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SRI LANKA

MAHAWELI GANGA DEVELOPMENT PROJECT

AIDE MEMOIRE

(February 1983 Project Review

1. A joint review mission comprised of representatives of the United Kingdom, Canada, United States, The Netherlands and IDA visited Sri Lanka February 10-16, 1983 to review project implementation progress and to assist the Government (MASL) in the decisions and actions to be taken in the further implementation of the project. Members of the Mission included Messrs. Bob Bell, Agricultural Engineering Advisor, ODA, David Smart, Senior Project Officer for Sri Lanka, CIDA, Gil Haycock, Chief Engineering Officer (Mahaweli), USAID, Sikke Bruinsma, Second Secretary, Netherlands Embassy, Dirk Leeuwrik, Senior Agriculturist, IDA and Stanley Baker, Deputy Division Chief (Irrigation I), IDA (Mission Leader).

2. Discussions were held with Mr. N.G.P. Panditharatne, Director General, MASL, Mr. Lalit Godamunne, Secretary General, MASL, Mr. K.H.S. Gunaratne, Executive Director (Eng), MASL, Mr. D.J. Bandaragoda, Executive Director, MEA, Mr. R.U. Fernando, Chairman, MDB, Mr. T.B. Ratnayake, General Manager, MDB, and with senior MDB and MEA office and field staff. The Chairman and GM of MDB and Executive Director of MEA and their senior staff accompanied the Mission during the field review and provided data and assistance necessary to ascertain implementation progress and problems, for which the Mission is grateful. The Mission's comments on the status of the project and recommendations for actions to be taken are provided in the following paragraphs.

Implementation Progress

3. Development of System H, and in particular H4 and H5 being financed under the Aid Package, is resulting in a well developed agricultural area with great promise for sustained high agricultural production. The lands are well repaired and, at the conclusion of the current maha season, the area has a look of prosperity. The high level of development input is achieving the project's initial agricultural objectives. However, some aspects of the project, i.e. work quality and water management, are disappointing, as detailed in succeeding paras, and unless improved may result in limited project life and only marginal crop production increases.

4. MDB Construction Progress. MDB has reported that the construction of irrigation infrastructure in H4 and H5 is complete, except for a small amount of work in Block 419, some small structures in other Blocks, and canal lining estimated to cost about Rs.15M. The Mission noted during its field review that although most (about 75%) of the repairs and rectification work identified during the joint MEA/MDB inspection had been completed and the remainder is scheduled for completion by June 1983, there remains a substantial amount of work to complete/modify and calibrate water measurement and control structures essential for effective water management, which has not yet been undertaken. The Mission also believes that canal lining requirements may be significantly underestimated by MDB. About 90% of buildings for social infrastructure needs have been completed (2036) and most of the remainder (209) are under construction. The small number of buildings not yet undertaken (61) have been delayed due to problems of land acquisition or are being reconsidered as to need by MEA.

5. MEA On-Farm Development and Settlement Activities. All clearing, levelling and bund marking are complete, except for Block 419 and approximately 260 ha at scattered sites in H4 and H5, where rough levelling is necessary to bring portions of allotments under command. In Block 419 clearing of regrowth by settlers is in progress and bund marking and initial tillage should be completed in 1983. Progress of well construction accelerated during 1982 and about half of the wells are now completed. The balance are scheduled for completion during 1983 and 1984.

6. Settlement in all blocks except for Block 419 is essentially complete, and 50 settlers (out of 435 planned) have been settled in 419. Two of the hamlet areas in Block 419 are now occupied. Settlement of Block 419 is scheduled for completion during March 1983 and on-farm development is planned for completion in time for a late maha crop in 1983/84. On-farm development is dependent on settlement, since clearing of regrowth and some field canal construction is done by the farmers. The Mission was pleased to find the newly settled farmers in Block 419 happy and eager to complete their homesteads and commence development of their farm tracts.

Work Quality and Acceptability

7. The quality of completed irrigation infrastructure in Block 419 is poor, with trees being left in canal embankments, roots and stumps projecting into canal prisms, gates only partially or poorly installed

concrete of poor quality in structures, canal banks not properly compacted, bedrock not yet excavated and canals not constructed to grade, and recently constructed canal lining already deteriorating. It appears that work quality has retrogressed back to the 1978-79 period, when project works were being undertaken on a crash basis without regard to quality. It should be remembered by construction engineers and technicians that the project is being constructed for a 50 - 100 year life and that construction of canals and structures of poor quality, even though more cheaply done, is false economy. The handing over of poorly constructed works results in an immediate and costly rehabilitation and maintenance program.

8. Of particular concern to the Mission was the condition of recently completed canal lining, which was already cracking and crumbling in many areas. A properly designed concrete mix should be used, the canal prism and banks upon which concrete is placed should be adequately compacted, and proper curing should be provided (keeping moist for several days or spraying with curing compound), none of which currently is being done. When questioned by the Mission, the response was that this would cost much more. The Mission would like to stress that the disbursement of donor funds will not be approved for works constructed of poor quality. The Mission again reminds that responsibility for the acceptability of completed works, both in terms of completeness and work quality, rests with MDB and MASL. Prior review missions have stressed the need to have properly trained and supervised construction inspectors.

9. Contrasting sharply with the irrigation infrastructure, the quality of building construction appeared to be excellent, much better than achieved during the early years of project implementation. The use of proven contractors producing works of good quality appears to be paying good dividends and is to be encouraged. Contractors should be informed that those producing works of poor quality will be barred from further contracts.

Water Management

10. As emphasized by prior review missions, efficient water management is requisite to achieving projected project benefits and in ensuring that all farmers have an adequate and equitable irrigation water supply. While the Mission notes that all concerned are much more aware of the priority and

importance of achieving much higher water use efficiencies and that programs are underway to this end, conditions within System H are not yet much improved from the standpoint of being able to achieve measured and efficient water issues than in March, 1982. Very few gauges have been installed, only few of the water measurement structures have been calibrated, some measurement structures were submerged, and many gates are inoperable or have been damaged and are not yet repaired. (The Mission again recommends that MEA and MDB refer to paras 9-13 of the March 1982 Aide Memoire). In interviews with gate operators and project operational staff, the Mission found that considerably more training and supervision will have to be given to enable such staff to minimize operational errors and to operate measurement and turnout structures correctly. (Again, paras 46-50 of the March 1982 Aide Memoire are recommended reading). The Mission wishes to commend water management staff and operational staff in H5 for their initial efforts in preparing a water diversion schedule and water measurement calibration of measurement structures in H5.

11. The importance of achieving good water management in the downstream areas of Mahaweli such as System H cannot be overemphasized. The creation of the Water Management Secretariat, the Micro Water Study being made by NEDECO in System H and the appointment of expatriate advisors to provide irrigation management and agricultural water requirement assistance in System H are steps in this direction. However, the Mission believes that the assistance of an expatriate Hydrological Advisor for about six months still will be required to achieve an acceptable operational water delivery program within a reasonable timeframe. If all areas in System H are included in the water management program, which is needed and currently envisaged, thousands of structures will have to be calibrated or made operational. This is a large undertaking and it should be given high priority if a good water balance is to be obtained. Key staff should be appointed to the Water Management Secretariat and to water management units in each organizational block and these staff should be properly trained and provided with the necessary measurement and calibration equipment and transport. The Mission also recommends that MASL continue to expand the educational and training programs for farmers and field level water management staff, and the establishment of the two training centers in System H are considered to be key requirements of this program.

Project Costs and Budget Allocations

12. Total project costs are now estimated to be Rs.1,080M or Rs.30M less than the estimate prepared at the time of the 1982 review mission, the difference being essentially due to the reduction in equipment costs. Actual expenditures through December 1982 amounted to Rs.982M or approximately 91 percent of the total estimated project cost. MDB's budgeted expenditures for 1983 are Rs.65M, leaving a minimal (Rs.33M) to be carried forward into 1984. MEA has forecast a budget of Rs.192M for the project in 1983. Project costs may exceed these estimates, however, when including all remedial canal lining works, repairs to structures required to make the irrigation system fully operational and as designed, additional O & M equipment and health department staff quarters, and other possible costs identified in para 16.

Implementation Program

13. MDB's construction work is scheduled for completion in 1983. However, with the considerable amount of canal lining requirements currently identified, it is clear that this work will extend to 1984 and possibly longer. A [illegible]ve budget of Rs.15M has been allocated for canal lining work, but the Mission believes this may be too conservative and canal lining requirements will be considerably greater. Since canal lining must be done during canal closure periods, it will be necessary to exercise close control and supervision to make best use of the limited time available to construct such works. It should be noted that only three closure periods remain before June 1984 (the possible extended credit closure date) and it is doubtful that all lining work could be completed by then. Furthermore, the first closure period in February/March 1983 may be lost due to lack of preparation of tenders and stockpiling of required materials. The Mission saw no preparations of any kind and were informed tender documents and designs had not yet been prepared for the contracting of this work. A full assessment of canal lining requirements and preparation of tender documents and designs should be made without delay in order to complete all required works by 1984.

14. MDB's and MEA's building construction program appears to be achievable by end 1983 or by early 1984. However, construction of the proposed training centers probably will extend to mid 1984, and possibly much longer if this work is not tendered soon. On-farm development should be able to be completed by end 1983 with the completion of settlement no later than March or April 1983. The well construction program will have to be improved substantially to complete by mid 1984 the approximately 50% of the wells yet remaining to be completed.

Current Status of Utilization of Aid Package

15. As of December 1982, a total of US $15.37M equivalent (Rs.354.25M) of the aid package was undisbursed. Of this balance about US $9.05M equivalent (Rs.208.95M) currently is expected to be withdrawn by the closing-date-of the agreements, resulting in a saving of US $6.31M equivalent (Rs.145.45M). Most of the projected withdrawals would be for a telecommunications system (CIDA), reimbursement of local cost expenditures on the civil works components, and procurement of operation and maintenance equipment (O & M). The situation is summarized in the following table:

Status of Aid Fund (M)
(31.12.82)

	CIDA (Cdn $)	UK (£)	USAID (US $)	IDA (US $)	NIO (Hfl)	TOTAL
Remaining Balance	1.21	0.73	0.5	10.78	5.3	
US $ Equivalent	0.98	1.13	0.5	10.78	1.98	15.37
Rs. Equivalent	22.58	26.05	11.5	248.48	45.64	354.25
Identified Use	0.5	Ø	0.5	6.49	4.47	
US $ Equivalent	0.41	Ø	0.5	6.49	1.67	9.05
Rs. Equivalent	9.45	Ø	11.5	149.52	38.49	208.95
Estimated Savings	0.71	0.73	Ø	4.29	0.83	
US $ Equivalent	0.58	1.13	Ø	4.29	.31	6.31
Rs. Equivalent	13.37	26.05	Ø	98.88	7.15	145.45

GOSL Recommendations for Utilizing Remaining Funds

16. The possible use of the projected unutilized aid funds (para 15) was discussed with the Mission. MASL informed the Mission that it will seek (or has sought) approval for the following works/procurement:

Item	Estimated Cost (Rs.M)	Donor
a) Additional O & M Equipment	30.0	IDA
b) Communications Equipment	9.5	CIDA
c) Micro Water Management Studies (System H)	6.0	NIO
d) Training Centers (2) for farmers & staff	30.0	IDA & NIO
e) Micro Computer for System H	0.5	IDA
f) Additional Technical Assistance for Water Management Studies (Irrigation/O & M Engineer, Agronomist, and Water Management Advisor to MASL)	7.0	IDA
g) Flow Measurement Equipment	1.0	IDA
h) Flow Measurement Devices	3.0	IDA
i) Canal Lining (in addition to 1983 program)	34.0	All Donors
j) Hospital at Tambuttegama	15.0	IDA & NIO
k) Metalling of Roads	13.0	IDA & NIO
l) Additional wells and Pumps	6.0	IDA & NIO
Total	Rs155.0	

The decision as to whether the above items would be eligible for financing will be made at the time such requests are received by IDA and the costs involved have been more accurately determined.

Status of Equipment Utilization and Disposal

17. The Mission saw very little heavy equipment in use in System H and was unable to assess its general condition.

O & M Equipment with MEA

18. Equipment for operation and maintenance work which has been taken over by MEA from MDB comprises:-

a) Motorized Graders	4 Nos.
b) Compactors Vibratory Roller	3 Nos.
c) Ford 515 Tractors w. Trailers	25 Nos.
d) Radio Transceivers	15 Nos.
e) Boats	2 Nos.
f) Fuel Bowsers	2 Nos.

This list appears to be based on that recommended for O & M work in Table 3, Annex 6 of the 1977 Project Appraisal Report. In view of the quantity of repair work to canals, bunds, canal structures and linings, it is likely that there will be a need for at least the following additional equipment:

a) Front end Loaders	3 - 4 Nos.
b) Light Bulldozers	4 Nos.
c) Stone Crushers	2 - 3 Nos.
d) Concrete Mixers	5 Nos.
e) Water Bowsers	4 - 5 Nos.
f) Air Compressor	1 No.
g) Pneumatic Drill	2 Nos.
h) Pneumatic Compactors	10 Nos.

19. The mission recommends that MEA urgently reassess the amount of equipment and vehicles it will require for infrastructure improvement and for O & M (e.g. water bowsers are required for water supply to settlers pending commissioning of wells, for tree planting by roadsides, as well as for earthworks and concrete work). The Mission believes that much of the plant needed for O & M should be available from the residue of construction equipment provided to MDB. It is estimated that cost of additional new equipment for O & M will be about US $1.5M.

Equipment Remaining with MDB System H

20. Much of the equipment supplied to MDB has now been transferred to other projects (most to Systems B and C). The approximate distribution is as follows:

Item	Total Nos.	Transferred to other projects	Remaining with MDB in System H	Comments
Crawler Tractor D7, D8	11	9	2	Most units requi repair
Motor Graders	6 + 4	5	1	4 others already transferred to MEA
Frontend Loaders (Bray)	6	6	0	4 under repair
Concrete Mixers	42	36	6	
Bowsers (Kenworth)	6	0	6	
Track Drills	3	3	0	
Air Compressors	9	9	0	
Road Rollers	10	7	3	2 sold
Stone Crushers	17	14	3	
Generators 10 KVA	16	13	3	
Generators 25 KVA	10	6	4	

The equipment list supplied by MDB and MEA gives additional information of present locations and conditions of equipment but does not give a clear picture of the condition of equipment still in System H, as was requested by the Mission in the March 1982 Aide Memoire (para 22).

21. Equipment for OFD and Agricultural Work. MEA has retained for OFD:-

Tractors 4 WD (DB 1210)	36 Nos.
Disc Plough 3F	16 Nos.
Disc Plough 2F	8 Nos.
Disc Harrows (Simba)	12 Nos.
Trailers 5 ton	15 Nos.

It is believed that about 60% of the equipment is currently operable and that the rest may be readily repaired when spares already on order are received. A few tractors may be written off and cannibalized for parts. The equipment currently operable appeared to be in good condition and should be adequate for remaining work in System H, On completion of OFD some of the 4WD tractors and trailers may be retained for heavy haulage. The Mission does not have a list of locations and use of the 86 farm tractors taken over by MDB (from the 200 intended for on-sale to farmers). Those seen at Kalankuttiya farm, Niraviya farm, Medyama workshop and at block offices appeared to be well maintained and in good condition. The Mission understands that use of these tractors for cultivation hire has ceased in H1, 2, 7, 9 and that in H4, H5 the hire rates have been increased to match those charged by private contractors.

22. Equipment provided for sale to Farmers. The Mission was pleased to learn of continued sales of the 3½-ton trailers, although the situation with disc harrows and tine tillers was unchanged. The Commercial Officerof MEA is to again offer this equipment for sale by tender in order that it may be utilized either directly or as components of locally manufactured equipment.

Workshops

23. Tambuttegama Workshop. This workshop has been taken over formally by MEA but is 'mothballed' pending connection of mains electricity. A-25 KVA generator is installed but its use is considered uneconomic. MEA is currently considering its strategy for maintenance and repair of equipment; i.e. whether to provide all its own repair facilities or to make greater use of private sector services. Alternative uses for the facilities at Tambuttegama are also being considered.

24. Mediyama Workshop. This workshop has mains electricity but facilities are otherwise inadequate and are much inferior to those at Tambuttegama.

25. The Mission strongly recommends that consideration be given to transfer of all repair work of the several hundred vehicles and other equipment in System H to Tambuttegama as soon as mains power is available. If the site at Tambuttegama is considered too large, it may be possible to divide it and to allocate some of the buildings and facilities to other purposes (e.g. vocational training centre). If Tambuttegama is utilized as a main repair centre for all Systems, it will require a lowboy transporter for recovery of vehicles requiring repair.

Operation and Maintenance

26. Since establishment in 1981, MEA has taken over operation of System H (excluding Block 419) and has prepared a maintenance plan. Maintenance activities were begun and carried out in 1982 for irrigation and agriculture infrastructure for the Galwewa, Nochchiyagama and Tambuttegama Divisions. Under the current irrigation season, water issues will be terminated by the end of February. Prior to that time MEA should make preparations for priority maintenance work, to ensure that such work can be undertaken immediately upon canal closure. The Mission was advised by MEA that necessary maintenance work will commence as soon as possible after the cessation of water issues.

27. MEA intends to continue to make two inspections per year (after Maha and Yala water issues) to keep an up-to-date estimate and schedule of work to be done for budgeting and cost control purposes. As more experience is gained in performing maintenance work, the cost estimates and schedules will become more accurate. The semiannual inspections will be carried out by water management staff at the block level. It is recommended that the maintenance work schedule clearly identify the location of required maintenance work within the irrigation system as well as the unit and block locations.

28. An Operation and Maintenance manual is being prepared by MASL for System B Left Bank Canal project which possibly could be used as the basis for a manual specifically for System H. The Mission recommends that an O & M manual, including schedules, be prepared for System H.

Agricultural Production, Crop Diversification and Marketing

29. Crops. Paddy yields declined from the high levels obtained in Maha 1980/81 (80-100 bu/acre) to an average of 71.7 bu/acre in Maha 1981/82 due to the drought experienced in late 1981 and the first few months of 1982. Crop failures and reduced yields were widespread, particularly in the late sown crops, with the result that farmers have been quick to adopt early sowing for the current Maha 1982/83 season. Efficient water management and improved agronomy, including early sowing, also received great impetus by training staff and turnout leaders at Maha Illuppallama and other training centres, and it is estimated that more than 90% of the 1982/83 Maha crop was early sown. In addition, row transplanting leading to better yields and lower water use, as well as making intercultivation possible to control weed growth, appears to be increasing in the project area. Well distributed rainfall during October and November allowed farmers to cultivate early but also reduced the effectiveness of chemical weed control. Despite a somewhat widespread occurence of weeds and some brown plant hopper attack, the crop looks excellent and a record harvest is expected, reinforcing the importance of early sowing. Harvest has begun in the project area, and it is expected that an estimated 5.0M bushels of paddy will be produced from about 55,200 acres with an average yield of about 94 bu/acre, far exceeding appraisal estimates. Yields are assessed by random crop cuts and may be somewhat overestimated. There is no doubt, however, that the 1982/83 Maha crop will equal or exceed the record yields of the 1980/81 Maha crop.

30. Due to the drought, Yala cropping during 1982 was much reduced, the total extent of paddy sown being about 6,200 acres. Paddy acreage was also reduced by a concerted effort to increase the area under other field crops during Yala, especially on the Red Brown Earth soils (RBE). The previous review mission has expressed some concern about the extent of paddy planted in Yala 1981 in view of available water. At least in parts of system H, however, acreage under other field crops has been progressively increasing. In H5 area, for instance, other field crops increased from about 70% of the total Yala cultivated area in 1980 to 82% in 1982, while paddy decreased from 30% to 18% in the same years (partly due to the drought). In the whole of System H, about 7,400 acres were under other field crops in Yala 1982, out of a total of 13,600 acres (54%). The Mission commends the concerned staff for this achievement and urges that the drive to reduce paddy cultivation

and increase other field crops receive continued emphasis in order to increase the efficiency of water use and also farmers' income. Although accurate water measurements are not available, water duties for paddy vary from about 4 to 8 acre ft and higher. Water tables are rising to high level in many areas, and farmers cultivating subsidiary field crops on the middle slopes may experience difficulties when adjacent upper slope neighbours continue to grow paddy. Although, in general, the progress made in increasing crop production has been impressive, the mission feels a great deal of scope exists for greater efficiencies in water use, and fairly simple refinement in cropping patterns and practices would lead to a more balanced and sustainable agriculture and substantially higher productivity.

31. Marketing. Following the observation of the previous review mission that MEA's marketing policies should effectively relate to its marketing activities, the MEA further clarified its objectives and approach. MEA does not engage in marketing itself, but provides marketing intelligence and services to facilitate smooth, efficient marketing operations and to ensure reasonable levels and stability of prices for the farmers. It acts as an intermediary between the farmers and marketing organizations, which may be private traders or Government Agencies, depending on demand and price levels. To facilitate marketing MEA provides facilities for Collection Centres, (including mobile units) and storage, and also arranges transport if required. While paddy prices were higher than the Guaranteed Floor Price (GFP) during the last few years, most of the paddy was marketed through private channels. It is expected, however, that a substantial portion of the Maha 1982/83 paddy will be purchased by the Paddy Marketing Board (PMB) since, with the anticipated bumper crop prices offered by private traders are likely to fall below the GFP. No problems are currently foreseen in marketing the 1982/83 paddy crop.

32. MEA facilitates the marketing of other field crops by matching likely demand in local markets (in the future export markets will also be considered) with supplies. Cropping patterns and acreages are planned at the beginning of each season and related to credit and market requirements, and arrangements are made for the disposal of produce to recognized bulk purchasers. Minimum price levels are set after harvest. The system has sufficient flexibility to afford farmers the opportunity to receive the best possible price, and so

far production has never exceeded demand. In Yala 1982, MEA disposed of about 186 tons of produce, for a value of about Rs2.8M.

33. The marketing services provided by MEA appear to be working satisfactorily, at least for present levels of production. The Mission is confident that available staff and facilities would be able to cope with considerably expanded production as farmers increase their acreages under other field crops. The Mission recommends, however, that progress be closely monitored to ensure that marketing arrangements will be adequate for the higher levels of production of diversified field crops and that adjustments be made for expanded services if and when needed.

Agricultural Credit

34. The amount of credit to be made available each season is determined on the basis of a credit disbursement calendar prepared as part of the crop planning process carried out at the beginning of the season. The amount for Yala 1982 was about Rs1.6M, and that for Maha 1982/83 was about Rs31.6M. Actual disbursements are, however, considerably less since, for a variety of reasons, a proportion of the farmers do not avail themselves of the available Bank credit. In Maha 1982/83, credit disbursed upto February 1983 amounted to Rs12.2M in 6,448 loans, or 39% of available credit. To facilitate and provide greater control of credit administration, only one bank provides agricultural credit in each of the H areas (People's Bank in H1, 2, 4 and 7, Hatton National Bank in H5, Bank of Ceylon in H9), although other banks may have branch offices in those areas and provide loans for other purposes. Credit applications are made through the Unit Managers and in some areas Bank Field Officers. It is considered worthwhile to evaluate both practices, in order to judge their effectiveness. Loan recoveries have been high in past seasons but dropped dramatically in Maha 1981/82 and Yala 1982 due to the drought, when many farmers could not repay their loans due to circumstances beyond their control, as is

shown by the following table (loan recovery percentages):

Season		H1, 2 & 7	H4	H5	H9
Maha	1978/79	85.93	-	-	-
Yala	1979	92.63	-	-	93.9
Maha	1979/80	81.77	89.07	-	94.3
Yala	1980	83.98	97.78	-	92.4
Maha	1980/81	72.82	84.63	93.54	89.8
Yala	1981	66.03	60.21	76.59	73.43
Maha	1981/82	14.69	7.61	25.47	31.3
Yala	1982	0.58	5.55	64.26	-
Maha	1982/83	-	-	-	-

35. Banks have rescheduled credit repayments due on loans for the Maha 1981/82 and Yala 1982 cultivation seasons to enable most of the farmers to qualify for credit in Maha 1982/83.

36. While credit has been generally adequate, and the system has proved itself sufficiently flexible to accommodate the effects of last year's drought, the Mission stresses the importance of taking every step to maintain the high levels of credit discipline shown by farmers in earlier seasons. Over and beyond the effect of the drought, there appears to be a trend in the above table of lower recoveries in more recent seasons, which is perhaps understandable in view of the greatly expanded volume of credit. The registering of the many small private buyers in System H attempted by MEA will assist in ensuring that loans are repaid.

Agricultural Extension and Farmer Training

37. An impressive and comprehensive farmer support structure has developed under the project. Two different organizational structures are operative, one in the H5 area (a pilot effort) and another in the remainder of the project area. These are essentially similar, but differ slightly in composition and function of the smallest managerial unit that is in direct contact with ther farmer. In both cases, the Unit Manager (UM) is a multipurpose worker responsible for providing assistance to farmers in all aspects of community development and services, as well as agricultural

extension. In the H5 area, however, the UM is responsible for about 100 farm families, and has no staff except a labourer to help supervise water deliveries, while in other parts of the project area the UM is responsible for about 250 families and is assisted by two Field Assistants, one in irrigation and one in agriculture. The Agricultural Field Assistant is equivalent to the Department of Agriculture's KVS. Another major difference between the two organizations is that in H5 all staff are directly employed by MEA while in other areas all agricultural staff are on secondment from the DA. While lauding the effectiveness of both systems introduced, the Mission endorses the concern expressed by previous review missions and others that there are some significant differences from the T&V system being introduced nationally under the Agricutural Extension and Adaptive Research Project. It was explained to the Mission, that in both systems, the T&V concepts of regular, topical training and systematic scheduling of farmer visits are being introduced. In areas other than H5, MEA has agreed that the Field Assistant (Agric.) will have no responsibilities other than extension. Since he is responsible for about 20-25 turnouts the FA is able to maintain satisfactory, regular 2-weekly contact with farmers within his responsibility according to the T&V approach. In this case, the Mission is satisfied that the extension activities are essentially in line with national extension policies and practices, and also notes the advantage of having direct linkage with the national extension system through the seconded DA staff. In the system developed in H5, however, the multipurpose approach is basically incompatible with the principles of T&V extension, even though some of its systematic training and scheduling are being applied. Nevertheless, it must be conceded that, under the particular conditions prevailing in System H, the extension and support system has been no less effective than in the other H areas. The very high ratios of staff to farmers, and the highly developed support services for credit, input supplies and marketing have resulted in effective farmer contact and participation in all areas. Particularly in newly settled areas, the Mission noted the impressive results of farmer education and adoption of highly productive technologies through effective extension and adequate, timely support services. The Mission reiterates, however, the necessity of structuring extension and support services in such a manner that eventually they can be easily incorporated into the national system.

38. Regular farmer training is conducted, concentrating on farmer leaders, farmer groups below a particular turnout and the newly-formed Settler Development Committees. Although the Mission did not have time to review

course content and structure in detail, widespread results from training were evident from discussions with farmers. UNICEF is continuing its assistance to the Farmer Training Program and is particularly focussing on improving communication of Farmer Leaders with other farmers. The Mission fully supports present efforts in farmer training in conjunction with agricultural extension activities and recommends that funds be provided under the project for two proposed Development Training Centres.

39. There is a need for greater integration of extension with adaptive research carried out in the region. In the opinion of the Mission, available results could be incorporated more readily in the on-going extension work. Investigations over the last 3-4 years at Kalankuttiya Farm have led to some useful results which, for some reason, have not been adopted by adjacent farmers even though the packages recommended would lead to better use of farm resources and increase farm incomes. Reasons for failure of more widespread adoption of technological improvements should be investigated to enable necessary adjustments to be made and effective extension to be carried out. The Mission recommends that the work at Kalankuttiya Farm receive continued support.

Farm Power

40. The question of farm power continues to be a matter of impression, opinion and conjecture, rather than of fact. Successive Missions have stressed the need for a thorough survey of farm power requirements and use, and MEA has gone some way towards collecting farm power statistics. Accurate and meaningful figures and an acceptable analysis are still not available, however, and the Mission adds its recommendation to those of the previous Missions that a detailed study of farm power be conducted to provide a basis for further planning. Earlier fears that available farm power would not be sufficient for timely cultivation of the 1982/83 Maha crop proved to be unfounded. As stated earlier, more than 90% of the paddy crop was early-sown. The availability of adequate power was no doubt assisted by the decision to increase the rate for primary tillage (two operations) to Rs500/acre, following the suggestion by the previous review Mission. Approximate figures supplied to the Mission regarding farm power available during the 1982/83 Maha

season are as follows:

Power Unit	H1, 2, 7, 9	H4	H5	Total
4W Tractor - within area	95	40	31	266
outside		63	37	
2W Tractor - within area	467	183	50	746
outside		37	9	
Buffaloes	6,698	2,633	1,215	10,546

41. The table shows that 266 4W tractors, 746 2W tractors and over 10,000 buffaloes were in H area during the season. It should be noted, however, that these numbers are unrelated to actual cultivation and not all tractors or draft animals were used for tillage. Most of the land was prepared by tractors. In H1, 2, 7 and 9, for instance 56% of the cultivated land was prepared by 2W tractor, 26% by 4W tractor, and only 18% by buffalo or by hand. The above table suggests that the preponderance of tractor cultivation was not due to a shortage of buffaloes.

42. Some controversy exists regarding the use of tractors vs animal power. Studies conducted by ARTI conclude that because of small field size, tractor use is inefficient and does not improve either the timing of paddy cultivation or crop yields and intensities; ARTI therefore advocates more widespread use of animal power. It is true that, while tractor power was essential for initial tillage and land development, power requirements of developed farms can, to a large extent, be met by animal power. However, because of the critical importance of timely operations for obtaining satisfactory weed control and greater efficiencies in water use, the role of tractors in the total farming system should not be dismissed out of hand. Tractor use and mechanised operations may also be required for the introduction and wide-scale adoption of improved techniques of land preparation and layout, such as investigated at Kalankuttiya Farm. There is equally great potential for use of animal power in secondary operations for weed control in upland crops. The Mission therefore recommends that more conclusive study be carried out to determine the relative role and value of tractor vs animal power, while at the same time present efforts to provide farmers with more draft animals are continued. These efforts should be further strengthened by a comprehensive survey of feed availability in System H, as against feed requirements. Upto now, sales of draft animals to farmers in the area

from Niraviya Farm have been limited. This can be partly explained by the severe drought and the limited capacity of the farm. However, there are also some indications that farmers do not purchase draft animals because they experience difficulties in feeding and caring for the animals. Another reason for the limited number of animals distributed to farmers is the slow and cumbersome process of credit application and disbursement. The Mission was pleased to learn that in H1, 2, 7, and 9 the private sector was able to provide all tractor hire required, and that in H4 and 5 charges by MEA were at parity with those by the private sector.

Community Development.

43. Once again the Mission wishes to underline the importance of the community development programs initiated and supported by MASL and UNICEF. The results so far are encouraging. These programs impart both knowledge and an awareness of responsibilities, which should eventually lead to greater people participation and a certain degree of self management. It is recognized, however, that there is still a long way to go to achieve this goal.

44. The Mission noted that project officials are becoming aware that those participating in training (farmer leaders) tend to be better off than those who do not. It will probably be more beneficial to move training programs from the classroom to the field to involve other farmers. In this respect, it might be necessary to provide facilities for demonstration purposes. The role and functions of the farmer leaders should be clarified, both to the farmers and project officials.

45. Community development requires organizing the community in cohesive groups either at turnout or at hamlet level. The three disciplines that are striving for the attention of the farmers' families (agricultural extension, water management and community development) should aim at a co-ordinated approach and reinforce each other. In this respect the role of the Settler Development Committees must be considered very important. In all programs in which volunteers are supposed to play an important role (health, sanitation), the activities, responsibilities and authority of these volunteers should be clarified to those whom they serve.

46. High priority is being given to womens activities in close co-operation with the Womens Bureau. A relatively new activity is a-home oriented nine-month training course mainly attended by young jobless women. Training courses geared at income generating activities for women will be held in close consultation with the institutions concerned (e.g. Department of Animal Health and Production), which the Mission considers to be a pre-requisite for such programs.

47. The Mission noted that a high degree of discipline is maintained in health services provided to the population (i.e., health clinics and mother and child care). The importance of discipline cannot be overly stressed. People must be able to rely on it. Whenever new facilities such as hospitals are provided, adequate staffing arrangements should be ensured.

48. The role of the Unit Manager (UM) in both the Extension and the Development process is very important. Therefore, the UM's role and responsibilities should be clearly defined. The farming population will consider him to be a Government representative, whereas the UM would probably like to be integrated in the community. This is a situation which might cause conflicts of interest. One should realize that this position is very delicate.

49. The Mission was pleased to observe that many of the officials interviewed were aware of the need for a constant monitoring and evaluation system to ensure that educational and extension programs remain focussed on and responsive to community needs.

Pipeline Irrigation Project

50. A detailed evaluation of the pilot Demand Irrigation Scheduling (DIS) project currently is underway for the 1982/83 Maha season, and the evaluation will be continued through the 1983 Yala season. It is hoped that the evaluation will clearly assess and define the advantages/ disadvantages of the DIS concept in terms of farmer acceptability and/or abuse, benefits vs costs, and water use. For reasons outlined in previous Aide Memoires, the Mission continues to support this pilot effort with the expectation that an improved method of irrigation can be developed, either along the line of the DIS concept or through a modified version, that may result in improved agricultural productivity and water use in major irrigation projects in Sri Lanka.

Reporting Requirements

51. Although MDB and MEA agreed to the recommendations of the March 1982 review mission to combine their Quarterly Progress Reports into a joint report, progress for the quarter ending December 31, 1982 was still submitted in separate reports. The Mission suggests that MDB and MEA consider presenting a joint Quarterly Report for the quarter ending March 31, 1983. The report should give a clear statement of financial as well as physical progress during the period.

52. The 1981 Audit Report for MDB was received by the Mission at time of arrival and the Mission was assured that comments on the Report would be submitted as soon as MASL has had an opportunity to study the report. The Mission requests that these comments, and the comments on and actions taken to correct the problems listed in the 1980 MDB Audit Report, be submitted to IDA no later than March 15, 1983. The Mission further requests that the Audit Reports for MEA and MASL, which were to be completed in January and March 1983, respectively, be submitted by March 31, 1983. The Mission again reiterates the requests of previous review Missions that action be taken to ensure compliance with the Credit Agreement, which stipulates that Audited Accounts be submitted no later than six months after each fiscal year. Earlier agreements that in future an expedited audit schedule would be followed should be implemented with the appointment of independent auditors well before the end of the year to be audited, so that preliminary audit checks could be made during the year and thus permit the final audit to be completed promptly after the accounts are closed. The 1982 Audit Reports should be submitted by June 30, 1983, and the Audit Reports for future years, promptly within six months after the end of each fiscal year. The Mission urges that effective action also be taken immediately to rectify the financial and management problems highlighted in previous Audit Reports.

Cost Recovery

53. Cost recovery is to be effected chiefly through the sale of land. The approved purchase price is Rs8,877.50 per allotment which was calculated on the basis of Rs3,145/- per acre of irrigable land and Rs1,015/- for half an acre of homestead area. Almost 23,000 farmers are expected to eventually to receive land titles. The sales schedule was to have been implemented by December 31, 1982. It was postponed, however, because of the severe drought experienced during 1981/82 and also because the necessary permits stating the purchase price had not yet been issued.

54. In discussions with IDA during negotiations for the Mahaweli III project, it was agreed that water charges representing an increasing percentage of O&M costs would begin one year after water was issued to each settler-farmer, to reach full recovery of O&M costs by 1991. However, MASL has proposed that full O&M costs be recovered from the beginning in new areas, and these were estimated to be Rs375 per ha in 1981 for the H1, 2, 4, 7 and 9 areas. Collections of water charges were to be implemented in September, 1982. O&M charges at the rate of Rs.75 per ha are to be collected in the old areas such as Kantalai, etc. This rate would be adjusted upward in successive years starting September 1982, to achieve full recovery of O&M costs by 1991.

55. Due to the 1981/82 drought, it was considered inappropriate to recover any O&M costs in System H. It is now proposed to recover partial O&M costs in H1, 2, 7 and 9 areas at the rate of Rs75 per ha after the 1982/83 Maha crops (beginning in March 1983). Collection of water charges in the H4 and 5 areas would start in March, 1984. The Mission recommends that MASL continue to develop O&M cost estimates for all areas receiving Mahaweli irrigation water and to recover such costs through collection on a gradually increasing rate as agreed with IDA.

Land Acquisition and Payment

56. Project implementation activities under the Mahaweli Accelerated Program required MDB to take almost immediate possession of lands to be acquired. Under Section 38A of the Land Acquisition Act, the Minister of Land and Land Development received power to acquire the land pending all formal inquiries, so that all required land could be handed over to MDB and MASL for construction and settlement work without administrative delays. However, normal acquisition procedures must be followed for compensation purposes.

57. Responsibility for land acquisition work lies with the Government Agent. Until Agust 1982, MDB provided the necessary funds and staff to the Government Agent. At the time MEA took over from MDB (August 1982), Rs4 M had been paid out, as against a total estimated compensation of about Rs40 M. In order to expedite compensation payment, a Manager Acquisition has been appointed, with a staff of 3 acquisition officers plus supporting staff. By the end of 1982, a total amount of Rs7.7 M in compensation had been paid. It is expected that with the present staffing, payments in 1983 will increase by approximately Rs8-10M. The

current status of land acquisition in System H is given below:

The total number of villages to be acquired in System H	321
Number of villages for which compensation has been fully paid	32
Number of villages for which compensation has been partly paid	147
The amount of compensation paid to end 1982	Rs 7.7M
Estimated total compensation to be paid	Rs40. M

It is expected that when the final village plans have been completed, the number of plots to be acquired will decrease by approximately 30%.

58. The Mission notes that payment of compensation in System H has gained momentum, but recommends that further steps be taken to speed up payments, since large numbers of dissatisfied resettled farmers may hamper future development activities. The amount of money involved could be an important capital input for the project area. Since the investigation work is the most time consuming part of the procedure, the Mission recommends that more staff be made available for this activity.

Project Completion Report

59. The project is entering its final year and most civil works are nearing completion. Work on canal lining and the construction of two Development Training centres may continue into 1984, however, which may delay the closing of the project by about one year. In accordance with requirements under the Credit Agreement, a Project Completion Report (PCR) is to be prepared by GOSL upon completion of the project. It was agreed that immediate arrangements would be made to start collecting, compiling and analysing available data and information for the PCR, to enable a thorough and objective evaluation to be made of the project. It was recognized that experience gained and lessons learned from the project could serve as a valuable guide for the implementation of future projects (e.g. Mahaweli IV). The content and scope of the PCR was briefly discussed and the Mission provided examples of completed PCRs to be used as a guide in the preparation of the PCR.

Disbursements

60. Disbursement problems, particularly the matter of missing documentation in disbursement applications, was discussed briefly with MASL. The Mission informed MASL that a World Bank disbursement officer was scheduled to visit Sri Lanka in the near future to resolve current disbursement problems and to provide guidance in disbursement procedures. In response to Mission recommendations, MEA agreed to make a detailed survey of all buildings constructed in the project area and financed under the project, listing type, exact location (Area, Block and Unit), completion date, condition, cost, and application under which claimed for reimbursement. Inasmuch as more than two thousand buildings are involved, this survey was agreed to be completed by mid May, 1983.

Does not apply PID

February 16, 1983.