

TRAINING; FOR IRRIGATION MANAGEMENT IN SRI LANKA

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Summary: This Main Report presents the findings of a review of present resources and activities in training for irrigation management in Sri Lanka. A strategy is offered to enhance what is being done already, and to prepare irrigation staff to adapt to new technical situations that can be expected in the imminent future. Annexes are published in a separate volume.

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ACRONYMS

ARTI	Agrarian Research & Training Institute
DAS	Department of Agrarian Services
DoA	Department of Agriculture
DoA(E)	Extension Services Division, Department of Agriculture
DoA(T)	Education of Training Division, Department of Agriculture
GITI	Galgamuwa Irrigation Training Institute
ID	Irrigation Department
IIMI	International Irrigation Management Institute
IMD	Irrigation Management Division
INMAS	Integrated Management for Settlement Schemes
IRDP	Integrated Rural Development Project
ISTI	In-Service Training Institute
KVSN	Krushikarma Viyaptha Seva Niladhari
MARD	Ministry of Agricultural Research and Development
MASL	Mahaweli Authority of Sri Lanka
MEA	Mahaweli Economic Agency
MECA	Mahaweli Engineering & Construction Agency
MIRP	Major Irrigation Rehabilitation Project
MLLD	Ministry of Lands & Land Development
MMD	Ministry of Mahaweli Development
PASE	Project for Advancement of Settlement Expertise
PGIA	Post Graduate Institute of Agriculture
SLIDA	Sri Lanka Institute for Development Administration
T&V	Training and Visit
VIRP	Village Irrigation Rehabilitation Project
WMS	Water Management Secretariat

ACKNOWLEDGEMENT

Following its meeting of 21 December 1985, the Sri Lanka IIMI Consultative Committee requested that IIMI should review the present resources and activities in training for irrigation management in Sri Lanka. This review was intended to determine the training requirements and to develop a strategy for meeting these requirements over the next 10 years. IIMI acknowledges with thanks the Ministry of Lands and Land Development and the Irrigation Department for financing this study.

1. INTRODUCTION

- 1.1 The Sri Lanka-IIMI Consultative Committee expressed a wish, at its meeting on 21 December 1985, that IIMI should review present resources and activities in training for irrigation management in Sri Lanka.
- 1.2 The purpose of the review would be to make recommendations for ensuring the adequacy of training and professional development arrangements to meet anticipated future needs over the coming five to ten years; and to see whether there were ways in which IIMI could support or assist a national programme of this kind.
- 1.3 This report presents the findings of the study. It is not a detailed plan for amending the entire training system, for this is a field that is inherently complex and subject to many practical constraints. We try therefore to present a flexible strategy, under which what exists now may be encouraged to evolve or improve in directions that seem desirable. Our aims are both to enhance what is being done already, and to prepare irrigation staff to adapt to new technical situations that can be expected in the imminent future.
- 1.4 This strategy is proposed in Chapter 7 and 8 of this report. It is put in outline only at present, as a set of principles and a limited number of concrete actions that would be required to initiate the changes. Our hope is that, if the main agencies concerned feel able to make these initial steps, modified no doubt according to the constraints within which they operate, then IIMI can continue to associate itself with the further evolution of the programme, and evaluate its success in practical performance.
- 1.5 The text of this report is written by Charles J. Abernethy, Senior Associate of IIMI. Many people have made inputs to the research leading up to it: they are too many for individual enumeration, but several are too substantial to pass unacknowledged. Dr. Gladys Nott, Consulting Economic Anthropologist to IIMI, organised the main enquiry into existing and recent training. Mr. A. Maheswaran, formerly Secretary to the Ministry of Mahaweli Development and earlier Director of Irrigation, contributed his special expertise acquired from heading two of the major agencies. Dr. Kapila Goonasekera, Head of the Department of Agricultural Engineering, University of Peradeniya, procured users' reactions to current training programmes by interviews with junior and middle grade staff in selected irrigation systems. Mr. D. Campbell, Visiting Consultant, contributed an international perspective of needs in irrigation management. Mr. Alex Gunasekera, Computing Consultant, processed considerable quantities of data received from the government agencies in response to questionnaires. The agencies themselves must be warmly thanked for their effort in abstracting personnel data in order to respond to the questionnaires. Finally, the Professional Development Group at IIMI (Chairman, Dr. Senen Miranda; members, Dr. C. Panabokke, Dr. E. Martin, Dr. D. Merrey, Dr. P. S. Rao) have monitored the exercise and injected their own ideas in the process.
- 1.6 The main activities of the investigation were the preparation of questionnaires and their completion by the main government agencies during mid-1986; face-to-face interviews by the team of Dr. Nott, Mr. Maheswaran and Mr. Campbell, with others, especially in May 1986; coding and analysis of the questionnaire returns through the latter part of 1986; a one-day workshop to discuss preliminary findings on 6 December 1986, and further field interviews by Dr. K. Goonasekera in January 1987.
- 1.7 A detailed description of the current and recent training programmes implemented in the Department of Agrarian Services is provided in Annex A, and for the Irrigation Department in Annex B. Annex C describes the methodology of the study. These Annexes are in a separate volume.
- 1.8 Names and other information about those who have received irrigation management training is provided in a third volume. Only a small number of copies have been produced for selective distribution.

2. GENERAL BACKGROUND: IRRIGATION IN SRI LANKA

2.1 Extent

- 2.1.1 The area of irrigated land in Sri Lanka was **550,000** hectares in 1984 (FAO, 1986). Figure 1 shows the way in which this area has **changed** in the past two decades. The average rate of increase of irrigated area since 1965 has been 2.1 percent per year, which is close to the average for South **Asia**.
- 2.1.2 The ratio of irrigated land to total cultivated land in Sri Lanka is currently **25** percent, which is not particularly high **by** South-East Asian standards, and indicates that the **unirrigated** sector is **by** no means negligible as a competitor for agricultural **skills**.
- 2.1.3 In common with other nations of South and South-East Asia, agricultural production, both in absolute and per capita terms, has **been** moving ahead at satisfactory **rates** in recent years. Cereal production (which is at present the main irrigation output in Sri Lanka) has risen from about 70 kg/person twenty years ago to 155 kg/person in 1984; although this still lays **behind** the Southeast Asian average of about 240 kg/person. Regionally, this trend seems to be closing previous gaps **between** supply and demand, and is slowing the rate of new irrigation developments. Sri Lanka is likely to move somewhat against this trend in the early future, **as** new areas are developed for **the** recently-completed major irrigation facilities. In these circumstances we make the **assumption** that the rate of expansion of irrigation in the coming decade will be of the same order as in the **past** two, that is about 2.1 percent per year.

2.2 *Types and geographical distribution.*

- 2.2.1 Climatic conditions are far from homogeneous in Sri Lanka. The same can be said of several other environmental factors that govern irrigation development and practices: land gradients, soil characteristics (notably permeability), population **density**, and others.
- 2.2.2 This variability of conditions has a significant impact on training requirements. Staff may have quite adequate skills for one part of the **country**, but may require to learn many new things if they move to a different region.
- 2.2.3 The environmental diversity has led to a diversity of scales and modes of irrigation across the island. For our **purpose** we may identify some main strands in the pattern.
- 2.2.4 In the Southwest, annual rainfall is high, river valleys numerous and generally perennial, and terrain deeply dissected except in the narrow coastal plain. Water management has certainly to be practised here, but drainage and avoidance of crop submergence are important, and saving of water, or **economising** on water consumption, is not the **primary** objective. Population density is high in this zone, and land is the constraining resource whose productivity has to be maximised.
- 2.2.5 In the North and East, agricultural conditions and practices are different. In the so-called "dry zone" (where average annual rainfall is in the range 1100-1900 mm per year, which would not be deemed especially dry in many countries), perennial rivers are rare or over large parts wholly **absent**. Rainfall is sharply seasonal: the **Maha** (major **season**, roughly October to March in the Northeast, delivers about threequarters of annual rain, and the Yala (minor **season**, though not entirely **rainless**, usually has prolonged mid-season breaks.
- 2.2.6 Rainfall, when it **occurs**, often has moderately high intensity, well beyond the absorption capacity of the land; **flashfloods** occur. The **capture** and utilisation of this **excess** rainfall is a clear objective of water management.

- 2.2.7 The historic mode of water use that grew up in response to these circumstances centres on the unit known as the tank: a storage reservoir contained behind a low earthen dam. The technology of these has over two thousand years of history in Sri Lanka. They are of a very wide range of sizes, the largest ones being on the order of 150 million cubic meters, the smallest perhaps around 10,000 cubic meters. The largest units tend to be found in the dry zone proper, where the alternative traditional agricultural mode has been *chena* (shifting cultivation).
- 2.2.8 Although it is convenient to categorise a dry and a wet zone, their demarcation is not sharp. In the transition area between them, tanks are still important, but tend to be smaller. They stabilise agricultural production, they make paddy cultivation possible in places where rain alone would not suffice, and they increase crop intensity by making at least a partial second cultivation possible. The smaller tanks are normally perceived as a single-village communal resource, whose use is regulated by a substantial body of customary rules.
- 2.2.9 Groundwater is not a main irrigation resource in the majority of the island, but in the extreme North and Northwest the absence of surface resources, and high infiltration rates, make it locally the dominant mode.
- 2.2.10 Into this scene, the principal modern intervention comes from the Mahaweli developments, which very significantly alter the potential and the objectives of water management over a large fraction of the dry zone. The Mahaweli and its tributaries are not only the largest river system in Sri Lanka, but are almost unique in that they flow from the wet zone right across the dry zone, thus making perennial water available there. The dams, weirs, and inter-basin conduits of the Mahaweli development programme have both regulated this flow so that it is more uniform through the year, and distributed it spatially to many areas in and well beyond the lower Mahaweli basin.
- 2.2.11 In the course of this, many pre-existing tanks are being used as intermediate storages within the new system. These tanks, formerly managed as independent, self-contained units, now receive water from the Mahaweli system, as well as from their own catchments. This creates many new operational and communication requirements. In particular we should note that irrigated areas and intensities can be expanded, and that the saving of water becomes a more significant objective for these tanks, because they are now participants in an extensive water-sharing system within which, if management is good, water saved at one place can be used elsewhere.
- 2.2.12 The basic water-diversion facilities of the Mahaweli system began to come into service in the early 1970's: Polgolla Barrage, Bowetenne Dam, and the associated inter-basin tunnels. Under the accelerated programme of the last ten years the four major new storages (Kotmale, Victoria, Randenigala, and Maduru Oya) have been coming into service in a short period of the mid-80's. These create new opportunities and new pressures for irrigation management staff, and a need for developing new skills which were not previously required.
- 2.2.13 Even in this very brief review of the Sri Lankan irrigation context, there are other developments that must be noted because of their relevance to training needs. First, the crop pattern is beginning to change and may be expected to change much further in future. Paddy has dominated the irrigation scene overwhelmingly, so that irrigation system management could substantially be seen in monoculture terms, with all the simplifications that implies in regard to water demands, cultivation techniques, planting dates and so on. Now the international market for rice is showing signs of an excess of supply that some anticipate will persist; so there is need to diversify, to some as yet uncertain degree, into non-paddy crops. This is not easy in systems designed for paddy operation. Accurate timing and quantification of water deliveries will become vital, and staff must learn many new operational practices.
- 2.2.14 Secondly, we must note that soil conditions in the new areas of Mahaweli often call for sensitive water management. The infiltration capacity of soils varies, sometimes very rapidly. Broadly speaking, one tends to find soil of low permeability in the valley bottoms and more permeable material up the slopes, but there are a great many variants of this single generalisation. In diversified cropping these variations assume new importance.

22.15 In Sri Lanka, as in other irrigation **societies**, recent years have **seen** an increasing awareness of the sociological **dimension** of irrigation management. The Gal Oya rehabilitation project of the early **1980's** was something of a catalyst to this process, focussing particularly **on** the question of how to encourage farmers to adopt forms of **self-organization** that would be conducive to their performing **some** maintenance work, and in other ways perform lower-level management **functions** previously considered (but not necessarily well executed) **as** part of the duties of government **agencies**.

2.2.16 It would be wrong to say that such ideas are permeating the entire system, but they could be said to be **diffusing** into a general awareness that the management of irrigation water **has** many dimensions, and that staff involved in irrigation management, at whatever level, though their duties may be defined within one **specific dimension**, will perform better if they have some understanding of the other dimensions.

2.3 *Government agencies involved*

2.3.1 The number of government organizations that are in some way concerned with the management of irrigation **is**, in Sri Lanka, quite large. The special pressures arising from the **size** and technical innovations of the Mahaweli development have caused the emergence of new bodies to cope with them. There is some **difficulty** in making **an** exhaustive list, because the various organizations do not all have the same degree of involvement in irrigation management, and there are some whose participation is marginal.

2.3.2 The organizations come under three **ministries**:

Ministry of Lands and Land Development (MLLD);
Ministry of Mahaweli Development (MMD);
Ministry of Agricultural Research and Development (MARD).

2.3.3 Within these, the major participants in irrigation management **are** the following eight bodies:

2.3.4 Ministry of **Lands** and Land Development.

2.3.4.1 The Irrigation Department (ID) has existed since 1900. For much of the **period since** then it **was** responsible for most aspects of the provision of irrigation services throughout the country: surveys, planning, hydrologic data, design, construction and operation of irrigation systems, as well **as** various other water-use topics such **as** groundwater exploration and exploitation. After a period of bureaucratic innovations and flux in the 1970's, its **scope** has changed somewhat. It retains responsibility for planning, design, construction and operation of major and medium irrigation schemes outside the Mahaweli system, and for operation of some pre-existing tanks now incorporated within the Mahaweli system; for rehabilitation of minor irrigation works; for **flood control** and drainage works; and for various specialist services. (We may **note** here that "minor" schemes are defined as less than **80** ha, and "major" **as** more **than** 1,000 ha).

2.3.4.2 More recently, the Irrigation Management Division (IMD) **came** into existence within the same Ministry in **1982**. Its role is a co-ordinating one, **essentially** an attempt to bridge the well-known inter-disciplinary and inter-departmental divides (particularly between engineering and agriculture) that **so** often affect irrigation. The exact functions of IMD are still evolving. Prominent activities in this process include:

Integrated Management for Settlement Schemes (INMAS), a programme under which officers entitled Project Managers are appointed to co-ordinate line agency work. **Some 25** of these officers **are so far** in **place**;

Major Irrigation Rehabilitation Program (MIRP), a programme affecting **4** of the larger dry-**zone** tank systems, under a World **Bank** credit, for which IMD is the implementing agency;

2.3.5 Ministry of Mahaweli Development.

2.3.5.1 The agency with overall responsibility for execution of the Mahaweli development is the Mahaweli Authority of Sri Lanka (MASL). Its executive functions, including all that concern irrigation management, are delegated to various subordinate and para-statal bodies, as follows

2.3.5.2 The Water Management Secretariat (WMS), created in 1982, regulates the strategic or large-scale aspects of water distribution in and from the Mahaweli system. With a hydrologic data collecting network and programmes in a main-frame computer in Colombo, it forecasts main river and canal flows and reservoir storage levels, and supplies predictive information on water distribution to the field project level. Thus it aims to regulate arterial flows down to land units of the order of 1,000 to 10,000 ha. It must also balance the needs of irrigation against those of power generation, flood relief, and other water management goals.

2.3.5.3 The Mahaweli Engineering and Construction Agency (MECA), also established in 1982 (successor to the earlier Mahaweli Development Board), is essentially the design and construction wing of MASL, but it also operates new systems in their early or partially finished phase. In recent years it has brought new land into irrigated service at rates on the order of 10,000 ha/year, so although its involvement in operation is transitional, it has at any time a significant amount of irrigation to manage.

2.3.5.4 The Mahaweli Economic Agency (MEA), established in 1980, is the subsequent development body. It takes over land that MECA has equipped for irrigation and arranges the induction of new settlers on it, as well as operating the irrigation system and promoting farmer organisation and other aspects of the settlement process. The purpose could be summarised as bringing the capital investments made under MECA to economic fruition, as swiftly and efficiently as possible.

2.3.6 Ministry of Agricultural Research and Development.

2.3.6.1 The Department of Agrarian Services (DAS) has existed since 1956. Initially it looked after cultivation aspects of paddy, and later of all minor irrigation. Since 1979 it has had charge of all aspects of minor irrigation (i.e., system smaller than 80 ha), and supervision of maintenance and water distribution in field channels of all Irrigation Department-managed systems. Special projects in which DAS is currently involved include the Village Irrigation Rehabilitation Project (VIRP), and the Integrated Rural Development Projects (IRDP).

2.3.6.2 The Department of Agriculture (DOA) directs agricultural development and research. This department therefore does not have an executive function in irrigation management; on the other hand, it has a significant role in advice, guidance and training for that purpose. The department's research division is concerned with establishing the water needs of crops; its extension services division, operating through the training and visit (T&V) system, informs farmers on aspects of water use; and its education and training division attends to the professional development of the department's own staff and those of other agencies that choose to use its facilities.

2.4 Staff members and grades.

2.4.1 As a first step in quantifying training needs, we sought to establish present and projected future numbers of staff at various levels in each agency whose duties involve irrigation management. Table 1 presents these numbers for 1986.

- 2.4.2** We cannot claim that this part of the exercise has been fully successful, for two reasons. First, the agencies do not appear prepared to make manpower projections forward five or ten years as we requested; and secondly, although no doubt all the staff enumerated in Table 1 have duties that in some degree impinge on irrigation management, they are probably not all involved to the same degree or for similar proportions of their time. For example, most Irrigation Department staff spend 100% of their time on duties that are, in one sense or another, irrigation management. Department of Agriculture staff, even those working in irrigated areas, are to some extent performing functions that they would also perform for unirrigated agriculture. It may therefore be useful in some future stage to refine Table 1 by incorporating some estimate of the proportion of staff time or effort that is devoted to irrigation management.
- 2.4.3** The table shows that, according to the agencies' data, **6,919** government staff are presently engaged in some way in irrigation management. If we assume that irrigated area is going to increase at its past rate of **2.1** percent per year (see para 2.1 3) and that staff numbers should increase in proportion, then the total staff should increase at about 150 per year, reaching about 7,500 in the year **1990** and over **8,300** in **1995**.
- 2.4.4** The vertical distribution of staff is on average **59%** in the junior grades, **34%** middle, and **7%** senior. This of course varies according to departmental function: broadly the engineering departments (**ID, WMS, MECA**) report fewer junior staff (**30%**) and more in the middle (**56%**) and senior (**14%**) grades, while the reverse is true of the agricultural and farmer-oriented departments (**DAS, DOA, MEA**) who report an average a **70%**, **25%**, and **5%**, respectively. This could represent different valuations of the professional status of engineers and agriculturists. We do not wish to enter this potentially controversial field and confine ourselves to saying that, as far as training needs are concerned, we do not feel convinced that these figures mean that the engineering departments have a need for more highly trained staff. The interpretation of grade levels by the agencies probably reflects standards of remuneration rather than of skill.
- 2.4.5** The question of staff grades and their job content is made unusually difficult by the adoption of different designations in the various agencies. Table 2 gives the field staff grades used in the principal departments, and an indication of their parallel levels.

3. PURPOSE OF TRAINING

- 3.1 There are a number of different reasons why the agencies involved in irrigation management should want to arrange training programmes for their staff. It is **necessary** that any national training strategy should cater to **all** of these objectives.
- 3.2 **These** various goals tend to correspond (although not exactly) with distinct phases and modes of training throughout an individual's career. We shall **need** to refer to these phases frequently in this report, **so** we give the main classification here. We **can distinguish**:
- a. Foundation or pre-service training
 - b. Functional training
 - c. In-service professional development
 - d. Extra-discipline training
 - e. Training for technical change
- 3.3 Some brief definitions of these will help our analysis. Foundation training is what is provided usually from outside the department, by the general public education system: schools and universities, but also including the specific-discipline tertiary education **facilities** like technical colleges and schools of agriculture. Foundation training generally culminates in the award of some certificate which is perceived **as** useful to the agencies for ensuring a degree of standardisation in their recruitment process, and at the **same** time is vital to the employee as underpinning **his** professional status throughout his **subsequent** career.
- 3.4 But we must not **confuse** the influence of pre-service training with its relevance. Since it is often given by institutions outside the control of the irrigation agencies, it will not **necessarily** cover all their **needs**.
- 3.5 Functional training means training while in service, for the purpose of ensuring that the individual is fully competent to perform the assigned functions of his post.
- 3.6 In-service professional development is the process by which the **officer** is assisted to expand **his** capacities and equip himself for higher level responsibilities as his career evolves.
- 3.7 Extra-discipline training aims at broadening the officer's understanding of his role. Irrigation management involves several disciplines, notably engineering, agriculture, soil science, sociology, **economics**. The officer's direct, functional duties can very probably be **defined** within just **one** of these; but he **has** counterparts in other departments who are affected by his performance and whose help he may sometimes need, so he is likely to perform **his** duties more successfully if he can be aware of the constraints and objectives of these other adjacent disciplines.
- 3.8 Within **this** category of extra-discipline or wider-awareness training we include the process of learning to understand, interact with, and generally assist the farmer community. Some would rank, **this as** a separate objective because of its importance.
- 3.9 Finally we have the category of training as a tool for assisting and accelerating technical change. All of the earlier categories are necessary in a technologically static system. But when the technology of irrigation is changing, there is added pressure for training. Staff at all levels must learn new activities as well as new ways of responding to formerly familiar circumstances. The rate of assimilation of new technologies will depend critically on the adaptation, by training, of existing **staff**.
- 3.10 **As** we have noted in the preceding **chapter**, technological change of many kinds is occurring now in Sri Lanka's irrigation schemes. Main-river, inter-linked storage facilities have appeared **in** the past two years and **their** benefits have to be realized. Formerly isolated tanks now participate in a large network. International markets are signalling the need

to change from monoculture to diversified cropping. Micro-computers have **become** sufficiently robust, inexpensive, and reliable to be used as field officers' management tools. The center of gravity of agricultural production continues to shift gradually from the water-abundant south-west towards drier *areas*, where expensive water must attain high productivity, and where the farmer's personal goals of optimising production per unit of land, labour and purchased inputs may **start** to diverge from the national goal of optimising the productivity of water.

- 3.11** Training has a key role in ensuring that agencies will be equipped to respond positively and swiftly to the opportunities created by these numerous technological changes.

4. PRESENT TRAINING ARRANGEMENTS

4.1 *Institutions.*

- 4.1.1 Just as with our review of the irrigation management agencies in section 2.3.5, so also in reviewing the institutions that provide training in irrigation management, there is difficulty in deciding where to draw a line. There are a great many institutions of training that provide at some point in their curriculum something which relates to irrigation. We shall try to exclude those which are only peripherally involved, and focus on the principal ones.
- 4.1.2 Table 3 contains a full list of these institutions, and Figure 3 shows their geographical locations. The following paragraphs delineate their contribution to the total pattern, referring as far as possible to the set of objectives identified in Chapter 3. There are 22 institutions listed in Table 3, of which only one (Galgamuwa Irrigation Training Institute, GITI) is exclusively concerned with irrigation.
- 4.1.3 Post-Graduate Institute of Agriculture (PGIA).
- 4.1.3.1 PGIA was established at the Peradeniya University in 1975. It awards degrees of master (M.Sc, 15 months; M.Phil 2 years) and doctor (Ph.D, 3 years). There are 50 students enrolled at present. Of these, eight are following a 3 year doctoral course in Advanced Irrigation Management
- 4.1.3.2 Three-quarters of the students are from Government agencies, so this form of training is to be regarded primarily as serving objectives c and d (paragraph 3.2.), i.e., in-service professional development and extra-discipline training. Some of the remaining students will presumably seek government posts, so there may also be a pre-service element, but it seems rather more likely that these people will continue in training or research.
- 4.1.4 Universities.
- 4.1.4.1 The University of Peradeniya is the major producer of graduates with an irrigation orientation. It is the only university in Sri Lanka that contains both Engineering and Agriculture Faculties. It does not, however, offer irrigation engineering as a distinct subject: its engineering students learn this as part of general hydraulics and hydraulic engineering.
- 4.1.4.2 Peradeniya has accommodation for 170 students in the Agriculture Faculty. The irrigation content of the course is not particularly high, and there is no department explicitly concerned with water or irrigation. Of 70 research publications by faculty members in 1985 only 2 or 3 related directly to irrigation, and of 40 odd ongoing research studies only a few deal with irrigation.
- 4.1.4.3 The Engineering Faculty has about 10 students in hydraulic engineering.
- 4.1.4.4 The University of Moratuwa is younger, having existed as a campus since 1972 and an independent university since 1978. It takes 270 students annually into its Faculty of Engineering; about 100 of these subsequently choose civil engineering. In their year of their 4-year course, these students study hydraulic engineering (compulsory) and irrigation engineering (optional, but the great majority choose it) as well as three non-water subjects, so the irrigation content is at best 40% and we may suppose that at most 40% of the graduates will seek employment in irrigation.
- 4.1.4.5 Moratuwa also offers post-graduate training. In 1986 it ran an M.Sc course on "Land and Water

Development" in collaboration with the International Institute of Hydraulic and Environmental Engineering, Delft (Netherlands). Twelve students participated, ten from the irrigation agencies (ID, 6; MECA, 4).

4.1.4.6 Thus the universities are geared particularly to objective a (pre service training), with a certain amount of attention to objective c (in-service professional development), both aimed at relatively senior staff grades.

4.1.5 Technical and Agricultural Colleges.

4.1.5.1 The Technical Colleges and Schools of Agriculture exist primarily to provide 2 or 3 year diploma courses, giving pre-service training with an engineering or agricultural orientation.

4.1.5.2 Katubedda Technical College is affiliated with the University of Moratuwa, and provides a diploma after 2 years of course work and one year apprenticeship. Its course content is satisfactory for general sub-professional technical duties, but it does not have a high content of specific irrigation material. It takes in about 250 students in all technical fields, annual intake about 150. The Hardy Institute at Ampara is rather similar; it had agricultural origins and is perhaps more attuned to providing for the rural sector.

4.1.5.3 The School of Agriculture, Kundasale is the oldest diploma level agricultural college, established in 1916. It takes in 140 students annually to a 2 year course. Irrigation between 1 and 2% of the total course hours does not figure highly in the course.

4.1.5.4 The Department of Agriculture runs Kundasale and in more recent years has established two similar, but as yet smaller, schools, at Pelwehera and Angunakolepelessa, with a combined intake of about 100 students annually.

4.1.6 In-Service Training Institutes.

4.1.6.1 The Irrigation Department established its Galgamuwa Irrigation Training Institute (GITI) in 1959, with the aim of training Technical Assistants. The Institute was closed down from 1971-1979 (we are unsure whether lack of funds or trainers caused this closure) but reopened in 1980 with fresh facilities funded from USAID under the Gal Oya rehabilitation project. In 1986 it put an intake of about 75 recent school-leaver recruits through a two year irrigation course qualifying them to become Technical Assistants. This course is not annual, and we understand will not be repeated until 1989. In addition it conducts several short-term courses each year in water management, aimed at all grades: engineers, technical assistants, and work supervisors. MEA sends its Engineering Assistants to these courses. GITI also provides non-irrigation courses in matters like construction management and stores accounting. The total number of people taking GITI courses in 1986 was about 240.

4.1.6.2 Eight In-Service Training Institute (ISTI) were established by the Department of Agriculture and have the primary function of equipping the field officers of the Extension Service (Agricultural Instructors and KVSNS) to carry out their duties under the Training and Visit system. The Institutes' main task is therefore pre-seasonal training twice annually for staff of these grades. Staff of DAS and MEA are also accommodated in such training periods.

4.1.6.3 ISTI Maha Illupallama is the most significant of these from the viewpoint of irrigation management, as it is responsible for the Anuradhapura and Polonnaruwa Districts, plus parts of Matale and Kurunegala, thus covering a substantial proportion of the dry-zone irrigated land. It therefore gives some water management courses outside of the routine pre-seasonal training periods. DAS and

MEA use this facility, as does DOA. ISTI Maha Illupallama is of course in a position to draw on specialist resources from the adjacent Maha Illupallama Research Station, and from GITI which is not far removed. It has accommodation for 50 students at a time.

4.1.6.4 In terms of the objectives stated in section 3.2. the ISTIs and GITI are aiming primarily at objective b: functional training. There could also be elements of objective c: professional development, and objective e: training for technical change, but our impression is that there is too much pressure upon insufficient trainer resources, leaving little spare effort to go beyond the functional needs of the sponsoring departments. We return to this matter of trainer resources later.

4.1.6.5 The MEA possesses its own Training Centres at Girandurukotte and Medagama, which come into this category of in-service training. These, however, do not have their own staff. MEA uses them intermittently to provide short specialist courses on different matters, using part-time trainers from its own ranks, or borrowed from outside agencies. Its Unit Managers go, as noted above, to courses at ISTI Maha Illupallama.

4.1.7 Professional development outside the line agencies.

4.1.7.1 It will be observed that objective d extra-discipline training has not yet featured strongly in this account. The kind of in-service institutes just described are not particularly well suited to it. The universities make some contribution, but it is not great because they are offering little in the way of short courses, and professional staff tend to feel their career cannot afford a prolonged absence for studies outside their primary discipline. In these circumstances institutes that are specially geared to provision of short courses have a role.

4.1.7.2 The Agrarian Research and Training Institute (ARTI) studies sociological and institutional aspects of irrigation, including matters like communication and farmer organisation. It provided several courses for institutional organisers under the Gal Oya rehabilitation project between 1981 and 1985. It also provides staff to teach part of the courses of some of the line agencies. It has accommodation capacity for about 60 trainees at a time.

4.1.7.3 The Sri Lanka Institute for Development Administration (SLIDA) offers general training in management principles (such as financial management, personnel management, project planning, monitoring and evaluation) through the medium of short courses aimed at both junior and senior engineers and others. It gives such training to 20 to 25 engineers annually.

4.2 Training outside Sri Lanka.

4.2.1 Staff go for irrigation management training in foreign countries under a variety of arrangements. Quite often projects with irrigation objectives, such as rehabilitation, will contain a training element in its budget; these may tend to emphasise overseas training. Some donors also maintain generalised training budgets, and will accept nomination of irrigation people for scholarships, through the Education Ministry channels.

4.2.2 Training in these categories therefore does not fall easily into any plan framework. The assumption underlying the use of training as a project component is usually that the successful assimilation of the other project inputs requires a certain reorientation of staff, or induction of new ideas; and that this may be supplied by a "one-off" injection of training. Other projects are, however, training exercises in their own right, rather than training appendages to projects with a different thrust. These aim to address a specific gap in knowledge or skills. Here again, the fact that a project is foreign-aided usually means that it is finite and not easily integrated into a continuous training plan. The assumption again must be made that a finite injection of external assistance can raise the knowledge base in a particular area and create a self-sustaining result.

4.2.3 A number of donor countries have been involved, **among** them Canada, Japan, the Netherlands, United Kingdom and United States. **In addition** there have been **study tours** and other training arrangements in some **Asian** countries where irrigation **is** important.

4.3 *Number of trainees.*

4.3.1 Much of the IIMI **questionnaire** exercise was directed towards the **quantification** of training activities. We have tried, in various ways, to **establish** how much of it is going **on**, and to **see** how such quantitative data might be analysed. The aim is to seek answers to question such **as**, is there enough training? Is it in the right subject-matter areas? Is **it** cost-effective? If increase is necessary, where should additional resources be **targeted**? These questions cannot be answered **in** an exercise of this duration and from the present data-base, but **some** indications **begin** to emerge.

4.3.2 Table 4 shows the number of training activities sponsored annually by each department. It shows a growing trend in recent years (apart **from** **1986**, whose data may be incomplete **as** the returns were made during the year). These numbers represent **all scales** of training, of short and long duration, arranged by each agency. The data refer only to training events with an irrigation management component, not all training sponsored by the agency. There is difficulty in **assessing** the proportion of irrigation management implied in each event.

4.3.3 Table 5 shows the numbers of **officers** who attended at least one training event in irrigation management each year. As the table shows, the total number is on average **about** 1,000 per year, distributed among the senior/**middle/junior grades** in the proportions **103456**. But there are very great differences in the numbers recorded **among** the various agencies.

4.4 *Trainers within the line agencies.*

4.4.1 Table 6 gives data on the **number** of trainers available in each agency, in **1986**. Only **12** full-time trainers were reported, and **26** part-time, which usually means experienced staff who participate as occasional lecturers and the like. We are uncertain how many of the trainers recorded as full-time can be regarded as having adopted this **as** their career **function**, or regard themselves as professional trainers. Some at least are apt to be transferred to other duties within their agencies.

4.5 *Subjects of training.*

4.5.1 **The** question whether training is available to **cover** all **aspects** of irrigation management also needs consideration. Table 7 **summarises** this question. In this table we have broken down the management of irrigation into fifteen distinct processes (with **the usual** boundary problems: we have included for instance design, which is not always treated as part of management, and we have omitted one or two functions that some would include). The table shows the agencies' views **as** to whether each process is within its responsibility, and if so whether it arranges any training, internally or externally, for that process.

4.5.2 Training "gaps" would be indicated by category c of this table, and there are relatively few such entries (only **10** out of **120**). However, it is **much** more difficult to ascertain whether the amount, and quality, of training offered is appropriate to **needs**.

4.5.3 The subject-matter of foundation training at the universities and diploma colleges has been mentioned in **section 4.1**, where we noted that it is in all cases given **as** part of a **course** that contains a preponderance of non-irrigation material, and that the irrigation content seems to vary between about **2%** and at most **40%**. The proportion related to management of irrigation (rather than irrigation as a whole) must of **course** be **substantially** less.

5. CONTENT AND QUALITY

- 5.1 Systematic evaluation of a training programme, to determine the extent to which it is **satisfying** its objectives, and **whether** its components are cost-effective, is a long-term **process** for which **continuous monitoring** arrangements have to be established. It **seems** desirable to **do** so for irrigation management training in Sri Lanka, because of the scale and significance of irrigation and its management in the national economy.
- 5.2 In the time-scale and the data-base of the present enquiry, it is not possible to investigate programme quality in a systematic way. We have approached the question by means of a limited number of **random** conversations with **users** of training (that is, either direct recipients of training or their **supervisors**) and with trainers. The assessment of such information is necessarily somewhat subjective, but we believe that **certain** comments recurred frequently enough that they should be given some weight.
- 5.3 In order to review the content of programmes, we divided irrigation management into the **15** processes, and asked each agency to say for each of these processes:
- Whether it **has** to be performed by members of their staff;
 - whether the agency had provided any training for **this** process in the past year;
 - whether the agency had **arranged** any training for this process, using other agencies' **resources**;
 - how many trainers, **full** or **part** time, of the agency's staff were competent to train for this process.

Table 7 summarises the replies received.

- 5.4 These tables imply that, in principle, the agencies consider that they have resources, in-house or external, to provide at least some training in virtually **all processes** relevant to each department.
- 5.5 Whether these **resources** are sufficient in quantity is quite another matter. We have **tried** to quantify the supply and demand of training, and have concluded **that** statistics are not kept in a manner that would make this possible.
- 5.6 We therefore **must** express some opinions based on interviews. We have formed these impressions, in regard to the in-service training programmes, **especially** at middle and junior levels:
- We doubt that the number of trainees available is adequate, in comparison with the **needs**;
 - there is difficulty in ensuring **that** the trainers' own knowledge is well suited to the problems faced by field **staff**;
 - a recurrent theme in interviews with those who had received formal training was that they were **taught** things which they could not put into practice: one might say that the training was **too** theoretical,
 - in some (perhaps not all) of the agencies, training does not have sufficient status or career prospects, which in turn means that people of good calibre are not attracted to become **trainers**;
 - training might have more lasting effect if ways could be found of relating it more closely to the set of problems faced by **the officer in the field**; **and**
 - more extra-discipline knowledge is desired.

6. DISCUSSION OF THE PRESENT SYSTEM

- 6.0.1 In the previous sections we have described briefly the existing arrangements for training in irrigation management in Sri Lanka, as they were reported to us in mid-1986. In this section we attempt to evaluate the information, and to consider whether the system seems appropriate to present and imminent requirements.
- 6.0.2 The discussion will be conducted with reference to the set of five aims of training that were stated in paragraph 3.2. As training needs also vary vertically within an organizational hierarchy, we also try to distinguish some of these differences among the senior, middle and junior levels defined in Table 2.
- 6.0.3 The purpose of this discussion is to lead us to a training strategy, described in the subsequent chapters of this report. In particular, therefore, we need to identify at which point in the system added efforts, or changed methods, would be most fruitful.

6.1 *Foundation or pre-service training.*

- 6.1.1 This category of training relies principally on the universities for senior staff, on the technical and agricultural colleges for middle staff, and on the schools for junior staff.
- 6.1.2 Considering the numbers in senior and middle grades as shown in Table 1, and assuming an annual intake rate of, say, 8% (2% for expansion of the irrigation system, 3% replacement of retiring staff, and 3% replacement of resigning or transferred staff), it seems that the basic capacities of the degree and diploma-giving institutes are in reasonable balance with the demand.
- 6.1.3 It is not possible to be emphatic about this, because none of the training is explicitly oriented towards creating irrigation managers. The degree or diplomas are broader-based, leaving their recipients with some choice as to which career to pursue. We have not examined how they make this choice. However we do not see a strong case for great expansion of the foundation training resources.
- 6.1.4 On the other hand, there certainly seems to be a case for considering the provision of courses more sharply focussed upon irrigation. The University of Moratuwa provides irrigation engineering as one option, but even so it only amounts to some 40% of the final year of a general civil engineering course. The irrigation content of the agricultural degree and diploma courses at Peradeniya and Kundasale seems to be even less.
- 6.1.5 It seems appropriate to consider whether the stage has now been reached (with the gradual increase of the national role of irrigated agriculture, and the Mahaweli development in particular) when Sri Lankan institutes should begin to offer primary degree and diploma training that is explicitly aimed at creating irrigation specialists.

6.2 *Functional training.*

- 6.2.1 Functional training within the line agencies is being supplied, as we saw, by the in-service institutes, most notably by GITI (Galgamuwa) for the engineering side of irrigation and ISTI Maha Illuppallama for the agricultural side. These are principally at middle and junior staff levels.
- 6.2.2 There seem to be acute difficulties in finding and retaining trainers of sufficient numbers and range of abilities and knowledge. We are very doubtful that the 12 full-time and 26 part-time trainers noted in Table 6 are adequate bearing in mind that they have also to train for other non-irrigation matters, and that the total body of staff in the middle or junior categories is in the neighborhood of 6,500 (Table 1). Assuming as in paragraph 6.1.2, an annual intake of 8%, this implies some 520 new staff each year.

- 6.2.3 If we recall that **these** trainers **also** have roles in training for the further objectives that we have yet to discuss, **we can see** that their numbers seem insufficient. This must also **affect** the modes of training used. With few trainers available, it is **difficult** to adopt any system other **than** orthodox or formal "class-room" methods. Such methods keep the **trainer/student** ratio low, but are widely **considered** to give low rates of assimilation and retention of information, **in** comparison **with** more inter-active or participatory styles.
- 6.2.4 Our impression is that it is **not** just a question of securing approval for more **posts** **of** trainers in **these** institutes, but also of enhancing the career attractions of training. It seems that **both** **these** **issues** **need** to be addressed.

6.3 ***Training for professional development.***

- 6.3.1 The principal vehicles for **this** class of training are, in Sri Lanka **as** elsewhere, short **courses**, workshops, and seminars, all of which **occur** at somewhat irregular intervals. Post-graduate training in universities also comes within this category. All **these** activities aim principally at senior or middle levels of staff.
- 6.3.2 The newer agencies, such **as** MEA, seem more inclined to **this** class of training. It is probably a growth of this category that **is** mainly **responsible** for the growth in the **total** of training activities recorded in Table 4.
- 6.3.3 The more an officer moves up in **his** hierarchy, the shorter are the periods of time for which he **can** **conveniently** leave **his** routine duties in order to attend a **seminar**, and the more demanding he is likely to **be** about the quality of the event. This **has** to be recognised in **the** provision of short, intensive, single-subject courses.
- 6.3.4 It seems to us that the line agencies must always have very great difficulty in providing professional development training **from** their own resources. We think there is considerable **scope**, on the other hand, for external bodies to make greater **contributions** than they have yet done. The **universities** can be encouraged to present more short courses (in the **one-** to six-week range, but probably inclining towards the shorter end of that range), and it may be in the interests of the agencies to give the **universities** contracts for the development of short-course material.
- 6.3.5 In addition, the role of organisations with non-executive functions, such **as** ARTI, could be **enhanced**. Short courses, intended for small **groups**, and using flexible modes of communications and interaction are in all professions an **important** **way** of stimulating senior and middle level professional development.
- 6.3.6 At junior and to some extent middle level, **professional** development happens in a different way. After his formal functional training, the junior staff member should not be disregarded or **left** to feel he is merely a cog in a large machine. Problems arise constantly in the exercising of his supposedly standardised functions. He should be encouraged to suggest ways of improving performance: his own and perhaps by extension that of colleagues. At the same time, he needs to be kept informed of the reasons why decisions are made, the constraints under which he **and** his **colleagues** operate, and so on.
- 6.3.7 This process, involving communication and feedback, we call "on the job" training. It is desirable for mobilising the full human resource, available to an agency, which a "top down" directive approach usually fails to do, being too critically dependent on the **correctness** of all top-level decisions.
- 6.3.8 "On the job" training **can** **never** be formalised or programmed into an agency. It is a question of creating the right climate and attitudes; giving senior, and most of all middle, staff some short **courses** in communication and personnel management techniques; and ensuring (at other points in the training **process**) that **staff** at each level are themselves well **enough** trained so that they can in turn be a source of **technical guidance** for those under their supervision.

6.4 *Extra-discipline training.*

- 6.4.1 There are relatively few mechanisms at present for providing better understanding of counterpart officers' problems in adjacent agencies. Sociological and communications training has been included at GITI and there are indeed other courses with this kind of cross-discipline content. Our impression is that it is not yet enough, and that there remain quite large gaps to be filled. This assertion recurred in field staff interviews.
- 6.4.2 Short courses have a role to play here too, but they would probably not be the same courses as those described in section 6.3. The need to understand something about other disciplines extends right down the line to junior staff, and at that level the need may best be met by line agencies' in-service institutes, offering more facilities to staff of counterpart departments. Some of this is already happening, but as we noted earlier the institutes seem short of staff resources and can hardly be expected to do this particularly well.
- 6.4.3 The resources at ARTI, for training in sociological disciplines relevant to agriculture, were used for courses of short and medium duration to prepare the institutional organisers in the Gal Oya rehabilitation project, and we understand this will be repeated by IMD. There is probably scope for increasing the amount of training of this kind, with the aim of inducing wider awareness of the institutional dimension of irrigation among those who will not see this as the main discipline of their regular work.
- 6.4.4 There seem to be few ways at present in which understanding of the economics of irrigation is introduced to staff who could benefit from the knowledge. There are some who would say that the absence of these disciplines of economics and sociology induces an unduly "mechanical" view of irrigation, especially in agencies devoted predominantly to engineering.

6.5 *Training for technological change.*

- 6.5.1 We noted in Chapter 3 that all the above categories of training are necessary in a technologically stable environment. Even when the tasks to be done do not vary much, new staff have to be shown how to do them, and shown how to absorb new responsibilities within the system as they move up, and as their personal roles evolve.
- 6.5.2 Training takes on an additional dimension when the technological situation itself changes. There are new opportunities: the institution must seize these and utilise them as quickly as possible. There are also usually risks. In a technologically changing environment, organisations come under special stress. Some older staff may feel insecure, and resist the introduction of methods other than those they have become familiar with. Middle and junior staff may feel unclear about what is expected from them. There are many other sources of tensions.
- 6.5.3 Irrigation in Sri Lanka is undergoing technological change in all the ways mentioned in paragraph 3.10. The Mahaweli developments are a major factor in the change, but not by any means the only ones. Training has a major potential function in harmonising responses to the innovations and making sure that staff at all levels are well prepared to reap the benefits and avoid the risks.
- 6.5.4 Organisational changes in recent years have reflected much of the new technological environment. The creation of agencies such as IMD, WMS, and MEA reflects a perception that existing institutions were probably not enough for the new requirements.
- 6.5.5 It does not seem that a parallel effort has yet been mounted in re-training the institutions for their new roles. We do not mean that nothing of the sort is going on; it is rather a question of the scale and modes of activity. Quite, probably at the senior levels staff may be getting enough, through in-house workshops and the like, but the need for fresh orientation has to be spread right through the system if top-level policies are to be followed through successfully.

615.6 We regard this as the most difficult area at present, and one that does not seem likely to be dealt with swiftly enough through the existing set of institutions.

6.6 *The quantity of training.*

6.6.1 One of the more difficult questions to address is whether there is enough training going on at present. In the preceding sections, where we reviewed activities by comparison with objectives, we mentioned areas where we think gaps can be perceived, or where the targeting of training towards specific goals might be sharpened. Now let us consider whether the amount of training rather than its style or content seems adequate to the situation.

6.6.2 We should say at once that we have not secured all the facts that would be needed for a definitive answer. That is clearly a longer exercise. However there are enough general indications for us to venture some opinions.

6.6.3 The question could be approached two ways: either from the "output" end by investigating (through random samples and personal interviews) whether knowledge and skill levels are satisfactory and rising; or by looking at the "input" end and forming an idea of whether the frequency, duration and method of training seem sufficient to keep injecting new information and skills at desirable rates. The former method is more satisfactory, but needs much more time to perform; the second method is more manageable in terms of data needed, so we have tried this approach.

6.6.4 According to the agencies' returns to our questionnaires, there are around 1,000 people receiving irrigation management training of some kind each year (Table 5). This is in-service, and does not include foundation training. The reported numbers for the past four years were 636, 1,039, 920, and 1,460 with an average of 1,014 per year.

6.6.5 The gross number of irrigation management staff in the reporting agencies is 6,967. From these we may exclude for the moment extension staff since their involvement in irrigation management is of a different, non-executive kind and they constitute only a small part of the total of persons receiving training. Excluding them leaves a balance of 4,831 staff. So it seems that on average 21% of staff receive training in any one year. Put in another way, that means that an individual can expect a training opportunity once in every 4.8 years.

6.6.6 We cannot measure the exact frequency requirement, but that interval of 4.8 years seems to us rather long.

6.6.7 However, the records show a great deal of inequality. The returns from MEA indicate a much higher rate of training: the agency has just under 15% of the total irrigation management staff, but reports more than 50% of all the trainees. This means that, calculating training frequency on the same basis as above, MEA staff seem to be getting a training opportunity almost annually (average interval is 1.3 years) and staff in the other agencies much less often (average of 8.6 years). This seems much too long, especially in conditions of technological change.

6.6.8 The disparities between training activities aimed at senior, middle and junior staff do not seem great. The average staffing ratios for the three grades are 4.3 : 31 : 65, and the proportions of trainees over the last four years are 10.1 : 34.3 : 55.6, which (hearing in mind differences of responsibilities) seem satisfactory.

6.7 *Co-ordination.*

6.7.1 The present irrigation scene in Sri Lanka is rather diverse. As we noted in Chapter 2, there are 3 ministries controlling 8 agencies and around 7,000 staff with some degree of involvement in irrigation management. That involvement ranges from 100% in IMD and WMS and very near 100% in ID and MEA down to comparatively low (but indefinable) percentages in DOA (Extension).

- 6.7.2 The **training resources** for these staff are distributed **among** the 22 institutions **listed** in Table 3. These again have widely varying levels of **specialization** towards the management of irrigation, from something **near** 100% at GITI, down to the order of 2% at Kundasale.
- 6.7.3 Within this system, something like 1,000 officers per year receive some sort of training; and this figure is exclusive of the foundation training **already given** in universities and **technical** or agricultural **colleges**.
- 6.7.4 It **seems** desirable, in an operation of this size, to set up some kind **of** arrangement **so** that efforts **can** be coordinated among the **agencies** and institutes, and also **so** that the whole operation **can** be regularly monitored and occasionally **evaluated** against performance targets. The very definition of targets is difficult and needs coordination among the **agencies**.
- 6.7.5 It seems that this requirement, and **some** of the other **needs** we have identified, could be met by the creation of a new inter-agency **Professional** Development Team to oversee the entire field of training. **This** idea is elaborated in Chapter 7.

6.8 **Cost**

- 6.8.1 It is right to **ask** whether the **resources spent** on training are producing adequate returns. We are not in a position to **answer** this clearly: it **needs** the routine monitoring and evaluation just mentioned, and agencies at present do not have the **data** that would answer it.
- 6.8.2 However we may **note** the prominent role of irrigation in the national economy. Over **25%** of agricultural land is irrigated. Assuming that the output of irrigated land is **2.5** times that of un-irrigated land, this implies that nearly 40% of agricultural production should come from irrigation. Agriculture accounts for over **50%** of all export trade, and about **25%** of imports: in money terms, about **21** billion **rupees** of exports and 13 billion of imports. Paddy production, the major output of irrigation at present, is valued at around **9** billion **rupees** per year.
- 6.8.3 The true cost of irrigation **management** training has not been quantified. But **in** the above context of production and trade it seems clear that even a 1% annual increase in irrigated output, **as** a result of training, would be far greater in value **than** the **present** cost of training, on which only **12** full-time **staff** and **25** part-timers are at present engaged. That is without beginning to consider other benefits, of which saving of water is the most obvious.
- 6.8.4 In short, while we feel that **steps** should be started to make it possible to do **proper** cost/benefit analysis of training, we feel little doubt that the present balance is highly favourable, and that much more expenditure **on** training could be incurred before **this** would cease to be the case.

6.9 **Motivation, rewards and status.**

- 6.9.1 It **seems** necessary to consider whether **staff** are sufficiently motivated to desire training. In the course of field interviews, the **opposite** point of view sometimes emerged, even to the extent of perceiving a training **course** as a **form** of punishment, perhaps for inadequate performance in the field. **In** some agencies a view was expressed that senior management **did** not care very greatly about training, and in general there **seems** to be some ambiguity about the status of training. This is perhaps reflected in difficulties of getting reasonably senior, experienced people into training roles in some of the agencies, which in **turn** may mean that some trainers are **not** viewed with high **respect** by those coming to be trained.
- 6.9.2 Other related matters, such **as** arbitrary trainee-selection procedures, very short notice of individual officers' despatch to training **courses**, and the like, have also been mentioned, reinforcing this image of training programmes **as** lacking in status.

- 6.9.3** It cannot be emphasised too strongly that training programmes without motivated participants are very unlikely to produce benefits. To the extent that these perceptions noted above are valid (which we find hard to gauge) it is essential that they be considered and diminished.
- 6.9.4** In Chapter 3 we have already reviewed the goals of training. These are, of course, the agencies' goals, and it is always mistaken to suppose that individual goals are identical. Individuals will be motivated in various ways, of which personal advancement and gain, and to a lesser degree job satisfaction, are likely to be most prominent
- 6.9.5** It is quite usual to link financial rewards to certificated training at the foundation and perhaps the functional levels. Thereafter it becomes less desirable to do this, and of course the administrative duty of assessing an officer's suitability for advancement can never be transferred to the training officer. Nevertheless it is desirable that staff should feel that (for instance) participation in training activities is correlated with subsequent advancement. All these points can be brought together in the general statement that strong backing, interest and enthusiasm from senior management are essential if a training programme is to succeed. This backing must be quite apparent to junior and middle staff.

7. PROPOSED PROFESSIONAL DEVELOPMENT TEAM

- 7.1 We have tried to draft our recommendations in the context of the existing set of institutions, and to make maximum use of what exists rather than proposing to add to what seems already a rather large set. However, our analysis has identified a number of gaps which do not seem likely to be filled by any one of the existing organizations. We propose therefore the creation of a small inter-agency Professional Development Team to deal with these.
- 7.2 The primary functions of the team would be co-ordination, monitoring and evaluation of all irrigation management training activities in the country.
- 7.3 We do not envisage this as a committee of existing officers. We regard it as a full-time function, and we think it would be important to ensure that the membership of the Team changed quite often. It should not be composed entirely of trainers; users of training should predominate.
- 7.4 To meet these conditions, we envisage a Team of 3 or 4 people who would be engaged on contract for, say, three years at a time. They could be drawn from the ranks of retired senior officers, from academic staff, and from non-government organizations. It is not our opinion that they should all be professional irrigation people, although undoubtedly some should.
- 7.5 Such a team would set up arrangements for implementation within the line agencies, for monitoring and feedback systems, cost analysis, and reviews of training content. Its members would identify the need for short courses, workshops and other irregular training activities, and would negotiate with the universities and others for preparation of such courses. They would themselves be part-time trainers, but this would not become a primary part of their role.
- 7.6 One of the team's major tasks would be to ensure the adequate supply of trainers to in-service institutes. This means reviewing all factors that may constrain the supply: aptitudes, status, rewards, motivation, and career prospects.

8. RECOMMENDATIONS

- 8.1 In this chapter we restate the findings from various parts of this report, and try to fit them into a consistent strategy for the future.
- 8.2 We think that an increase in the total training activities can be justified (paragraph 6.8). The present effort is, from some viewpoints, rather small. It is also uneven among the agencies involved.
- 8.3 Considered against the set of objectives stated in Chapter 3.2, the present activities satisfy some, but not others. In particular, we doubt that sufficient use is being made of training as an agent in the assimilation of technological changes.
- 8.4 At the foundation or pre-service level, there is not much training that is specific to irrigation. New recruits enter with degrees or diplomas of a general kind. We think that the economic role of irrigation in Sri Lanka, accounting for around 40% of agricultural production, justifies consideration of the provision of primary qualifications in irrigation.
- 8.5 There seems to be considerable scope for increasing the provision of short courses aimed at professional development, cross-discipline understanding, and technological innovation, for senior and middle level staff. The universities and other bodies outside the line agencies (such as ARTI) could be encouraged to undertake contracts for the provision of such courses, and perhaps for the provision of course material that could then be regularly presented in the existing in-service training institutes.
- 8.6 There is need for co-ordination, monitoring and evaluation of the whole operation. We propose that this be done by a new Professional Development Team, whose composition and functions are described in Chapter 7.
- 8.1 There is a need to ensure that junior and middle level staff learn continuously on the job, and for this purpose their supervisors (i.e., senior and middle level staff) need to be trained in communication skills and personnel management methods. This is particularly important for ensuring the translation, to field realities, of the off-site classroom training that these grades may receive in more formal in-service institutes.

9. **A** ROLE FOR IIMI

- 9.1 **One** of the reasons **this** study was initiated was to **see** whether **IIMI** could assist in any way in satisfying Sri Lanka's training needs. IIMI is not a large organisation and its **tasks** are international, so its resources do not stretch at present to the **direct** provision of **training** at national level. However, it is highly interested in such **questions as** the design of effective national training policies and in **the** evaluation of training.
- 9.2 At present, the wide range of organisations **concerned**, both **as users** and suppliers of training services, would **make** it difficult for IIMI to establish a close relationship. But if the agencies **can** accept our recommendation to form an inter-agency Professional Development **Team**, this would **make** a continuing IIMI involvement much more attractive and fruitful.
- 9.3 If the Team were created, IIMI would seriously consider advising it **on** aspects of its work, and would perhaps be able to provide a member **to** it, at least in a **consultant** capacity. If **all** went well, this could lead to other steps, such **as** preparation at IIMI of modules of short-course material. We would **see** the establishment of the Professional Development Team **as** the vehicle for such a process.

TABLE 1 Numbers of staff by agency and level with duties relating to irrigation management. Sri Lanka, 1986

Agency	Staff Grade Level			Total
	Senior	Middle	Junior	
Irrigation Department	260	986	638	1884
Irrigation Management Division	8	33	21	68
Water Management Secretariat	4	4	0	8
Mahaweli Engineering & Construction Agency	28	215	0	243
Mahaweli Economic Agency	34	84	586	704
Department of Agrarian Services	48	985	1921	2954
Extension Services Division, Department of Agriculture	176	410	1573	2159
Education and Training Division, Department of Agriculture	7	5	8	20
TOTAL	565	2122	4753	8040

- Notes:
1. Source: agency replies to IIMI questionnaires 2LA, 2LC.
 2. Data refers to **mid-1986**.
 3. IMD staff include some in process of recruitment and some working on a contractual basis.
 4. DoA staff do not have executive functions in irrigation management.

TABLE 2. Designations of field staff grades by agency. Sri Lanka, 1986.

Agency	Staff Grade Level			
	Senior(1)	Middle(2)	Junior(3)	Junior(4)
Irrigation Department	Irrigation Engineer	Technical Assistant	Work supervisor	Irrigation Distributor
Irrigation Management Division	Project Manager			
Mahaweli Engineering & Construction Agency	Project Director	Project Engineer/Engineering Assistant	Technical Officer	
Mahaweli Economic Agency	Project Manager	Block Manager	Unit Manager	Field Assistant
Department of Agrarian Services	Assistant Commissioner	Technical Assistant	Cultivation Officer	Vel Vidane
Department of Agriculture	Agricultural Officer	Agricultural Instructor	KVSN	

- Notes:**
1. In several of the agencies there are more grades (depending on function) at levels 1 and 2.
 2. KVSN Krushikarma Viyaptha Seva Niladhari.

TABLE 3. Institutions providing **training** in irrigation management **Sri Lanka, 1986.**

1. Post-Graduate Institute of Agriculture (PGLA)	Peradeniya
2. University of Peradeniya: Faculty of Agriculture	Peradeniya
3. University of Peradeniya: Faculty of Engineering	Peradeniya
4. University of Moratuwa: Faculty of Engineering	Moratuwa
5. University of Moratuwa: Technical College	Katubedde
6. School of Agriculture	Kundasale
7. School of Agriculture	Pelwehera
8. School of Agriculture	Angunakolapelessa
9. Hardy Institute	Ampara
10. Irrigation Training Institute (GITI)	Galgamuwa
11. In-Service Training Institute (ISTI)	Maha Illuppallama
12. In-Service Training Institute (ISTI)	Makandura
13. In-Service Training Institute (ISTI)	Bombuwela
14. In-Service Training Institute (ISTI)	Girandurukotte
15. In-Service Training Institute (ISTI)	Kilinochchi
16. In-Service Training Institute (ISTI)	Gannoruwa
17. In-Service Training Institute (ISTI)	Bindunuwewa
18. In-Service Training Institute (ISTI)	Angunakolapelessa
19. MEA Training Centre	Girandurukotte
20. MEA Training Centre	Medagama
21. Agra in Ru sa a l i n a t e (ARTI)	it
22. Sri Lanka Institute for Development Administration (SLIDA)	Colombo

TABLE 4. Number of training activities in irrigation management by staff level and year. Sri Lanka, 1980-86.

Year	Staff Grade Level			Total
	senior	Middle	Junior	
1980	7	9	8	24
1981	10	16	17	43
1982	3	28	17	48
1983	2	31	21	54
1984	7	36	35	78
1985	9	41	25	75
1986	8	25	9	42
Total (7 years)	46	186	132	364

- Notes:*
- 1: Source; Agency replies to IIMI Questionnaire 2LC.
 2. 1986 data may be incomplete.
 3. Includes returns from Irrigation Department, Irrigation Management Division, Mahaweli Engineering & Construction Agency, Mahaweli Economic Agency, Department of Agrarian Services, Department of Agriculture.
 4. Foreign training not included.

TABLE 5. Numbers of staff receiving some training in irrigation management by agency, staff grade level, and year. Sri Lanka, 1980-86.

Agency	Staff Level	Number of Staff involved in irrigation management (1986)	Numbers Trained						
			1980	1981	1982	1983	1984	1985	1986
Irrigation Department	Senior	93		8	5	33	59	21	30
	Middle	288	-	24	73	84	92	39	30
	Junior	384				-	29	100	120
	Total	765		32	78	117	180	160	180
Irrigation Management Division	Senior	8		1		1	2	5	
	Middle	33			5	8	15	12	30
	Junior	27							27
	Total	68		1	5	9	17	17	57
Water Management Secretariat	Senior	5	4	4	4	1	1	1	1
	Middle	4	2	2					
	Junior								-
	Total	9	6	6	4	1	1	1	1
Mahaweli Engineering & Construction Agency	Senior	28				1	5	4	
	Middle	215					29	3	25
	Junior								
	Total	243				1	34	7	25
Mahaweli Economic Agency	Senior	24	55	87	45	11	31	2	71
	Middle	259	163	267	115	42	76	15	174
	Junior	481	123	231	419	296	535	332	513
	Total	764	341	535	579	349	642	349	758
Department of Agrarian Services	Senior	48			1	2		43	44
	Middle	985			65	30	66	193	275
	Junior	1926				79	41	46	120
	Total	2959			66	111	107	282	439
Department of Agriculture	Senior	176	27	29		39			
	Middle	410			8	9	58	87	
	Junior	1573	-	131	27			17	
	Total	2159	27	160	35	48	58	104	
All Agencies above	Senior	382	86	129	55	88	98	76	146
	Middle	2194	165	293	266	173	336	349	534
	Junior	4391	123	362	446	375	605	495	780
	Total	6967	374	784	767	636	1039	920	1460

TABLE 6. Number of trainers employed by irrigation management agencies. Sri Lanka, 1986.

Agency	Number of Trainers	
	Full-time	Part-time
Irrigation Department	5	10
Irrigation Management Division		15
Water Management Secretariat		
Mahaweli Engineering & Construction Agency		
Mahaweli Economic Agency		
Department of Agrarian Services		7
Department of Agriculture Extension Services Division		5
Department of Agriculture Education of Training Division	7	3
Total	12	40

- Notes:**
1. Source: Agency replies to IIMI questionnaire 2LC, question 7.
 2. Data refers to 1986.
 3. Numbers are trainers able to give training in aspects of irrigation management. Other sorts of trainers not included.

TABLE 7. Agency responsibilities for fifteen irrigation management processes, and availability of training for each.

Process Number:	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
Agency															
ID	a	a	b	b	a	a	a	a	-	a	a	a	a	b	c
IMD			-	b	b	b	a	a	a	c	c	a	a	c	a
WMS			-	b	b	b	c	b	-	b	b	-	b	b	c
MECA	b	b	b	b	b	b	b	b	-	b	-				
MEA	b	b	b	a	a	a	a	a	a	a	a	a	a	b	a
DAS	a	a	a	a	a	a	a	a	b	a	a	b	b	c	b
DOA (E)					-	b	b	a	b	-	-	a	a	a	b
DOA (T)	-	b	-		-	b	c	c	c	-	-	a	b	b	-

- Key:
- a. Agency performs this process, and provides training for it.
 - b. Agency performs this process, and arranges training externally.
 - c. Agency performs this process, but arranges no training.
 - Agency is not responsible for this process.

Key to process numbers:

- 1. Planning and design of physical structures: operational aspects.
- 2. Planning and design of physical structures: agronomic aspects.
- 3. Planning and design of physical structures: social & economic aspects.
- 4. Planning for operation and maintenance.
- 5. Water scheduling, distribution and system operation: engineering aspects.
- 6. Water scheduling, distribution and system operation: agronomic aspects.
- 7. Water scheduling, distribution and system operation: social and economic aspects
- 8. On-farm application of water.
- 9. Provision of agricultural support services.
- 10. Evaluation of system performance.
- 11. Management of financial resources.
- 12. Personnel management and human relations.
- 13. Communications with users and the public.
- 14. Environmental management.
- 15. Bureaucratic management and co-ordination.

Figure 1. Irrigated area in Sri Lanka.

**IRRIGATED AREA
(hectares)**

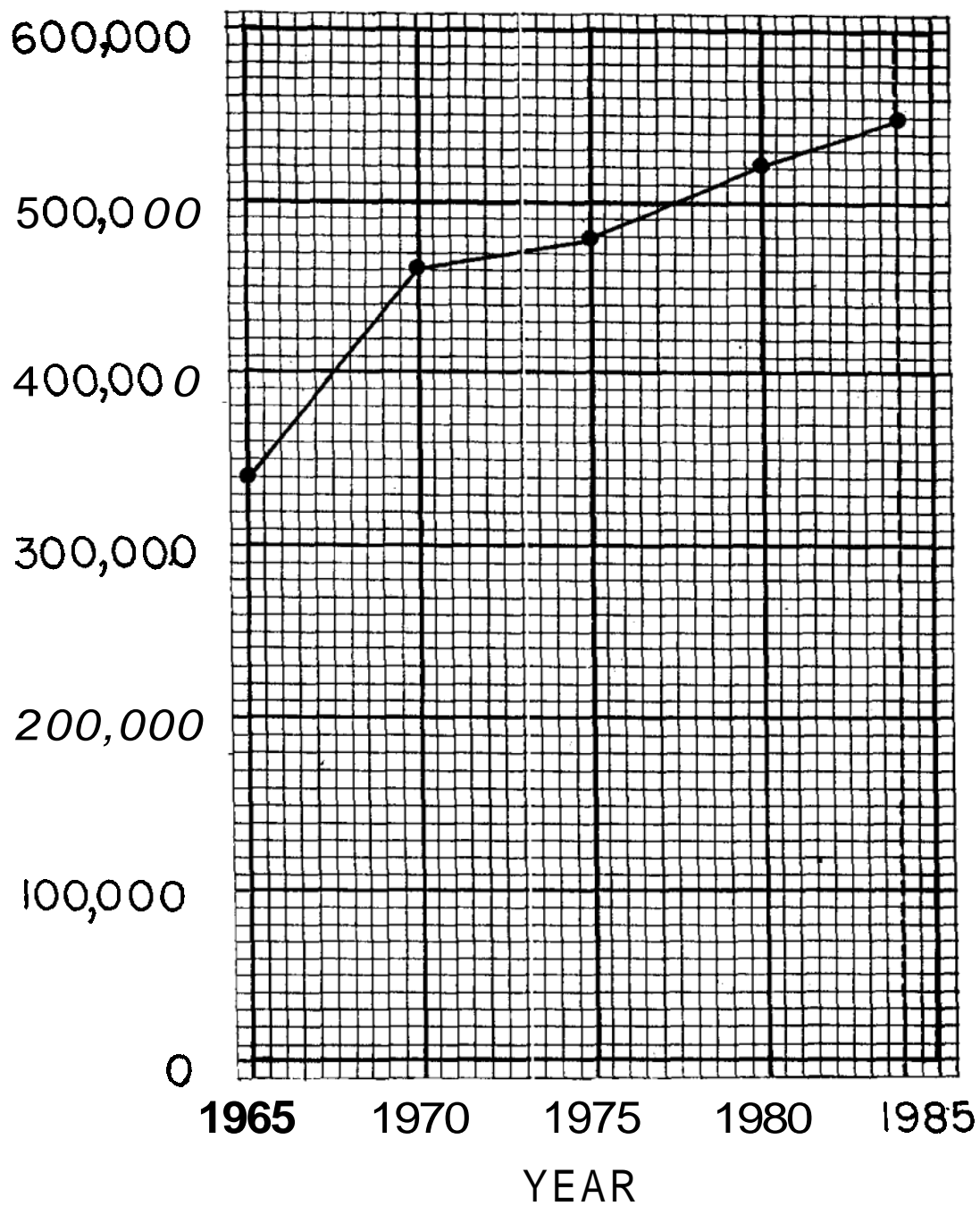
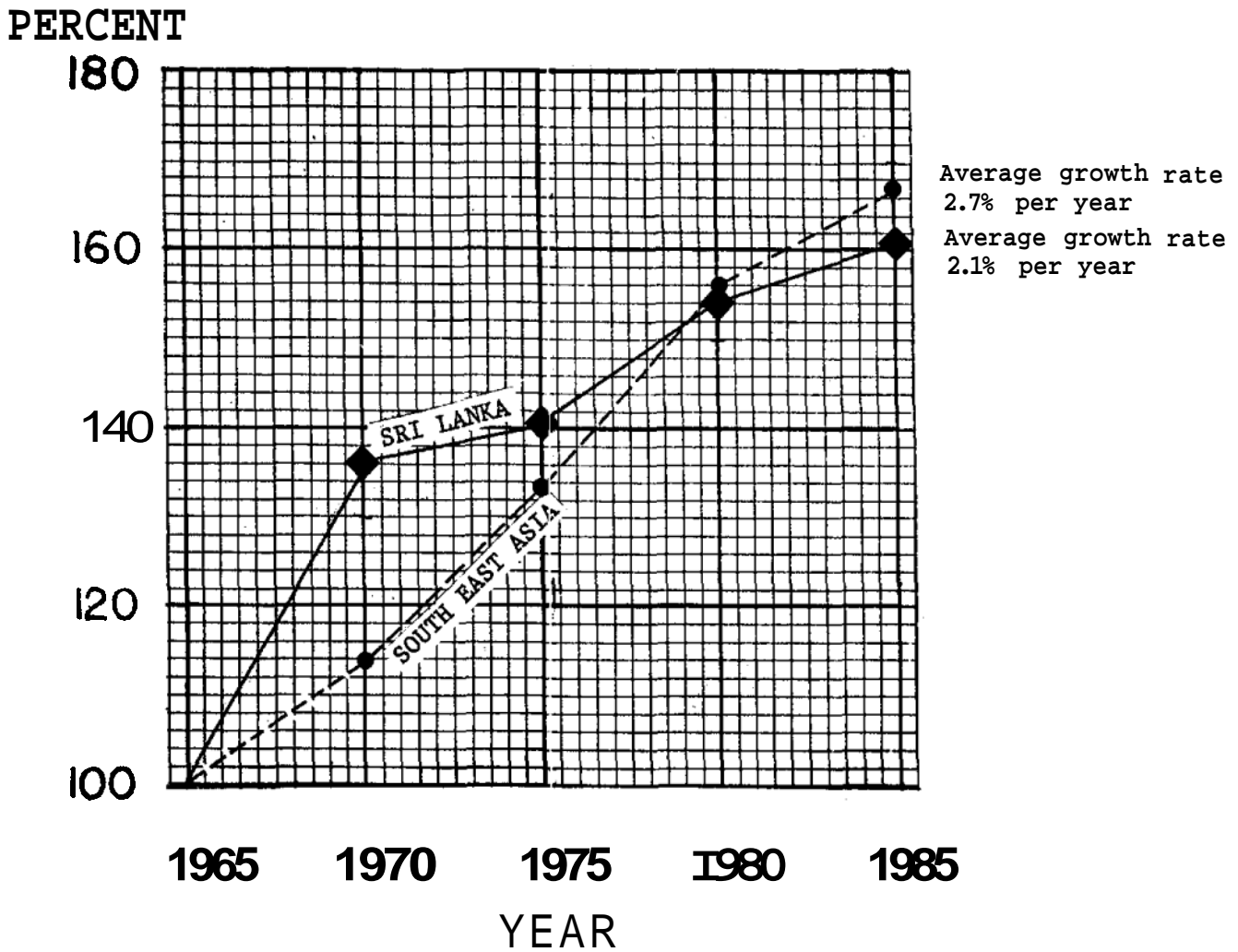


Figure 2. Rate of growth of irrigated area: Sri Lanka and South-East Asia.



- Notes:
1. Source: FAO World Agricultural Statistics 1986
 2. SE Asian countries used are Indonesia, Philippines, Malaysia, Thailand, Burma, Bangladesh.

Figure 3. Location of principal training institutions in Sri Lanka.

