — as will be the case with Victoria relocation. As such it need be carefully assessed so as to ease the stressful transition for the people involved and to ensure their subsequent rehabilitation. Careful monitoring and evaluation is needed, followed by carefully executed policies designed to aid "the relocatees" development without creating the type of dependency that all too often accompanies compulsory relocation.

### C. Contract Research

While the Centre must have its own research program, contract research for national, bilateral, and multilateral organizations

should also be an important component of the Centre's activities. Wherever possible such research should also serve the goals of the Centre as well as those of the contracting agency. Three main types of contract research are envisioned. The first type would involve bench mark surveys and studies followed by restudies at periodic intervals. Such research would most likely be concentrated in the systems being developed under the AMP with the contracting agency being the MASL or the MEA or a bilateral or multilateral agency like the World Bank or CIDA. All such agencies should be encouraged to contract settlement research through the Centre rather than carry out their own surveys and studies. The MASL and MEA in particular should be encouraged to use the Centre's research and policy forming capacities since it is always difficult to monitor and evaluate one's own development programs. Bench mark surveys and restudies in particular systems should be integrated wherever possible into the Centre's own program of long-term comparative research.

The second type of contract research would relate to a variety of basic issues such as have already been outlined under the Centre's program of topical and problem-oriented research. Such research should also be integrated into the Centre's own research program wherever possible. As development costs rise above Rs.45,000/- per acre, the MDB might well request the Centre to explore various options for cutting costs without seriously jeopardizing development goals. Such options would include a number of the special topics previously outlined, including more efficient and effective use of settler initiatives (including that of encroachers and second-generation settlers) as it relates to criteria for settler selection, phasing of physical and social infrastructure, integration of old and new settlements, and enhancement of existing commercial and town centers.

The third type of contract research would involve short-term and one-shot surveys, including prefeasibility surveys for potential donors. In recent years a very large number of such surveys have been carried out, especially in the Mahaweli areas. In the future, they should be more carefully coordinated and integrated with previous and ongoing research, since at present they tend to make poor use of Sri Lankan staff recruited as national counterparts and they tend to contribute little to an improved understanding of the settlement process. At the very least, such surveys should be discussed with staff of the Centre before they are executed, and quite possibly their coordination and in some cases execution should be an institutionalized function of the Centre.

#### HYPOTHESIS TESTING, POLICY FORMULATION, AND DEMONSTRATION

Far too much research is unutilized for development purposes because its policy implications are unknown to, or ignored by, planners and implementers. Because the Centre is part of a line ministry some of whose departments are directly responsible for settlement implementation, because the Minister is also responsible

for the Ministry of Mahaweli Development, and because the Centre's mandate includes policy formulation as well as research and training, it should be possible to avoid this major failing of past research institutes.

Staff members will be expected to formulate and test hypotheses as part of their research responsibilities. They will also be expected to think through and write up the policy implications of the Centre's ongoing research program. Hypotheses can be tested both in the field and on the Centre's field station. Old, modified, and new forms of local participation, for example, can be first tried out on the Centre's field station and subsequently on such other research stations as the 404 Block in System H, the Demonstration Centre in System C, and such other research stations as may be created in System B (as recommended by ACRES), System G (as recommended by FAO), and elsewhere. Indeed, the conceptualization of research stations yet to be established in the dry zone should be done in such a way as to strengthen the capacity to formulate, test and demonstrate policies for subsequent implementation.

Through their local organizations, settler communities will participate in the planning, implementation, management and evaluation of new policies that relate directly to their welfare. After all, where these are tested out on their own farms, within their own turnout units, and within their own communities they, rather than the research staff, are the principal risk-takers and as such should be fully informed about the potential risks and payoffs involved. If settlers are fully involved, the danger of them becoming overdependent on the Centre or hostile toward its research staff is significantly reduced. A case in point are the newly formed laborer/settlers groupings in System C, some of which are pushing for even more responsibility for preparing their lands and associated water conveyance structures. Properly planned, an effective partnership can be developed between the Centre and participating farmers whose communities subsequently become demonstration areas after trials are successfully completed. In this regard, portions of existing and new settlements should not be included within the boundaries or under the jurisdiction of the rural headquarters unless such inclusion has the approval of the majority of the settlers involved.

## TRAINING

Although this section on training is relatively short, training must be seen as equal in importance to research in terms of the overall program of the Centre. At least three types of training are envisioned. These are training through participation in coursework, in research, and in internships.

### A. Coursework

Coursework initially would be directed at nationally and internationally recruited officials responsible for the planning, implementation, management, and evaluation of settlement schemes. It would include conferences, seminars and workshops for senior officials; courses of short duration (several weeks to several months, or once a week, fortnight, or month over a longer time period) including refresher and followup courses; and longer one to two year diploma courses. In time, courses might be extended to include settler leaders and settler groups — provided such courses would not infringe upon and duplicate the efforts of farmer training centers, extension programs and other types of existing training and orientation for farm and nonfarm families on settlement projects. Or the Centre might restrict its activities in this area to advising on the curriculum for such courses and evaluating their effectiveness.

Coursework would be carried out at both the urban and rural headquarters and would involve field visits and field work where appropriate. Location of the urban headquarters in Kandy would permit the future possibility of the Centre affiliating itself with the University of Peradeniya so that some officials and staff could pursue higher degrees while in residence at the Centre. In the meanwhile Centre staff would be available to participate in a wide range of training and teaching programs offered by other institutions, including the University, although careful guidelines need be worked out so that such participation does not infringe upon normal staff responsibilities.

The curriculum for the various courses need be carefully worked out once the type of courses to be offered by the Centre are more carefully delineated. In Appendix 5 of his 1979 report, West lists a number of possible subjects with supporting topics.

### B. Training in Research

While coursework would include the design of research programs (and techniques and methods for the execution of research) and the analysis and writeup of data, research training would also involve active participation in appropriate on-going research projects so that trainees would not only become more aware of how research relates to development but also as to how it is carried out. Though not all training programs would involve work in the field both on and off the rural headquarters, fieldwork would be considered a major training mechanism.

### C. Internships

To broaden their experience, trainees participating in longer courses would be expected to serve as interns in a variety of

organizations involved in settlement work. These could include, for example, the Department of the Land Commissioner, the Department of Agriculture, the Department of Agrarian Services, NADSA, and the Mahaweli Economic Agency. Internships in western medical science are a required part of every doctor's training. Internships are also becoming an increasingly accepted form of training in business and a wide variety of government agencies. Along with fieldwork, a program of internships would appear to be an especially suitable form of training for the Centre to pursue.

#### COORDINATION, DOCUMENTATION, AND PUBLICATION

The Centre should become a clearing house for settlement studies in Sri Lanka. As it builds up its library, national and expatriate researchers are more apt to stop over at the Centre, hence increasing its capacity for coordination of settlement studies as they relate to dry zone development. Expatriate researchers and consultants dealing with the dry zone in particular should be encouraged to visit with the Centre's Director, Deputy Director, and appropriate staff; and they should be requested to leave copies of their reports, unpublished manuscripts (such as Ph.D. theses), and published materials with the Centre's librarian-publication officer who would be responsible for periodically bringing out a listing of the Centre's library resources. He would also be responsible for the Centre's publications series.

#### STAFF

The staffing of the Centre will depend on its scope and size. Senior staff should include a director, a deputy director, a librarian-publications officer, research and training officers, and international associates. A distinguishing feature of all staff should be their interest in policy-oriented settlement studies.

The director should be a senior official with both administrative and research experience. As the principal executive officer of the Centre, he would be based at the urban headquarters. The deputy director would reside at the rural headquarters the operations of which he would direct. Though administrative capacity is important, the deputy director should be a more academically oriented official who has designed, supervised and executed research relating to dry zone settlement in Sri Lanka. The functions of research and training officers would be roughly equivalent to similar staff at the Agrarian Research and Training Institute. Their selection should bear in mind the range of disciplines covered by the Centre — including micro and macro economics, anthropology-sociology, geography, political science, regional planning, social psychology, statistics, and water management and rural and urban land use planning.

At least two categories of international associates are anticipated. The first category would consist of postgraduate fellows who would be primarily involved in the Centre's research program. They would be appointed on either a short or long-term basis varying in duration from several months to several years. The second category would include more senior scholars and administrators of dry lands settlement who would be expected to contribute to both the research and training program of the Centre. Like postgraduate fellows, they would be appointed on either a short-term or long-term basis. The Centre would also welcome affiliates who would be Sri Lankan and expatriate students who wish to undertake research on dry zone settlement in Sri Lanka for a higher degree at an accepted University.

#### THE GOVERNANCE OF THE CENTRE

We suggest that the Centre be governed by a Steering Committee of no more than ten people. They could be chosen according to their institutional affiliation, their disciplinary expertise, and their interest in and experience with new lands settlement. No more than half would be appointed ex officio, including the Secretary of the Ministry of Lands and Land Development (or his nominee), the director (and possibly deputy director) of the Centre, and the directors of ARTI and the Postgraduate Institute for Agriculture. The latter two officials would be included to enhance collaborative research dealing with the farming systems aspects of new lands settlement and to minimize duplication. The remaining members of the Steering Committee would be appointed by the Minister for Lands and Land Development according to a carefully worked out set of eligibility criteria.

The Steering Committee should be appointed at the earliest possible moment so that it could participate from the start in developing the scope, structure, and research and training program of the Centre. Once the Centre was operational, it would meet twice annually over a 2-3 day period. On such occasions the Steering Committee would be responsible for reviewing the operations of the Centre, especially its research and training program. Not only would the Steering Committee be responsible for setting standards for research and for periodically evaluating the scope and quality of the Centre's ongoing research and publication program, but it would also be responsible for ensuring that the research actually carried out relates to national and, in some cases, international needs, as well as to the needs of the Centre and its staff.

The Steering Committee would also have the responsibility of channeling potential staff, international associates, and affiliates toward the Centre. For that reason alone it is desirable that at any one time, the Steering Committee contain members drawn both from the University of Colombo and from the University of Peradeniya.

The Steering Committee would be assisted by an International

Advisory Panel which periodically (perhaps at two year intervals) would make an indepth review of the Centre's program and operations. Including international settlement experts, this panel could be recruited on either an ad hoc or more permanent basis. Ex officio, it could include representatives of major international donors to the Centre (whether such donors would also have ex officio members on the Steering Committee would be a matter for negotiation).

#### THE FINANCING OF THE CENTRE

At this point in time it is not feasible to draw up even a tentative budget for the Institute. It is clear, however, that major international funding will be necessary. Though catering to Sri Lankan needs, we believe that we have conceptualized the Centre in such a way that it also has international relevance, hence increasing its attractiveness to a range of international donors. Among potential donors we include the Ford Foundation, IDRC, the World Bank, and UNFPA as well as a number of bilateral government agencies which have actively contributed to settlement programs both in Sri Lanka and elsewhere.

#### COLLABORATION WITH OTHER RESEARCH AGENCIES AND INSTITUTES IN SRI LANKA AND ABROAD

Close collaboration is especially desirable with the Agrarian Research and Training Institute in both the research and training areas. As the following examples illustrate, there is ample room for collaboration between ARTI and the Centre just as there are more than enough important research questions to keep both organizations fully occupied for years to come.

##### A. The Use and Importance of Seasonal and Permanent Labor on Land Settlement Schemes at Different Stages of Development

As settlers commercialize and intensify production on their allotments, many recruit additional labor regardless of farm size. Planners have tended to be unaware of this trend, operating on the assumption that the size of holdings should be no larger than can be fully utilized with family labor. While this assumption is applicable to some tree crops, it is not applicable to annual crops characterized by fluctuating labor profiles.

The use of seasonal and permanent labor is both undersurveyed and underresearched on settlement schemes. Yet large numbers of such laborers are there, their number probably exceeding the number of allottees on successful settlement schemes like Minneriya. It is neither in the interests of the nation or of the laborers themselves to pretend that they do not exist, or that future planning can eliminate the need for them.

Interdisciplinary research is badly needed on this topic, dealing for example with:

1. The economic and social reasons for recruiting both seasonal and permanent labor in connection with different farming systems.
2. The living conditions, status, and numbers of seasonal and permanent labor.
3. The goals and aspirations of seasonal and permanent labor. The last topic is important because an unknown number of seasonal laborers subsequently become permanent laborers, while an unknown proportion of permanent laborers become farmers and businessmen through encroachment, marriages into settler families, and sharecropping, leasing and "purchase" of settler allotments.

Utilizing the results of such research, it should be possible to increase the productivity of settlement agriculture, to increase its employment potential, to increase its diversification (by helping enterprising laborers establish their own nonfarm businesses), and to meet the neglected homesite plot and social infrastructure needs of farm labor.

B. The Integration of Livestock into Systems of Mixed Farming for Settlers as a Source of Animal Protein, Cash Income, and Draft Power

Though thinking is slowly changing, planning in the early 1970s for System H deemphasized animal husbandry during the early stage of development. Since then the situation has changed drastically, with the rise of petroleum prices and of prices for the purchase and rental of tractors and other mechanized equipment. As a result national policy goals now include increasing the supply of draft animals along with the increased supply of meat and milk. At the same time, the development of animal husbandry on the farm is seen as a mechanism for providing a cash income for settler wives and employment for settler children. But planning to achieve these goals still lags behind, in good part because of the absence of relevant research.

C. Net Income to Farm Families Under Different Farming Systems and Its Relationship to Settler Aspirations and Their Investment Strategy

Collaborative research monitoring and evaluating the amount and use of the income from different farming systems over time is essential if the development potential of old and future settlements is to be more fully realized. Minimal consumption needs must be met before income can be reinvested in agriculture or invested in other

productive and labor generating activities. As the relationship between farmgate prices and costs of inputs, services and consumer goods varies, and as aspirations change, so too do the income needs of settlers change. Monitoring and evaluation is needed to revise net income goals as they relate both to settlers and to levels of production and employment throughout the dry zone.

D. Optimal Size for Irrigated Lowland, Irrigated Highland, and Homesite Plots for Different Farming Systems

Both directly and indirectly, research topics A to C all relate to this topic. As conditions and assumptions change these changes must be continually evaluated as they relate to optimum farm size. Especially neglected in the past is the relationship of farm size to the generation of nonfarm employment at different points in time and under different pricing systems, cropping intensities and degree of intensification. Since employment generation is considered to be a major purpose of new lands settlement in the dry zone this dynamic relationship requires more careful attention in the future.

Collaborative research and training relationships with other research organizations, with universities, and with government agencies both at home and abroad should also be actively pursued. Joint work with the Post Graduate Institute for Agriculture is one example. The Centre should also provide the facilities of both its urban and its rural headquarters to other agencies where possible. Hence crop cutting research on the Centre's field station and demonstration farms could be carried out by the Department of Statistics, while the Department of Agriculture, the Research Department of the People's Bank and other organizations may wish to benefit from the Centre's access to settler communities both on and off the rural headquarters in regard to a range of research, trials, pilot projects, and demonstration projects.

During the initial years of its development, the Centre may also wish to establish an institutional relationship with such agencies as the University of Cambridge and the Land Tenure Center of the University of Wisconsin, drawing on their resources, for example, for the advanced training of staff, for curriculum and syllabus formation, and for expediting the recruitment of international associates and affiliates.

**APPENDIX 2**

**SRI LANKANS, TOURISTS, AND NATIONAL PARKS**

**Thayer Scudder**

**Colombo**

**July 1980**

## SRI LANKANS, TOURISTS, AND NATIONAL PARKS

### INTRODUCTION

This brief memo is the product of only a brief tour of Gal Oya, Uda Walawe, and Yala East National Parks, and of Lahugala Sanctuary. It was part of a longer one-month tour of new lands settlements in Sri Lanka, the Sri Lankan experience with such settlement, and its relevance to Mahaweli planning and implementation being the main purpose of my current visit as well as of two previous visits in 1979.

For making my tour of the above parks possible and for discussing their problems with me, I wish to thank Sarath Amunugama, Secretary of the Ministry of State; Lyn de Alwis, Director, Department of Wild Life Conservation and of the Zoological Garden; Edmund Wilson, Park Warden, Gal Oya; and Chandra Jayawardene, Park Warden, Yala East National Park. I also wish to thank Kapila P. Wimaladharmasiri, Head, Department of Land Settlement, Ministry of Lands and Land Development -- with whom I discussed the ideas in this paper and their feasibility under Sri Lankan conditions in detail.

### WORKING WITH THE LOCAL POPULATION RATHER THAN IN CONFRONTATION WITH THEM

Confrontation between local farmers, fishermen, herdsmen, and Departments of Wildlife Conservation characterize most countries in the tropics. Certainly this is the case in Sri Lanka. But the situation is deteriorating in many countries or remaining, at best, static. Especially where people are increasing at a rate faster than game, I think another approach is worth trying, at least on an experimental basis. I call this approach "giving the local population an economic stake in parks and tourism" -- whereby they benefit economically from park development and tourism along with the nation and the Department of Wildlife Conservation. The major assumption here is that if people benefit economically from a park they will help preserve it.

There are a number of ways in which the surrounding population can benefit economically from a national park or other conservation area in their midst. The following deserve brief mention.

[1] The Department of Wildlife Conservation makes a concerted

attempt to recruit local residents as casual laborers, permanent laborers, game guards, and other staff. In this way wages are brought into the village on the one hand and on the other the employees are available as channels of communication between the Department and the local villages. Whether intentional policy or not, this approach is currently quite effective, in my opinion, in Yala East. I think it warrants consideration in Gal Oya as well. Whether or not those involved are actually stationed in their home area is a decision which will have to be based on local circumstances.

[2] Revenue sharing with local village and rural councils whereby a proportion of the income from certain parks and conservation areas is channeled back to the local villagers for financing community needs like potable water, small tank reconstruction, and so on.

[3] A system of incentives to encourage local citizens to report offenders of park regulations through a system of rewards and by channeling a proportion of fines back to the communities involved for development purposes. The Department of Customs has set a precedent here.

[4] When surplus populations of wild buffalo build up in the parks (as is apparently the case in Yala West), local people are given permits to catch and train them either for local cultivation or for export to settlement projects like Mahaweli. Because of the increase in petroleum prices in recent years, the comparative advantage of buffalo in relationship to tractors has been increasing. Yet during those same years the national buffalo herd has decreased. As a result, surplus buffalo from the parks are a valuable national resource in the exploitation of which the local population should be allowed to play a major role. There is precedent for this since Mr. Wimaladharma has informed me that in years past local residents were paid for each buffalo they caught in Yala West.

[5] The Department of Wildlife Conservation encourages the local people to cater to the tourist trade by developing their own rustic safari camps under their own rural councils, and guided tours of carefully selected border areas (including villages, village tanks, and associated farming systems) adjacent to the park so as to inform tourists about local customs, ways of living, and local industries.

This approach has a number of merits not just in regard to national parks but to the development of tourism in general. Tourism is hardly an unmixed blessing as many resort areas have belatedly learned. While it can provide a critically important source of foreign exchange, it can also shock local sensibilities as when bikini-clad women walk through conservative Muslim villages. Tourists can shock local sensitivities in innumerable ways, many of which the tourists are unaware of. They can also play a major role in exacerbating class consciousness and hence contribute to political unrest. These problems are not easily solved. But I believe that they can be lessened if:

1. The local economies in which tourism occurs benefit directly from that tourism through some form of revenue sharing. This rarely happens, the income from tourism either going directly into the pockets of private operators and businessmen, or into the central treasury or ministry account. Tourism should provide job opportunities to local people on a preference basis although here it is important to include training programs so local residents are not just hired in the lowest menial positions. All too often tourist hotels see the local people as undesirables and try to insulate the tourists from them. I noticed this at Nilaveli where one tour hotel made no attempt to hire local people; indeed, its policy seemed intentionally to ignore them.

2. An attempt is made to better inform tourists about local customs and sensibilities, with the local people themselves playing a role in such tourist education. Not only can this provide income to local councils and entrepreneurs, but it can also prove attractive to tourists, many of whom are interested in how local people live. In the United States, for example, some firms are now offering ethnic tours which concentrate on informing a certain type of tourist about local life styles. Such tours, however, can be merely another means of local exploitation unless the local people also benefit from them.

#### CONFRONTATION TACTICS

Confrontation usually ends with the Department of Wildlife Conservation attempting to relocate the offending communities or families. Usually such relocation is compulsory, and invariably it causes far more stress to the relocatees than departmental officials realize at the time. Indeed, such relocation can even be responsible for higher death rates among the relocatees, especially the elderly and among children. A section of my main report attempts to explain why compulsory relocation is so stressful for people in villages like Kumana. If government officials better understood the predicament of those involved, it might be possible to work out alternative solutions which are not so stressful. And where the relocation option is selected, it should be possible to reduce (but not eliminate entirely) the length of the stressful transition period and to improve the chances of the relocatees being better off in the long run.

#### KUMANA AND YALA EAST

Although compulsory relocation should be considered a last resort measure, there are cases in which it remains necessary to achieve national development goals. I believe that Kumana is one such case. On the other hand, I believe that the current plans for the removal of Kumana are inadequate, with too much emphasis placed on housing and too little on the economic support base for the villagers at Helawa. In saying this I do not mean to be critical of the Department of Wildlife Conservation since the weaknesses of the Helawa

plan characterize relocation projects in most countries in the world.

Before making some suggestions, I would like to discuss the Kumana case in a bit more detail. These villagers have lived at or near their current site for over 100 years. The village is an isolated one and the residents have strong ties to it. Relocation for some of them is bound to be stressful, and probably already is since the people have known about the possibility of removal since the 1940s and their land was officially gazetted for government acquisition in the 1950s. So the villagers have been living under uncertainty for over twenty-five years, which is a long time. That uncertainty no doubt has negatively influenced the development of the community and created hostility toward the Department of Wildlife Conservation on the part of some people — including, I would assume, the more traditional elderly people with strong, and perhaps even religious, ties to the area and those younger men (including poachers) who have the most to lose economically when they leave the Kumana area.

On the other hand, the Department of Wildlife Conservation has been a major force for good in the lives of the people, even though they may not admit this. First, without the park it is likely that at best they would still be tenants for the Panama mudalali who previously controlled the land, since it was because of the park that he was not allowed to bring in new tenants when the Kumana people reacted against their tenancy conditions. Second, the department's record in recruiting employees from the village is excellent. For that reason there is considerable goodwill and a willingness, perhaps among a majority of the families, to move to a new site relatively close by -- provided the people can make a living there and provided there is adequate potable water.

I do not believe this will be the case if the Kumana people are moved before the Helawa tank is rehabilitated, the channels made operational, and the land properly leveled. Furthermore, I do not believe this will be the case if the people are moved before drinking water is available for them. Accordingly, I recommend that the actual move be delayed until the tank is rehabilitated and the land below it ready for irrigated farming. That means some delay, with two associated problems. First, the people will remain at their present site, hence causing disturbance to the sanctuary and the surrounding ecosystem. However, they have been living at Kumana for generations without irreparable harm so one to two more years is really not that serious, especially if the future well-being of the people is kept in mind. Second, the housing will be completed before the tank is, and hence the risk of deterioration and theft of house materials is a real one. There are two solutions to this problem, of which I favor the second. The first is to hire sufficient security staff to protect the housing by living in several of the homes. The second is to practice a form of "advanced alienation" whereby some of the Kumana villagers are employed as part of the labor force for rehabilitating the tank and associated works, during which time they live in and look after the housing estate. And if they themselves are directly involved in

digging the channels and leveling the land that they will eventually be cultivating, the odds are that a better job will be done, hence reducing the water management problems which all too often occur after the engineers hand over poorly prepared land to the settlers.

I have explained in the main report why land and water resources, drinking water, and schools are more important for compulsory relocatees than housing. However, it should be possible to correct this failing in the planning and plan implementation before the people are moved. Should they be moved into the housing before the land is ready for cultivation, I predict that relationships between the villagers and the Department of Wildlife Conservation will deteriorate and that the costs to the department in the long run will exceed the costs of delaying relocation until after the tank is rehabilitated and the land prepared for cultivation.

#### THE GAL OYA SITUATION

This is much more complicated than the Kumana situation, what with chena cultivators, fishermen, and gemmers. Obviously strict enforcement must be used with the gemmers — no matter who they are. But for the majority of the local residents who surround the park I think a rather different approach need be taken. Although this may have to involve a relocation component, I would hope that more emphasis could be placed on the National Park and the people learning to live with each other. Let me use the fishermen here as an illustration of the type of approach which may prove to be the most satisfactory in the long run.

##### A. The Fishermen

Currently permits have been given to fifty fishermen to have boats on the reservoir. Nine more boats have been counted and the total number of boats which are used at one time or another during the year are estimated by the fishermen themselves as being between 80 and 100. Each fisherman has at least one assistant. As for fish marketing, the fishermen estimate that up to 150 cycle traders are involved along with ten vans, the latter being used during the main fishing season. Fish are sold fresh, with any surplus being sun dried (as was the case on August 2 when we carried out our brief interviews).

While I suspect that these figures are an exaggeration, it is probable that at least 1,000 people (counting dependents) are dependent on fishing or fish trading as their major source of income (the fishermen's own figure was 3,000). That's a fairly large number.

The fishermen come either from the Inginiyagala area or from an area over fifty miles away. The latter live near the south end of the bund. But the best fishing grounds, for good ecological reasons,

are in the zone of submerged trees at the upstream end of the lake. Fishermen know this, with at least some paddling to and fro several days a week. They say they leave at about 2:00 p.m., setting their nets in the submerged tree zone before dusk. They then remain in the area until the early hours of the morning, both to protect their nets and to drive fish into them by beating the water. They pull their nets early in the morning and get back to the landing point after the sun rises.

Though this account is based on very brief interviewing, and hence should not be taken too literally, there is no doubt that the fishermen are convinced that their techniques for night fishing are necessary both to guard against theft and to catch more fish. As a result of having studied African inland fisheries since 1962, especially on man-made reservoirs, I can understand the fishermen's distress when they were told the day before our arrival that henceforth only daytime fishing would be allowed. While changes in techniques (like blackening their nets) can raise their yields, the distance from the best fishing grounds remains a major problem if they have to set their nets in the evening and then have to return to pull them the next morning. And the theft problem during the night would increase. So the fishermen's concerns are legitimate (as is their complaining to their M.P.) just as the concerns of the Department of Wildlife Conservation about nighttime poaching are legitimate.

Currently the fishermen and the department are on a collision course which can be expected to involve increased confrontation. Is there another possible solution other than restricting the fishermen to daytime fishing or prohibiting fishing entirely? I think there is. The fishermen claim that they are not the major poachers. Rather, they blame the chena cultivators (who no doubt blame the fishermen) and others. They claim that they know more about who poaches than do senior Department of Wildlife Conservation officials. They also claim that they are willing to cooperate in a program to control poaching. Such an experiment was tried in Lochinvar National Park in Zambia with considerable success, in my opinion, and I think it is worth trying in Sri Lanka. The fishermen say that if they are allowed to fish at night, they are willing (1) to have game guards accompany them and (2) to help control poaching. Why not take them up on this offer, if it is genuine, and see what happens over an experimental period of, say, one year. At the same time start a recruitment program as in Yala East whereby the sons of some fishermen are recruited into the department so that they can, on the one hand, learn more about departmental concerns (and pass these on to fishermen) and, on the other hand, can explain the fishermen's position to the department. Hopefully poaching will decrease — or at least not increase as a result.

The above approach may of course fail. But I think it is worth experimenting with. The way to start might be to have the relevant government agent (or agents since the park falls in two provinces) call a meeting of those involved (including fishermen,

departmental officials, and relevant M.P.s) to discuss the problem and attempt to work out an experimental approach. The fishermen would be told very clearly that if poaching exceeded a certain limit set by the department the experiment would be stopped and more stringent regulations introduced and enforced. It would then be up to the fishermen to deliver.

#### B. The Chena Cultivators

Though I would hope compulsory relocation can be kept to the minimum, should it be necessary the best solution under present circumstances may well be to move the entire community of Baduluwela rather than just the nineteen park encroachers. This is because the problem of encroachment will continue so long as the lands available to the village for cultivation are inadequate for present members, and especially for their descendents in the next generation. Furthermore, it may not be possible to meet the villagers' land needs through a village expansion scheme or a small tank development program since the better lands probably lie down the tributary system and hence in the national park itself.

If relocation is required, it is best that the people be relocated as a village, if they so choose, to a settlement project of their own choice. I would suspect that they would prefer Mutukandiya since it is the closest major project to their present homes. As in the Kumana case, irrigation water in the right amounts at the right times, properly prepared land, adequate access roads, potable water, and a school should be ready at the time of their removal. And they should be given priority as settlers.

As noted at the beginning of this section, the Gal Oya situation is a complicated one, with the proposed elephant corridor to Lahugala making the situation still more complicated. It would appear that development is proceeding on all sides of the park, although at different rates. An improved new road, for example, is being constructed toward Baduluwela from Dambagalla, having reached Ruval Vela. At the same time, improvements are being made on the Buddama Road while a major land settlement project is under construction immediately to the south. It might be worth while to examine the 1956 and 1972 aerial photography to see at what points and in what ways pressure has increased on the park, bringing the data up to date through a current survey of the land use around the park. In that way, planning for the future can be based on a better knowledge of the past and current trends in land use. Such planning, I believe, will be more successful if the local people surrounding the park participate in it.