CHANGE AND CONTINUITY IN VILLAGE IRRIGATION SYSTEMS

A Case Study in the Moneragala District Sri Lanka

Research Study No. 75

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AGRARIAN RESEARCH AND TRAINING INSTITUTE,
114, Wijerama Mawatha, Colombo 7.

SRI LANKA

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FOREWORD

Small-scale irrigation systems are increasingly attracting the attention of national governments and donor agencies the world over. In Sri Lanka the Village Irrigation Rehabilitation Project (VIRP) is a major rehabilitation programme, which with World Bank assistance, is rehabilitating 1,200 small tanks and anicuts in 14 districts and thereafter introducing a systematic water management programme in each of the rehabilitated systems. The implementing agencies of the project are the Irrigation Department and the Department of Agrarian Services.

At the instance of the World Bank, the Agrarian Research and Training Institute (ARTI) was commissioned by the Department of Agrarian Services to undertake a study of six village irrigation systems at different stages of rehabilitation, with a view to understanding the existing institutional arrangements for irrigation water management and the impact of the government's intervention strategy for the management of irrigation water. For this purpose, three tanks and three anicuts were selected for in-depth study in the Moneragala district and studied over the period of two cultivation seasons in 1984.

The study findings are interesting and useful for their analysis of changes in village irrigation management policy and institutions and for their documentation of the impact of the rehabilitation-cum-institutional exercise under VIRP for village irrigation management. The attempt to analyse the differences between tanks and anicuts for irrigation management is one of the important contributions of the study.

The research team, that carried out this study consisted of Mrs. Shyamala Abeyratne (Co-ordinator), Dr. Jayantha Perera and Mr. Ishak Lebbe. Mrs. Abeyratne and Dr. Perera were responsible for writing the study findings in this form.

Our thanks are due to the researchers for their valuable efforts and also to the World Bank and the Department of Agrarian Services for making it possible for ARTI to get involved in a study in an area which is paramountly important from the point of view of the rural economy and rural welfare.

F B Subasinghe
DIRECTOR

ACKNOWLEDGEMENTS

We are most obliged to several people who, helped this study along the way. Most especially we are grateful to Mr. Jaliya Medagama (Deputy Commissioner, Water Management) of the Department of Agrarian Services, who not only provided us with needed background data and information but also gave very constructive comments on the draft study. Mr. Yoganathan (VIRD/Project Director) of the Irrigation Department was also helpful in providing us district-wise data and other information when we visited his office. The Deputy Director of Irrigation Department, Moneragala district and others in the District Offices such as Mr. Ismail (IE), were most helpful and gave willingly of their time when we dropped in to worry them with questions and requests for maps and other data.

Our sincerest thanks go to our six field investigators, Mr. G P Sumanadasa, Mr. H R Dharmasoma, Mr. M K A Wickramaratne, Miss R H J Perera, Mr. A G Jayasena, Mr. A M Karunaratne, who laboured under trying conditions to collect the data for this study, and to Mr. Ishak Lebbe Research and Training Officer of the ARTI who did much of the field supervision work.

This study would not be in this form if it were not for Mrs. Soma Wijewardena who so cheerfully and capably got this into the word processor.

Last, but not least, we are grateful to Mr. Sena Ganewatta, Dr. Jeff Brewer and others at the ARTI, who provided many useful insights into the preparation of the research proposal and helped with the data handling, and to Mr. Subasinghe, Director, who gave his whole-hearted support to the study.

Shyamala Abeyratne
Jayantha Perera

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Chapter One

1.1 INTRODUCTION

From early times, village irrigation systems (or minor irrigation systems, as they are officially designated) have occupied a central place in the life of the rural community, being in effect the focus of community life, socially, economically and politically. Today minor irrigation continues to account for the irrigation of more than 40% of the area under permanent cultivation and 30% of the paddy acreage[1]. But despite its pivotal role in the socio-economic life of the rural people, emphasis for a long time, both in terms of research and investment, has tended towards major irrigation[2].

This slant in the direction of major irrigation commenced roughly in the 1930's with the State Policy of large-scale peasant colonization of the dry zone. Motivated by the social welfarism of the time, this was aimed mainly at opening up of new areas for re-settlement of landless families from the wet zone. Correspondingly, smale-scale village minor irrigation

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1. J.M. Gunadasa, P. Wickramasinghe and Gamini Herath, Socio Economic Survey of Minor Irrigation in the Dry Zone of Sri Lanka. Peradeniya University 1980. See forward.

2. The distinction between minor and major irrigation is in terms of differences in scale and organization, not in differences of physical type of source, conveyance or storage of water. Generally a minor irrigation system has a command area of less than 200 acres (80 ha).

received little attention after the 1930s[1] from the State and this was reflected most specifically in enactments of the time which shifted responsibility for the maintenance of minor tanks from one department to another[2]. As a result today only 50% of the minor irrigation schemes are considered to be in working condition (at different levels of efficiency) while 30% of the irrigable area under minor irrigation remains unutilised or under-utilized for paddy cultivation[3]. Moreover the average yields obtained under minor irrigation works are about a third of the average yields obtained under major irrigation systems[4]. The reasons for this are many. To cite some: (i) low cropping intensity of 1.0 - 1.2%, (ii) low levels of input use, (iii) poor water management and (iv) neglect in maintenance due to lack of funds and staff.

From 1977 onwards Government investment in minor irrigation increased spectacularly as the former began to give priority attention to the rehabilitation of small-scale irrigation systems, recognizing not only the potential for expanding the paddy acreage under minor irrigation,[5], but also recognizing the possibility it offers for distributing State funds more widely and thereby significantly helping small and marginal farmers.

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1 Until the 1930s, the British rulers governed the rural areas through a system of indirect rule in which the village unit was the primary focus. Therefore the government had seen it fit to concentrate its attention on village irrigation.

2 For example, since 1947 there have been 4 different Agrarian Laws which have shifted responsibility for the development and maintenance of minor irrigation from one institution to another.

3 Gunadasa, Wickramasinghe, Herath, op. cit., see forward

4 Major irrigation systems have been defined as anything with a command area of over 200 acres.

5 It has been estimated that the potential exists to increase the cultivable area by 50,000 - 75,000 ha (1,25,000 to 1,72,500 acres).

The Village Irrigation Rehabilitation Project (VIRP)

With assistance from the World Bank, the Government of Sri Lanka has embarked on the VIRP to rehabilitate some 1,200 minor tanks and anicuts in 14 districts of the island. The VIRP seeks to achieve several related objectives:

(i) Major changes in the technical parameters of the project that would lead to an increase in the irrigated area by 40%;

(ii) to strengthen appropriate farmer organizations in order to train farmers in effective water management and timely maintenance of the irrigation systems;

(iii) to strengthen and train irrigation and other related staff and to improve their operational efficiency by providing adequate transport and equipment;

(iv) to establish, monitor, record and evaluate the overall system and operational efficiency;

(v) to influence the traditional farming methods by introducing an extension package which seeks to raise paddy yields, increase the cropping intensity and introduce crop diversification;

(vi) to raise farm incomes in village irrigation schemes.

Tanks and anicut systems coming under the VIRP have to statisfy the following criteria to be selected for rehabilitation:[1]

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1 World Bank Staff Appraisal Report, Sri Lanka, Report No. 3363-LE. 1981.

(a) The command area should not be less than eight hectares (20 acres)[1];

(b) The tanks should be in inhabited areas and thus with easy access;

(c) The useful tank storage should not be less than three acre-feet per acre in the Dry Zone, 2.5 in the Intermediate Zone and 1.5 in the Wet Zone, and it should not exceed 70% of the yield potentials;

(d) After rehabilitation the tank should benefit a minimum of ten families;

(e) The incremental area brought under direct maha irrigation should be at least ten times the privately irrigated lands submerged or three times other cultivated lands submerged;

(f) The soils of the catchment area, reservoir and the command area should be suitable for their respective purposes;

(g) The maximum cost of a project including all civil works and physical contingencies valued at mid-1980 prices but excluding price contingencies, engineering and administration should be calculated at a rate of Rs. 24,700 (US$ 1000) per hectare of incremental area.[2]

1.2 DEFINITION OF MINOR IRRIGATION[3]

Originally a distinguishing characteristic of minor irrigation was its

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1 Except in the case "where a number of tanks are in cascade in the same catchment and an upstream tank requires strengthening (even if commanding less than eight hectares) to avoid damage to a downstream tank in case of failure". World Bank, op. cit.

2 "Minor schemes which do not meet the cost per acre and/or supply criteria, may be included in the project provided they are economically-justified (economic rate of return of at least equal to 15)". World Bank, op.cit.

3 In this study the terms "minor irrigation", "small-scale irrigation" and "village irrigation" have been used interchangeably to mean the same thing.

community management aspect. The Irrigation Ordinance of 1946 explicitly embodied this when it defined a minor irrigation system as one which is:

(a) "Constructed by the proprietors without Government aid or with the aid of masonry works and sluices supplied free of charge by the Government, and

(b) maintained by the proprietors".[1]

However in recent times surface irrigation projects in Sri Lanka have become classified as major, minor or multi-purpose on the basis of several other factors, including the extent of land irrigated, investment costs and which management agency the irrigation system comes under. This definition was embodied in the Agrarian Services Act No. 58 of 1979 where minor irrigation works were classified as those that benefit less than 200 acres (80 ha.) and design and construction are the responsibility of the Irrigation Department, whilst operation and maintenance are that of the Department of Agrarian Services (DAS) which enlists the involvement of the community for the purpose [2].

Twenty-seven percent of all irrigable land in Sri Lanka is served by minor tanks and anicut schemes. This is evident in the table below which shows the paddy extents by season that fall into major, minor and rainfed categories:

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1 Legislative Enactments of Ceylon, Vol. XII, Part IX, p. 784.

2. This is the definition used in the Village Irrigation Rehabilitation Programme.

Table 1.1 - Paddy Acreage by Type of irrigation, 1978

Crop Season	Type of Irrigation			Total (1000 acres)
	major	minor	rainfed	
Maha	33.7	27.3	38.2	1,420.7
Yala	41.8	19.7	38.5	742.4
Total	36.5	24.7	38.3	2,163.1

Source : Department of Census and Statistics.

1.3 OBJECTIVES OF THE RESEARCH STUDY

Under the VIRP, the Agrarian Research and Training Institute (ARTI) was requested to undertake a socio-economic study of selected small-scale irrigation systems. While an extensive baseline study had been undertaken earlier by the University of Peradeniya,[1] the ARTI study was commissioned to undertake a study of a few selected tanks and anicuts. Under the VIRP, it was believed that programme planning for water management would be better done when based on a detailed understanding of existing local social structures and institutional arrangements - both formal and informal - for water management. Thereafter based on these research findings, an action programme would be devised to experiment with alternative organizational forms for irrigation water management.

The objectives of the research study undertaken by the ARTI were to:

1 Gunadasa, J.M., Wickramasekera, P & Herath, Gamini, H.M. Socio-Economic Survey of Minor Irrigation in the Dry zone of Sri Lanka, Peradeniya University 1980 .(mimeographed)

1) understand the evolution of irrigation and water management practices in small-scale irrigation systems;

2) ascertain the existing institutional arrangements for irrigation water management in small-scale irrigation systems;

3) study the rehabilitation process in so far as it affects the subsequent operation and maintenance activities of farmers;

4) monitor/evaluate the post-rehabilitation institutional arrangements for water management (as typified by the APT approach);

5) Based on the above, to suggest alternative arrangements for farmer participation in water management under small-scale irrigation systems.

1.4 METHODOLOGY

Six locations were selected for the study. These were three tank systems and three anicut systems, all in the Moneragala district (see Map I for locations of study villages). As the State intervention process, viz. physical rehabilitation of the irrigation system plus water management programme, was considered to be a crucial factor affecting our research outcome, we decided to select a tank and an anicut each at different stages of rehabilitation. In this way we hoped we could separate out some of the effects of State involvement through physical rehabilitation of the irrigation system, on relevant social and economic variables. Hence our research design was as follows:

Figure 1

Stages of Rehabilitation	Anicut System	Tank System
Pre-rehabilitation	Udamallahawa (A 1)	Meegahapitiya (T 1)
Rehabilitation in progress	Wattarama (A 2)	Halmillapillawa (T 2)
Post-rehabilitation	Pussellawa (A 3)	Kehellanda (T 3)

Henceforth in our discussion, A 1, T 1, etc. will be used to denote the particular irrigation system.

As there were very diverse irrigation systems coming under VIRP, we tried to keep some consistency by studying only systems that had a population of at least 25 families, relied mainly on the tank or anicut system for cultivation, cultivated mainly paddy, were of the same ethnic group (Sinhalese), and were all approximately the same distance from big towns. In addition, we tried as much as possible to select communities that were older and more established (viz; not newly alienated lands) as we felt this would give us more insights into traditional and informal arrangements for water management. Moneragala district was chosen since it has both tanks and anicuts and also afforded some agro-ecological variation, falling into both the dry and the intermediate zones.

Field work was carried out in two phases. In the first phase which extended over two months, six resident research investigators (one each assigned to a study village) gathered information to obtain a general overview of the study villages and especially of the irrigation systems. They spent much of their time meeting and talking with village-level officials, eg. the Vel Vidane, who had been or who was now in charge of irrigation management, farmers and others. The investigators had a

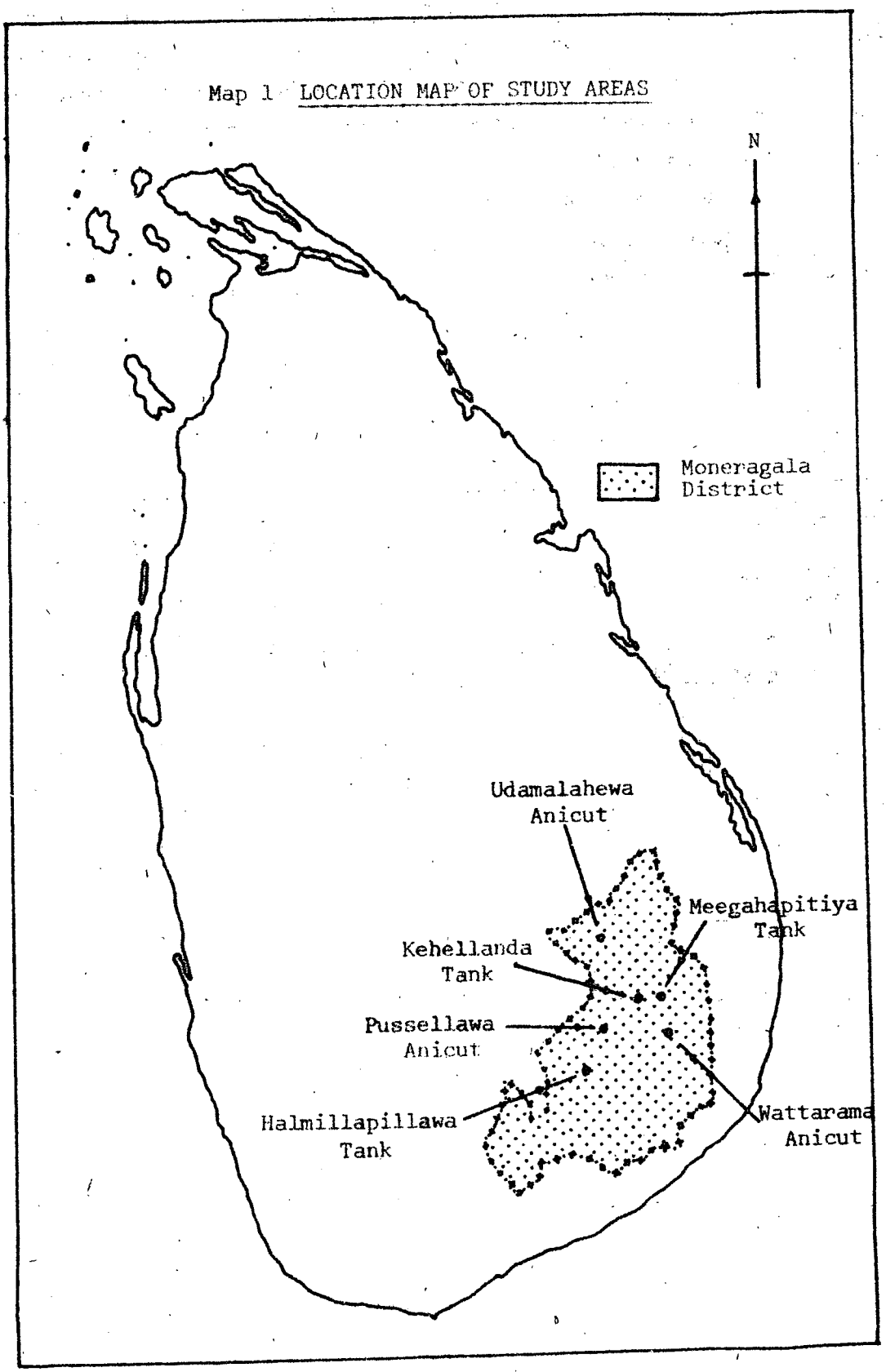
checklist of questions of research interest and were instructed to obtain detailed information on those questions. In the second phase we devised a short questionnaire using the information gathered in the first phase, to administer to all those living and cultivating within the command area of the selected tanks and anicuts. This amounted to 311 households in all, with the head of household typically being the respondent. The questionnaire survey took about another two months to complete. The number of households surveyed in each study location is given below:

Figure 2

Irrigation System	A 1	A 2	A 3	T 1	T 2	T 3
No. of farm families interviewed	24	27	30	29	117	84

Total = 311 families

Map 1 LOCATION MAP OF STUDY AREAS



1.5 BACKGROUND TO MONERAGALA DISTRICT

Moneragala district lies in the South-Eastern part of Sri Lanka and covers a land area of 5,591 square kilometers. Half of the district falls into the Intermediate Zone and the other half into the Dry Zone. The South-East and North-East of the district are mostly flat or gently undulating while the North-Central area is hilly with steep slopes that rise to over 600 meters in the West.

The rivers in the district originate mainly in the North-Western uplands and flow towards the east and south. Streams that have their source in this wetter area are perennial in nature, but elsewhere, although local runoff may be large, many streams have little or no flow during the months of July and August. These streams are what have been dammed and turned into anicuts, of which there are many in the intermediate zone. There are in addition ten major tanks and 137 minor tanks in the district, most of which fall into the dry zone area of the district. Ground water resources are insufficient for irrigation but are important for domestic use.

The population of Moneragala district in 1981 was 279,700 persons and this was an increase of over 110% from 1963. This was due not only to a natural increase in population that is higher than the national average, but also to the heavy migration into the area from districts such as Matara and Badulla. While the population density is still very low compared to the national average,[1] in-migration has radically altered the man-land ratio, social relations and social organization of the district.[2]

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1 Population density of 50 persons per sq. kilometer in Moneragala compared to national average of 230 per sq. kilometer.

2 A.J. Weeramunda, From Chena Plot to Gemming Pit : Case Study of Okkampitiya (Moneragala district), Sociological Aspects of Rural and Regional Development Colombo Research Paper Series No. 3, 1984.

The majority of the people in Moneragala are Sinhala Buddhists with only 7.1% belonging to other racial groups and only 7.2% to other religious groups. Forty seven percent of the population is younger than 18 years of age.

By national standards, Moneragala can be considered as one of the more backward areas of Sri Lanka and certainly it is also the least urbanized. Only 2.2% of the population lives in Moneragala town which is the only one classified in 1981 as urban. A further 3% live on estates, while the rest of the population is resident in the rural areas. The majority of the population (67%) is engaged in small-scale agriculture, the service sector accounts for a further 28%, while small-scale industry, mainly jaggery-making, pottery, saw milling, brick-making and gemming account for about 7% of the employment. Growing of ganga (marijuana) in the context of limited economic opportunities has also proved to be a very lucrative activity.

Sugar cane was introduced into the Moneragala area as a cash crop in the 1960's and State subsidies were given for fertilizer, and credit was made available through local banks. Farmers took to sugar cane readily and converted many old chena lands to sugar cane. The profits derived from this crop however were short-lived as the Government decided to import sugar in the late 1970's, thereby bringing down local sugar cane prices drastically. Although farmers still continue to grow sugar, it appears that they are barely able to cover costs.

Other alternative economic strategies include chena cultivation, but today, ecological constraints, primarily a rapidly increasing rural population, have set limits to the expansion of a slash-and-burn agriculture or even in retaining existing jungles for chena cultivation.

Hence we see in Moneragala district an area that has enjoyed little state-supported economic development activity while at the same time experiencing the disruption of a high population growth rate, not the least because of the heavy influx of migrants into the area. As

encroachment on forest lands for purposes of slash-and-burn agriculture is reaching its natural limits as are employment avenues based on gemming and entrepreneurial activities connected with it, alternatives may only be found in the more intensive use of existing agricultural lands through irrigation development.

1.6 BACKGROUND TO THE SIX STUDY-VILLAGES[1]

1.6.1 Udamallahawa - Pre-rehabilitation[2]

Udamallahawa (A 1) is an anicut in the Bibile electorate which has not been selected for rehabilitation under VIRP. The anicut that exists is a temporary one which supposedly the farmers had got together and constructed across the Gal Oya in the very distant past. It had got damaged by floods and about 3 years ago (1982) the farmers got together and repaired it. However, they are not satisfied with it and therefore they sent a petition through the Government Agent (GA) to the Member of Parliament (MP) asking the Government to construct a permanent anicut. Such an anicut in their opinion would serve to augment the maha season water supply and provide water for a second paddy season. Also they believe that this would help in the rainy season when the Galoya river floods and virtually separates the village into two. As yet however they have had no State assistance.

Udamallahawa anicut is part of a string of 5 anicuts (3 above and 1 below) which provides supplementary irrigation to waterobtained from the Paragahakadura, a small stream/pond. Though farmers obtain

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1 For maps of the six study areas showing both the village environs and the irrigation system layout, see appendix I.

2 Pre-rehabilitation does not necessarily mean that they have been earmarked for rehabilitation at a future date.

water from what are essentially two sources, they are nonetheless unable to cultivate a yala crop and often even the maha crop is on a bethma basis[1]. Hence chena constitutes an essential component of the economy with 90% of the owner-cultivators of paddy engaged in chena cultivation. Many also grow ganja which is of course prohibited by law but nonetheless provides a lucrative income in a situation of limited avenues for alternative employment. The 27 acres that come within this anicut system, consist of 40 holdings cultivated by 32 farmers. One third of these farmers are cultivating on an ande tenancy basis, mainly as tenants on land belonging to the village temple.

1.6.2 Meegahapitiya - Pre-rehabilitation

Meegahapitiya (T 1) is a tank that was built in the 19th century, as the story goes for one individual as the wallow for his buffaloes. It is in the Bibile electorate. The nearest town Makulle is 2.5 miles away, while Moneragala town is 12 miles away.

Twenty acres cultivated by 26 farm households come under the command of the tank which to date has had no Government assistance for physical rehabilitation. A breach in the tank and the sluice three years ago were temporarily repaired by the farmers, using sand bags which are removed or put back when water is required or not. Chena forms a very important component of the community's existence and the latter appears to have access to vast tracts of jungle land. Many farmers also grow sugar cane.

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1 A cultivation practice to share limited water available among all share holders of the paddy tract in a draught season. If the entire group of shareholders of the yaya agreed, all of them cultivated a small area and shared the harvest.

Contrary to expectations, with the tank community being a relatively old one, cultivation is not guided by traditional rules and regulations with regard to irrigation. The Farmer Representative system exists in name only while farmers irrigate their fields as they please, with basically the top-enders getting all the water they need and tail-enders only if they resort to some form of water piracy. As a result most of the lands are mainly rain-fed in the maha and no yala cultivation is ever done. The bethma system (which is premised on a community decision to cultivate on a limited, shared basis) has never been practised here. There has also been no maintenance of the tank or canal system in the last 10 years.

1.6.3 Wattarama - Rehabilitation in Progress

Wattarama anicut (A 2) has an interesting origin. In the early 1960's, sixty families were brought from Kalutara and settled in the Ethimale colony while the Wattarama area was still jungle. These colonists were told to grow coconut but because of the harsh conditions in the area, only 20 families were soon left. A certain rich individual acted as the leader of these families and together they decided to refurbish an old tank which was said to have existed during the times of the Sinhala kings. They rebuilt the dam at their own cost and with their own labour and started to cultivate paddy. Unfortunately heavy rains the following season destroyed the dam and the farmers were very discouraged. However again on the initiative of the same person, the farmers of Ethimale and Kotiyagala colony (established in 1964) formed a Society and set up a "Tank Development Fund" soliciting Rs. 15/- a month from each member. In 1968 the tank was refurbished by these farmers by hiring in earth-moving machinery at a cost of Rs. 8,400/-. This refurbishment allowed for the cultivation of 70 acres of paddy land by 35 farmers. Then in 1980 the Government stepped in and constructed an anicut across the Vilo Oya to feed the tank, which was then used for paddy cultivation in the maha season though no yala cultivation was still possible.

There are basically two groups of farmers who are cultivating land here. Those who reside close to the tank and who are in fact the original farmers who helped build the tank, belong to a self-formed Society (that contributed to the Tank Development Fund) and have first access to water. The other group cultivates lands that are some distance away and receive water only after the first group of farmers and if there is any excess. Hence there is a clear distinction between those with property "rights" to irrigation water (and land) and those in the recently asweddumized lands with no riparian rights and dependent on the magnamity of the former. The former comprises about 26 while the latter about 30 farmers.

1.6.4 Halmillapillawa - Rehabilitation in Progress

Halmillapillawa (T 2) is a tank in the Wellawaya electorate, the closest town being Buttala (3 1/2 miles away). It is a purana tank which had been more or less abandoned till 1969 when the Irrigation Department stepped in and refurbished it, thus making about 117 acres irrigable. However no yala cultivation is still possible and even maha experiences heavy water shortages.

Rehabilitation under VIRP started in 1983 and mainly consisted of strengthening and raising the level of the dam which allowed the command area to be increased by 62 acres, thereby benefiting 60 farmers. Because of rehabilitation farmers had to forego cultivation of the 1983-84 maha season but were thereafter able to cultivate a meda (middle) season (starting in February) of the entire area.

Since it was an abandoned tank, it was only in 1969 that a Land Kachcheri was held and 130 farmers were selected from Matara district and given approximately one acre each but not with title deeds. Now in addition to the land given to these farmers, there are 12 acres of encroachment which in 1982 were made irrigable by

the Irrigation Department. At least 75% of the farmers also cultivate chenas.

There is no sense of a community based on identity with the tank as cultivators are relatively new to the area (viz. post-1969). Residential patterns are however consistent with caste, with goigama and vahampura groups living in separate clusters.

As rehabilitation work had only just been completed, the tank was still under the supervision of the Irrigation Department. This was evident most especially in the manner in which the kanna[1] meetings were held. The meeting was summoned by the Cultivation Officer and attended by the relevant irrigation officers and other officers plus the farmer representative and presided over by a relatively high-level official of the Irrigation Department. Decisions made on date of water issues etc. were thereafter conveyed to the farmers but there was little discussion with the latter.

1.6.5 Pussellawa - Post Rehabilitation

Pussellawa Anicut (A 3), is a part of a string of anicuts, the fourth in fact, among seven anicuts on the Kuda Oya. It is located about 12 miles from Moneragala town towards Bibile. Pussellawa village is an agricultural community which depends primarily on paddy cultivation with water from the anicut, and on sugar cultivation which is rainfed. It consists of 36 households, all kinsmen, cultivating 20 acres of paddy using water from the anicut.

The Pussellawa villagers had their own make-shift anicut until 1946, when the Government stepped in and constructed a permanent anicut. This anicut was refurbished in 1982, enabling the cultivation of ten

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1 Seasonal cultivation meetings where cultivation schedules and related agricultural matters are decided.

more acres of paddy in both the maha and yala seasons, thereby benefiting 15 families. Although Pussellawa anicut constitutes one of seven anicut systems dependent on the same stream, there is hardly any observed interdependence among the anicuts in terms of irrigation activity.

1.6.6 Kehellanda Tank - Post Rehabilitation

Kehellanda (T 3) is a relatively old tank dating back to 1903. At present, two main communities depend on it for their living. The first community is primarily engaged in paddy cultivation but also cultivates chenas in the nearby jungles. For paddy cultivation, the community is dependent on the Kehellanda tank which is about 300 metres away from the village paddy fields. This agricultural community consists of about 86 households, cultivating 112 acres of paddy. While refurbishment of the tank benefited about 40 families and promised the others a second crop of paddy, the latter has not been feasible to date and only other field crops have been grown on a limited basis below the tank during the yala season. When the rain fails for paddy, or during the slack periods in paddy cultivation, the villagers cultivate chenas in the surrounding jungles.

The second group in Kehellanda which is in fact resident immediately adjacent to the tank, is a fishing community. The State recently introduced Japanese fish culture into the tank as a subsidiary income source and this is being exclusively tapped by this community for their living. These villagers do not cultivate paddy and depend entirely on fishing in the tank for their livelihood. Since the two communities depending on the tank are pursuing different economic activities, their interests often clash. The fishing community obviously prefers that the tank water levels remain low so as to ease fishing, while the agricultural community desires that the tank retains as much water as possible for paddy cultivation. This conflict has led to the emergence of two separate communities

dependent on a single source of water. For the purpose of this study, we will concentrate on the agricultural community as it is this group that uses the tank water for irrigated agriculture.

Chapter Two

MAJOR TRENDS IN IRRIGATION MANAGEMENT POLICIES IN SRI LANKA: AN OVERVIEW

This chapter discusses the evolution of systems of irrigation and water management as they have existed from early times to the recent period. It will highlight the evolution of policy with respect to irrigation and water management, to provide a backdrop to our present concern with village tank irrigation. This is only a presentation of major trends in policy and is not meant to be an exhaustive or detailed historical review.

2.1 "HYDRAULIC SOCIETY" : CENTRALIZED BUREAUCRACY VERSUS VILLAGE TANKS

Classical Sri Lanka presented a "pure type" of hydraulic society in the Dry Zone from approximately the third century B.C. until the 12th century A.D.[1] . Upto the end of the 8th century A.D, the capital was continuously in Anuradhapura and around this area developed a vast network of major hydraulic works. This system had two major functions; it provided a larger area around the capital with a more secure supply of irrigation water than that supplied by small village tanks and it provided the capital with a water supply. This hydraulic system has been examined extensively by historians. It merits some discussion here as many aspects of present day social organization in the Dry zone can be

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1 E.R. Leach, "Hydraulic Society in Ceylon" p. 21. In Past and Present, 15(1959, pp. 2-26

viewed as direct survivals from this period.[1]

Most of the population was distributed in this period among small villages, each usually comprising fewer than 50 families. Each village was dependent for its survival on an area of irrigated paddy land, deriving its water from a man-made reservoir. In ancient times these tanks were built typically in a crude fashion by constructing an earthwork transversely across the line of a natural stream and damming the water behind it. A few village tanks, in particular those belonging to temples, were found to be more sophisticated, having been equipped with scientifically designed spillways and sluices.

Routine maintenance of village tanks was conducted by the villagers themselves, while major repairs were entrusted to a specialised group of hired Tamil labourers.[2] What is pertinent to note therefore is that the ancient Central State did not concern itself with village tank management.[3]

In contrast, management of the major tanks in ancient time was the responsibility of the Central State in keeping with Wittfogel's thesis.[4] Though this has been open to much controversy among historians, Leach contends that consistent with accounts by Knox, in ancient Sinhala times land was held in direct fief from the Crown with irrigation works of all kinds being rajakariya.[5] The tyrannical

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1 ibid. p. 21.

2 The Tamil labourers were known as "Kullankatti".

3 E.R. Leach. op. cit. p. 9.

4 Though Wittfogel himself very conspicuously left out the example of classical Ceylon.

5 Rajakariya means literally "King's work" or "King's duty" by which a holder of land is subject to obligations inherent in the title to the land.

authority of the King derived from his ultimate title over all irrigated land, yet the land was generally granted to his provincial governors "for their encouragement and maintenance, with all the fruits and benefits which before came to the King"[1], or to the Buddhist monasteries. The grants of land included control over the population supported by it, the irrigation works and water and the right to levy corve'e labour. What is pertinent is that rajakariya, while known as "king's work", was in reality an obligation to the grant holder - i.e., the provincial governor - rather than directly to the King. For analytical purposes, Leach designates this as a type of "feudalism". According to Leach, what is different in this feudalism from the European archetype is that while the former was also one of "service tenure", the services due to the landlord were of various types (determined primarily by caste) and not exclusively military as in the European case.[2]

An important point is that though the major irrigation works provided food for artisans and labourers, amenities to the palaces, and supplemented the village tank water supply, they were not crucial from a subsistence point of view. This is evident in the fact that when the Central Government was disrupted and major works fell into disrepair, village communities were able to survive on irrigated agriculture based on their small village tanks.

2.2 VILLAGE TANKS

Large-scale irrigation systems and accompanying socio-political forms have generally featured prominantly in the anthropological and historical literature. Major works in Sri Lanka have enjoyed the same kind of attention, having been described as examples of the archetypical "Indian

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1 E.R. Leach, ibid p. 15.

2 Op. cit. p. 19.

hydraulic civilization" as opposed to Wittfogel's description of China as the Asian archetype.

Documentation on small-scale irrigation works and on the social organization that surrounds them however has not been as prolific, even though several thousand village tanks are in use today.[1] One of the few studies and probably the best known, is an account of Pul Eliya, a village in the North Central Province of Sri Lanka.[2] Pul Eliya deserves mention here as an example of village tank irrigation and of the kinds of social organizational responses that have arisen to ensure both continuous production and an equitable distribution of water, especially in times of scarcity.

Leach's study in fact most aptly demonostrates the importance of the tank and its water in the village economy. It is water rather than land which ultimately sets limits to cultivation and to the size of the population that can be supported. As Leach States, "For purely technical reasons, connected with the procedures and efficiency of irrigated rice agriculture, the arrangements of the Pul Eliya ground are difficult to alter. They are not immutable, but it is much simpler for the human beings to adapt themselves to the layout of the territory than to adapt the territory to the private whims of individual human beings".[3]

2.3 BRITISH COLONIAL POLICY WITH REGARD TO IRRIGATION AND WATER MANAGEMENT

By the time of the advent of the British in Ceylon in 1796, rice culture

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1 Only a few however have been in continuous use over the centuries. Many have been abandoned and then restored again.

2 E.R. Leach, Pul Eliya : A Village in Ceylon.

3 ibid. p. 301.

had declined over a period of centuries to reach one of its lowest ebbs. The country was highly dependent on foreign supplies - mainly Indian - which in themselves were precarious. Chena cultivation according to the 'Blue Books' comprised some 100,000 acres out of the 450,000 acres being cultivated in 1833, and was an important complement to rice in the rural economy, often serving to offset the consequences of frequent rice shortages.[1] The Crown Lands Encroachment Ordinance of 1840, its amendment in 1897 (The Waste Lands Ordinance) however curtailed the benefits of this system of farming.[2]

Soon after the consolidation of their power over the entire island in 1815, the colonial Government of Sri Lanka began addressing the task of boosting indigenous agriculture. It recognized that restoration of the ancient irrigation works could be a prerequisite to increasing domestic rice production even if only to levels satisfying domestic consumption. Expense proved to be the greatest impediment to this endeavour but during the early decades of the 19th century attempts were made to restore at least a few of the major tanks. The Government also toyed with the idea of giving protection to the domestic rice producer by imposing a customs duty on imported rice. Despite these measures, domestic rice production hardly appeared to have been resuscitated and by the end of the first half of the 19th century, irrigation works and improvements had come to a halt and the Government began to neglect the rice farmer in favour of the more lucrative plantations. Indeed dominant thinking at the time was that it was a more profitable course for Sri Lanka to grow coffee and import rice, a view which seemed further justified given the fact that only 20% of export earnings went towards rice imports in this era.[3] Moreover the planters as a class were now in a position to influence

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1 Chena cultivation is shifting or slash-and-burn cultivation.

2 Because of the damage to land fertility caused by chena farming, it was called a "system fraught with greater evil".

3 A.C.M. Ameer Ali, "Rice and Irrigation in 19th Century Sri Lanka" in Ceylon Historical Journal, Vol 25, Nos. 1 - 4: p. 256.

Government policy and was firmly committed against any Government investment in irrigation which might create a competing demand for labour.

Coupled with the above, a further important reason for stagnation in irrigation works was the Colebrook Commission, whose deliberations resulted in the abolition of rajakariya in 1832. While this system had in certain ways become a burden to the people, "even the Commission admitted the usefulness of rajakariya for irrigation purposes"[1], especially maintenance.[2]

Neglect and decline of the domestic rice sector through a halt in irrigation works continued until certain events in 1848 and after, (including a rebellion and acute shortages in the country's food supply) induced the Government to embark on a policy of repairing irrigation works. This was fuelled further by the need to feed imported Indian coffee plantation labour, which made Coomaraswamy State in the Legislative Council that "coffee cannot prosper without rice, and the two must go hand in hand".[3] As a result an estimated total of 13.5 million rupees was spent between 1855 and 1904 on irrigation.

What were the effects of this investment in irrigation? According to available data, paddy acreages were extended from approximately 400,000 acres to 600,000 acres within a period of roughly 45 years. What is interesting is that most of this expansion took place between 1850 and 1880 when concentration was on the small village tanks rather than on the larger tanks. Also, most of the land that became cultivated as a result of investment in irrigation were not virgin lands but rather those that

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1 ibid. p. 256

2 Though here a distinction should be made between state - rajakariya and community - rajakariya. The latter tended to continue despite official abolition as it was important for community survival.

3 ibid. p. 259.

had been abandoned in an earlier period because of a deterioration in older tanks and canals.

What merits an explanation is why expansion in paddy acreages slowed down after 1880, especially with the restoration of larger irrigation works in this period. The answer can be sought in the report of the Central Irrigation Board regarding the Tissawewa, at Anuradhapura, restored by 1877 at a cost of nearly Rs. 13,000. It States that, "the main objective of this tank was colonisation and not to supply the wants of an existing population" but that after completion, "there were no people to purchase lands there".[1] According to another report, by 1887 there were nearly 100,000 acres of irrigated land lying idle in the hands of the Government, most of them in sparsely populated areas, because there was no effective demand for them. Table 2.1 depicts the situation in 1905. What is noteworthy is that the highest percentage of unutilized irrigated land was in the North Central, Central, Nothern and Western Provinces and it was in these parts and the Southern Province that the Government spent most on irrigation. The Government's expectation was that once irrigation was provided by restoring the large tanks, people would automatically migrate to these places.

> "Low country Sinhalese and Tamils from congested areas as well as capitalists must look in the main for the opening up of the country with rich soil and so many fields of enterprise to be carried out. There is every ground for hope that men of the right stamp will begin to be attracted as soon as the railway has made the country accessible and the restoration of the tanks for irrigation completed".[2]

But this proved to be unreasonable as the high price of paddy lands after 1860, endemic malaria and parangi (yaws), the attraction of more prosperous ventures in other areas and the vagaries of colonial administration, all combined to impede migration.

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1 Ameer Ali, op. cit. p. 265.,

2 Government Agent's report for the North Central Province, 1904, 110 p.

Table 2.1 - Irrigated (New) Lands Cultivated and Uncultivated (1905)

Province	Total acreage	New Lands cultivated (acres)	New Lands Unsold (acres)	sold Lands %
Western Province	664	459	205	31
Southern Province	18,930	9,823	9,107	48
Northern Province	18,262	4,676	13,586	74
Central Province	1,857	263	1,594	8
Eastern Province	46,855	32,406	14,449	31
North Western Province	11,079	1,286	9,793	88
North Central Province	10,927	6,559	34,368	84
Uva Province	3,478	1,432	2,046	60
Sabaragamuwa Province	4,390	1,246	3,144	72
Total	146,442	58,150	88,292	60

Source : Sessional Paper XLV of 1905.

Yet another reason contributing to the under-utilization of irrigated lands in the Eastern Province and in the Vanni Pattu areas of the Nothern Province was the burden of the water rate introduced in 1867.[1]

1 Whenever irrigation works were constructed or refurbished the villagers who got benefited from such works were expected to repay the State's costs in ten instalments. This was then known as "water-rate". See Roberts, "Land Problems and Policies", in University of Ceylon, History of Ceylon. vol. 3. p. 141.

The rule of paying for water is one that needs elaboration, especially in today's context when water management problems have evoked serious concerns. It is felt today that it would be politically volatile to ask Sri Lankan farmers to pay for irrigation water, when it is considered a resource to which they have always had an inalienable right at least in terms of village tank water. But it is interesting to note that payment for water was not new to Sri Lanka even in 1867. It had been in fact an indigenous regulation in many parts of the country from a much earlier period.[1]

The problem with the water rate introduced in 1867 was that it was calculated on a new principle which made it burdensome for areas which were less populated and more remote, hardly an inducement to settlement in these areas. As a result of the first purpose of irrigation which was to extend the cultivated area through resettlement, met with only limited success.

A review of irrigation policy in the 19th century moreover shows that all irrigation restorations were of a piecemeal nature where more attention was paid to the physical restoration of tanks rather than to providing the connecting links, first among the tanks and second, between the tanks and the fields or the tanks and the stream. As it happened all the tanks in the Eastern Province were restored without attention to natural feeder or intake channels for supplementing rain supply. As stated by one author, the British probably misunderstood the importance of canals which to them, "were more a means of transport than of irrigation"[2] and the importance of which deteriorated even further in their thinking with the advent of railways. Without proper links between the streams and tanks and the tanks and fields, regular cultivation and harvests were hampered

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1 L.S. Perera, "Proprietory and Tenurial Rights in Ancient Ceylon" Ceylon Journal of Historical and Social Studies, Vol. 1, No. 2, 1959.

2 Ameer Ali, op. cit. p. 273.

and more importantly, wide fluctuations in the seasonal production of paddy became the order of the day.

The dominant theme in British policy of indirect rule until the 1930s' was to institutionalize customary forms of social organization at the village level. As for water management, the British institutionalized the post of Gamarala or Vel Vidane to continue customary forms of water management in village irrigation systems.

It can be recalled that the British had created their own problems by abolishing the system of rajakariya in 1832, followed by the instituting of minor courts which deprived the gamsabhavas[1] of the legal means at their disposal for ensuring compliance with village agricultural customs, including mobilization of village labour for irrigation maintenance. With the deterioration of village tanks and ensuing decline in village-level cooperation, the British decided to introduce the Paddy Lands Irrigation Ordinance in 1856. This document was remarkable for its recognition and support of traditional customs and institutions, including the gamsabhavas as "indispensable preliminaries to any attempt at improvement".[2] Accordingly, the gamsabhavas were resurrected particularly under the chairmanship of the Korala and empowered to enforce decisions through fines. The gamsabhavas were to be simple in form and summary in action. Provision was also made to give "grants-in-aid" for half the estimated village irrigation work if the villagers themselves contributed the other half in money or labour. This brought concrete benefits to several districts.

From all available accounts, the Ordinance enjoyed a great deal of success, especially in eliciting a spirit of cooperation and in

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1 Village Tribunals.

2 Micheal Roberts, "Traditional Customs and Irrigation Development in Sri Lanka" in E.W. Coward (ed). Irrigation and Agricultural Development in Asia, 1980, p. 188.

instilling villagers with a sense of self-reliance. Indeed Governor Ward spoke of the Ordinance as having effected a "moral and social change".[1] Not surprisingly, the Government renewed the Ordinance in 1861 and made it further flexible.[2] Each Irrigation Division,i.e. Village Cultivation Officer's division was now allowed to opt for either the gamsabhava or the Village Headman or for a combination of both the Gamsabhava and the Headman. It is interesting to note that the last option was the most favoured. Under the Headman there were several Vel Vidanes (Irrigation Headman) each of whom was elected by the entire village community under the supervision of the Ratemahatmaya (native chieftain) who assisted the Government Agent on matters of native custom and law.

The role of the Vel Vidane warrants more detailed consideration here. Given the importance of the resource he controlled, i.e. water, the Vel Vidane enjoyed undisputed local authority. In theory he was accountable to the Village Cultivation Officer (VCO), but since the VCO was responsible for about 50 or more villages, the Vel Vidane was generally left to his own devices and could, if he so chose, wield wide and autocratic powers.

Traditionally, the Vel Vidane's primary duty was to supervise the cleaning and maintenance of the irrigation channels and at all times, but especially during droughts, to ensure a fair distribution of water for

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1 Roberts, op. cit. p. 193.

2 The emphasis on village communal self-Government was further supported by the British administrators by enacting a similar interesting piece of legislation, namely the Village Communities Ordinance in 1871. This ordinance provided that the Government Agent should at the request of ten villagers establish a Village Committee and the villagers should decide their own welfare. However, this Ordinance separated the judicial functions of the Committee and vested them solely in the gamsabawa. Jayantha Perera, New Dimensions of Social Stratification in Rural Sri Lanka, 1985, 45 & 46 pp.

irrigation. Any breach of irrigation regulations or land disputes were to be reported to the tulana headman[1] or to the VCO who would in turn take it to the Gamsabava.

The Vel Vidane system worked satisfactorily for several reasons: First, the Vel Vidanes were from the villages and quite often came from the ranks of the village elites. This meant that they commanded a large measure of respect and power which allowed them to be effective even without recourse to the formal sanctions of their authority. Second, they were accountable to the irrigators they were serving because they were appointed and directly compensated by the latter. As compensation was a share of the total production - 1/64 of the total harvest of each paddy holding in each cultivation season - it was in the Vel Vidane's interests to ensure maximum production, with water being delivered to the tail-ends - especially since marginal water tends to be more productive at the tail-end rather than at the head-end. And third, the Vel Vidanes were always at hand and could take swift punitive action when the need arose.[2]

It did not always follow however that the Vel Vidane system functioned well. In many instances, the Vel Vidanes succumbed to favouritism[3], or the cultivators were reluctant or unable to remunerate them. According to one source, "the greatest problem bedevilling the work of the Irrigation Ordinance was the inability of so many villages to sustain their corporate activities without the compulsive fiat of Government. However, much local influence the headmen were supposed to have,

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1 Headman responsible for dozen or more villages and his area of operation was generally known as tulana or Ararachchi's Vasama.

2 M.M. Karunanayaka, "Farmer Organizations and Irrigation Leadership in Sri Lanka: Retrospect and Prospect". Marga, 1981, p. 7

3 Harriss in his discussion of water management in Hambantota states, "far from being the dictators of popular mythology, the Vel Vidanes in Hambantota district seem to have been pawns in the hands of the elite" in B.H. Farmer, Green Revolution?, 1977, p. 369.

they were not altogether successful in enforcing obedience to irrigation rules and in supervising irrigation works".[1]

After the 1930's and 1940's one can see the decline of communal action and of the authority of the Vel Vidane as a consequence of the many changes that were taking place at the time; the intrusion of a money economy and new forces of trade and individualism. These changes were mainly due to the (i) changing ideologies of the British - "the ideology of self-Government began to supercede that of imperialist colonialism"[2] and (ii) the accelerated process of politicization that began in 1931 with the introduction of universal franchise.[3] Also there emerged a new class of non-cultivating landowners as a result of the sale of crown land which continued until 1935. Under the village tanks, crown lands for paddy cultivation were sold in four-acre blocks and they were commonly known as akkara idam ('acre-land'). Then only the rich villagers could afford to buy acre-land. They sharecropped their land and extracted payment and rents while disassociating themselves from the technical requirements of agricultural production.

It is self-evident that these factors contributed to undermining the strong social conditioning in traditional irrigation practices, the only climate which would effectively support a Vel Vidane model of irrigation leadership. We shall return to this point when comparing the Vel Vidane system with the Cultivation Committees which were to replace it.

2.4 POST-INDEPENDENCE POLICY WITH REGARD TO IRRIGATION AND WATER MANAGEMENT

With the enactment of the Paddy Lands Act in 1958, we come to the next

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1 M. Roberts, op. cit. p. 200.

2 E.R. Leach, op.cit., p. 50.

3 Jayantha Perera, op.cit 1985.

major landmark in the evolution of systems and policies of irrigation and water management. Under the Paddy Lands Act, Cultivation Committees (CC) were set up at village-level, on the one hand, to enforce tenancy reforms and on the other, to promote the development of paddy-cultivation. In accordance with the latter, CC's were to develop and maintain irrigation works by setting up "irrigation committees" within the framework of the CC system. Village representatives (known as Irrigation Agents) were to be elected to them and made responsible for all irrigation-related affairs in respect of the villages they represented.

Evidence suggests that basic contradictions which surfaced in the implementation of the Paddy Lands Act contributed to the failure of the CCs in achieving the objectives assigned to them as village-level institutions.[1] To this was added the conflict in orientation and function between the tenancy reform objective and the irrigation management objective. The Paddy Lands Act was primarily concerned with the tenants while the Irrigation Ordinance was concerned with the proprietors, who were the only persons allowed to attend the kanna meeting. Again, the CCs were required to implement a controversial land tenure law while at the same time, promote a non-controversial service function of irrigation. And perhaps the greatest drawback was that of the non-inclusion of the CC's in the schedule of the Rural Courts Ordinance, which meant that the CC's had no recourse to action against those who contravened irrigation rules. As Weerawardena states, by the time the legal defects were remedied, "the damage was irreparable".[2]

A comparison of the Vel Vidane system with the Cultivation Committee approach to water management, moreover shows that none of the merits of the former were encompassed in the latter. It will be recalled that the merits of the Vel Vidane system lay in a form of compensation tied to

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1 M.M. Karunanayake, op. cit., 29

2 I.K. Weerawardena, Lessons of an Experiment: the Paddy Lands Act of 1958, 1973, p. 24.

production, accountability, and some degree of traditional authority. The Cultivation Committees, by the very fact that they were to be democratically elected and remunerated by a proportion of the acreage tax (which was dependent ultimately on the ability to extract this money rather than on effectiveness in ensuring adequate and equitable distribution of water), did not possess these features. As a result of the combination of all of the above, cultivators observing their ineffectiveness, "withdrew their participation as well as their call on them".[1] As Chambers remarks, "with their low incentives and slight powers, what is remarkable is that the Govimandala Sevakas[2] have worked at all ..... that they have done so reflects the need for their services".[3]

Hence there was a void created in the transition to the CC system with the result that there was a serious deterioration in irrigation systems following the Paddy Lands Act.[4] As the CCs could not prosecute defaulters for their failure to contribute labour for maintenance, tanks and channels, bunds and water courses fell into disrepair. Despite the need for amending legislation, a decisive step in that direction was not taken up until late 1967 when the Amendment to the Irrigation Ordinance finally gave the CCs the legal powers they lacked.

The post 1970 era witnessed several reforms in village-level institutions, which came into being with the 1972 Agricultural

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1 N. Sanderatne, The Political Economy of Asian Agrarian Reform: A Comparative Analysis with Case Studies of the Philippines and Sri Lanka, Unpublished Ph.D thesis. p. 377.

2 Administrative Secretary of the CC who also generally functioned as Irrigation Agent.

3 R. Chambers, "Water Management and Paddy Production in the Dry Zone of Sri Lanka".ARTI Occasional Publication No. 8, 1975.

4 M.E. Gold. Law and Social Change 1977, p. 101

Productivity Law, and the 1973 Agricultural Lands Law. These had certain consequences for village-level agricultural planning and development, and to some extent for the link up of villages with the national economy through a process of politicization. However until the 1979 reforms - notably the Agrarian Services Act - irrigation-related functions of the CCs remained more or less the same. The Agrarian Services Act attempted to combine both the old Vel Vidane system and the Cultivation Committee system. In this regard the election of Farmer Representative with similar powers and duties as the old Vel Vidane, and the appointment of the Cultivation Officer as the last link in the bureaucratic chain, have had far reaching consequences for irrigation management at the village level. This is elaborated upon in Chapters 3 and 8.

From the foregoing discussion one can see an increasing expectation that villagers will manage their irrigation systems. State intervention facilitated this by the refurbishment of irrigation systems, while leaving the village communities to operate and maintain them. But from the beginning of this century, the Government found that the promotion of village irrigation-based agriculture did not provide adequate food stocks for the growing population. As stated earlier, the two World Wars, and the rising prices of imported rice, compelled the State to open new lands in the Dry Zone to cultivate paddy on a large-scale. For this purpose, the State spent colossal sums of money on new large-scale irrigation systems where the management of water became highly bureaucratized. Thus we see a parallel development of irrigation policy; one which catered to the national food needs through major irrigation systems and another which continued to provide for more dispersed and more subsistence--oriented needs through minor irrigation. Especially after Independence, the welfare ideologies of the time, hand in hand with the politicization process, allowed a wider-based population some power and decision-making in terms of its own welfare. This in turn necessitated renewed Government interest in minor irrigation systems and related institutional forms, as was manifested in various laws and acts enacted from the Paddy Lands Act of 1958 onwards.

2.5 MAJOR AND MINOR IRRIGATION SYSTEMS

An important preliminary clarification which is pertinent to Sri Lanka and this study is the classification of irrigation systems into "major irrigation" and "minor irrigation" which fundamentally distinguishes them according to scale and organization, rather than by physical source, conveyance or storage of water. Colonization schemes correspond to "major irrigation", where management of water from the tank to the field channels is bureaucratically governed. From the field channels to the individual field it becomes the responsibility of the users.[1] This system can be termed "bureaucratic - communal allocation".[2]

As can probably be inferred, the fact that in major irrigation systems water is first controlled by a bureaucracy and then by individuals, gives rise to a particular set of problems, chiefly of allocation and appropriation, within the communities, within the bureaucracy, and between the community and bureaucracy. Some of the specific problems that can arise are:

(a) Loss of community self-management and communal labour for maintenance as users get habituated to having all other tasks performed for them and therefore expect the bureaucracy to perform functions such as maintaining field channels, which is supposed to be the community's exclusive responsibility.

(b) Slow response time where poor communication between the bureaucracy and the users leads to poor service efficiency, both from technical and water-user view points. Of grave concern is the lack of reliability in water deliveries.

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1 With the exception of the Uda Walawe Colonization Scheme which is entirely bureaucratically-managed.

2 R. Chambers, op. cit. p. 345.

Irrigation management in the major settlement schemes in the pre-1958 period was under the Vel Vidane system with usually one colony unit overseen by a Vel Vidane. This system atrophied with the introduction of the Paddy Lands Act (PLA) of 1958, but it was not until an amendment to the Act in 1964 that the major irrigation schemes actually came under its purview. As a result there was a hiatus in local-level irrigation management. A few schemes or parts of schemes carried on with a modified Vel Vidane system but what was conspicuous was a lack of community mechanisms arising to fill this vacuum in the majority of schemes. Reasons can be sought in many factors, chief of them in the heterogenous background of the new settlers and a resultant lack of social cohesion and strong traditional leadership.

The Cultivation Committees instituted in major colonization schemes after 1964 faced many problems. The CCs in the major irrigation schemes had neither clearly defined functions nor clearly demarcated areas of jurisdiction. The heterogenous backgrounds of the settlers and irrigation-interest areas that were not coterminous with residential patterns, were some of the factors that made more difficult the tasks of the Cultivation Committees.

In summary then, it appears that while the Paddy Lands Act and subsequent legislation intended to make more participatory the management of water, in major irrigation schemes, the management system resulted in being a combination of bureaucratic control and of ineffectual participation. Though all proprietors were represented in the "water meetings" and elected a representative for regulating water issues at the yaya level,[1] the latter's authority was curtailed by the "self-management" aspects of the new system.[2]

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1 Paddy tract.

2 While water allocation/distribution persistently requires policing and prosecution of infringements, the CCs were not able to fulfill these functions.

It would be easy to conclude from this that a more authoritatian system, specially set up for the purpose such as existed under the Vel Vidane system, would perform irrigation-related tasks better. But it is clear that the factors that made the Vel Vidane system work were no longer valid, if indeed they ever were for colonization schemes. The challenge was perhaps to decide on how to strike a balance between the two principles of authoritative leadership and peoples' participation.

In contrast, minor irrigation systems were characterized typically by a communal system of irrigation management. Water that was required for irrigated paddy cultivation was collected and impounded in irrigation tanks which traditionally were the common concern and property of the community which cultivated the land under these tanks.

The equitable delivery of water to all cultivators was regulated by the village community itself and implemented through appropriate organizational forms that took into account the community's exclusive social identity. Delivery from a common water source required a convergence of community interests such that as a community, the tank bund, the inlet channels, the sluice, the spillway and the numerous small storage-tanks, were maintained in good order. Communal water management under minor irrigation systems also meant collective operational decisions regarding the allocation and distribution of water, cropping patterns, input use and other decisions which would be vital when the water supply was low.

In the next chapter, several key isues pertinent to minor irrigation are discussed in more detail.

Chapter Three

SELECTED ISSUES IN MINOR IRRIGATION

In this chapter we briefly touch on some issues that constantly surface in the water management literature on discussions of minor irrigation systems, as we feel they warrant some attention before proceeding to a discussion of our six study-villages per se. The issues that have been selected are not necessarily the only ones pertaining to, or are exclusive to minor irrigation, but are what we consider to be some important aspects of any discussion of small-scale irrigation systems. Where possible we have attempted to relate these issues to the particular examples of our six study villages.

3.1 NOTIONS OF COMMUNITY BASED ON THE IRRIGATION WATER SOURCE

In the Dry Zone, the most prevalent community type was a tank-based one. The predominance of small tanks as the base of village communities was mainly an outcome of the topography and rainfall pattern of the Dry Zone. In Monaragala district however, the predominant base of village communities seemed to have been both anicuts and village tanks. The fact that a good portion of the district falls within the Wet Zone and this area topographically is hilly allows many perennial streams to flow across the district which were then tapped for cultivation purposes by constructing an anicut or a chain of anicuts. Unlike the typical purana villages based on small tanks, villages that cultivate paddy with the help of water from an anicut have a greater assurance of water for cultivation throughout the year. Purana village tanks generally depend on the North-East monsoons which are seasonal and erratic unlike the South-West monsoons which provide ample water for cultivation of paddy in

the maha season in the Wet zone. The assurance of water in the anicuts throughout the year allows anicut-based communities to cultivate paddy in two seasons. This factor has led to the main difference between the two types of small irrigation-based communities, viz. anicut-based communities where the anicut provides the primary source of irrigation water for cultivation, and the tank-based communities where the tank generally provides supplemental water to augment that supplied by rainfall, especially towards the end of the season (see Chapter 7 for a more detailed discussion).

But in either situation the pattern of community dispersion in the area suggests that the water source was fundamental to the emergence and survival of the community. And this meant that the regulations that governed the water source were pre-requisites to its survival.

> "In the irrigation works which were owned by a village community as a whole, it was an imperative necessity to ensure that the supply of water was distributed equitably, so that one individual did not obtain an advantage to which he was not entitled, and that the maximum benefit was derived from it in the all-important task of raising rice crops. Elaborate regulations had been drawn up for the guidance of the village communities in this respect".[1]

These regulations had their origin in many factors, but primarily in who originally constructed the water source such that they and their descendents had legitimate claims over the water source and the land that could be cultivated using its water. "Though the reservoir itself was held in common by the village community, fields irrigated by them were divided into plots, no doubt of varying extent and productivity, which were individually owned".[2] But, in order to prevent wastage of water, it was necessary that the ploughing of the fields and their flooding should be undertaken in an orderly sequence and, in order to control

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1 University of Ceylon, History of Ceylon, Vol. Part 1, 1959, p. 360.

2 ibid, p 361.

these and other matters connected with the cultivation of the fields, there were field level officials who were responsible to the community as well as to the State. Thus not only matters concerning the supply of water and land preparation at the right time, but also the type of seeds that should be cultivated was not left to the choice of individual farmers.[1]

These regulations and those selected to implement them indicated that agricultural production even in the past was subject to a certain amount of planning, so that commodities needed for the community's survival were produced avoiding shortages of some and over production of others.[2]

Claims over land and water resources and compliance with the community's regulations over water use and production plans provided the primary basis for community organization, while the physical unit, the irrigation system, provided the villagers with a social identity. This identity was articulated by the villagers in their dealings with outsiders as 'ape wewa' (our tank) 'ape gama' (our village) and 'ape aya' (our people).

defined in terms of social exclusiveness, the villagers' concept of community based around the water source had at least two meanings. The first meaning was a physical area, which consisted of the water source and the potential area that was irrigated by the water source; the second was attributed to a group of people who had exclusive rights over these two resources, viz; the water source and the land under its command.

For all practical purposes it was in the community's interest to develop exclusive proprietary rights over the amount of land that could be irrigated by the water supply. It was essential for the community to

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1 University of Ceylon, op.cit. p. 361.

2 ibid, p 361.

institutionalize these proprietary rights to ensure the community's continuity. This becomes most clear when an outsider wanted to obtain a piece of land for cultivation. In this instance, he had to obtain a temporary right from the community to have access to the land and the water resources that went with it. This permission was granted if the following criteria were met: (a) sufficient water had to be available to meet cultivation needs of the farmers of the community (viz: those who have customary rights to use water); (b) there had to be a surplus over and above (a) and (c) in the event of there being a surplus, those having customary rights over land and water had to give their consent at a community gathering.

Thus we see that the water source was the basis around which the community originated and which contributed to its persistence. Access to land and water decided membership in the community, and rituals and customry laws served to regulate these interaction. However, today with the accelerated incorporation of village communities into the wider socio-economic system, the prominence of the water source in the life of the community has diminished and has been replaced with more outwardly-oriented identities such that the very basis of village community around a water source is called to question. Since this is a topic with relevance for irrigation water management, a more detailed examination is made in chapter 7.

3.2 TRADITIONAL IRRIGATION LEADERSHIP

According to several inscriptions of the ninth and tenth centuries, there were several village-level officials called vel-kami to oversee agricultural activities and other matters connected with the cultivation of the paddy fields. "Owners of fields who contravened the orders with regard to ploughing etc., were fined; so were those who neglected the ploughing of their allotments at the due date ..... The peasant

cultivator had, of course, to give a stipulated share of the produce as water rates".[1]

This pattern of irrigation and agricultural administration remained more or less the same until the 20th century. The British administration which consolidated the entire island as a Crown colony followed a system of indirect rule, leaving effective authority in rural areas in the hands of 'native' officials appointed by the Government from among the individuals who had property qualifications and social standing in their respective areas. Thus these officials scarcely differed from the feudal overlords.

The British rulers' interest in resuscitating village level 'republics' as the units of production and development had led to a series of changes in the traditional irrigation leadership in purana villages. Among these changes, the creation of the post of Vel Vidane was very important for village irrigation leadership. The post of Vel Vidane was created by the Paddy Lands Irrigation Ordinance of 1856. In each village, paddy land owners elected their Vel Vidane and normally one of the biggest land owners was elected to the post. Whenever the post became vacant, the Village Headman arranged a meeting of all paddy land owners in the village and invited the Ratemahathmaya[2] to preside over the meeting. In the presence of the Ratemahathmaya, the land owners indicated their preference for a candidate by a show of hands. Each land owner could vote for several candidates, but the candidate who was preferred by the majority was elected to the post. The Vel Vidane was responsible to the Government Agent of the Province (GA) through the village Headman and to the Vav Lekam (the Divisional Irrigation Officer). The main duties of the Vel Vidane was to ensure that the cultivators adhered to irrigation

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1 ibid, 361-2 pp.

2 Native Chieftain who assisted the Government Agent in carrying out traditional duties.

regulations pertaining to the management of water in the village tank or anicut. He was not paid a salary, but was entitled to a payment in kind which included 1/64 of the total harvest of each paddy holding, in each cultivation season. In addition, he received half the amount of fines imposed on violators of irrigation rules.

Every cultivation season, the Vel Vidane called a meeting of all paddy land owners in his village to discuss the cultivation schedule. The Vav Lekam and the Irrigation Department's petty officer called the 'Guardian' attended the meeting and decisions were taken by majority vote. Each paddy land owner, whether present at the meeting or not, had to sign the register after the meeting to show that he was bound by the decisions of the meeting. The register was kept by the Vel Vidane and it contained information on land ownership, tenure arrangements and the decisions of the seasonal meetings. The Vel Vidane supervised the activities agreed upon in the meeting such as clearaing the dam of the tank or main channel of the anicut and the maintenance of irrigation ditches. It was his duty to protect the weak cultivators from the powerful ones. He had the key of the sluice of the tank and only he could legitimately regulate water of the tank. Furthermore, no cultivator could remove his harvest of paddy from the field until the Vel Vidane permitted him to do so. Usually, the Vel Vidane waited until every cultivator completed harvesting his holding before removing the fence around the paddy field which protected the crop from stray cattle. In the case of pests and weeds, he went to the provincial town to buy the necessary pesticides and weedicides to distribute among the cultivators.

Although the Vel Vidane's duties were limited to agriculture and irrigation matters, the latter's scope often gave him powers over non-agricultural matters in the village as well. He acted as the representative of the Village Headman and assisted him in handing over summons, catching stray cattle and in other general administrative matters in his village.

Unitl 1935, the Land Settlement Officer was in charge of the Crown land sales in the villages and the Vel Vidane as the village-level representative of the Village Headman helped him in carrying out his duties. The Vav Lekam oversaw major repairs to the tank along with the 'Guardian' of the Irrigation Department. The Vav Lekam attended to the complaints of cultivators against their Vel Vidane, if any. In irrigation disputes and in the event of a breach of irrigation rules, offenders were prosecuted by him on the recommendation of the Vel Vidane.

This traditional irrigation leadership became attenuated and less prominent when the Vel Vidane system was abolished and the new Cultivation Committee (CC) system was introduced in 1958 under the Paddy Lands Act (PLA). The importance of the village as an administrative unit diminished and it lost its identity as an 'organic whole'. The CC was expected to provide a suitable framework for increasing the productivity of village paddy lands, for regulating rents paid by the tenants, for providing security of tenure to the tenants and for assuring proper wages to the agricultural labourers. However, a CC had authority over several villages, sometimes over as much as ten villages. There were ten Committee members and each of them was elected for three years. The Committee members elected did not represent wards or villages and this sometimes led to the over-representation of large villages while depriving small villages of the chance of having their members on the Committee.

Until the early 1960's, the CCs were not established in most of the rural areas partly because the Department of Agrarian Services - the department in charge of the CCs - was not fully organised in every district, and partly because of certain legal and administrative problems in the implementation of the PLA, which were not corrected until 1964. This vacuum in irrigation leadership at the village level contributed to the deterioration of village irrigation systems, especially with regard to maintenance. Also often the ex-Vel Vidanes who were not elected to the CC attempted to sabotage it. For example, several ex-Vel Vidanes in the study villages had apparently told the cultivators not to pay the

acreage levy of Rs. 6/-, claiming it was a new Government tax on land. In 1964, farmers were expected to elect their own Irrigation Representative to continue the duties of the Vel Vidane of the pre-1958 era. The Irrigation Representative was entitled to 1/3 of the acreage levy he collected. In 1969 this person was replaced by a divisional officer called the Govimandala Sevaka who worked as the Executive Secretary of the CC. For his services he could retain 40% of the acreage tax he collected.

The election of the CC members contributed to a radical change in traditional village leadership. When a low-caste villager or an outsider who had recently settled in the area was elected to the CC through the support of his fellow villagers, the traditionally powerful, often high-caste villagers, attempted to boycott the CC's decisions. Numerical dominance of caste groups or political groups allowed different sections of villagers to elect their representative to the CC irrespective of their land-owning status in the village. This shift in leadership sometimes led to the total non-participation of some other groups in the CC's affairs. They refused to pay the acreage levy or to take part in maintenance work. In some villages only 5% or less of the cultivators in fact paid the acreage levy.

For several reasons the office-bearers of the CCs sometimes were reluctant to prosecute the levy defaulters and those who did not contribute to irrigation system maintenance. In the first place, although the office-bearers enjoyed a measure of popular support, they lacked the type of qualities which were necessary for village-level irrigation and agricultural administration. Many of them had neither the education nor experience to master the technical details of the PLA so that the interpretation of complicated clauses of the Act and its amendments were beyond their command. In fact, a Sinhalese translation of the Act was not available until the late 1960s. Secondly as stated in Chapter 2, the non-inclusion of the CC in the schedule of the Rural Courts Ordinance had far-reaching effects for the authority of the CC over irrigation systems in its area of operation. And even after the

legal defects were corrected, the office bearers in many CCs were reluctant to prosecute the wrong-doers .

As a result of increased State intervention in rural areas and the concommitant process of politicization of rural organizations, the villagers were brought into close contact with Government officials in the towns. This often allowed some rich villagers to obtain advice and help in legal matters and to challenge their CC members in courts. In some instances, even if a defaulter was prosecuted, it was doubtful whether the judges would be impartial in trying the case as some rich, educated land owners had good contacts with Government officials and knew how to avoid legal sanctions directed against them by the CC.

The post-1970 era in rural Sri Lanka witnessed increased party political intervention in local organizations. A clear indicator of this process was the move from election of office-bearers of Cultivation Committees to their appointment by political leaders. The Agricultural Lands Law of 1973 superceded the PLA of 1958 and abolished the old CC system based on election. Instead, it introduced a new CC system with appointed members to function as village-level agents of a new divisional agrarian agency called the Agricultural Productivity Committee (APC). This move led to the further deterioration of village-level irrigation leadership as the CC members were appointed by the politicians on the criteria of political popularity and the ability to deliver votes in an election. Property ownership, family status and social standing which constituted the traditional criteria of village leadership thus became less important while the ability to be a good "vote bank" became more important in the appointment of CC members.

The Agrarian Services Act of 1979 in its attempt to combine both the old Vel Vidane system and the Cultivation Committee system, established Agrarian Services Committees (ASC). The members of the Committee were to be appointed by the Commissioner of Agrarian Services. It "shall consist of not more than fourteen persons of whom not more than eight shall be public officers or employees of public corporations and statutory

bodies".[1] The Commissioner was empowered by the Act to appoint a salaried official called the 'Cultivation Officer' for each division of the ASC, who is supposed to be a link in the bureaucratic chain - an agent of the Government. At the tract (yaya) level, cultivators elect their 'Farmer Representative' (FR) who is the village level agent or helper of the Cultivation Officer. Villagers normally address the FR as Vel Vidane and the latter is entitled to receive half a bushel per acre as his huwandiram (salary) as in the past. However, the new Vel Vidane is the last link in the Government hierarchy of a system of 'direct rule'. The selection criteria are often based on political party loyalty and links with the officials rather than on property ownership and traditional acceptance as an influential member of the village. The Farmer Representative has little powers over irrigation matters and he plays more of an intermediary role between farmers in a yaya and the Cultivation Officer.

3.3 FRAGMENTATION

One of the major problems besetting minor irrigation systems today is the question of fragmentation. Fragmentation is a natural response to pressure on land. When each child is entitled to inherit property from his parents, the progressive subdivision and fragmentation of agricultural holdings are inevitable. Added to this is the continuing prestige attached to owning at least some land in the village paddy field since the latter defines membership in the village and the ability to take part in village decisions over agricultural production and irrigation matters.

In the past, when population grew faster than the expansion of irrigable land under the village tank, there were several options available for villagers to adapt to these contingencies. The first was to move out of

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1 Agrarian Services Act, No. 58 of 1979, p. 38.

the village to establish a new village under a refurbished tank.[1] The second was to practise thattumaru and kattimaru[2] methods of cultivation on existing lands. The third was to keep customary rights over some paddy land and the tank but to rely on chena cultivation in nearby jungles for most if not all subsistence requirements. At present, all three alternatives pose problems. The establishment of new villages is difficult as abandoned tanks are no longer available in the vicinity and because the law currently does not recognise the right a villager earlier had over a tank that was refurbished by him. Today extensive jungle lands are also not available to cultivate chenas as permanent settlements have grown up to accommodate the growing rural population. The size of land holdings does not make thattumaru and kattimaru practices practical any more and those who do follow these practices are now further inconvenienced by the lack of adequate employment opportunities during the periods when it is their turn to forfeit their right to cultivate.

The non-availability of adequate alternative employment opportunities and the sub-division of the allotment have given rise to several problems. Chiefly amongst them fragmentation has resulted in many uneconomic-sized holdings which moreover constitute an obstable to the efficient organization and management of paddy cultivation and especially the synchronization of agricultural operations. While to some extent in the purana villages we studied the deleterious consequences of dividing the land among several offsprings have been mitigated by cultivating the land collectively according to an agreed schedule, the spread of concepts of individual property ownership has been pervasive, militating against such cooperative cultivation. As a result, the adverse effects of fragmentation have become clearly evident most especially in the fact

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1 This was the case in Ethimale, one of the study villages.

2 In the event of pressure on land a system of rotation either by plot (thattumaru) or operator (kattimaru) was instituted as an adaptive mechanism.

that it has demanded more offtakes from the irrigation channel and ultimately more irrigation water to cultivate the same piece of land.

Fragmentation has had further consequences for paddy production. For one, it strictly limits any advantage associated with economies of scale such as tractor use, and for another, because the returns to labour are marginal, farmers are found to divert their labour when possible, to other areas, for example expanding the acreage under chena cultivation or pursuing non-farm employment elsewhere. This results not only in low average yields under minor irrigation systems, but also brings into question the whole issue of investing in rehabilitation of minor irrigation systems in the context of farmers not placing their economic priority on these lands but on other activities beyond the confines of the irrigation systems. This is especially the case today in tank-based irrigation systems. As they appear to play only a supplemental role in village agricultural activities, it would seem that any improvement to the physical structures without accompanying tenurial refoms would bring little benefits to the community.

The VIRP does not address this issue directly but rather seeks only to achieve the objective of improving the irrigation water supply for cultivation. Thus it aims not at the improvement of the farm size and settlement patterns by purposeful changes in property rights but rather at the improvement of the land use pattern without changing existing rights to land and water. Thus even if a farmer's water supply increases because of rehabilitation of the system, the smallness of his property will remain a limiting factor militating against any possible marked increases in income and family welfare. The fact that this is a grave problem is evident in the table below which gives the size of holdings in our six study locations. As can be seen, 70% of all holdings are less than one acre each.

Table 3.1 - Size distribution of paddy holdings in the study villages (N=311)

Size (acres)	A 1	A 2	A 3	T 1	T 2	T 3
Under 0.25	2 (8.3%)	0 (0.00)	0 (0.00)	0 (0.00)	1 (0.9%)	1 (1.2%)
0.25 - 0.50	0 (0.00)	11 (40.7%)	21 (70.0%)	9 (31.0%)	3 (2.6%)	18 (21.4%)
0.51 - 1.00	0 (0.00)	7 (25.9%)	8 (26.7%)	12 (41.4%)	108 (92.3%)	19 (22.6%)
1.01 - 1.50	0 (0.00)	5 (18.5%)	1 (3.3%)	6 (20.7%)	5 (4.3%)	20 (23.8%)
1.51 - 2.00	16 (66.7%)	4 (14.8%)	0 (0.00)	0 (0.00)	0 (0.00)	11 (13.1%)
2.01 - 3.00	4 (16.7%)	0 (0.00)	0 (0.00)	1 (3.5%)	0 (0.00)	6 (7.1%)
Over 3 acres	2 (8.3%)	0 (0.00)	0 (0.00)	1 (3.5%)	0 (0.00)	9 (10.7%)

3.4 TENURIAL COMPLEXITIES

One result of a limited resource base plus a natural process of differentiation has been the emergence of different and complicated systems of tenure within small irrigation systems, further complicated by the fact that even many of the original cultivators do not have free-hold rights to the lands they cultivate.

The villagers of the Monaragala district still derive most of their income and subsistence from paddy and chena cultivation. The village wewa (reservoir) or anicut plays an important role in the village economy. The extent of paddy land the villagers could cultivate depended

on the amount of water the wewa held or the amount of water the anicut delivered in a given season. In a paddy tract, at least two sections can be recognised: mulatha (top-end) and agatha (tail-end). In some instances a mada (middle) block can also be identified. Cultivators hold land individually or jointly in these sections and their holdings are known as pangu (shares). Several Ordinances enacted by the British rulers between 1840 and 1935 brought several structural changes to the purana village economies. Ordinance No. 14 of 1840 - The Waste Lands Ordinance - and its Amendment of 1897 were enacted to achieve security of tenure land and to protect Crown lands from encroachment. The British rulers believed that the security of private property was essential in establishing a suitable foundation for agricultural development. The Ordinance required surveys of all lands in the island to distinguish Crown lands from private lands. Both paddy land and high land which were under permanent cultivation at the time of the survey were recognised by the Government as praveni (ancestral) property and the rest as Crown land inclusive of the village tank.

The earliest phase of State intervention in rural areas could be seen in the refurbishment of tanks and anicuts by the Government. The refurbishment of water sources by the Government took the form

either of replacing a plank sluice with a sluice which had a metal valve to regulate the water supply from the wewa, or raising the dam of the wewa to hold more water, or providing permanent structures for temporary anicuts. With these physical works the State sold land within the command area, which came to be known as akkara idam (acre land) or sinnakkara idam (freehold land). Thus two main types of paddy land came to be identified, that is purana land and akkara (acre) land.

High land, that is unirrigated land was of several tenurial categories: praveni (ancestral), sinnakkara (freehold), badu (leasehold) and anawasara (encroachments). Homesteads constituted the first and second category of highland. Village Expansion Schemes consisted of lands designated as badu idam which were not allowed to be sold by the occupier. The fourth category was chena lands.

Until recently, each village was surrounded by scrub jungles which were accessible to all villagers to cultivate various crops under rainfed conditions. Such cultivation was done for one or two years on a piece of land before it was abandoned for a much longer period for regeneration. chena cultivation on Crown land was officially branded as encroachment. A major aspect of the land policy of the British administration in the 19th century was to stop such encroachments.

Under minor tanks, usually villagers are able to cultivate their paddy holdings only during the maha season and this is done mainly to provide for subsistence needs. Tank water is used generally towards the end of the cultivation season to complete their field operations. In our tank-based study villages, 96% of villagers said that they owned their paddy lands singly and cultivated them with the help of family and hired labour. However, under anicuts several types of tenurial arrangements are reported and this seems to support the contention that paddy cultivation plays a vital role in the community's economy. Under anicuts 42% cultivators own their paddy fields singly and another 24% jointly. The number of cultivators who leased-in land is also significant (30%) (see table 4.1).

The marked incidence of leased-in (ande) tenancies under anicuts is not the result of the availability of large paddy holdings to let out to tenants. The average size of paddy holding under an anicut is 1.15 acres and for a tank 1.19 acres. Land owners let out their small paddy holdings on ande tenancies for other reasons. Many land owners still think (and are often reminded by their landless relatives and friends), that they have an obligation to lease out some of their paddy holdings to their kinsmen and friends. Second, renting out land on tenancies is a sure way of recruiting dependants in the villages. Third, some of the landowners rent out their land either because they have left the village or because they are engaged in more lucrative occupations other than paddy cultivation, e.g., sugar cane cultivation or chena cultivation on a large-scale. Fourth, whenever a villager mortgages his paddy holding to obtain a substantial amount of ready cash for a family crisis, the general practice is to allow the mortgager to keep the land to cultivate on ande tenancy if he so desires.

In our study locations, we came across several types of tenure which have in effect recognised the usufruct rights to land. Some of the variations of tenure which we found to be very common were:

(a) Kuli Ande (Labour Tenancy) The landowner gives land, seed paddy, fertilizer and buffaloes to plough the land, and the andekaraya (tenant) provides his labour and manages all the production operations in the holding. At the end of harvest, seed paddy and acreage levy are deducted from the gross harvest and the net harvest is divided equally between the tenant and landowner.

(b) Otu Ande: The landlord provides only land and the tenant supplies all the inputs in addition to his labour and the management of the operations. Under this arrangement, the landlord receives only 10-12 bushels per acre (about 25% of the total harvest) as ground rent. This arrangement is popular among relatives. Widows, old and sick landowners also prefer this arrangement and in reality, it is considered more as assistance than as an ande relationship.

(c) Badu (Mortgage) : Under this arrangement, a landlord agrees with a cultivator to give up his use rights for a season or two for a fixed payment. In 1984, for an extent of pala roughly 1/2 acre) the payment was between Rs. 225/- Rs. 250/- a season. Generally this is an oral agreement between the two.

(d) Another variation of (c) is to lease out paddy holdings indefinitely. Under this arrangement, the landlord gives the land on rent for approximately Rs. 450/- an acre and the leasee cultivates it until such time that he has paid back the entire amount. The leasees pose problems in the sphere of irrigation management. They normally do not take part in the main channel maintenance which is the duty of each cultivator of paddy under the community's water source. Then the mortgager has to attend to this work which he also often neglects.

The Paddy Lands Act and subsequent tenancy laws aimed at giving the tenant the status of a renter of land, paying only one quarter of the harvest to the landlord. The laws attempted to guarantee that he could neither be evicted nor be asked to pay more than a quarter as rent. The rent provisions of the laws combined the advantages of a fixed rent and a share rental. The share, fixed at a maximum of one quarter of the gross harvest, divided the risk of harvest fluctuations. At the sametime, a fixed rent ceiling - only 12 bushels of paddy - gave tenants an incentive to increase production.

All these measures, though favourable to the tenants however, did not guarantee the security of their tenancies nor limit their rents. Many tenants still pay share rental, as we observed in our study villages, at customary levels above a quarter of the harvest for many reasons. Among them are (i) the fear of eviction, (ii) dependance on the landlord to obtain draught animals, seed paddy and sometimes subsistence during the period between sowing and harvesting, and (iii) social and customary restraints - long standing friendship and primordial relationships. The tenants who cultivate holdings of widows and of old and sick landlords

usually give half of the harvest as help and not because of pressure from the landlords.[1]

3.5 PADDY - CHENA INTERRELATIONSHIPS

Typically village tank systems had a two-fold (paddy-chena) land use pattern that was adapted to the Dry Zone environment and in turn decided the direction of allocation of resources, especially family labour. This has evolved through the years on the basis of the farmer's knowledge of how best to manage his land and water resources within the confines in which he operates.

Chena cultivation is devoted mainly to the production of upland crops and is not only an insurance against crop failure in paddy but is in itself an important contributor to family income and family diet. The villagers saw chena cultivation primarily as a regular means of growing essential food and also as a surplus for sale. In fact income from chena has increased substantially over the past few years because of the high openmarket prices for most chena crops. Crops such as chillies, gingelly and kurakkan, which were earlier grown for subsistence are now grown on a commercial basis, along with soya beans and cowpea. Hence chena cultivation is a significant part of the farming system and when successful, often provides a bigger income than paddy. The seasonal pattern of chena earnings is also important as chena requires labour and provides income at the time of the year when labour opportunities elsewhere in agriculture are minimal and when outlays for maha paddy land preparation need to be made. Hence earnings from chena are critical for the maha paddy cultivation that is to follow.

The mixed cropping aspect of chena had many advantages. The wide variety of crops grown made chena cultivation suitable to a range of soil and water conditions. Chena cultivation involved at least 2 crop rotations:

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1 Jayantha Perera, 1985. op.cit. pp. 99-102.

simultaneous rotation evident in mixed cropping and the rotation between two seasons, the maha and the yala. The maha crropping of kurakkan was generally followed by more drought resistant crops such as gingelly in the yala. In the yala such cultivation was risky as the rains often failed, but the profits of a successful crop were very high, especially since paddy cultivation was not possible under many small irrigation systems.

Chena cultivation was further a system that allowed for some distributive justice for all inhabitants of the village. Since paddy lands under small irrigation systems had their natural limits, each generation had less land in the village yaya than its predecessors. Thus the only source of land for expansion were the surrounding jungle lands which were considered to be part of the village. Villagers who worked hard started their own chenas since their cultivation required minimal capital : a few tools and some labour for clearing the jungle and fencing the area.

Generally farmers tend to go first to their chenas, taking advantage of the initial maha rains.[1] By the time their chena crops are established and most of work relating to them is over, the tanks also have filled and they begin their paddy cultivation therefore with some assurance of having irrigation water to complete their field operations.

Hence the "delay" in starting paddy operations is often a rational course of action for farmers and is dictated by several factors including the fact that chena cultivation is an important and integral part of the tank economy relying exclusively on rainfall, and that waiting for the tank to fill gives some assurance against paddy crop failure. These factors must

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1 Chena is much more dependent on the vagaries of rainfall than paddy since paddy can depend on irrigation water.

be remembered in relation to the new water management programmes that have been advocated under VIRP which appear to be premised on the notion that chena cultivation in some way adversely affects paddy cultivation.[1]

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1 Studies have been done to show that chena cultivation is not detrimental to paddy cultivation. See for example, W.P.T. Silva "Chena - Paddy Interrelationship" in B.H. Farmer (ed.), Green Revolution? 1977.

Chapter Four

A COMPARISON OF TANK AND ANICUT SYSTEMS

As stated earlier, three anicut systems and three tank systems were taken up for study and we felt it might be useful to determine if because of the water source there were differences in terms of community formation, water distribution, conflict management and generally in terms of institutional arrangements for irrigation water management.

4.1 WATER SOURCE AS A BASIS OF COMMUNITY FORMATION

The fundamental difference between a tank-based community and an anicut-based community in Dry Zone Sri Lanka can be seen in the multiple functions the water source plays in the formation and continuation of these communities. Tank-based communities are comparatively older than anicut-based communities. The former originated around a new or a refurbished reservoir by a group of families who later claimed exclusive rights over it and the land cultivated under it. In fact, even during the British period, it was the policy that anyone who went to the trouble and expense of repairing a small abandoned wewa (tank) in the jungles was entitled both to the land of the wewa itself and the area cultivated under it. Thus the identity of the community and operational rights to land were decided by the use-rights over the tank and the tank water.

However, the tank's importance for the community's identity was not always matched by its importance for the economy. Villagers did chena cultivation (slash-and-burn) in the Crown jungles and the produce of such cultivation often provided the villagers with their staple food. But access to Crown lands to practise chena cultivation did not provide a

permanent base for community formation. Thus, the paddy lands which were dependent on the village tank fulfilled this role and thereby played a more non-economic role for the community than generally attributed to it by researchers (e.g. Leach, 1961); that is, the tank provided the base for community formation. Moreover, various rules governing village life and the use of land and water such as the fact that only villagers could own paddy land in the village, or institutions like variga,[1] (sub-caste) were mechanisms to keep village land intact from outsiders, while providing an exclusive community identity, although the tank-irrigated land did not always provide the staple food and/or major source of income.

This fundamental aspect of community formation and survival around the tank has continued even with several phases of State intervention in the form of refurbishment of the tanks and institutional arrangements for water management introduced from without. This is evident in the fact that the majority of farmers under tank systems still feel that they themselves are responsible for certain maintenance work e.g., cleaning field canals and fencing the yaya prior to the cultivation season.

In an anicut-based community, the water source was established by an existing community, which as a group diverted the stream for purposes of irrigated agriculture. In all three anicut systems under study, the farmers can remember the origin of their anicuts. Thus the anicuts are of comparatively recent origin and the histories of anicuts are not as old as the communities they serve. As anicuts are diversions of a stream/river, the anicut-based community does not always comprise of the water source, the residential hamlet and the irrigated fields all next to one another as in the case of a tank-based community. In contrast, in anicut-based communities, there is somewhat less of an integration between the water source and community, not the least, because unlike in

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1 Sub-caste.

tank systems, the residential cluster is not located by the water source but is often some distance away. In the tank-based system, the legitimacy of land ownership and use-rights arose from the tradition of labour which was internal to the community, whereas in the anicut-based systems, the apparent legitimacy of using water by a particular community was strengthened by the intervention of the State in the form of reconstruction and rehabilitation. Therefore one can observe that farmers tend to believe that the responsibility for maintenance of the anicut systems lies with the State or its agents at the village level, viz; the Farmer Representatives - assistants to the State-appointed Cultivation Officers. Another reason for lesser involvement of farmers in the maintenance of anicut systems is that an anicut system is often one in a chain of anicuts along the same stream/river. For example, in Pussellawa, there are five anicuts above the Pussellawa anicut and another three below it. Thus unlike in a tank system, an anicut system does not have a clearly demarcated reservoir area and a water source which can be governed by the community as its exclusive "property". Rather water in the anicut is "fugitive water" and does not have the advantage of being stored.

In this context, it is noteworthy that all three study anicuts were originally built by farmers and in the case of A 2 and A 3, the Government stepped in mainly to convert what were temporary anicuts into permanent ones. This was the first major intrusion by the State into these systems and this served to legitimise them and especially the irrigated land, in the eyes of the officials and of the people. Government intervention also appears to have affected the perception of these two communities as to whom the irrigation systems belong and therefore, as to who should do maintenance work. Farmers were quick to State that the anicut belonged not to them but to the State. This is in direct contrast to the rehabilitated tank systems where there was more ambiguity in the minds of villagers as to whom the physical works belonged, with the result that some farmers said it belonged to the community, others to the State and some others stated that it belonged to a particular individual (for reasons of initial construction).

4.2 PRIMARY VERSUS SUPPLEMENTAL ROLE OF WATER SOURCE IN THE VILLAGE ECONOMY

Another important difference between tank-based agricultural systems and anicut-based agricultural systems in the Monaragala district is that the former mainly fall into the Dry Zone areas of the district and the latter into the Intermediate Zone. The uncertainity of rainfall in the Dry Zone areas has given the tank-based agricultural systems a distinct character which distinguishes them from anicut-based agricultural systems. The small village tanks in the Dry Zone usually do not have feeder streams or rivers but solely depend on rainfall to collect water. Rainfall is erratic and especially in the yala cultivation season, it is highly unreliable. Thus a tank system rarely allows farmers who cultivate paddy under it to have a second crop, i.e., yala harvest. In the past five years, as many as 85% of the farmers had not cultivated a yala paddy crop and 12% had not even cultivated a maha crop.

In contrast, the three anicut systems studied are located in the lower reaches of the central hills where streams have their catchment areas. Hence they have a relatively continuous flow of water throughout the year. Thus compared with Dry Zone small village tanks, anicut systems provide a more regular and adequate water supply for two cultivations of paddy per year. In all three anicut systems, all farmers had cultivated maha and in the last 5 years about 40% had also been able to cultivate some of the yala seasons.

The average yields per acre however were comparatively the same under the two systems. Under the tanks, farmers got an average of 41 bushels per acre in the maha 1983/84 and in the event they cultivated yala, they obtained an average of 21 bushels per acre (15% cultivated some paddy land during the yala and such cultivation was done in the top-end of the paddy tract). Under the anicut systems, 43 bushels an acre on average was obtained in maha 1983/84 and about 08 bushels per acre in yala 1984.

Under tank systems, farmers prefer to defer their paddy cultivation until they have got their chenas growing using the maha rains, as chenas formed an important part of the tank-based economy and brought in a major portion of the household income. Generally, as a result, farmers tend to return to their paddy fields towards the tail of the rainy season, so that they end up relying on tank-stored water to complete their maha paddy operations. This precludes them from cultivating a yala crop using stored water from the tank. Thus one of the main differences between the two water sources (viz. tank and anicuts) was that the tanks were essentially supplemental irrigation water sources for a maha cultivation while yala was generally not cultivated. In contrast, the anicuts were essentially primary irrigation water sources for both maha and yala cultivation of paddy.

The above point can be further illustrated by a comparison of the tenurial status of farmers under anicut and tank systems. The anicut-based communities displayed a much higher level of transactions land than in the tank-based communities, as seen in the tenurial arrangements given in the table below:

Table 4.1 - Tenurial Status of Farmers Under Anicut and Tank Systems

Tenurial Status	Anicut systems		Tank systems	
	No.	%	No.	%
Singly owned	25	42	206	96
Jointly owned	14	24	02	01
Leased out	01	02	02	01
Leased in	17	29	04	02
Mortgaged	02	03	00	00
Total	50	100	214	100

The operational diversity as typified under the anicuts supports the contention that farmers within anicut systems are more dependent economically on the water source and the land irrigated by it than those within tank systems. Under anicuts, unlike under tanks, nearly 1/3 of the farmers are engaged in temporary land-use practices such as leasing-in, suggesting perhaps that paddy farming plays a more important role for the anicut-based economy than for the tank-based economy.[1]

The issue of the adequacy of water for paddy cultivation in the maha season may also support the contention that anicuts are a primary source of water while tanks are more supplemental one.

Table 4.2 - Percentage Reporting Adequacy of Water for Paddy Cultivation in the Maha season (N = 311)

Response	Anicut systems		Tank systems	
	No.	%	No.	%
Adequate water	46	57	221	96
Not adequate water	35	43	09	04
Total	81	100	230	100

As seen in table 4.2, 96% of farmers felt that their tanks provide enough water. It appears to be adequate mainly because cultivators rely on the tank-stored water to complete their maha cultivation operations unlike

1 High incidence of leasing in of land under anicuts perhaps suggests that (a) many people depend on paddy cultivation for their livelihood, (b) the relative assurance of water pushes up the value of irrigated land and encourages investment in leaseholds.

under anicuts where there is sole reliance on the anicut. And of course in the latter as water cannot be stored it also contributes to greater relative inadequacy. Certainly the real role of a source of stored water lies in its ability to provide ample amount of water for a water scarce season, i.e., yala season, to cultivate a second crop. This is reported to be impossible in all three tank systems under study and seems also to be the case under those tanks studied by Gunadasa et. al (1980). They showed in fact that the main reason for an inadequate supply of water, as cited by farmers, is the low level of water in the tank, a factor which would not figure in the continuous flow from a perennial stream of an anicut.

Table 4.3 - Reasons for Inadequate Supply of Water in Tank Systems (N=1403)

Reasons	No. Reporting	%
Low level of tank water	965	69
Small size of tank	77	06
Unsatisfactory condition of tank	183	13
Damaged channels	91	71
Fields far from tank	31	02
Unauthorised tapping of water	56	04

Source : Gunadasa, et. al, op. cit. 1980, p. 104.

4.3 IRRIGATION WATER DISTRIBUTION: EQUITY AND ADEQUACY

On the issue of a fair water distribution in a typical maha season, there were no marked differences in response between anicuts and tank systems as seen below:

Table 4.4 - Percentage Reporting Whether Generally Distribution of Water in Maha Season is Fair (N = 311)

Response	Anicuts	Tanks
Fair	47%	54%
Not fair	12%	02%
Do not know	35%	07%
Not applicable	06%	37%
Total	100%	100%

However, under tanks nearly 40% reported that the question of fairness in water distribution is not applicable even in the maha season, because of inadequate water, whereas under anicuts only 6% reported this. This again lends support to the argument that tanks play only a supplemental irrigation role for these communities.

In the event of a scarce supply of water, more farmers under anicuts than farmers under tanks consider water distribution to be fair. Eighty three percent of farmers under anicuts and 56% of farmers under tanks. Anicut systems unlike tanks, have few physical controls which can be manipulated by some farmers, e.g. the elite and/or top-enders of the yaya to their advantage. In anicut systems, irrigation water first goes to the agawatha (tail-end) of the yaya. This is the complete reversal of the practice we observed under tank systems. In some anicut systems, the division of the yaya into several blocks, e.g., agatha (tail-end), mada (middle) and mulatha (top-end) and the issue of water only to one or two blocks according to the amount of water available, facilitates the fair distribution of water in a dry season. This practice is somewhat similar

to the traditional bethma system. In contrast, in tank systems we observed the disappearance of the bethma system. For example, in Meegahapitiya (T 1), bethma is not practised anymore allowing the more powerful families to get water from the tank whenever they please. On the other hand, in some tank systems, e.g., Kehellanda (T 3), a new form of bethma is 'enforced' with a new set of rules which do not conform with traditional irrigation rules and regulations. In the past, those who owned land in the upper reaches of a tank system were compensated for the use of their land for bethma purposes in a dry season by being allowed to collect a special 'rent' from their new 'tenants'.[1] This in turn enhanced their social as well as economic status in the village. Now these farmers in the purana wela sections feel that they are losing out as no compensation is given for such bethma arrangements in their holdings. Moreover earlier, there were several reasons for sharing one's prized land in the upper reaches in a difficult season: bethma was practised to raise at least seed paddy for the next season as the village community as a relatively closed community did not have much contacts with the outside world. Furthermore, subsistence ethics prevailing within the community compelled the well-to-do farmers to share their fortunes with the less fortunate in a difficult season. Now the practice of bethma has given a different meaning to suit the official programmes. Thus now the limited acreage in a difficult season is cultivated with other field crops - a new practice which goes against the traditional function of bethma of sharing scarce water equitably among all farmers in a given season to cultivate paddy.

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1 See, Jayantha Perera, Change and Settlement: A Portrait of a Sri Lankan Village, 1985(b), for a detailed description of this bethma procedure in Dry Zone villages.

Table 4.5 - Manner of Water Distribution when Water is Scarce in the Maha Season (N=311))

Manner of distribution	Anicuts		Tanks	
	No.	%	No.	%
Farmers take as they please	00	00	15	07
Farmers take water by force	04	05	14	06
Practice of bethma	02	02	24	10
Fair rotation of available water	75	93	157	68
Do not know	00	00	02	01
Not applicable	00	00	18	08
Total	81	100	230	100

When water is scarce, bethma is still practised under tank systems to cultivate paddy, although its overall importance is diminishing. Two-thirds of farmers under tanks who reported that there was a fair distribution are in fact referring to the new official programme which encourages the cultivation of other field crops during the yala season.

Under anicuts, traditional bethma is not practised. But the farmers believe that the new method of rotation of water from the tail-end to top-end, guarantees a fair distribution of water. By the time the fieldwork was completed, the farmers under anicuts had cultivated only one or two yala seasons after the refurbishments of anicuts and they had sufficient amount of water to cultivate all paddy fields in the yala season. Therefore, it is difficult to guage the farmers' behaviour in a real water scarce situation.

4.4 CONFLICTS OVER IRRIGATION WATER DISTRIBUTION

Our survey showed that two-thirds (68%) of farmers under anicuts felt that some farmers get more than their due share of water whereas only 42% under tanks responded in the affirmative. Farmers under tanks often attributed this phenomenon to thuggery, water piracy and strong-arm methods of the rich landowners of the upper reaches of the yaya. On the other hand, since tanks play only a supplemental role even in maha, many farmers do not feel strongly about the question of equity. Under anicuts, farmers did not report many instances of thuggery or water piracy. This may be more a function of built-in factors - such as topography - which do not allow transgressions of the norms even though water supplies are perceived to be insufficient.

The more inadequate the water supply especially given its primacy for livelihood, the more likely it is for there to be conflicts over irrigation water. This may account for the fact that anicuts mainfested a more frequent incidence of conflicts over irrigation water than tanks.

Table 4.6 - Percentage Reporting Conflicts Over Distribution of Water in Maha 1983/84

Response	Anicuts %			Tanks %		
	A 1	A 2	A 3	T 1	T 2	T 3
Conflicts	38	70	60	17	08	17
No conflicts	62	30	40	80	69	64
Do not know	00	00	00	03	23	18
Not applicable	00	00	00	00	00	01
	100	100	100	100	100	100

Table 4.6 also supports one of the continuous themes in this report which is that increased State intervention in the form of rehabilitation of water resources has had an impact on how the community relates to the water source. As we have seen earlier, State intervention in the case of anicuts has changed the perception of farmers as to the ownership of the irrigation system. Not only does the community feel that they no longer own the anicut, but they also expect the State to maintain the irrigation system. Also the rehabilitation process has attached more value to anicuts as a irrigation water source by increasing its capacity and by providing legitimacy for agricultural lands under it. [1] For all these same reasons we now also see an increased incidence of conflicts with State intervention under anicuts as seen in Table 4.6 and 4.7

Table 4.7 - Percentage in Anicut Systems Reporting Conflicts over Distribution of Water in Yala, 1984

	A 1 %	A 2 %	A 3 %
Conflicts	00	00	57
No conflicts	100	100	43

In tank systems however there is hardly an increase in reported conflicts over water distribution with State intervention (see table 4.6). The refurbishment of tanks has not increased the capacity of irrigated agriculture remarkably nor changed the perceptions of the farmers about land ownership and community identity. Tanks still remain as supplemental sources of water for a maha cultivation as in the pre-rehabilitation situation.

1 Particularly de-jure rights to irrigated land under these systems.

4.5 CONCLUSION

In summary, we can offer the following findings which may have relevance for the VIRP. First that there is a distinction between the economic and social functions played by the water source such that tanks provide a social basis of interaction but not always an economic one, whereas under anicuts, the reverse appears to be the case. Second and relatedly, irrigated agriculture under anicuts appears to constitute a primary component of the economy, whereas tank-based communities rely on the tank water source mainly for supplementary irrigation of paddy, which is also often not the primary income source. Third, greater dissatisfaction appears to be voiced over issues of water adequacy and equity in water distribution under anicuts resulting also in more water-related conflicts. This appears to lend further credence to the contention that irrigated paddy agriculture is more significant to the anicut-based communities than to the tank-based villages in our sample.

In addition, upon trying to make some assessment of the impact of rehabilitation for the two different water sources, we see that farmers under the rehabilitated anicut stated that rehabilitation and later the water management component had had a more profound impact on their own water supply (for the better) when compared to the rehabilitated tank system.

Hence it would seem that both the argument for rehabilitation, and in the formulation of an appropriate water management programme, it would be expedient to make an initial distinction between tank-based and anicut-based irrigation systems.

Chapter Five

REHABILITATION PROCESS UNDER THE VIRP

5.1 VIRP - RATIONALE FOR REHABILITATION

Self-sufficiency in food has been the focus of Sri Lanka's agricultural policy for the past several decades. Consistent with this goal, a major strategy in the past has been to expand the acreage under food crops through the development of major irrigation schemes. Such major irrigated agricultural schemes have also allowed for the resettlement of landless and unemployed people from the more congested areas of the island.

As avenues for expanding paddy acreages are faced with natural limits, the Government has turned to a strategy based on the intensification of agricultural production on existing irrigated lands. Within this larger effort, the Village Irrigation Rehabilitation Programme (VIRP) occupies a significant position. Of the 47,000 minor irrigation works, 16,500 tanks and about 10,000 anicuts are found to be in some working order while 12,000 further tanks/anicuts can be rehabilitated/augmented. Rehabilitation of these small-scale tanks/anicuts, it is believed, would offer certain advantages: (i) short gestation periods compared to large-scale irrigation works, (ii) dispersion of Government funds to neglected rural areas for the upliftment of the welfare of the poorest sections, (iii) creating conditions for more efficient use and control of water and expansion of the crop acreage as well as cropping intensity.

5.2 DEFINING REHABILITATION

Rehabilitation has become a catch-all phrase to describe a whole range of programmes in existing irrigation systems. It appears generally to refer to any activity other than the installation of completely new systems.

Under VIRP the following components appear to be included under the rehabilitation programme:

(a) Expansion of the designed command area: this includes a goal to increase the overall irrigated area. It can involve the repair of existing conveyance infrastructure but may also result in the latter being upgraded or totally redesigned.

(b) Restoration of lost capacity: Many of the schemes are currently unable to deliver water to areas that they had initially been able to and thus rehabilitation is aimed at restoring water deliveries to these areas.

(c) Overcoming technical deficiencies that may have been present in the original construction such that rehabilitation is geared towards replacement or of upgrading specific parts of the infrastructure that may be limiting the performance of the irrigation system. In the case of anicuts, this may result in a permanent anicut being constructed to replace a temporary anicut that is periodically washed away with the rains/floods.

(d) Major changes in the technical parameter of the project which would involve constructional works such as remodelling tank bunds, installing sluices, spillways and constructing new field structures.

Under VIRP it is estimated that a 40% increase in the irrigated area can

be achieved through rehabilitation of irrigation systems along the lines indicated above.

In addition to these physical aspects, there is also an institutional component, which is to (a) strengthen appropriate farmer organizations and to provide discipline and training to farmers in order to achieve optimum water management and timely maintenance of the irrigation system; (b) strengthen and train the irrigation and other related staff and to improve their operational efficiency by providing adequate transport and equipment; (c) establish monitoring and evaluation arrangements to record the system's efficiency; and (d) to change the traditional farming system by raising paddy yields, increasing cropping intensity and introducing crop diversification.[1]

5.3 THE REHABILITATION PROCESS

The rehabilitation process under VIRP can be divided into 3 major stages, namely the preliminary investigation stage, the design stage and the construction stage. A fourth stage, which is that of handing over to the Department of Agrarian Services and thereafter introducing a water management programme, will be discussed in Chapter 6. In this Chapter the primary concern is to investigate the rehabilitation process as it unfolds and to see just how much the community is involved in it. It is believed that farmer participation in rehabilitation work, starting from the design stage and extending right through the construction phase, will contribute to the rehabilitation exercise, whilst also persuading the local community that they are responsible for the future operation and upkeep of the irrigation system. Otherwise, it tends to be hard to persuade the local community to be responsible for something that the

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1 K.P. Wimaladharma and M.M. Karunanayaka "Village Tank Restoration and Rural Development : A Case Study of the VIRP", 1981.

Government has created and that all parties perceive as belonging to the State.

5.4 THE PRELIMINARY INVESTIGATION STAGE

Under VIRP, there exist pre-determined technical criteria that function as the guidelines for the construction agency (viz. the Irrigation Department) to follow in selecting tanks/anicuts for rehabilitation. These basic criteria which have been outlined for the selection of tanks/anicuts for rehabilitation are as follows:[1]

(a) The command area should not be less than eight hectares (20 acres).

(b) The tanks should be in inhabited areas and thus with easy access.

(c) The useful tank storage should not be less than 3 acre-feet per acre in the Dry Zone, 2.5 in the Intermediate and 1.5 in the Wet zone, and it should not exceed 70% of the yield potentials.

(d) After rehabilitation the tank should benefit a minimum of ten families.

(e) The incremental area brought under direct maha irrigation should be at least ten times the privately irrigated lands submerged or three times the cultivated lands submerged.

(f) The soils of the catchment area, reservoir, and the command area should be suitable for their respective purposes.

(g) The maximum cost of a project including all civil works and physical contingencies, engineering and administration should be calculated at a rate of Rs. 24,700 (US$ 1000) per/ha of incremental area.

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1 World Bank, op.cit. 1981.

From a sociological point of view there are a number of features that require mention in terms of the above. The first point of contention is the criterion specifying that the minimum number of families that should be benefited ought to be at least ten. Instances were reported to us that tanks have been selected which have benefited a lesser number of families. But more importantly, it appears that simply looking at a minimum number of beneficiaries has obliterated the importance of ensuring that the villagers are in
fact dependent on the tank/anicut for their subsistence, or conversely that the more impoverished farmers are being reached. Hence some further definition of who the beneficiaries are must be an initial first step.

Second specifying criteria and only ensuring that they are met at this preliminary investigation stage is hardly sufficient. If a community already exists around the particular tank/anicut, then it is only correct, if not imperative, that some dialogue is had with them. To begin with, have they themselves articulated a need for Government intervention for rehabilitation of their irrigation system? If so, what particular suggestions have they made?

This step of the local group coming forward with a request for assistance, to achieve an outcome that it has identified as important, is factor that cannot be down played. Coward[1] for example, cites all the positive factors that derive from this, not the least the fact that communities that are able to come together and agree to request assistance will display the social capacity required for successful future irrigation development.

Third, if a community does not exist, some specific criteria for Land Kachcheries, in terms of at least selecting the most needy plus those

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1 Coward, E. Walter, Jr. "Improving Policies and Programmes for the Development of Small-scale Irrigation Systems" WMS, No. 27. 1984.

with an agricultural background, should be laid down. Otherwise, the intended social welfare aspects of this programme will not be met.

5.5 THE DESIGN STAGE

As in all rehabilitation exercises, the technical irrigation agency - in this case the Irrigation Department - is given the responsibility for establishing design criteria and thereafter in applying these to construction. When responsibility is bestowed almost entirely on the Irrigation Department and since this in effect makes them accountable for any problems in design and construction in the future - it is almost inevitable that the local community is not consulted nor involved in the design process.

The omission of local knowledge and experience from the design process is a serious drawback. Engineers and others from the "outside" are hardly as familiar with the micro-variations in terrain, stream flows etc. as the local population. Hence a strong case can be made to tap these sources of information, both since they are otherwise not available in the formal sector for a specific location and because farmers if consulted feel more involved in the rehabilitation process. This is not to say that the technical irrigation agency must incorporate all suggestions made by farmers. This would be unrealistic given that the Irrigation Department is eventually responsible if designs are faulty. Rather a case can be made for a more responsive approach that is able and willing to utilize local knowledge and experience where it is useful.

Unfortunately, in our four study locations that have had or are undergoing rehabilitation, less than 1% of the farmers said that they were consulted or even kept informed of the design plans or of their progress. When asked if they would have been able to provide useful information if actually consulted, most farmers said that they could have given some useful information. Sixty six percent of the farmers who said that there were problems in construction work under the rehabilitation

programme, attributed these problems to the fact that the Irrigation Department did not consult the local residents. In one of the study anicuts for example, the farmers complained that the Irrigation Department undertook rehabilitation of the anicut - viz. raising and strengthening the dam - without really realizing that what was needed was a feeder canal from the adjacent stream to augment the water supply. Medagama[1] also cites an illustrative example of a tank that was rehabilitated at the cost of Rs. 25,000/- only to be abandoned, as it only irrigated 2 ha. on completion. At the same time, farmers in the area said that what was really required was a way to divert a stream in the catchment area rather than to improve the headworks.

A related fact that needs to be mentioned is the question of when the APTs should begin to function.[1] While the question of whether in fact the APTs are really the appropriate institutions for water management is one that will be discussed in a later section, if the APTs are to be formed, then there is a real case to be made for having them in place right from the beginning as they can be the avenue through which the Irrigation Department (ID) personnel can go to the village and discuss the rehabilitation programme with the cultivators. Not only consulting farmers but also keeping them posted with the progress of rehabilitation is also important. As many as 1/5 of the farmers in our study-villages which had or were undergoing rehabilitation were unaware even of any rehabilitation work being done. Medagama[2] correctly states that if farmers are kept informed about plans and designs as well as their social obligations, it is easier to elicit their cooperation and prevent them, for example, from doing tavalu (tank bed) cultivation and damaging the sluice and tank bund for this purpose.

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1 J. Medagama "Some Observations on Farmers' Involvement in the VIRP Sri Lanka", unpublished paper, 1982.

5.6 THE CONSTRUCTION STAGE

The actual construction stage was studied in the two locations (A 2 & T 2) currently under rehabilitation and of course questions were also asked of respondents in the post-rehabilitated situations (A 3 & T 3).

The construction phase as it happened was as follows: After the particular tank or anicut was selected from a large number that had been earmarked for investigation in the district, an estimation of cost was undertaken by the ID, which then called for tenders. The contractors selected - supposedly the lowest bidders - were not people from the local area and consequently they preferred to bring in their own labour from outside and construction went on apace without any input from the local people. Construction materials were also imported from outside. Supervision of construction was done by the Technical Officers of the Irrigation Department.

The farmers we interviewed were unhappy about the way the construction work was carried out. First they complained that they had little knowledge of the amount awarded to the contractors which was translated into suspicion that some one, somewhere, was raking off the profits. Second, they resented the fact that they were not consulted and were not even informed of what was really going to take place in their village till actual physical work was started. It was then too late, they felt, to voice their feelings or their fears. Third they would have liked to have provided labour for construction, especially since during this period they were unable to cultivate one or more seasons and had no other means of subsistence. But in fact not a single farmer in any of the four locations was recruited to provide labour for rehabilitation. Fourth, they felt that there was poor supervision of construction work and yet

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1 The APTs or Agricultural Planning Teams are discussed in detail in Chapter 7.

2 Medagama, op. cit 1982.

they had no authority to check on the type and quantity of materials nor the quality of work. In Kehellanda (T 3) for example, farmers did not feel as if they had benefited from rehabilitation as the contractors had done a poor job and as a result the tank is more silted now and therefore able to hold less water.

In effect then, the situation as described above hardly contributed to the community's involvement in rehabilitation or to good relations between the ID and farmers. Often also construction was not carried out according to the time schedule prepared by the Irrigation Department in Colombo and in some cases, by the district office of the Irrigation Department. These delays in construction which may have been for very real and unavoidable reasons were interpreted by farmers to be deliberately done or at best delayed by the contractors as they were not interested.[1] Farmers in turn suffered great hardships by not being able to cultivate one or more seasons.

Problems with the physical works after rehabilitation were pointed out by farmers who stated that this was due in large part to their not being included in the rehabilitation process. Indeed 66% of our respondents in the four locations (83% in the anicut-systems and 60% in the tank-systems) said that there were problems with the physical works after rehabilitation, thus adding to the discontentment they felt at the way the construction phase was implemented (see table 5.1).

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1 Often contractors bidded for more than one construction contract at a time, thereby delaying all of them.

Table 5.1 - Problems with Physical Works after Rehabilitation (N = 114)

	Pussellawa Anicut (A3)	Kehellanda Tank (T3)
Problems with physical works after rehabilitation	25 (83%)	50 (60%)
No problems with physical works after rehabilitation	5 (17%)	33 (39%)
Not applicable	-	1 (1%)
Total	30 (100%)	84 (100%)

5.7 CONCLUSION

Having studied the process of rehabilitation as it has been undertaken under VIRP for the four study locations, several key programmatic issues come to the fore which warrant some discussion: First, what should be the form of Government intervention in rehabilitation? When the communal ownership, operation and maintenance aspects of small-scale irrigation have always been highlighted, let alone used to define small-scale irrigation, should the type of investment be direct State investment with all the attendant features outlined earlier, or should it be an indirect approach which is characterised by subsidies, low interest loans, or food-for-work aid?[1]

There are in fact several advantages to a strategy of indirect investment for small-scale irrigation systems that should be considered here[2]: (a)

1 Walter Coward (1984) has provided an excellent discussion of these alternative investment strategies. See: Coward, 1984, op. cit.

2 ibid (1984).

Government investment can be matched by investment by the local group, thus reducing the cost of irrigation development for the former, (b) recurring costs to the Government can be reduced because the responsibilities for maintenance and operation justifiably can now be the responsibility of the community, (c) relatedly, the transfer question will not be a problem as local people will not feel that the irrigation system belongs to the State and hence feel dependent on the latter for subsequent maintenance etc., (d) there will be more room and flexibility to incorporate community needs, experience and knowledge into the design and construction process since the community now altogether has a greater share and stake in the rehabilitation process.

Hence what is suggested here is that rather than accepting the direct State intervention/investment approach as a recipe for rehabilitation work, that some thought be given to an alternative model, not the least because such an alternative might be able to get over the basic problems which have so far plagued the rehabilitation exercise.[1]

The second issue of some importance is the question of what should be the institutional back up for rehabilitation? This is an issue that seems to have been given some consideration but needs to be thought out and implemented in a much more forthright manner. In T 1 situation for example, there was no viable organizational form that could have been enlisted to undertake rehabilitation work, but on the other hand there had existed some kind of irrigation leadership plus social body in the A 1 situation which had nevertheless been overlooked in the

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1 The Freedom From Hunger Campaign (FFHC) has experimented with rehabilitation of village tanks, using an alternative approach. The FFHC entertains requests from rural farming communities who wish to take over the repair, maintenance and operation of their village tanks through a Reservoir Council consisting of all farmers cultivating paddy land irrigated by the reservoir on the understanding that they will contribute to a Reservoir Maintenance Fund from their harvest each season (see FFHC, Farmer Participation Series No. 3 1983).

rehabilitation process. The point is that where a functioning local group exists for irrigation water management, it is truly advantageous to enlist its support and use it as a vehicle for promoting the participation of the community in rehabilitation work. Moreover, the indirect intervention- /investment approach can be facilitated by the existence of such a group. Hence in all such situations, effort must be needed to study, utilize and actively promote the existing group as part of the project.

In the event that a viable group does not exist and the plan is to introduce some organizational form - which in this case has been the APT plus a Tank Committee, the latter must be initiated at the preliminary 'Investigation Stage' using the pre-construction activity - especially problem identification - as the focus for group formation. Forming Tank Committees/APTs at this stage will avoid farmers feeling that they have been organized after the fact, so to speak, merely to look after an irrigation system belonging to the State.[1]

Hence based on our study we feel that a strong case can be made for local organization to <u>precede</u> physical rehabilitation such that the latter can articulate the needs of the community and in all ways play an active and responsible role in the rehabilitation process.

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1 This has infact been heeded and since 1984-85, APTs have been brought into the picture at the preliminary investigation stage.

Chapter Six

THE WATER MANAGEMENT PROGRAMME UNDER VIRP

This chapter primarily looks at Pussellawa (A 3) and Kehellanda (T 3) both of which have been "handed over" to the Department of Agrarian Services (DAS) and where a water management programme is under way. To a limited extent the A 2 and T 2 situations, which are nearing or have reached completion are also discussed.

6.1 HANDING OVER TO THE DEPARTMENT OF AGRARIAN SERVICES (DAS)[1]

One initial factor that became clear is that there is little coordination between DAS and ID. To quote Medagama [2] "the two departments have numerous difficulties in handing and taking over a particular scheme". This was evident from the simple fact that when we wished to obtain basic information on selected tanks or anicuts where rehabilitation was supposedly over, the demarcation of responsibility between the DAS office and the ID office in Moneragala was ambiguous. The main reason for this, it appears, is that the DAS has been reluctant to take over schemes that it felt had not been properly or completely rehabilitated since it would have future responsibility for them. Hence many schemes were in a no

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1 Of course this process of "handing over" from one department to another does not take place under the Village Irrigation Modernization Programme where the DAS itself handles the contracts for physical rehabilitation.

2 Medagama, op. cit. 1982.

man's land so to speak. This would seem to be inevitable in a situation where one department is involved in rehabilitation work while the other is held responsible for operation and maintenance.[1]

6.2 THE WATER MANAGEMENT PROGRAMME

Once the DAS has taken over a tank/anicut, its Water Management Division is responsible for implementing the Water Management Programme. The major goal of the Water Management Programme under VIRP is to make more efficient use of rainfall and tank-stored water by improving the reliability of the water supply and by distributing water in a more equitable fashion among the farmers of the command area. The management innovations under the Water Management Programme are: (a) a rotational water supply with fixed delivery schedules, (b) supplementary irrigation based on current rainfall, and (c) the application of an equitable method of water rationing in case of insufficient tank water. Associated agronomic practices that have been advocated are: (a) early ploughing and sowing for improved utilization of maha season's rain; (b) introduction of short-duration paddy varieties; (c) cultivation of other food crops in the yala season; (d) after-harvest ploughing to facilitate early land preparation; and (e) greater input use[2].

The APT consisting of a Technical Assistant (TA) an Agricultural Instructor (AI) and a Divisional Officer(DO;) is first expected to visit each tank/anicut that is rehabilitated, and prepare and implement the Water Management Programme. The Tank Supervisor (TS), Cultivation Officer (CO) of the DAS and the local Extension Worker (KVS) and the Farmer Representative (FR) are expected to collaborate in implementing

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1 This has been ameliorated by a new system of joint inspection done by the ID & DAS on completion of physical rehabilitation. This method was commenced subsequent to our study.

2 Medagama, op. cit, 1982.

the Water Management Programme. This group must in turn collaborate with the "Tank Committee" which consists of all the Farmer Representatives (FR) of each tract, plus all the farmers.

6.2.1 Some Selected Agricultural Practices under VIRP

(a) Dry sowing of paddy in the maha season with the first rains

Generally, farmers tend to wait for the tank to fill before starting their cultivation work. However under the Water Management Programme, a main contributor to water saving is the recommendation to do dry sowing of paddy in maha by utilizing rainfall. It is anticipated that the water saved in this manner can be used for either a second season of paddy or for a non-paddy crop in the yala season.

While the 'Walagambahu concept' as this practice is often referred to has several points in its favour, there are very rational reasons why farmers under minor irrigation systems are reluctant to practice it. As evinced in our tank systems, the constraints to adopting a practice of (early) dry sowing ranged from not wishing to forego chena cultivation (over 75% of the farmers) to not being able to predict rainfall reliably and therefore being unwilling to take the risk of sowing before the tank was at least minimally full. Farmers were quick to point out how important chena crops were to their subsistence and for generating a cash income for their families. They were also quick to point out the risks involved in dry sowing paddy with the first maha rains in the event that the second rains did not arrive at the anticipated time. Theirs is predominantly an area of unreliable rainfall and in such a situation farmers are hesitant to start maha cultivation till the end of October or the beginning of November, around when they feel that they not only have their chenas on their feet, but when they can also make some

(visual) assessment for themselves of the water situation in their tanks.

(b) Ploughing Immediately after Maha and Yala Harvests

The idea behind this is to facilitate early land preparation for the next season as discussed above and is premised on the availability of tractors for this purpose. Again farmers pointed out several factors that impeded their adopting this practice. First farmers claimed that if they did follow this recommendation, they might often have to do an additional ploughing immediately before sowing, thus increasing the cost of land preparation let alone it resulting in wasted labour. Second, farmers said that they are reticent to plough six months ahead of time in the event that six months later there may be inadequate rains and water to allow for even a maha cultivation. Typically their forecasting is based on more immediate factors at the start of the season e.g., the rate of flow of water in the anicut which is gauged mostly by experience, and hence in their minds it is inadvisable, if not downright foolish, to plough so early. Third, tillage on residual moisture soon after the completion of a season is difficult without prime reliance on 4 wheel tractors, and fourth, even given access to tractors, there is no guarantee or confidence that others will also do the same. The recommendation also assumes that farmers always have a successful maha season and yala season and therefore have enough cash in hand to bear the cost of tractor hire at the completion of the season. As our study shows, 12% of the farmers under tanks were unable to cultivate one or more maha seasons out of the last 5 and 85% could not cultivate a yala season in five years, let alone providing a good harvest and cash in hand. This was matched by 61% under anicuts who could not cultivate one or more yala season in the last five years.

Hence in a situation of such unreliable water supply coupled with high risk and high costs of draft hire, one can easily

understand why farmers will not accept the recommendation readily.

(c) Growing Other Food Crops (OFCs) in the Yala Season

This is a laudable recommendation aimed at diversification of crops and implicit in it, a substitution for the cultivation of chena crops. It is hoped to do this through the mechanism already discussed for saving water so that this water can be used for non-paddy crops in yala in the low lands. It is recommended mainly on the recognition that OFCs have a lower water requirement compared to paddy.

This programme had been started the season before our study at Kehllanda (T 3) and 30 acres had been cultivated on an experimental basis, with success. While most farmers told us that they would prefer to grow paddy if they had the choice, those who had volunteered their land for the growing of the OFCs and those who were in neighbouring fields of the former, said that they would be happy to grow OFCs in the next yala season. Hence this may simply be a question of time for OFCs to be grown in the entire area in the yala, but of course other factors such as seed materials, marketing and prices will crop up and have to be resolved along the way as would the other problems of animal damage and pest and disease attacks. The diverse reasons generally profferred for not growing OFCs in the yala season on the low lands are given in table 6.1:

Table 6.1 - Distribution of Farmers in the Moneragala District by Reasons for not Cultivating Other Field Crops on Paddy Lands During Yala (N = 66)

	Reason	No	%
1.	Lack of water	15	20.5
2.	Land not suitable for OFCs	13	17.8
3.	Lack of experience	9	12.3
4.	Difficulty in crop protection	21	28.7
5.	Paddy farming more profitable	6	8.2
6.	Rice needed for home consumption	5	6.8
7.	Lack of marketing facilities	-	
8.	Other	4	5.5

Source : Gunadasa et. al, 1980, p.108.

From the evidence in the table it may be correct to say that farmers' preference for growing paddy over other field crops are rooted in perfectly rational economic and social reasons and that in this context, growing of OFCs may catch on only in the absence of adequate water for paddy such that growing something becomes more worthwhile than growing nothing. However, even in the latter instance, the high credit requirements of growing OFCs - for seeds, chemical inputs and labour - may preclude some farmers from growing them even if they wished. Coupled with this is of course the fact that some of the crops that have been suggested in the package are completely new to many farmers, especially under irrigated conditions.

Hence the diversification component would require the intensive and coordinated support of the agricultural extension staff, not only in recommending suitable crops for different areas/soil types but also initially to supply seed material, to determine input requirements and to organize appropriate irrigation schedules. All this would appear to warrant more active planning and coordination than is at present apparent, in Kehellanda at least.

6.2.2 Improved Water Management Practices under VIRP

(a) Allocation of water from tail to head-end areas under VIRP

Again this is not necessarily a novel idea. As described earlier, in Pussellawa this was exactly the system of water distribution in the recent past. However, it functioned because there was a strong sense of community and of leadership and because this community depended on the anicut for cultivation even in the maha season. Thus when water was scarce, the community as a whole devised a mechanism to use the available water both efficiently and equitably. This involved issuing water when it was most abundant at the beginning of the season to the lands farthest from the main canal, (viz. the tail-end) and thereafter as water became less, working up the system towards the head-end. This system therefore looked after the entire community's subsistence requirements by optimizing on available water and by getting over the problem in anicuts of not being able to estimate the available water supply precisely.

A system of water distribution from tail-end to head-end of the yaya would be harder to implement in situations where the factors in operation above are non-existent. Rather it would be expected that farmer at the head, especially in the event of water being scarce and having to flow past their lands to areas at the tail, would not

only be hostile but that they would go right ahead with obstructing such an allocation.

Hence tail to head water allocation would require (apart from suitable field channels and control structures to implement such a system) either constant policing to ensure that the system is not sabotaged by the head-enders or the forming of strong water-users' associations that put community interests ahead of individual interests. The latter of course would be preferable but not always that easily realized.

While questions of topography etc. many contribute to this method of tail to head being suitable for anicut systems, it may not automatically be true for tank systems. As Chambers[1] has pointed out, priority to tail-enders may result in the reduction of efficiency of water use due to conveyance losses and loss of opportunity to reuse drainage water and to raise the water table usefully. Thus this recommendation must be re-considered carefully weighing the benefits against the problems that may arise in trying to implement it.

(b) Rotational water supply

This recommendation is reckoned on the fact that paddy tends to be grown under continuously flooded conditions leading to a tremendous wastage of water. According to the DAS such a practice increases the water requirements in maha by about 12-18 acre-inches per acre and in yala by an additional 12 acre-inches per acre. Therefore it is felt that by using a rotational schedule there can be a significant saving of stored water. However instead of a blind acceptance of water rotation as a necessarily good thing it should

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1 Chambers, R. Water Management and Paddy Production in the Dry Zone of Sri Lanka. op.cit. 1975.

be recognized that rotation does not create additional supplies of water that would otherwise be lost to beneficial use. Rotation is useful in so far as it is followed during periods of water crisis such that by rotating the water, all farmers can keep their rice plants reasonably wet during the "crisis". Without rotation, all of the water would be used by the head-enders while the tail-enders would experience substantial yield losses. Rotation thus ensures proportional allocation of water throughout the system by minimizing the stress throughout. However, its value is rather less as a continuing management technique and likewise it should not be expected to guarantee adequate water; only a possible equity in water distribution.

And even with respect to equity, there is the problem that with a given (limited) supply of water, more water to the tail will only create more 'tail-enders' towards the head. As David Seckler has aptly put it, "the effective command area can be either lengthened or widened by rotation but not, unfortunately, both".[1]

Indeed the returns to rotational supplies in paddy irrigation are highly sensitive to the ability to predict the duration of drought periods. In the event that a wrong prediction is made, viz. that the crisis period is longer than bargained, a rotation programme can have the catastrophic result of all of the crop, instead of only one-half, being lost. However, there seems to be little informed calculation of these risks from our field observations.

A rotational schedule was being implemented in Kehellanda (T 3) and Pussellawa (A 3) under the Water Management Programme. The rotational schedule was commenced after the first ploughing was done using the maha season's rains. Water under the rotation was

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1 D. Seckler "The Management of Padi Irrigation systems" A Laissez - Faire, Supply Side Theory" in ODI, 1985.

typically allocated for 2-3 days every 7 days, though it varied somewhat depending on the acreage in the particular yaya. The rotation is decided at the kanna meeting and its implementation was ensured by the Farmer Representative. The distribution of water in maha in the pre-rehabilitation tanks/anicuts and the post--rehabilitation tank and anicut situations is shown in table 6.2. It is evident that with the Water Management programme, there is a more disciplined distribution of water.[1]

Table 6.2 - The Method of Water Distribution in Maha in the Pre-Rehabilitation and Post-Rehabilitation Systems (N = 167)

	Method of Distribution	Pre-Rehabilitation	Post-Rehabilitation
1.	No management because water is plentiful	0 0.0%	30 26.3%
2.	Farmers take water as they please	24 45.3%	0 0.0%
3.	Planting with rain water and rotation during plant maturity	19 35.8%	13 11.4%
4.	Water rotation every 7 days	0 0.0%	40 35.1%
5.	Distribution by FR and CO on no specific schedule	4 7.6%	30 26.32%
6.	Don't know	1 1.9%	0 0.00%
7.	Not applicable	5 9.4%	1 0.9%
	Total	53 100%	114 100%

1 The questions of adequacy and equity in water distribution subsequent to rehabilitation plus Water Management Programme are dealt with in detail in Chapter 8.

6.3 CONCLUSION

From the foregoing discussion, it is fair to say that the Water Management Programme under VIRP has addressed itself to some of the key issues in irrigated paddy and related agriculture. However, in many instances we found that (a) the "handing over" process has been fraught with difficulty such that there were problems in coordination when "handing over" and large delays between actual completion of rehabilitation and the implementation of the Water Management Programme. This lack of coordination has made it difficult to ensure compatibility between physical structure improvements and subsequent operation of the Water Management Programme; (b) advocation of certain agronomic and water management practices without sufficient attention paid to local experience gleaned from those having farmed under local conditions. This has made some components of the Water Management Programme unacceptable to farmers; (c) most components of the improved agronomic practices package were followed in Kehellanda (T 3) as it was the "showpiece" and thus had concentrated extension activity. In Pussellawa (A 3) there was less follow up and hence few, if any, farmers were implementing the proposed programme. This raises pertinent questions as to who should oversee the programme and the extent of extension services required for the programme to be successful.

But all in all, when farmers were requested to state whether with the new Water Management programme their own water supply had improved, all the farmers under the rehabilited anicut (A 3) and 63% under the rehabilited tank (T 3) said that their own water supply had in fact improved (see table 6.3).

Table 6.3 - Impact of the Water Management Programme on Individual Water Supply

Responses	Anicut (A 3)	Tank (T 3)
Water supply improved	30 100%	53 63%
Water supply not improved	0 0.0%	30 63%

Table 6.4 - Impact of Rehabilition on Individual Water Supply

Responses	Anicut (A 3)	Tank (T 3)
Water supply improved	27 (90%)	40 (47.6%)
Water supply got worse	0 (0.0%)	3 (3.6%)
Water supply remained the same	3 (10.0%)	32 (38.1%)
Can't say	0 (0.0%)	8 (9.5%)
Not applicable	0 (0.0%)	1 (1.2%)
Total	30 (100%)	84 (100%)

As seen from tables 6.3 and 6.4, farmers are found to comment more favourably about the water management cum improved agronomic practices than about actual physical rehabilitation. This raises the interesting

issue of whether a Water Management Programme without rehabilitation might have had the same positive effects. Unfortunately we do not have sufficient data to answer this in a conclusive way.

The institutional aspects of the post-rehabilitation phase undertaken under the Water Management Programme of the VIRP are dealt with in the next chapter.

Chapter Seven

THE INSTITUTIONAL ARRANGEMENTS FOR IRRIGATION WATER MANAGEMENT AFTER REHABILITATION

As stated earlier, upon completion of physical rehabilitation the tank/anicut in question is handed over to the Department of Agrarian Services which has been requested to implement a Water Management Programme suitable for the rehabilitated tank/anicut. As part of the latter, a special committee called the Agricultural Planning Team (APT) has been appointed to visit the rehabilitated system, collect needed data from farmers and with the latter's help, formulate a Water Management Programme suitable to each tank/anicut.[1]

The APT consists of three Government officers, namely a Technical Assistant (TA), an Agricultural Instructor (AI) and a Divisional Officer (DO).[2] The implementation of the Water Management Programme prepared by the APT becomes the responsibility of an officer designated as a Tank Supervisor (TS).[3] In addition, a semi-farmer organization called the Tank Committee, headed by a Vel Vidane is constituted for each rehabilitated tank and is responsible for operation and maintenance activities.

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1 The Water Management Programme is prepared following the guidelines prepared by the DAS Water Management Division.

2 The TA & the DO are divisional officers of the Agrarian Services Department and the AI of the Agriculture Department.

3 Each Tank Supervisor is in charge of 10-15 tanks or anicuts and is a salaried officer.By the time of printing this report, this position had been abolished.

After the APT has finalized the Water Management Plan and it has been approved by the Deputy Commissioner (Water Management) of the DAS, the Tank Supervisor sees that the command area is divided into formal groups of about 6 to 10 farmers (about 4 ha. each), generally organized around a field canal, who in turn select one farmer as their representative. All these farmer representatives under the command area plus all the relevant Government officials[1] are represented on the Tank Committee. It is this Tank Committee which will decide the actual management and distribution of water. The operation of the system is mainly in the hands of the Vel Vidane. He is supposed to operate the sluice and ensure adherence to the rotational schedule as published on the display boards, though the Tank Supervisor would be in overall charge of the implementation of the Water Management Programme. Below we elaborate the roles and functions of the APT's and the Tank Committees:

7.1 THE AGRICULTURAL PLANNING TEAMS (APT)

At the onset, it must be stated that the two post-rehabilitated systems (A 3) and (T 3) had only recently been handed over to the Department of Agrarian Services and thus we were not in a position to evaluate the APTs and the Water Management Programme as such but rather to point out some positive and some negative factors which came to light as a consequence of interviewing farmers in both systems.

We were first interested in finding out whether farmers were in fact aware of the existence of the APT, since the latter was strictly - speaking meant to have visited the irrigation system(s) and discussed a programme for water management with the farmers.

How much farmers had contact with the APT came out clearly when we asked farmers to rate the APT, as seen in the table below:

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1. Local officers of the Extension Services and the Department of Agrarian Services and other officers connected with agricultural activities, such as the Cultivation Officer (CO).

Table 7.1 - Rating of the Agricultural Planning Team by the Villagers

Rating of APT	Pussellawa (A 3)		Kehellanda (T 3)	
Good	0	0.00%	44	52.4%
Fair	1	3.33%	6	7.1%
Bad	1	3.33%	8	9.5%
Don't know of APT	28	93%	24	28.6%
Not applicable	0	0.00%	2	2.4%

As can be seen, farmers in Pussellawa (A 3) were not aware of the existence of an APT though the latter was supposed to have visited the area by the time we visited the field. In Kehellanda however, nearly 70% were aware of the APT to be able to rate it and approximately three-fourths of the farmers who knew about the APT rated its work as good.[1]

Leaving farmer perceptions aside, we tried to make an objective assessment of the positive and negative aspects of the APT approach, based on our field observations. We found the following to be positive aspects of the APT approach:

(i) Technical skills are required in the rehabilitation situation and especially in the post-rehabilitation situation, and these were provided by the APT.

1 It must be mentioned here that Kehellanda functioned as the pilot project for the Water Management Programme in Moneragala and as such seemed to enjoy greater attention from the relevant Government departments.

(ii) The APT played a necessary catalytic role in promoting the formation of the Tank Committee and in selecting farmer representatives and in otherwise bringing farmers together to follow the Water Management Programme.

(iii) The APT, as it functioned at the district level, facilitated the very necessary links with the outside, especially with the Government bureaucracy.

(iv) The APTs as they had wide coverage were in a position to be more appreciative of district-wide problems.

On the other hand, there were several factors that militated against the effectiveness of the APT:

(i) The APT consisted of officials only and no farmer representation; hence there was little, if any, understanding of socio-economic factors in operation within the community.

(ii) But despite its "official flavours", it had no representative of the ID within it, so it remained "external" to the physical rehabilitation process.

(iii) The APT came into being towards the end of the rehabilitation process, hence its effectiveness was not fully realized.

(iv) Since their area of operation was large (i.e. district[1] area) and they had to be a "patron" each to about 15 - 12 tanks/anicuts, there was a lack of accountability or answerability to any one particular community.

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1 Divisional Officer of the Department of Agrarian Services.

(v) Because programme formulation was separated from programme implementation, after the initial visit and formulation of the Water Management Programme, there was little follow-up visits/action and the APT's "agent", the Tank Supervisor, was similarly not available.

As a result of these shortcomings and despite the articulated aim to adapt the Water Management Programme to suit a particular location, the tendency has been to formulate and apply a blanket Water Management Programme across most locations, irrespective of cropping system, irrespective of the importance of irrigated agriculture to the particular community and irrespective of whether it is a tank or anicut system. Hence components of the Water Management Programme that were proposed were sometimes simply not feasible for the particular locale and farmers were reluctant to accept them. This has been realized by the DAS which has suggested in its 1984 report that there should be a comprehensive study of existing agricultural practices prior to formulating water management plans.

7.2 TANK COMMITTEE

While in the final analysis we feel that the APT approach has more merits than defects, and its effectiveness can be improved with the suggestions made in Chapter 9 (see recommendations), we find fundamental problems plaguing the concept of a Tank Committee. The Tank Committee idea is fundamentally one of harking back to an era when the village community - both economically and socially - was centered around the tank or water source. As seen in Chapter 3, the water source in that era gave rise to the social identity of the villagers and accounted for much of its subsistence. However, as our research has shown and as pointed out repeatedly throughout the study, village communities based around a water source and deriving their livelihood and social identity from it is now no longer the focus for interaction as in the past. Communities are no longer "closed" systems but are forged with the outside through

multi-faceted links as a result of State penetration. This has had an impact on the fundamental relationship of the people to the water source in village irrigation systems as concomitantly the water source has diminished in importance.

This can be clearly seen in the responses received when we probed into what defined "community" and whether the water source per se figured in this definition and whether it consequently spelt out a set of privileges and obligations for those who lived and cultivated relying on the water source. Contrary to the pervasive belief that village irrigation systems were the focus of community and community life, especially because those who used the irrigation system felt the system belonged to them, we found an ambivelance to the question of who "owned" the irrigation water source. Some farmers answered that those who cultivated relying on the water source or owned irrigated land or both, also "owned" the water source; but the majority (67%) said quite definitely that the State owned the irrigation works. Probing this further we found that notions of community were likewise fluid and that there was always no clear relationship between the water source and those who resided near it. This could be explained in several ways. First, with State penetration there has been an influx of outsiders into the area who have managed to buy land even in the traditional purana wela [1] sections, thus making it harder for the 'original' cultivators to maintain exclusive rights to land and irrigation water on the basis of prior appropriation. Second, State penetration has not only resulted in Government-sponsored and financed refurbishment of the water source but it has also resulted - starting from the 19th century in increased State sponsorship of institutional arrangements for irrigation water management. This has been especially marked since the Paddy Lands Act of 1958, as the village became opened up and linked at higher levels with the State apparatus on

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1 This was the old or traditional land developed for cultivation with the original construction of the village tank and thus enjoys a primary right to tank water.

a basis other than village.[1] Third, processes at work within the village environment - mainly population pressure and resultant land fragmentation - have resulted in irrigated paddy land decreasing in importance for the community in providing for all its subsistence needs so that families have been compelled to look more towards other crops (primarily chena) to obtain a cash income and/or to move out in search of non-farm employment. Population pressure has meant that the village boundaries have expanded to cover further acreages beyond what can be watered by the tank such that these paddy lands are essentially rainfed and not dependent on the irrigation water source.

Hence we find that the many-faceted aspects of State penetration and population growth have contributed to a blurring of notions of community based around the irrigation water source, and that at the same time the irrigation water source is not always critical to the villagers' livelihood, either because many people in the village grow paddy with little reliance on tank irrigation water or because other crops and other activities bring in a larger proportion of the income.

The fact that the Tank Committee was not a functional reality to the farmers was most evident when we requested farmers in Kehllanda (T 3) to rate the Tank Committee. Even though farmers themselves are supposed to be on the Committee, more than half the farmers were unaware of its existence as seen in table 7.2. It therefore would be more practical to recognize this fact and organize farmers in more socially viable and functional groupings.[2]

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1 For example, a Cultivation Committee area was not defined by village boundaries.

2 Meegahapitiya (T 1) is a good example of this. It is a purana tank, but there's no "community" around it; only those 9-10 families closest to the tank are interested in it and since they can take water as they please there is little reason for them to organise themselves for better water management. In fact, they discouraged the officials from selecting their tank for rehabilitation under the VIRP.

Table 7.2 - Rating of Tank Committee by the Villagers of Kehellanda (T 3) (N = 84)

Rating	Kehellanda	
	No.	%
Good	0	0.0
Fair	0	0.0
Bad	7	8.3
Don't know	74	88.0
Not applicable	3	3.6
Total	84	100

7.3 CONCLUSION

Thus we find on the one hand that the institutional framework set out under the VIRP, with the only forum for any farmer participation being the Tank Committee makes sense as it requires farmer participation only to the extent that the farmer representatives sit together with government officials at the Tank Committee, which translates into being a substitute for the kanna meeting. Even the tasks of conflict resolution tend to be taken out of the community realm for mediator by the Cultivation Officer. On the other hand, the government cannot forever shoulder all the administrative, financial and logistical burdens of irrigation management and will have to hand over some of these activities to the irrigation-community. It is anticipated that the ability and willingness of the community to take on project responsibility at this later stage would be problematic given the nature of the rehabilitation intervention up to date.

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1 See Chapter 9 for recommendations.

Chapter Eight

VIRP AND CHANGES IN MINOR IRRIGATION SYSTEMS

8.1 INTRODUCTION

In the past, village irrigation systems, relatively speaking, were less dependent upon the Government because their mix of chena and irrigated rice cultivation gave them a measure of protection from radical changes in Government policy. The ability to capture and store water as well as the ability to intergrate chena cultivation with paddy were the major factors which in those days decided the viability of the village economy, in addition of course to labour and financial resources available to the individual farm family and to the community more broadly. However starting in the early twentieth century, with increasing population pressure, with limits to the expansion of chena land and concomittently the shrinking of existing chena lands, with the impact of the expansion of the major irrigation systems - through effects on hydrology and in some cases through incorporation of small tanks into larger systems - village irrigation systems today have become forever linked to the larger environment.

This is perhaps most reflected in the multitude of Government institutions and parastatal organizations which are involved in village irrigation today:

a) The Ministry of Lands and Land Development (MLLD) which is responsible for irrigation development, land administration and land settlement;

b) The Ministry of Agricultural Development and Research (MADR) which is responsible for field crop production and for supplying inputs and for marketing of paddy;

c) The Ministry of Plan Implementation (MPI) which under the IRDP and Decentralized Budgets in the district are responsible for the rehabilitation of several minor irrigation works.

For over-all project management, control and co-ordination of minor irrigation, three agencies at different levels have been appointed: the National Committee for Village Tank Rehabilitation, the Project Steering Committee and the District Agricultural Committee. These committees have been established under the Irrigation Ordinance and have responsibilities for the coordination of irrigation and agricultural activities in the districts. They also link up with the District Development Councils and ensure consistency with other programmes, for example, those financed under rural development projects.[1]

This set up of management and coordination is clearly manifested in the VIRP which has both a supra-village coordination and an intra-village implementation. The VIRP is of course deliberate and focussed State intervention through a process of physical rehabilitation, coupled later with a water management/institutional component.[2] The VIRP, by physically rehabilitating tank/anicut structures, by providing advice on appropriate operation and maintenance activities, and on new agricultural technologies, is intervening into irrigation systems which up to that point were influenced only largely by their internal configurations and by the immediate circumstances of each season.

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1 Paiva, T.S., Shamsul Bahrin (eds) Rural Migration Policies and Development APDC. Malaysia. 1984 p. 146-178.

2 Government expenditure on minor irrigation can be seen in the tables in Annexe 2.

With State intervention under VIRP, along with improvements to the physical control infrastructure and the introduction of the divisional level Agricultural Planning Team (APT), has been an attempt to improve village level management capabilities in irrigation. We see thus the continuing and accelerated intrusion of the State into a realm which had previously been limited to the community.

State intervention through physical rehabilitation under VIRP anticipated certain changes in village irrigation systems. Below we examine some selected factors.

8.2 PRODUCTION IMPACT

(i) Area effect:

The area effect refers to the impact of intensity which arises either by (a) cultivation of already asweddumized land normally left uncultivated due to water problems (either in maha or in yala) or (b) asweddumization of new extents of land.

In Kehellanda, 36 acres of new land were brought under cultivation, benefitting 40 farm families already resident there. In Pussellawa (A 3) refurbishment of the anicut enabled the cultivation of an additional 10 acres of paddy in both maha and yala, though original estimates had suggested that 30 acres of new land at least would be brought under cultivation. Fifteen families in Pussellawa were benefitted by this.

(ii) The yield effect:

We were interested in finding out if the physical rehabilitation of the system, thereafter coupled with a Water Management Programme had given rise to any changes in paddy yields. Of course the data obtained were based not on crop cut surveys nor were any attempts made to control for rainfall, input use etc. but merely relied on asking farmers in all six study locations for their yields. As crude as this method was, it seems

that physical rehabilitation of the system had resulted in little perceptable change in average yields. In fact when we compared the pre-rehabilitated tank (T 1) and anicut (A 1) with the post-rehabilitated tank (T 3) and anicut (A 3), the average yields (bushels per acre) for maha 1983-84 and yala 1984 were as follows:

Table 8.1

Season	Pre-rehab. locations (bu/ac) (A 1 + T 1)	Post-rehab. locations (bu/ac) (A 3 + T 3)
Maha 1983-84	47.28	41.74
Yala 1984	1.23	7.36

While we caution against any conclusions based on the very rough figures presented we may hazard a guess that the rehabilitated irrigation systems are really not producing any higher average yields than the systems that were not improved[1] and indeed may have comparable yields only when taking into account both maha and yala cultivations. Furthermore rehabilitation did not allow for the cultivation of a yala paddy crop where it was not originally cultivated (viz: under the tank systems) though in Kehellanda a concerted effort was being made to grow other field crops (mainly soya bean) and this had met with some success.

We also tried to ascertain if the percentage of paddy harvest sold was substantially higher in the rehabilitated systems but here again the results were as follows:

1 It is generally known that farmers understate yields and incomes but then this would have happened consistently in all six study-locations.

Table 8.2

	Percentage of harvest sold
Pre-rehabilitation	0.36%
Current-rehabilitation	0.39%
Post-rehabilitation	0.40%

In other words, rehabilitation of the system did not result in increases in yield such that a greater surplus was produced and sold in the market. Rather all the locations continued to sell less than 1% of their harvest, confirming that the paddy fields under these minor irrigation systems remained primarily to provide for the villagers' subsistence requirements.

In this respect taking the average holding size in the post-rehabilitation villges which works out to 1.17 acres, a rough calculation was done to determine how many persons could subsist on a holding, given average yields of 49.1 bushels per acre as obtained in these two systems.

Using the Sri Lanka standard of 2,200 calories as the requirement per person, we find that a holding that is cultivated in both maha and yala can support 3.3 persons. In the event that only maha is cultivated, the same calculation shows that only 2.8 persons can be supported.[1] Given that the average family size is 6.5 persons in the post-rehabilitated study villages, one can see that the yield effect has not contributed to raising yields even up to subsistence levels. As rough as this

1 10% subtracted for wastage, seed requirements etc.

calculation is, it is a grim verdict of productivity levels within small-scale irrigation systems, even after physical rehabilitation.

8.3 INSTITUTIONAL ARRANGEMENTS FOR IRRIGATION WATER MANAGEMENT

A further concern of this study was to ascertain the evolution of systems of irrigation water management through time, especially understanding the role of the State in instituting different arrangements for the management of irrigation water.

We were able to understand the evolution of systems for irrigation water management, both through a diachronic approach of studying all six study-locations as they each had a different degree of State intervention, and also through a synchronic approach by talking to farmers in each system and asking them about the different methods of irrigation water management that they experienced in their life times. In this way we hoped to get a clear picture of what existed, how it changed, what exists now and the relative advantages- /disadvantages of each.

The pre-rehabilitation situations (viz. A 1 and T 1) indicated several factors. First, the Vel Vidane system had existed and functioned very well up until the late 1950s. The Vel Vidane's functions were to (i) maintain the main canal and sluice, (ii) see that farmers cleaned the field canals, (iii) see that farmers fenced their lands, (iv) get people together for kanna meetings, (v) inform farmers of the cultivation/water schedule, (vi) distribute water according to availability and needs, (vii) ensure that people got together for protecting fields against pests and wild animal attacks and other activities that required group activity and, (viii) resolve conflicts over irrigation and related matters.

The Vel Vidane system according to all respondents worked well because it was based on a form of traditional leadership, where the Vel Vidane was selected on the basis of family standing and age, and hence was accountable to the community. In turn this accountability was reimbursed

by an honorarium paid to the Vel Vidane in the form of a share of the harvest (4 kurunis for 1 acre cultivated). The Vel Vidane in turn was accountable to the Rate Mahathmaya on questions of land disputes, prosecutions and so on. The arm of the State was also present in another form. The Vel Vidane had to report to the Guardian who was a Government official of the Irrigation Department with wide ranging powers on technical matters relating to village irrigation.

Hence we saw a system of traditional, accountable leadership, backed on the one hand by the Rate Mahathmaya - the 'legal arm' - and on the other by the Guardian - the 'technical arm'. That the system worked is clear from our interviews. Eighty percent of the respondents in the pre-rehabilitation situations and 73% of those in the post-rehabilitation situations said that the Vel Vidane system of the past was better than what operated now. They attributed its success to the social status on which it was based and which therefore allowed the holder of the office to command respect and authority. According to the respondents farmers complied with directions from the Vel Vidane and it was rarely that farmers disobeyed him or had to be prosecuted. But this was not to say that the Vel Vidane ruled in an autocratic fashion. The kanna meetings (which incidentally were introduced by the State) allowed for a group backing or consensus of the Vel Vidane's directives.

With the Paddy Lands Act of 1958, the Cultivation Committees (CC) came into being, though in our six study villages this did not really take effect till about 1962-63. According to farmers while the Cultivation Committee leadership by and large still hailed from the same families, with time it became increasingly politicized. This politicization of the CC's had the disadvantage that being dependent on the vote banks, they could hardly hope to antagonize their clientele - the farmers. Moreover, the CC's were set up primarily for tenancy reforms and the more regulatory functions of irrigation water management were only peripheral functions that were tagged on and as such they only enjoyed an ancillary status.

The Administrative Secretary of the Cultivation Committees officially had the same duties as the Vel Vidane, with the addition that he had to collect the acreage tax (Rs. 6 for 1 acre) of which 40% he could keep as his commission. The very fact that he charged a tax instead of receiving an honorarium as payment, that he was appointed by law and not by tradition, that he did not have to come from the village or reside in it, that his area of responsibility extended beyond a single village, that he was in office for a short duration, all worked against the effectiveness of the CC system and especially the Administrative Secretary. Respondents in our six study locations corroborated this, with under 20% making any positive comment on the CC system when compared with either what preceded it or with what succeeded it.

With the introduction of the Cultivation Officer (CO) and the Farmer Representative (FR), we come to the climax of the politicization process. In the study locations that had a CO and a FR, the latter was found to come from strong political groups (note that previously it was 'family' and not 'group' that figured). The CO who must have political qualifications in addition to educational qualifications (at least, G.C.E. 'O' level proficiency) is paid a salary, while the FR, who was elected by farmers in a tract, is paid in kind. While in a sense this pattern of leadership is reminiscent of the Vel Vidane/Rate Mahattaya system of the previous era, it is not premised on the same factors. The CO and the FR do not have the legitimacy wrought by tradition and yet they lack the legitimacy bestowed by the State. This is evident most especially in the fact that the FR at his level is unable to do much else than direct farmers to get together at a kanna meeting each season. Generally requests by him to fence fields or clean field channels fall on deaf ears. In the event that farmers do not comply - and from all accounts in the six study-locations non-compliance appears to be the norm - the FR has no punitive powers at his command to prosecute these errant farmers. As a result, there is hardly any maintenance of the irrigation system. In the pre-rehabilitation tank (T 1) for example, the irrigation canals have not been cleaned in nearly 10 years while the FR continues to exist, albeit in name only.

Hence what we see is that the Vel Vidane system worked well because of the basis on which its irrigation leadership was premised, combined with the social millieu in the tank/anicut communities in which it was found. Old, recognized families gave rise to leaders who were able to command the respect of the community and were therefore able to dispense with the prescribed duties. With State intervention in the 1960's - in the larger process of State penetration into the rural areas with its related consequences of a market in land which brought 'outsiders' into hitherto 'closed' communities - the Vel Vidane mode of leadership and authority was replaced by a Cultivation Committee system. Unfortunately village water management was relegated to second place within this largely bureaucratic system that sought to redress structural inequalities in the countryside through tenurial reforms. This was moreover inevitable as the village now did not constitute a unit within the bureaucratic system. This system was hardly bettered by the introduction of the CO/FR combination which soon became politicized.

The results are most clear in the pre-rehabilitation situations, where[1] State intervention has ensured the abolition of the old Vel Vidane system but has not replaced it with anything effective. The FR exists in name only and has not been able to call together even one kanna meeting. As a result, in T 1 for example, total anarchy exists with regard to tank water distribution. Only those nearest the tank get any water and they do so on an individual basis, using strong-arm tactics. Those further along the system obtain water when they manage to breach a bund somewhere. Otherwise, the greater portion of the system remains rainfed.

8.4 WATER DISTRIBUTION

One explicit goal of rehabilitation and of the subsequent Water Management Programme is to improve water distribution within the command

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1 Not the least because Water Management Programmes have been newly introduced from above into the T 3 and A 3 situations while the other 2 study locations are still in the throes of rehabilitation.

area. To ascertain the differences in water distribution as a result of rehabilitation, a series of questions were asked on perceived improvements, equity in water distribution, allocations during scarcity and simply the manner of water distribution in the maha season as opposed to the yala season.

To the question of whether generally the distribution of water is fair, an overwhelming number (84%) in the current rehabilitation situation said 'yes' while only 16% in the pre-rehabilitation and 29% in the post-rehabilitation situations said 'yes'. The fact that less than 1/3 of the farmers commented positively on the distribution of water after physical rehabilitation and after a Water Management Programme was implemented, is rather worrisome. We decided to approach this question from another angle and asked if some farmers get less than their due share of water. In the post-rehabilitation situations we found as many as 54% saying 'yes' with the only heartening fact being that a greater number (70%) in the pre-rehabilitation situations said 'yes'. Again the current rehabilitation situations showed only 13% as stating that some farmers got less than their due share of water. It appears from this that actual Government presence and/or the fact that rehabilitation has just finished and there has been no time for problems to have cropped up, have contributed to better water distribution according to farmers in these 2 latter locations (viz: T 2 and A 2).

In situations of water scarcity in maha, the Water Management Programme and the rotational schedule implemented within it, appears to fare very well. As many as 92% of the farmers under this programme said that the rotation allows for a fairer distribution of water in times of scarcity. This is in contrast to the pre-rehabilitation situation where nearly half the respondents said that farmers take water as and when they please and often by using force. Interestingly bethma did not appear to be practised in the event of water scarcity even in the pre-rehabilitation situations. This indicates the losing of village identity and exclusivity as a result of State intervention.

On asking questions on water adequacy in the maha season for paddy, it was found that farmers in the post-rehabilitated systems commented favourably on the adequacy of water and that there was a some improvement from the pre-rehabilitation situations, through current rehabilitation to the post-rehabilitated situations, so that as many as 94% in the post-rehabilitated locations stated that their water supply was adequate.

Table 8.3 - Percentage of Respondents Reporting on the Adequacy of Water Supply for Maha Paddy Cultivation (N = 311)

	Pre-Rehabilitation A 1 + T 1	Current-Rehabilitation A 2 + T 2	Post-Rehabilitation A 3 + T 3
Adequate water	38 (72%)	120 (83%)	109 (96%)
Inadequate water	15 (28%)	24 (17%)	5 (4%)
Total	53 (100%)	144 (100%)	114 (100%)

Of course the real test is the adequacy of water supply in the yala season, as seen below:

Table 8.4 - Percentage of Respondents Reporting on the Adequacy of Water Supply for Yala Paddy Cultivation (N = 311)

	Pre-Rehabilitation	Current Rehabilitation	Post-Rehabilitation
Adequate water	0 (0.00%)	0 (0.00%)	4 (4%)
Inadequate water	53 (100%)	144 (100%)	110 (96%)
Total	53 (100%)	144 (100%)	114 (100%)

From the table it is apparent that rehabilitation of the irrigation system plus the Water Management Programme have not contributed to an adequate water supply for paddy cultivation in the yala season. In fact only about 1% seems to have benefitted and report adequate water supplies. A breakdown by anicuts and tanks is given below showing that both anicuts and tanks are equally affected by this problem.

Table 8.5 - Adequacy of Water Supply in the Yala season (N = 311)

	Anicuts	Tanks
Adequate water supply	1 (1.23%)	3 (1.30%)
Inadequate water supply	80 (98.7%)	227 (98.7%)
Total	81 (100%)	230 (100%)

8.5 MAINTENANCE

It was pertinent to note that with rehabilitation and the strong presence of the State, notions of who should maintain the irrigation system have changed.

In the current and post-rehabilitation locations, farmers were more inclined to put the onus for maintenance on the Government or at best on the Farmer Representative, though in actual effect the farmers themselves participated more in maintenance work in what can be called a "compulsory" shramadana mode of work. The previous maha season (1983-84) was taken as an example and while 50% of those in the pre-rehabilitated situation said that they themselves had taken part in some maintenance work, as many as 86% in the post-rehabilitated situations had undertaken maintenance work in this "compuslory" form. Probing this further it was found that the variations in responses were found to be mainly in terms of maintenance work on the tank/anicut or the main canal in terms of earthwork/bunding, whereas in the case of field canals, the responsibility was put then and now squarely by the farmers on themselves. The fact that field canals were actually better maintained by farmers after rehabilitation is evident in the fact that at least a quarter of the farmers in the pre-rehabilitation situations said that canals were simply not maintained by anybody while in the post-rehabilitations situations, as much as 90% said it was the farmer's responsibility and that in fact the work was done. But overall, when asked whether maintenance was done better in an earlier period, 36% of those in the post-rehabilitation situation said 'yes' while 46% said 'no'. This may suggest that these two communities prefer the new mode of maintenance coming under compulsory fiat, but of course these figures are not conclusive in any way. But what appears clear is that with increased State intervention the tendency has been for the community to feel that the responsibility for maintenance was with the Government though in actual fact they themselves ended up actually doing maintenance work, because they were compelled to do it. Also because of the fact that they were compelled, in reality more thorough maintenance work was

done. But then the pertinent question is whether without state presence and the compulsion derived therefrom, farmers on their own would continue to do maintenance work in the future.

8.6 CONFLICTS AND CONFLICT RESOLUTION

We tried to obtain some idea of the degree of conflicts over water within the irrigation system and the mechanisms at hand to resolve these conflicts.

The number of farmers reporting conflicts over the distribution of water in each of the six irrigation systems during maha 1983-84 is given below:

Table 8.6 - Percentage Reporting whether there were Conflicts over the Distribution of Water in the Maha 1983-84 Season

	Anicuts			Tanks		
	A 1	A 2	A 3	T 1	T 2	T 3
Yes	9 (37.50%)	19 (70.37%)	18 (60.00%)	5 (17.24%)	9 (7.69%)	14 (16.67%)
No	15 (62.50%)	8 (29.63%)	12 (40%)	23 (79.31%)	81 (69.23%)	54 (64.29%)
Don't know	0 0.00	0 0.00	0 0.00	1 (3.45%)	27 (23.08%)	15 (17.86%)
Not applicable	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	1 (1.19%)
Total	24 (100%)	27 (100%)	30 (100%)	29 (100%)	117 (100%)	84 (100%)

From the table we can see that in the anicuts especially, physical rehabilitation appears to have increased conflicts substantially while under tanks the level of conflicts appears to have returned to levels comparable with the pre-rehabilitation situation. This is all the more evident during the yala where in the post-rehabilitation anicut (A 3), 57% of the farmers reported conflicts compared with no incidence in either the pre-rehabilitation or current-rehabilitation anicuts. Since some yala cultivation was always possible under all three anicuts the reason has to be sought in why with physical rehabilitation the level of conflicts has increased so dramatically. To probe this the source of conflicts was also ascertained, as depicted in the following table:

Table 8.7 -Reasons for conflict

Reason for conflict	Anicuts	Tanks
Breaking ridges and channels	15 (18.52%)	2 (0.87%)
Deviations from water distribution norms	27 (32.10%)	19 (8.26%)
Taking water at will	4 (4.94%)	3 (1.30%)
Wasting water	0 (0.00)	1 (0.43%)
Not applicable (i.e. no conflicts)	35 (43.2%)	205 (89.1%)
Total	81 (100%)	230 (100%)

As the reasons for conflicts were not fundamentally different for anicuts and tanks, the higher incidence of conflicts under anicuts subsequent to rehabilitation might perhaps be explained by the disruption of traditional rules and regulations with regard to the distribution of

irrigation water. As described in more detail in Chapter 3, both anicut and tank systems traditionally had well-defined social mechanisms for the distribution of water, with built-in mechanisms for ensuring equity in distribution. But with state intervention which appears to have had a greater disruptive impact on anicuts than tanks, the social mechanisms that existed for conflict resolution were disrupted in A 2 and then finally replaced in A 3 with the DAS Water Management Programme. This seems to be a possible answer as to why conflicts appear to have increased in A 2 and A 3.

8.7 CONCLUSION

In conclusion we can reiterate certain trends that appear to be manifested. First we see that state intervention has changed from being indirect to being direct and focussed intervention that seeks to consolidate the State's role in village irrigation. Also we see what was essentially incipient state control at the village level, becoming at its climax in the 1970s direct state control, and thereafter becoming what is now state plus community control. Second, from what was representative leadership at the village level we see a movement through non-representative, to representative, community-wide leadership. Further, we see the relevant operational unit first being a traditional village, then a village cluster under the Cultivation Committee/Agricultural Productivity Committee system, then a Division under the Agricultural Services Committee area system, till finally now it is an attempt to consolidate the administrative structure down to the village level while providing some token room for farmer involvement in system O & M. Fifth, we see agricultural policy first being irrigation-dominated (up to 1958), then being governed essentially by concerns of agricultural development-cum-tenurial reforms (1958-1977), then being primarily agricultural development-oriented (1977 onwards), till finally there has been an attempt to return to an irrigation-centred thrust.

The cyclical nature of policy indicates a serious attempt to resusciate

tried out institutional arrangements, which from hindsight at least, appear to be successful. However it fails to realize that because of the process of increased state intervention and resultant incorporation of rural areas into national social and political systems along with natural demographic processes, changes have been wrought in the countryside which no longer make the old institutional village-focussed arrangements socially valid or workable.

Chapter Nine

MAJOR LESSONS LEARNED AND RECOMMENDATIONS

On the basis of the study findings[1] the following recommendations are made for the rehabilitation process and the institutional arrangements for irrigation water management that follow rehabilitation.[2]

9.1 REHABILITATION PROCESS

(1) Selection of tanks/anicuts

We believe that there should be an assessment of the following factors at the selection stage, in addition to those already laid out under VIRP, if rehabilitation is to meet with any success:

(a) A preliminiary survey of the district to choose the most deserving communities, with special attention being paid to disadvantaged groups for state support through rehabilitation of their water sources.

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1 The recommendations are based on the status of the project during the field work period in early 1984. It is realized that major changes have been made since that period and this report being published and which unfortunately have not been included.

2 These recommendations are in terms of tanks/anicuts which are already in use and not those which were abandoned and then refurbished for new settlement.

(b) A survey of the types of land and land tenurial patterns in the puranawela, akkarawela, badu idam and encroachments of village irrigation systems so that there will be a better understanding of the category of land and of the type of persons who will benefit from rehabilitation. Rather than merely meeting the criteria that at least ten families and 30 acres should be benefited from rehabilitation, this will allow more attention to be paid to the impoverished groups in the command area as well as giving some consideration to those who had prior water rights in space and time.

(c) An assessment of the importance of off-farm and non-farm employment in household economic strategies and conversely, the importance of irrigated paddy and hence of the community's reliance on the irrigation water source. This will ensure that tanks/anicuts are selected where irrigated agriculture is important for the community such that if a reliable source of water is provided there will be sufficient attention paid to on-farm activities.

(d) Community/group articulation of desire for physical rehabilitation of their irrigation system as this would facilitate subsequent involvement in operation and maintenance activities.[1]

(2) Pre-construction phase

At this stage certain features need to be reconsidered, primarily:

(i) How best farmers (beneficiaries) can be involved in decision-making regarding design and construction, and in

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1 Of course it is realized that not all communities or project areas are characterized by social harmony or uniformity of interests.

contributing labour and/or capital, all of which will contribute towards increasing their commitment to operating and maintaining the system after rehabilitation.[1]

(ii) What institutional set-up already exists for water management and related agricultural activities and how best it/they can be co-opted for rehabilitation and post- -rehabilitation work. These may be formal associations- /organizations or informal ones - e.g. reciprocal and communal labour associations that are adapted to the particular irrigation system's needs.

(iii) More broadly, some understanding of the local social structure, including an understanding of local property rights in land and water.[2]

(3) Construction phase

(i) At this stage, every endeavour should be made to involve farmers in the actual work (farmer groups can be awarded the contract)[3] or in a supervisory capacity if contractors (who have the necessary technical skills) are brought in from outside. This will ensure not only that farmers are provided some work and income when they are unable to do any cultivation, but that they are made to feel that it is their irrigation system and hence that they have a right to ensure that the work

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1 For the very useful contributions farmers can make to design decisions, see P. Ganewatte "Farmer Participation in Planning, Construction and Management of Irrigation Systems" (mimeo) ARTI. 1985.

2 Rapid rural appraisal techniques have been developed and can be used for this purpose.

3 If given to an organization of farmers, then more powerful/rich farmers are less likely to be able to exploit the situation.

is done well. This will probably result in the work being of a higher quality than at present.

(ii) If outside contractors are used, to introduce a clause stipulating that they take on only one contract at a time, thus reducing construction delays in any one scheme.

(iii) Where possible utilize local materials.

The involvement of the community in all the above phases and aspects of irrigation rehabilitation would not only heighten committment to the system but would produce an increased capacity at the local level to cope with future demands on the system which may result because of population growth, changes in cropping patterns and water requirements, climatic changes and so on.

9.2 INSTITUTIONAL ARRANGEMENTS FOR IRRIGATION WATER MANAGEMENT

(4) The APT approach

In Chapter 8, we discussed the positive and the negative features of the APT system which has been introduced as the main strategy for ensuring better water management under VIRP. If we assume that the APT's are here to stay, we would like to suggest the following for improving their effectiveness:

(i) Reconstitute the APT to include a Farmer Representative(s) for a particular village or other viable grouping. The suggestion here is to introduce a FR as a recognized "spokesman" for the village/community/group who will be able to provide the social dimension to an otherwise technically-oriented team. Since the APT is formulatged on a district-basis, a FR from each tank committee could be inicluded in the APT.

(ii) The APT should begin work at the pre-rehabilitation stage so that farmer involvement can be elicited from the beginning.[1]

(iii) The APT should involve the KVS,[2] and other village-level officials more in formulating the Water Management Programme so that there will be follow-through activity once the APT moves on. This may rectify the gap that now exists between Water Management Programme formulation and implementation.

(iv) The APT should liase with existing farmer organizations and not work in a vacuum, or as is happening now at a supra-level ignoring the existence of the latter. Rather the APT should assist in the formation or strengthening of existing farmer organizations/water users' groups.

(v) More time (than the current maximum of 2 weeks) should be given to the APT to familiarize itself with the peculiar conditions of each irrigation system. More time would allow them the opportunity to meet with farmers and discuss the micro-variations in soil and other factors that only those cultivating there will be aquainted with and the knowledge of which will lead to a water management package that is better adapted to the particular system.[3]

(vi) The APT should be provided better transport facilities since it has to cover a large area (15 - 20 tanks/anicuts).

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1 When we were doing field work there was discussion about this and this may well be in operation now.

2 Krushikarma Vyapthi Sevake - village level extension officer.

3 Reconnainance and survey data suggested earlier should be made available to the APT. Also technical drawings, estimates etc. which are in the DD/ID office.

(II) The Tank Committee

It was argued in Chapter 7 that because of the changes through time - especially because of the process of state penetration and concomitant encapsulation of the tank village community into the wider arena of government administration - that a grouping around the tank or water source has only limited utility and social validity and that it may not be sustaintable through time. As a consequence, and having the new proposals to the Agrarian Services Act in mind, we suggest that farmers be encouraged by the APTS (of course with a farmer representative/institutional organizer as part of the APT) to organize themselves in more functional groupings (e.g. on a yaya basis or around a field canal) and thereafter to request the Divisional Level Committee - in this case the APT to recognize/register them under the Agrarian Services Act. Especially given the existence of the APT at the Divisional Level, this would seem to be a pragmatic approach. Hence what we suggest is for the APT at a divisional level where all the delivery mechanisms for state benefits would be consolidated, and at a more socially-viable level, functional groupings of farmers, legitimised under the Agrarian Services Act. The link between the two can be resolved through village-level functionaries such as the Farmer Representative, the KVS or the Jala Palaka.

(III) Water Management Programme:

Two general recommendations are applicable here:

(a) That more attention be given to differences between tank and anicut systems in formulating Water Management Programmes and in promoting the associated agricultural extension package. This is all the more important given the different roles the two water sources play for the community and the resultant differences in cropping patterns.

(b) That the Water Management Programme not be an uniform blanket one but rather more specific to the location. This can be done if the APT's are given more time and if there is more committment to involving farmers in formulating the programme.

9.3 POSSIBLE ALTERNATIVE APPROACH TO VILLAGE IRRIGATION WATER MANAGEMENT

(i) The Institutional Organizer (IO) Approach

Given the recommendations made earlier with regard to the composition of the APT and thereafter the manner in which their efficacy can be improved, a case can perhaps be made to introduce the IO approach to irrigation water management under minor irrigation systems. This is an approach that has been tried out with some success under major schemes - most notably in Gal Oya[1], and there has been some discussion of its suitability, if not advisability, for minor irrigation systems.

We feel that the IO approach, meaning basically that an Institutional Organizer type of person be atttached to the APT, will offer the following advantages:

(1) It will allow for some integration of the physical construction aspects of rehabilitation with the social development aspects of rehabilitation by allowing IO's to act as catalysts in organizing farmers for activities during the pre-rehabilitation, rehabilitation and post- rehabilitation phases.

(2) The IO's can facilitate a dialogue between farmers and officials

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1 For a discussion of the IO approach as used in Gal Oya, see S. Abeyratne, et. al., "Improving Irrigation Management Through Farmer Organizations: Responses to a Program in Sri Lanka". 1984.

such that both parties benefit from increased and better communication.

(3) The IO's can bring in the community development aspects of rehabilitation, and especially pay attention to the more disadvantaged groups e.g., encroachers or landless, in the systems that are to be rehabilitated.

(4) Unlike the rest of the APT, IO's can be persons from the village and resident in the village. This will allow him/her to see that group formation is sustained through time, especially after the APT has moved on.

(5) IO's can bring in a wider range of interests for group formation - that is not merely water management needs but broader agricultural and rural development concerns-such that there will be a basis for these groups to be sustained through time.

In the event that it is decided to create an Institutional Organizer role, we recommend that a person from the village community be trained in IO concepts (viz: group formation, communication methods etc.) and be attached to the APT, though of course remaining behind in the irrigation system once the APT moves on to the next irrigation system.[1] The major advantages of this would be that a local resident can continue to form or engage in his usual occupation and be paid an honorarium for his activity as IO (hence a reduction in cost) and more importantly, such a strategy would avert the high attrition rate faced in Gal Oya because the IO's were from other parts of the island.[2] However, before totally

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1 However an outsider might be able to play the role of catalyst more effectively, hence this might have to be re-considered.

2 Relevant lessons can be learnt and adapted here from the Philippine experience with communal systems where the ICO's are in effect farmers resident in their own villages who work in the capacity of ICO's after some training. As their job is considered "part-time", they are paid an honorarium, which of course is also less costly.

recommending this approach it will be correct to present some factors which might be obstacles to promoting the IO approach under minor irrigation:

(1) Village irrigation systems often still have strong group formations and factions (e.g. along caste lines) which may be resistant to change along those lines suggested by the IO approach;

(2) Likewise an IO if he is young and educated (the usual background for someone in a catalytic role) may not be taken seriously or command the necessary respect in a traditional village environment;

(3) It has been proved in Gal Oya that IO's work better in a team where mutual reinforcement is possible. Under village irrigation systems one IO would be allocated to one village irrigation system. In this sense he will be relatively isolated and may not be as effective in a catalytic role;

(4) One of the main functions of the IO's in a major irrigation system is to facilitate the interface between the bureaucracy and the water-users since both have a hand in managing water. Under minor irrigation this is hardly a problem, thus perhaps obviating one of the main needs for such a role.

However despite these probable shortcomings, in the final analysis it appears that there is much to be said for an Institutional Organizer to be attached to the APT. This person would have the important role of being enlisted by the community to help it to establish its irrigation priorities, to assist in forming associations/organizations to carry out new functions related to development, and to help convey the needs of the community as a whole into viable proposals for outside support. More importantly, such an approach would not be handing out a blue print for irrigation management but rather providing the flexibility of a "learning

process approach"[1], which simultaneously builds bureaucracy and community capacity to develop appropriate responses to problems as and when they occur.

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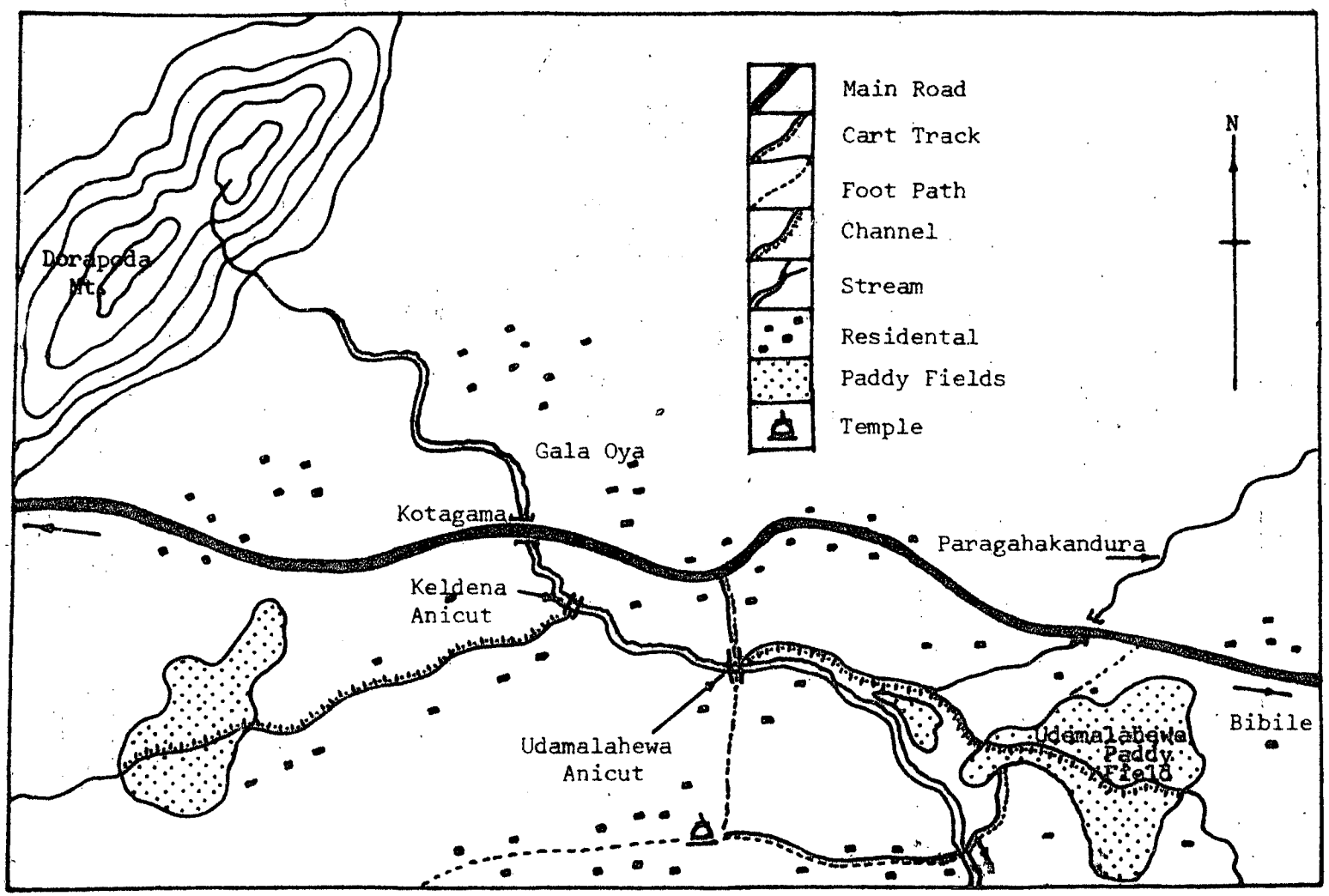
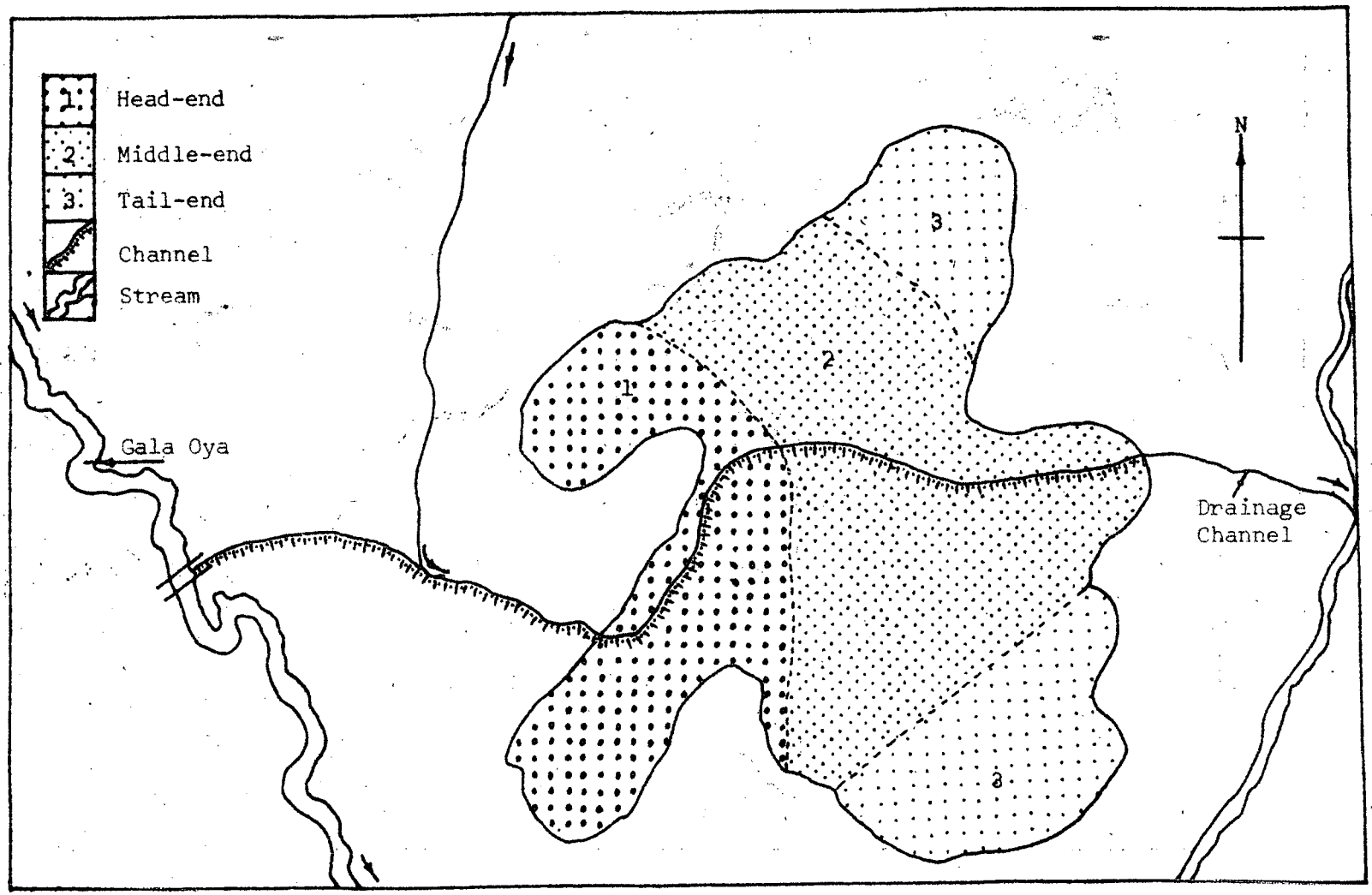
1 F. Korten, "Building National Capacity to Develop Water User's Associations: Experience from the Philippines". World Bank Staff Working Papers. No. 528.

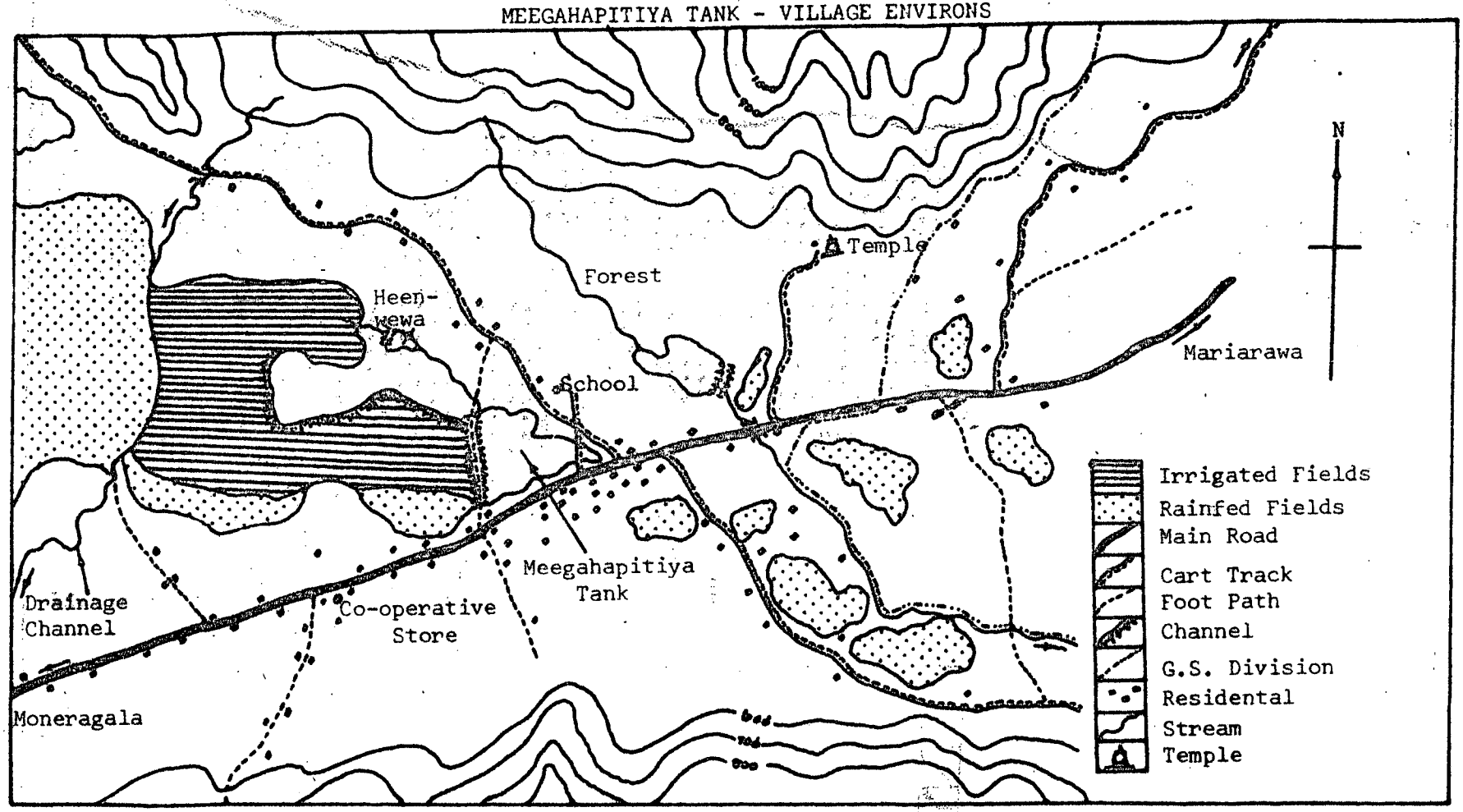
UDAMALAHAWE ANICUT - VILLAGE ENVIRONS



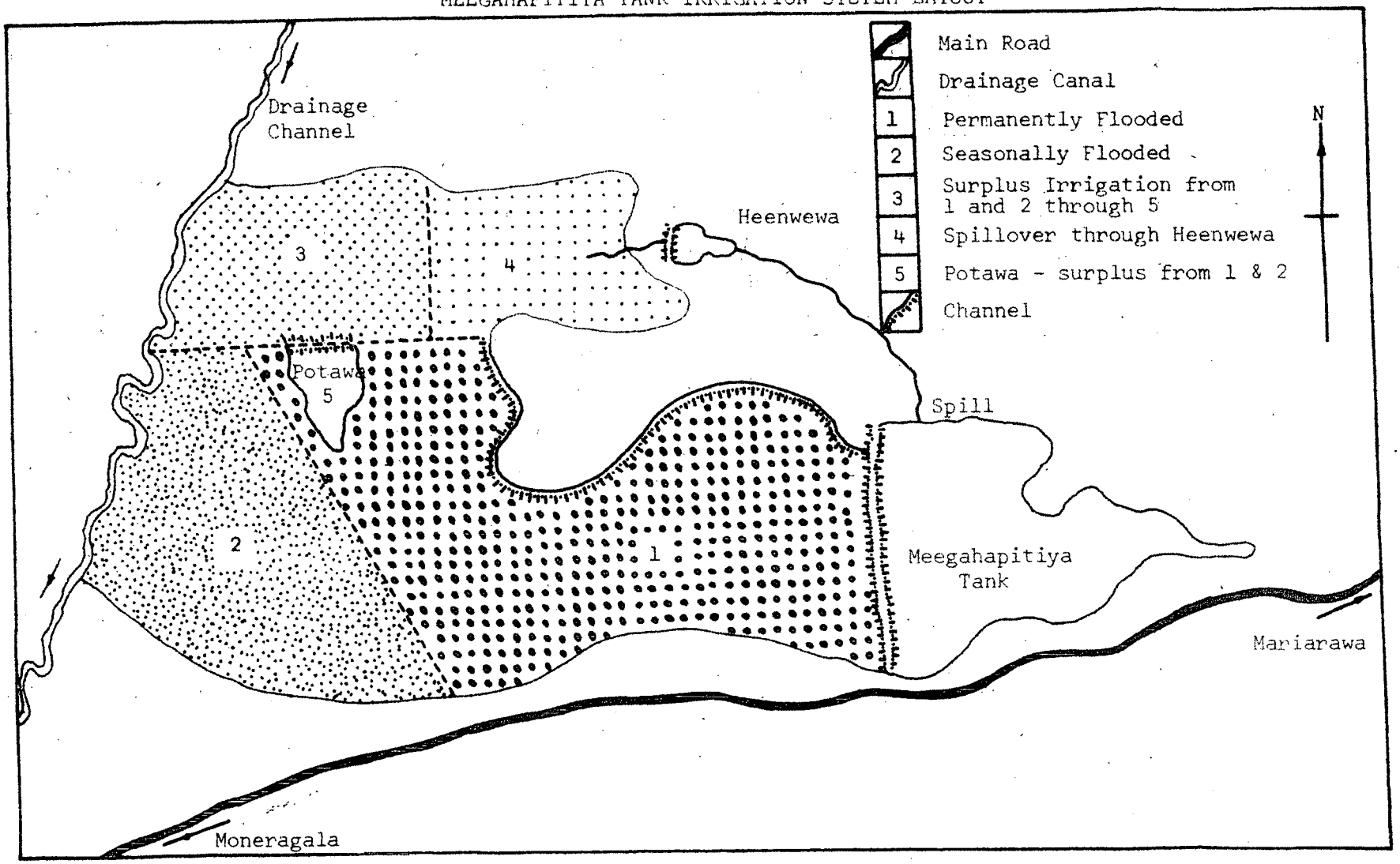
UDAMALAHAWE ANICUT IRRIGATION SYSTEM ANICUT



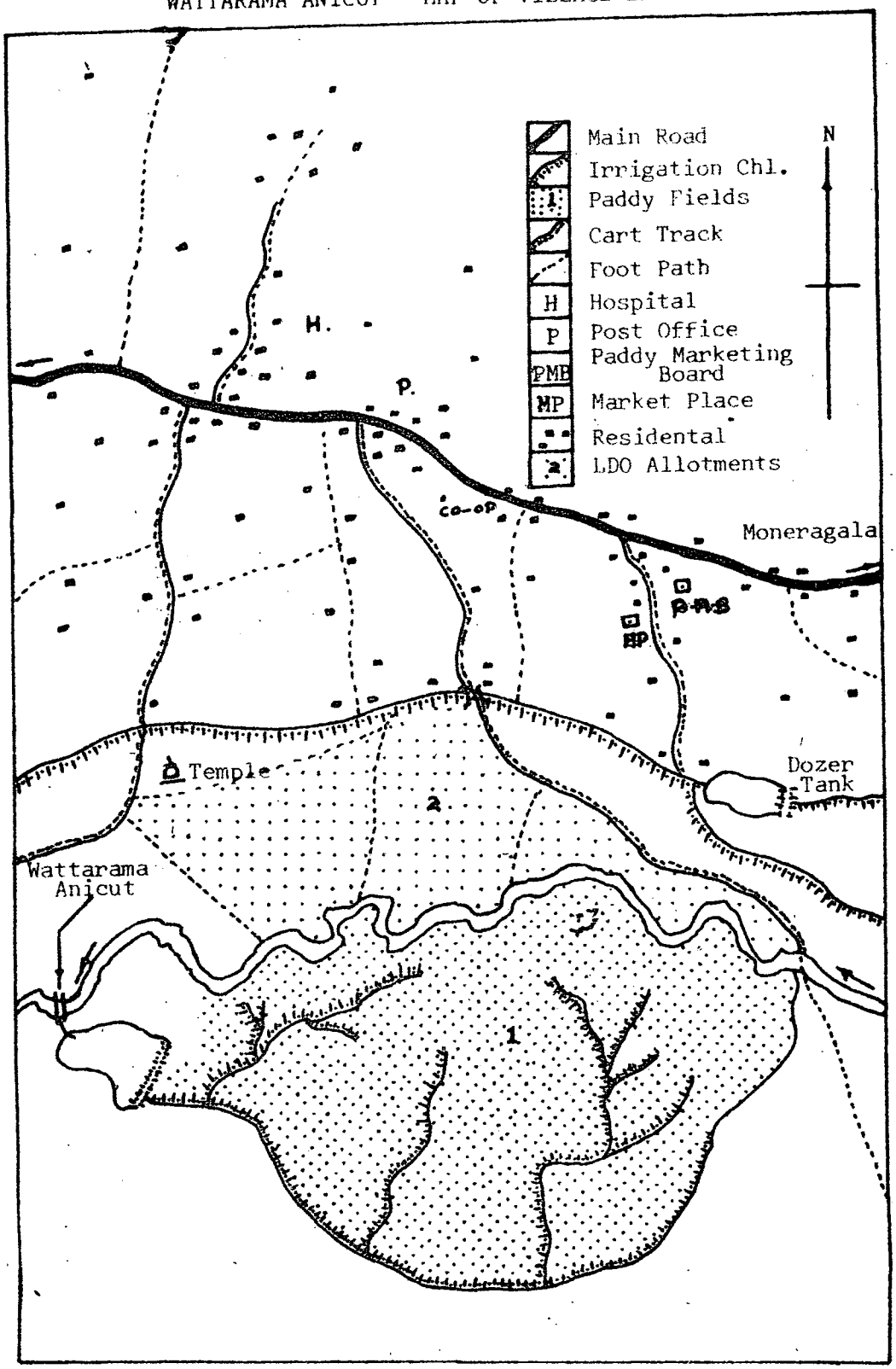
MEEGAHAPITIYA TANK - VILLAGE ENVIRONS



MEEGAHAPITIYA TANK IRRIGATION SYSTEM LAYOUT



WATTARAMA ANICUT - MAP OF VILLAGE ENVIRONS



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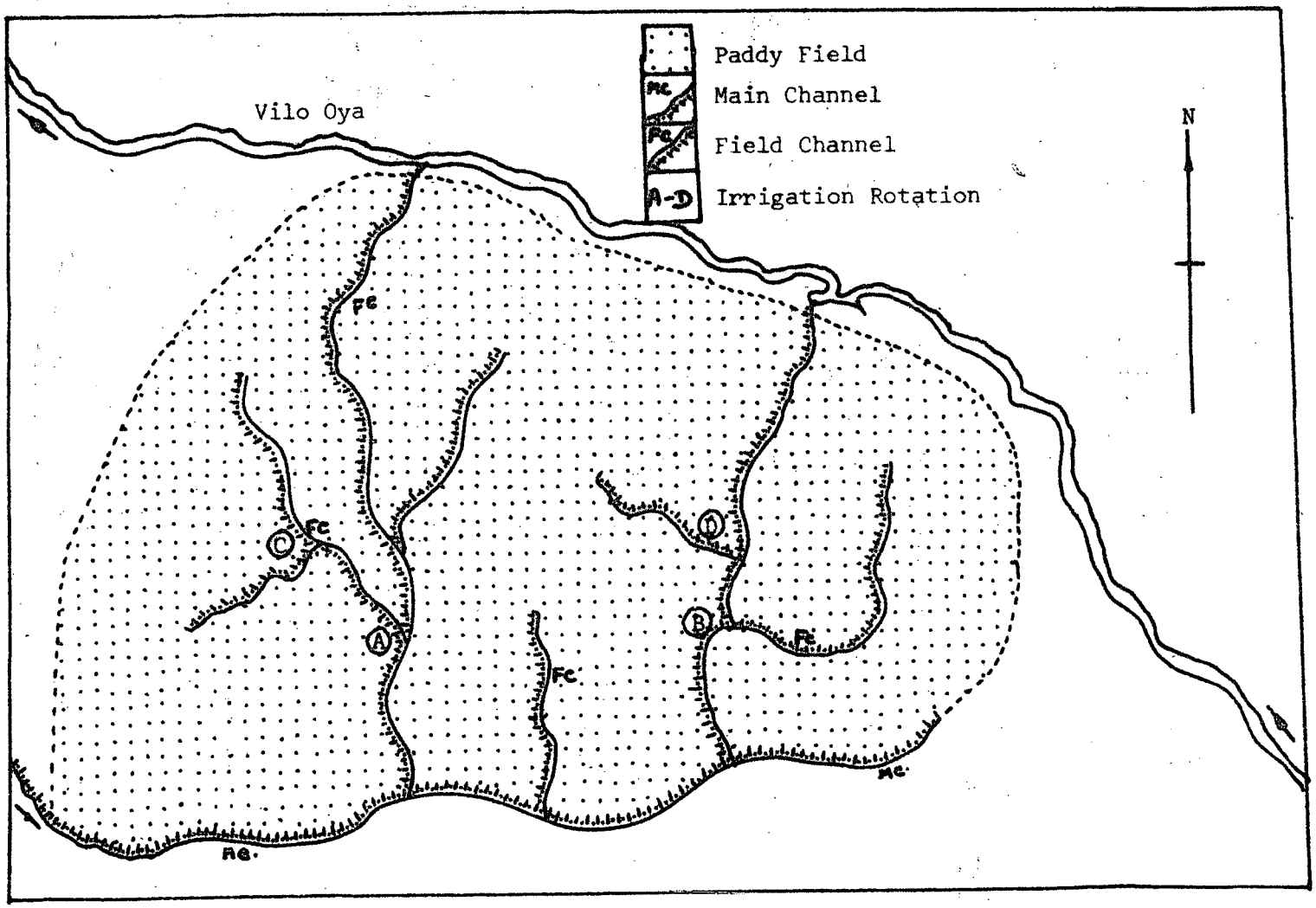
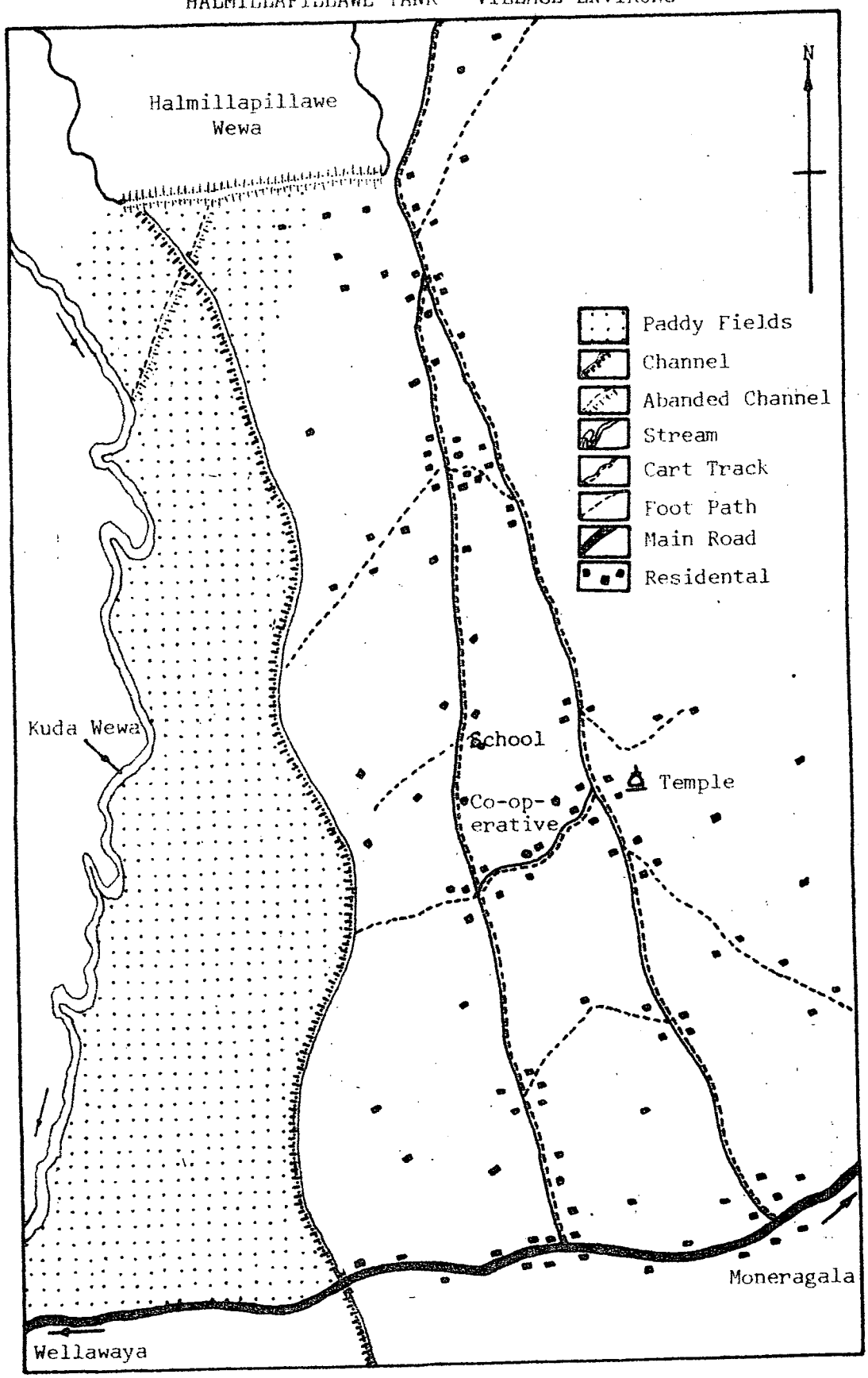


HALMILLAPILLAWE TANK - VILLAGE ENVIRONS



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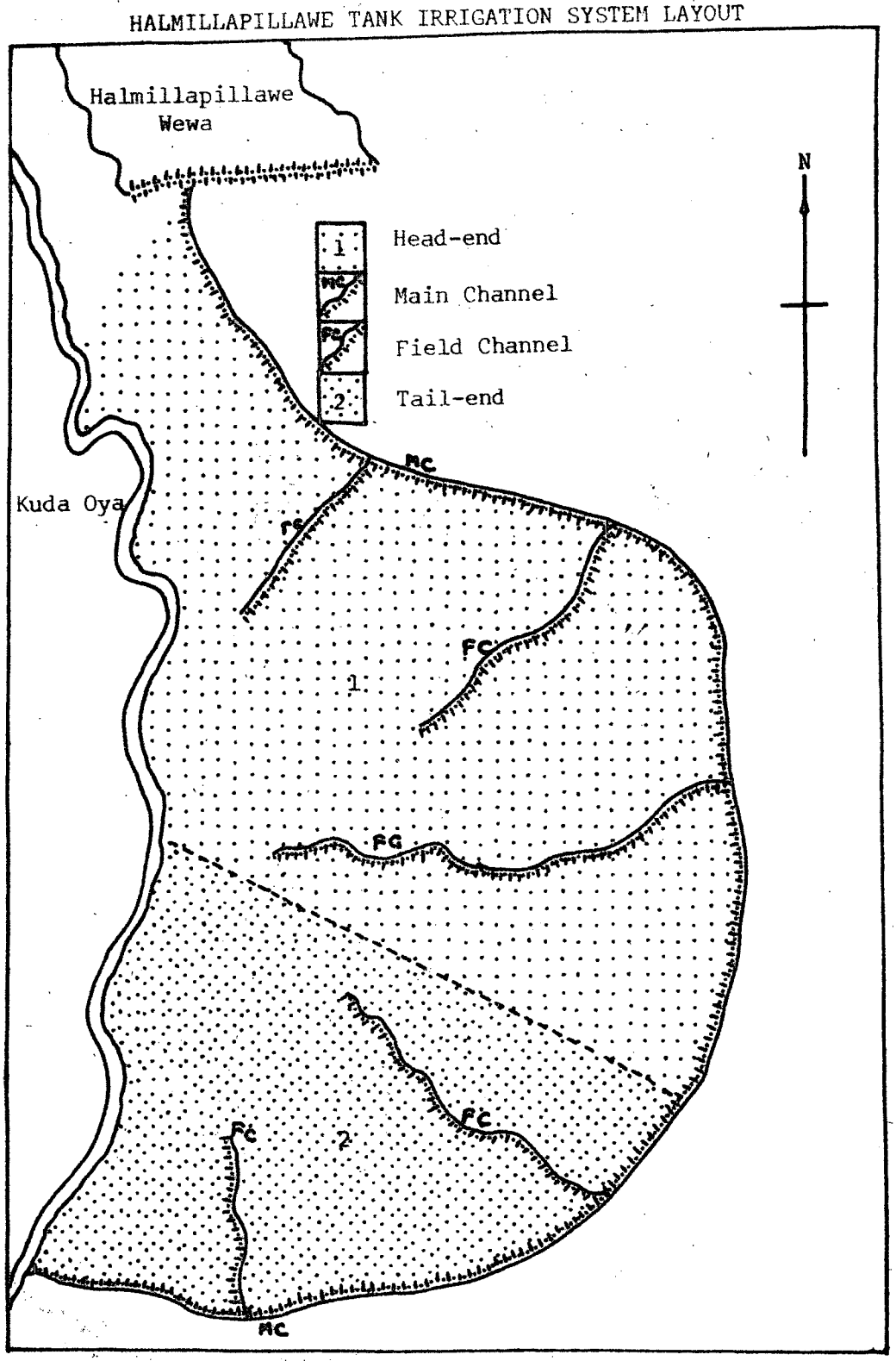
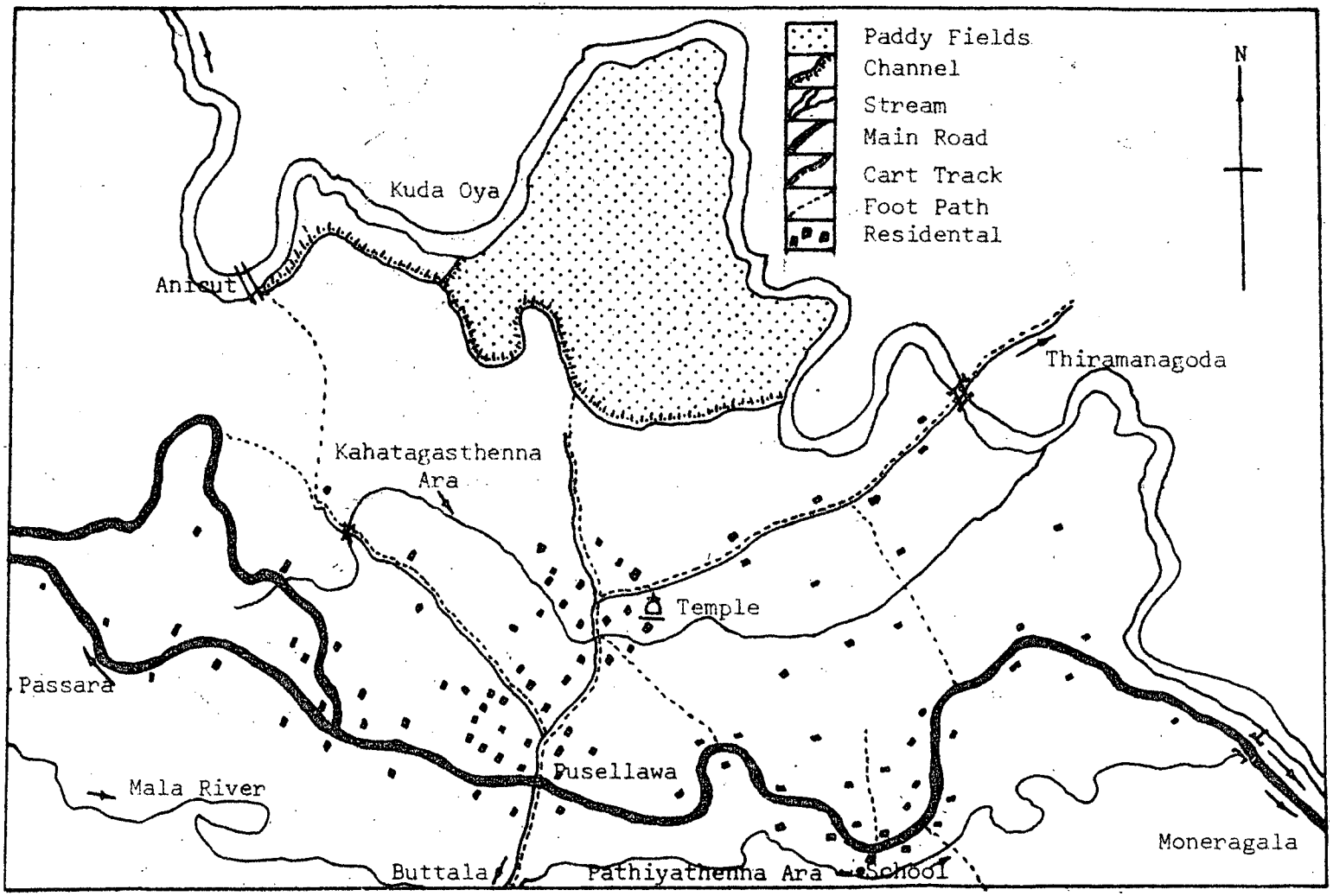
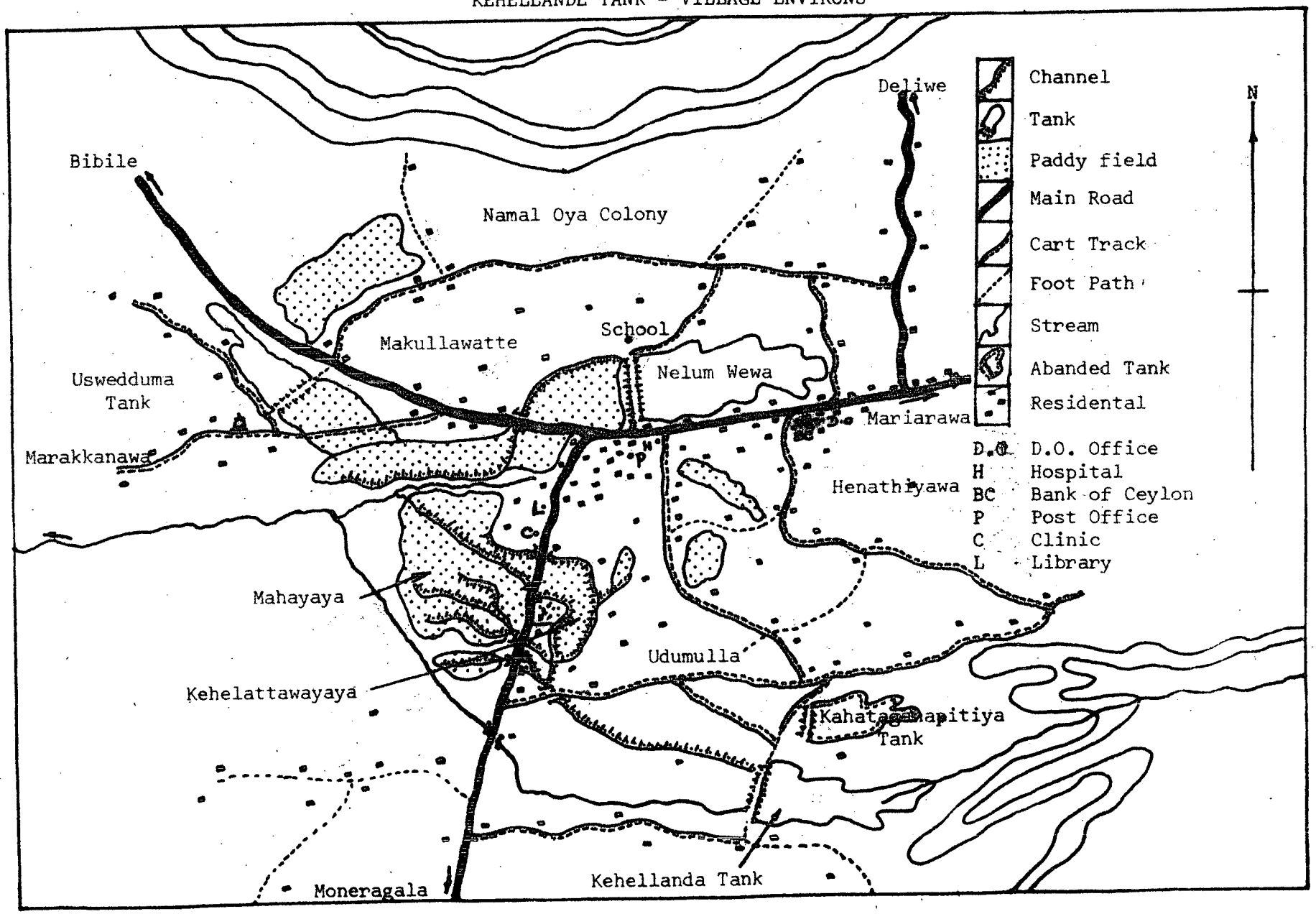


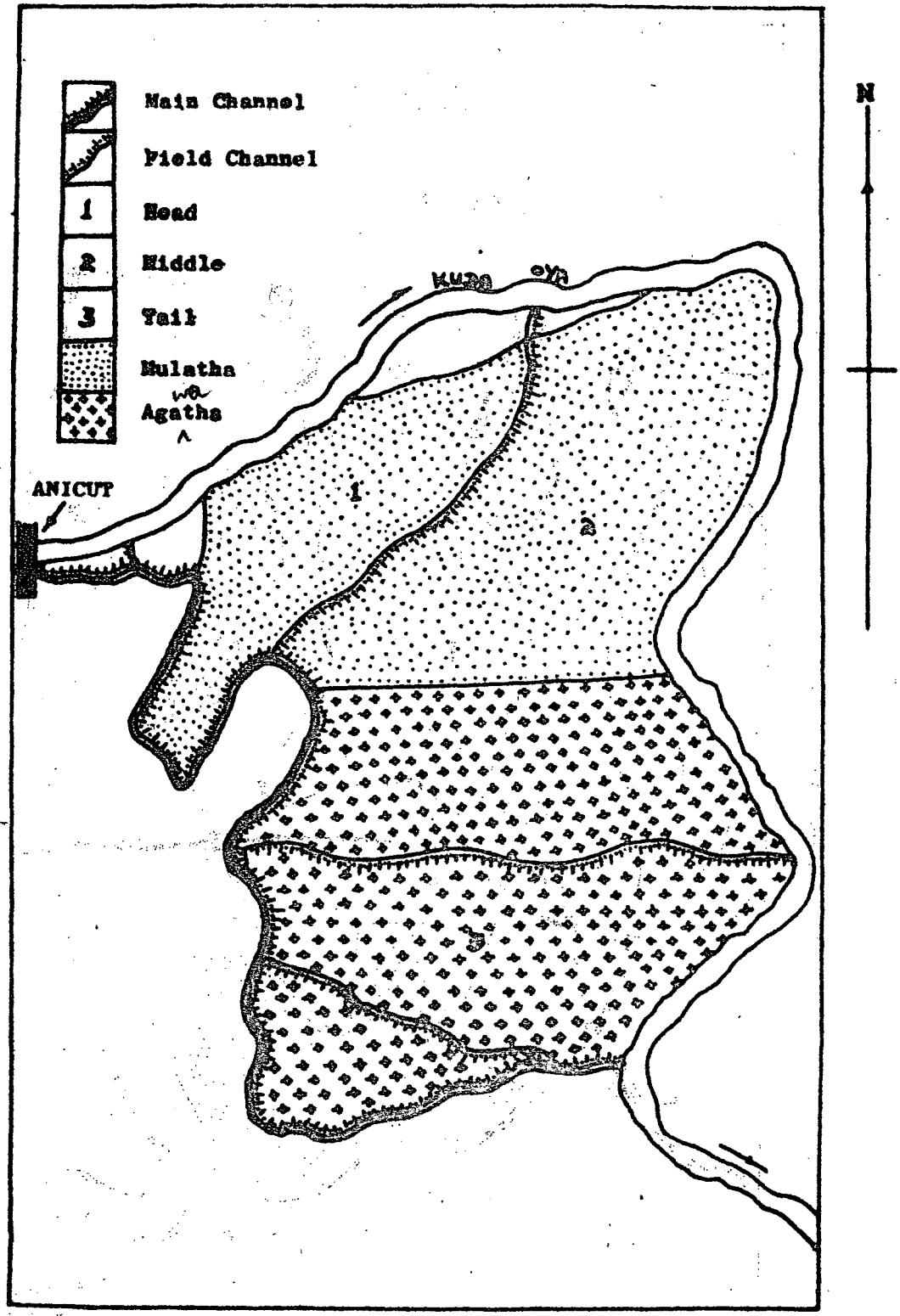
PUSSELLAWA ANICUT - VILLAGE ENVIRONS



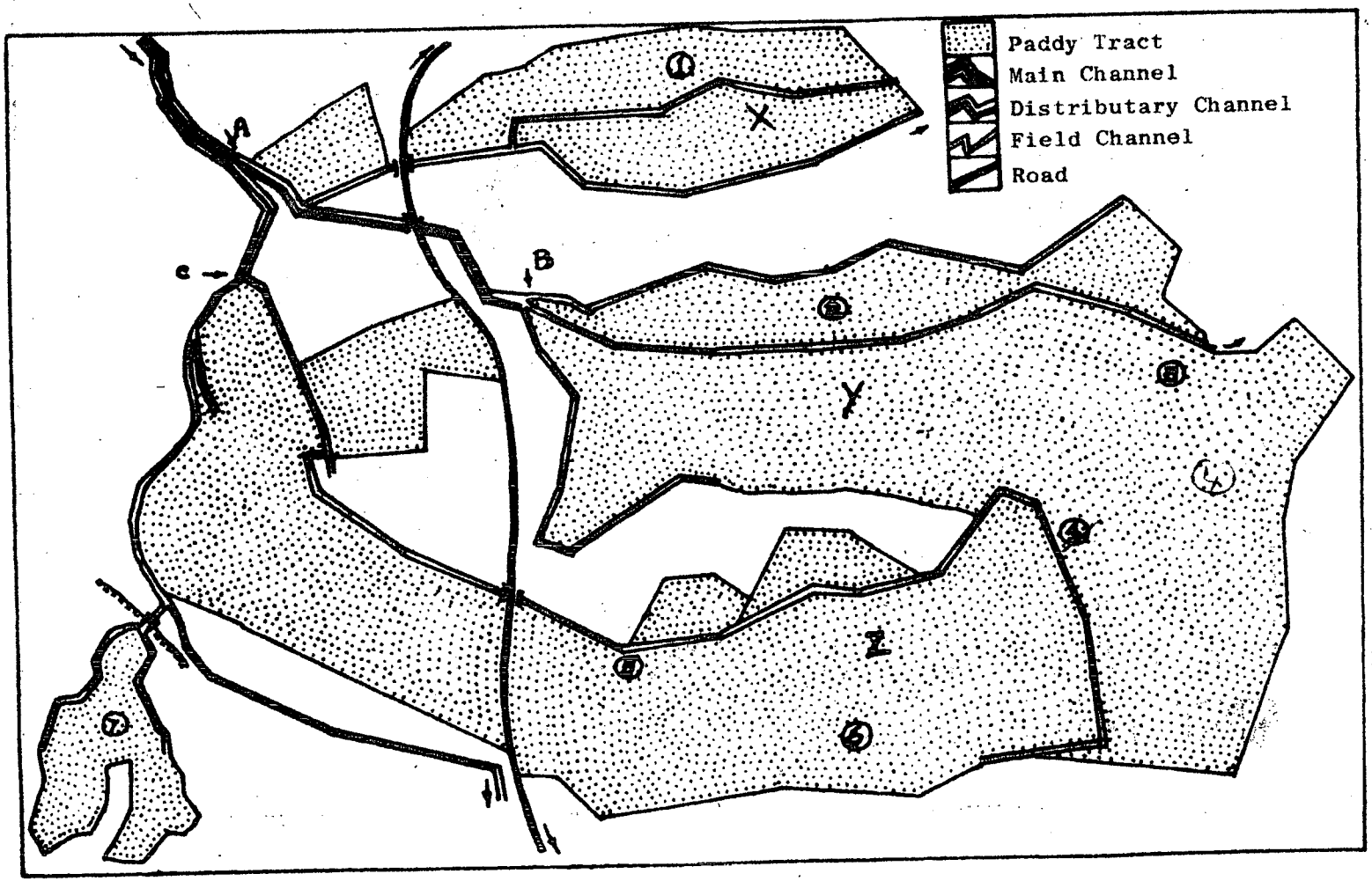
KEHELLANDE TANK - VILLAGE ENVIRONS



PUSSELLAWA ANICUT - IRRIGATION LAYOUT



: KEPELIANDA TANK - IRRIGATION LAYOUT



Annex II

Table 1 - Government Expenditure on Minor Irrigation for Selected Years

Year	Expenditure (Rs. million)
1958/59	3.19
1962/63	4.31
1965/66	5.39
1968/69	11.90

Source : Department of Agrarian Services

Table 2 - Government Expenditure on Minor Irrigation 1978-1981

	Agency	1978	1979	1980
1	Irrigation Department	25.66	52.36	92.76
2.	Agrarian Services Department	-	8.60	22.94
3.	National Committee on Village Tank Rehabilitation	-	-	23.07
4.	Freedom from Hunger Campaign	-	-	.50
5.	IRDP		7.33	14.52
6.	District Decentralized Budget	75.91	46.69	1.90
	Total	101.57	114.98	155.69

Source : Ministry of Agricultural Development and Research

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