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SOCIAL ASPECTS OF WATER MANAGEMENT DURING THE MAHA SEASON 1985/86 IN DEWAHUWA AND MAHAWELI H-2 BLOCK 305 - PRECEPT AND PRACTICE

by

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INTRODUCTION

The International Irrigation Management Institute (IIMI) began research projects in Dewahuwa Tank and Mahaweli H-2 during the Yala season (May-Aug.) of 1985. The research focussed initially on agricultural economics (e.g., farmers' use of agricultural inputs and returns from different crops) and on irrigation engineering (water distribution and flow rates). In the second season (Maha 1985/86) of research a social science component was added to address issues of farmers' management decisions and the institutional arrangements by which farmers and agency officials operate and maintain the irrigation works. This report summarizes the research results of the social science component for the Maha season, from October 1985 to April 1986. This report has been prepared by Mr. Senarath Bulankulame (Research Associate), and is based largely on field data collected by Ms. Ranjanie Moragoda and Mr. Ekanayake Ratnasiri (Project Assistants) as well as the author's independent data collection and observations. Dr. David Groenfeldt, who with the author jointly supervised the research, has helped in the editing of this report.

Objectives of the Study

The primary objective of IIMI's research activities in Dewahuwa and Mahaweli H-2 has been to understand how management interventions in the irrigation system can promote and facilitate the cultivation of diversified (non-paddy) crops. A multi-disciplinary approach has been applied to this research problem involving the three components described above: (1) economics, (2) engineering, and (3) sociology. In addition to the primary objective, each component focussed on other issues as well. For example, the economics component addressed the dynamics of resource mobilization and cost recovery, and the engineering component collected data relevant to evaluating overall system performance. The sociology component focussed on farmers' formal and informal organizations for irrigation management in order to understand how management decisions were being made. It was felt that a basic understanding of management processes at the farmer level is essential to support eventual management interventions aimed at promoting diversified crops. As a result, this report deals with institutional aspects of irrigation management rather than dealing directly with farmers' cropping decisions.

Study locales

The areas in which the study was carried out covered a relatively small geographical area. In Dewahuwa the sample area comprised 3 turnouts in Tract 5 (turnouts 10, 11 & 12) while in Mahaweli the sample area was confined to a single distributary (D-4), again selecting three turnouts (turnouts 3,4 & 5). Within these turnouts a 100% sample of operators (whether owners or lessees) was conducted. The proportion of Tract 5 covered in Dewahuwa was 25% and in Mahaweli 50% of D-4 was covered.

Methodology for data collection

Most of the data on which this report is based were collected by Ms. Ranjanie Moragoda (Mahaweli H-2) and Mr. Ekanayake Ratnasiri (Dewahuwa) who are Project Assistants at IIMI, based at the research sites. They spent the Maha season living in the home of a farming family and conducted interviews and observations both in farmers' homes and in their fields. In addition they met periodically with project level officials of the irrigation department (Dewahuwa) and Mahaweli Authority.

Two different questionnaires were used during the Maha research: (1) A census administered to all households living within a defined residential unit, and (2) A farmer-questionnaire administered to all operators cultivating land within the selected turn-out areas. In addition, open-ended informal interviews were held with the operators and with other key informants on topics such as land tenure, rotations, crop decision, sources of financing and credit, and land preparation activities. Participant observation was also carried out on water rotations, land preparation, use of water, and other activities both to enrich the data and as cross-checks to the qualitative data. The observational and qualitative data was collected both by the Project Assistants, who submitted written bi-weekly reports, and by the author, who supervised the field research and conducted independent interviews and observations throughout the season.

Organization of the Report

The first section of the report describes the background of the operators, their operational status, and their land tenure relations. The second section is concerned with farmers' behavior in managing irrigation water, the availability of water, the mode of distribution at the turnout level, and maintenance and cleaning of their distributary and field channels.

The third section presents the forms of organization that exist in the two systems - Mahaweli and Dewahuwa. The roles and functions of the farmer representative and the interactive process that exists between farmers and officers, are discussed. The final section attempts to draw some conclusions regarding how irrigation water is managed by farmers and how the bureaucracy affects farmers' management behavior.

CHAPTER 1

THE FARMERS OF DEWAHUWA AND MAHAWELI-H

In Dewahuwa the study area is in the command area of Tract 5. A single long distributary serves 6 field channels (49 allotments) and gives direct issues to 10 other allotments; in addition, 16 allotments are served by turnouts taking off directly from the main canal (see Map 1). The three "turnout groups" which make up the sample were selected from the head, middle and tail portions of the Distributary Channel (DC). Turnout groups are used as administrative units for the project management and do not correspond exactly to areas served by individual field channels.[1] The three sample turnouts comprised a total of 21 allotments, each about 5 acres in extent. During the Maha season, 70 operators were farming these 105 acres (see Table 1).

In Mahaweli H-2, the D-4 distributary in Block 305 served as the sampling universe, from which three of its five turnouts were selected for the sample (see Map 2). The channel network of the Mahaweli system is more regular than Dewahuwa, with each "turnout group" corresponding to a separate FC serving between 7 - 20 allotments. The three sample turnouts comprised a total of 44 allotments, each 2.5 acres in extent. During the Maha season 56 operators were farming these 110 acres (see Table 1).

The families who were allotted irrigated farmland in Dewahuwa were also given residential plots of 3 acres, for highland gardens. The Tract 5 residential area is separated from the Tract 5 command area by the canal, and forms a spatially coherent unit. Many of the 65 residential allotments, originally intended for one family, today support three or four houses of extended kin. About 800 people live in the 140 houses of Tract 5.

The farmers in Block 305 in Mahaweli H-2 have been given much smaller residential plots of 0.5 acres which have not yet been subdivided. Most of the inhabitants settled in their new homes within the last five years. In Hamlet 5 (Mawathegama) and Hamlet 5A (Namalgamuwa), only two of the 110 house plots have more than one family.

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[1] A turnout gate serves a field channel, and the terms are often used interchangeably in this report. A "turnout group" is a term used by the project management to refer to a group of allotments having a single Farmer Representative (Farmer Rep). The turnout group is only loosely coincident with a field channel, as some allotments are served by very small FCs, or receive water directly from a DC and MC.

TABLE 1

NUMBER OF ALLOTMENTS AND OPERATORS IN SAMPLE TURNOUTS, DEWAHUWA AND MAHAWELI-H, MAHA 1985/86

	No. of Allotments	No. of Operators	Av. Number Opers/Allot.
DEWAHUWA			
Turnout 10	7	27	3.8
" 11	7	15	2.1
" 12	9	28	3.1
TOTALS	23	70	3.0
MAHAWELI			
Turnout 3	20	24	1.2
" 4	12	14	1.2
" 5	12	18	1.5
TOTALS	44	56	1.3

Residential Pattern

In the command area of both schemes[2], most of the operators live in the corresponding residential areas, but a significant number live in outside areas. In the Dewahuwa sample, 74% of operators come from within Tract 5 itself, while in the Mahaweli sample, 66% come from the two corresponding hamlets of Mawathegama (50%) and Namalgamuwa (16%). The greater proportion of Dewahuwa operators who reside in a single unit is significant, since the Mahaweli settlement pattern was planned to be a cohesive group linking residential neighbors with field neighbors and homestead gardens with irrigated agriculture. Dewahuwa, an earlier settlement scheme, was based on a linear settlement model which, though scattered and dispersed in places, appears to be more centrally oriented than the Mahaweli scheme. When neighboring tracks (in Dewahuwa) and hamlets (in Mahaweli) are considered, however, the Mahaweli residences appear more centralized, with a number of operators who farm land within the sample area living just outside the corresponding residential area. Of the sample operators in Dewahuwa, 9% live outside the settlement scheme, whereas only 3% of sample operators in Mahaweli live outside the H-2 area.

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2 "Scheme" refers to the research sample area in Tract 5 of Dewahuwa and D-4, Block 305, of Mahaweli H-2.

TABLE 2

TENURIAL AND OPERATOR STATUS IN DEWAHUWA AND MAHAWELI SAMPLE TURNOUTS BY PERCENT, MAHA 1985/86

	DEWAHUWA (n=70)	MAHAWELI (n=56)
OWNER-OPERATORS		
Owner-cultivator	13%	36%
Family tenure	17	11
Encroached	--	2
SUBTOTALS	30%	48%
NON-OWNER OPERATORS		
Ande	31%	30%
Lease-in	3	9
" caretaker	3	2
Mortgage-in	11	2
" -in, ande-out	16	6
" -out, ande-in	4	--
" -in, caretaker	1	4
SUBTOTALS	70%	52%
TOTALS	100%	100%

Land Tenure

In all irrigation settlement schemes, land was alienated from the state, or was acquired from individuals. Ownership was generally a "prescribed free hold tenure" (Ellman et al 1976:4) with restrictions preventing outright sale or subdivision. Later on alienated land was allowed to be inherited by one or two successors, and could be legally divided among children.

In Dewahuwa, which was settled over 30 years ago, 62% of the allotments are still owned legally (not legally transferred) by the original allottee, 25% have been legally transferred to the second generation, and 12% have been illegally sold. In the Mahaweli sample, settlement took place only with past 10 years, and 98% of the allotments remain (legally) in the hand of the original allottees.

In addition to the planned allotments of irrigated land, significant portions of reservation lands have been encroached, particularly in Dewahuwa. Most encroachments are on upland areas beyond the level that can be irrigated by gravity, but in some cases encroached lands are irrigated either by gravity or by pumping from the canals. Except where official allotments have been expanded through encroachment, encroaching operators are not represented in the sample. A rough estimate of encroached irrigated area in Dewahuwa is

about 10% of the designed command area of Tract 5, and about 5% of the designed command area of the D-4 Distributary in Mahaweli.

Types of Land Tenure. Leases and mortgages are not recognized legally, but are fairly common among operators in the Dewahuwa sample (29%). In Mahaweli, the corresponding figure is considerably lower (11%) due to the young age of the scheme (see Table 2). Ande (sharecropping) is widespread in both schemes, with 31% of Dewahuwa operators and 30% of Mahaweli operators farming under ande arrangements. Taken together, the various forms of "hidden tenancy" or non-owner cultivation apply to 60% of Dewahuwa operators and 41% of Mahaweli operators.

Combinations of hidden tenancy complicate the land tenure pattern in both schemes. A fairly common practice is that land is taken on ande, lease, or mortgage by a tenant, and then given out to a third party on a second ande, lease, or mortgage. In Dewahuwa, for example, only 35% of the 23 operators farming mortgaged land were the actual grantors of the mortgage. Often the original owners continue to operate the land but as tenants.

While the proportion of tenants to owner operators is quite high in both schemes (70:30 in Dewahuwa and 50:50 in Mahaweli), many of these "tenants" are actually close relatives of the owners, and in some cases are paying rent on land which they will probably, but not necessarily inherit as their own (see Table 3).

TABLE 3

OPERATORS' RELATION TO OWNER IN DEWAHUWA AND MAHAWELI IN SAMPLE TURNOUTS, BY PERCENT MAHA 1985/86

Relationship	Dewahuwa (N=70) %	Mahaweli (N=56) %
Father-in-law	---	1.79
Owner	11.43	35.71
Husband	---	3.57
Acquaintee*	51.42	32.14
Father	---	---
Mother	---	---
Son	24.29	3.57
Daughter	---	---
Brother	1.43	3.57
Sister	2.86	7.15
Brother-in-law	---	---
Sister-in-law	---	---
Son-in-law	5.71	10.71
Daughter-in-law	---	---
Other relatives	2.86	1.79
Total	100.00	100.00

Tenurial Contracts. Lease and ande arrangements are temporary, and may be in cash or kind. Typical rents are 25-30 bushels of paddy[3] per acre during the Maha season. In general, cash transactions are more common in Yala (when typical rents are ca. Rs. 1000 per acre for chilies), and in-kind transactions are the normal mode during Maha. Long-term rents of several years duration, effective for the Maha season only, are arranged at a rates of approx. Rs. 600/season/acre. Mortgages involve substantial amounts of cash, e.g., Rs. 5,000 per acre, and are seldom redeemed because of the amount involved.

Conclusion

The vision of irrigated settlement as reflected in the Land Development Ordinance of 1935 was that operators would be free-hold peasant proprietors. The data from both Dewahuwa and Mahaweli indicate that land has moved further and further from the original owners, both through family subdivisions and through economically-constrained tenancy relations. The settler who was envisaged to be a "self reliant" farmer bent on improving his economic status by intensive production of his irrigated allotment has turned out to be an absentee owner illegally leasing out his allotment to others. This situation has come about partly because of contradictions in the settlement policy. Freehold restricted ownership, restrictions on sale, purchase mortgage, transmission legally only to two family members, selection in time, settlement and pattern grouping patterns at settlement etc.

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[3] Paid in kind; the cash equivalent is approx. Rs. 2,000. It is paid generally at the end to season with the yield.

CHAPTER 2

OPERATORS' INVOLVEMENT IN IRRIGATION

This chapter discusses how owner and non-owner operators use the irrigation facilities in Dewahuwa and Mahaweli-H. The operators' behavior is conditioned by the knowledge and experience which they (and/or their parents) brought into these schemes, as well as reflecting adjustments to the current socio-economic circumstances which they face. The agency's[4] objective is to distribute water equitably and efficiently to all farmers and allotments. In both schemes, water distribution at the level of the main channel and distributary is the responsibility of the agency, while water control within the field channels is in the hands of farmers.

Water Delivery in the Main System

A schedule of water issues is established before each season at kanna (cultivation) meetings. At these meetings, farmers meet with representatives from the district administration, banks, and line agencies of agriculture and irrigation.[5] In general, a continuous flow is provided during the land preparation stage, and rotational or intermittent issues thereafter.

Dewahuwa. Dewahuwa tank feeds a single right bank canal 16 km in length, from which a series of distributary channels as well as direct turnouts provide water to the fields (see Map 3). The system feeds a total of 480 recognized allotments, as well as substantial encroached areas, for an estimated total command area of 3,000 acres.

The first issue for land preparation during Maha was on 1 October 1985. At this time, however, many of the farmers were planting upland chena lands outside the scheme area, while other farmers were attempting to collect a last harvest of chillies from their irrigated plots. After 30 days of land preparation issues, the second stage of issues began, based on a 7-day cycle with 4 days on and 3 days off. The total command area was divided into two parts: Tracts 1-4 receiving water on the first two days, and Tracts 5-9 on the second two days. Within Tract 5 (the sample area), the ID's plan called for a rotation with the tail-end being irrigated first. Instead, farmers took water continuously during both days that water was flowing in the Distributary.

Mahaweli. The sample area of System H-2 is fed by waters originating in Kalawewa tank, and stored in the Kallankuttiya tank ca. 16 km W. of Kalawewa. From Kallankuttiya, a single canal serves 20 distributaries over its length

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[4] In Dewahuwa, the Irrigation Department; in Mahaweli-H, the Mahaweli Authority of Sri Lanka, and in particular, the Mahaweli Economic Agency.

[5] see H. Murray-Rust and M. Moore, Formal and Informal Water Management System: Cultivation Meetings and Water Deliveries in Two Sri Lankan Irrigation Schemes. Cornell Studies in Irrigation No. 2. Cornell University, Ithaca, New York, 1983.

of ca. 13 km (see Map 4). The sample area, D-4, is fairly typical of these distributaries; it serves 5 field channels (FCs) for a total command area of 250 acres. There are no direct issues from the distributary.

The first issue for land preparation started on 15 October 1985 After 30 days of land preparation issues, the rotational pattern followed in Mahaweli during the growing season was based on rotations of the D-Channels along the main canal. The 15 head-end D-Channels were open for 4 days and closed for 3 days; the other 5 D-Channels were open for the other 4 days (with one day overlap) and closed 3 days.

F-Channel gates were generally kept open during the Maha season, receiving water whenever water was flowing in the D-Channel. Within the sample area (D-4, Block 305) the Unit Manager (Unit 3) attempted to introduce 6-hour rotations within each F-Channel instead of letting water flow continuously in small quantities (which requires tail-end farmers to irrigated when the head-end farmers are not irrigating, particularly at night). As a result of these rotations, which were not adhered to due to they not meeting their perceptions regarding water needs farmers behavior was to store water in allotments at fill level resorting illicit tapping from F.C.

During the rainy period following land preparation, there was very little demand for irrigation water. When dry weather was encountered in late January 1986, farmer demand suddenly rose creating scarcities in tail-end D-Channels. In D-4, the 6-hour rotational system broke down completely, and instead of 4 farmers receiving water at a given time, most farmers attempted to irrigate simultaneously. In response, the project management resorted to turnout rotations, prompting farmers to take water whenever and however possible by not closing outlets, cutting the F-Channel bund, and using drainage water.

Water Use at the Farm Level[6]

The normal procedure for water distribution within the F-Channel is for all farmers to take water (or to attempt to take water) simultaneously. In TO 4 of the sample area this procedure was followed. Farmers were obligated to remain in their fields during irrigation in order to ensure constant flow; otherwise their pipe outlet was likely to be blocked by neighbors. Tenant operators not residing in the area were at an inherent disadvantage under this system.

In the three Mahaweli sample turnouts, a maximum of 16 allotments were found to be receiving water simultaneously; in Dewahuwa a maximum of 9 allotments and a minimum of 2 allotments (of 12 in the tail-end FC) were receiving water at the same time.

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[6] Data regarding irrigation practices were gathered throughout the Maha season (October to April) and particularly from December to February.

Mahaweli. Within the turnout (TO), rotations are the responsibility of the farmers, and also of the Farmer Representative (FR). To a large extent this is an informal arrangement among farmers that one farmer will irrigated at a certain time, or that all farmers will take water simultaneously.

Of the Mahaweli sample, 61% of the farmers claimed that rotations are sometimes practiced, 21% said they are not, and 18% did not know. Of those reporting rotations, less than half (41%) reported them for the Maha season, 32% reported rotations the previous Yala, and 21% could recall rotations only during earlier Yala seasons. Operators' awareness of rotations is linked to their land tenure status: All owner cultivators gave a definite response (Yes or No), while 34% of tenant operators claimed ignorance one way or another.

The general practice as reported through informal interviews is that ad hoc irrigation practices are followed at water scarcity but cannot be continued due to lack of cooperation and construction defects like bad leveling, irregular levels of outlets etc. Head-enders can assure their supply of water only at the expense of tail-enders.

In TO 3 at the tail-end of D-4, constant conflicts and irregular water use patterns were observed by the Project Assistant (Report of 12-21 February 1985). Because of the length of the D-Channel and the difficulty of bringing water to the tail, a diversion channel was constructed by M.E.A. during Yala 1985 to augment the F-Channel with drainage water. The allotments at the head of TO 3 are upstream of the augmentation channel and tend to block the F-Channel when the flow is reduced, to capture all available water before it can flow to the tail. At the tail-end farmers have adequate supplies due to the new channel. The disparity between the head and tail within this F-Channel results in continual conflicts over water.

One of the farmers in TO 3 took it upon himself to open the TO gates of the head-end F-Channels (after informing the Unit Manager of his intended action) in order to bring more water to the tail F-Channel. The farmer in question was an encroacher and a relative of the FR; however, the FR objected to any challenge to his role (even from a relative). Upstream farmers who were not receiving adequate water supplies also objected to this unilateral action; they re-opened their TO gates and quickly put an end to the attempted rotation. The Unit Manager resolved the situation by arranging for an extended water issue for the D-Channel, with the additional water delivered to TO 3.

In general, head-end farmers receive more water than others but, as the example of TO 3 demonstrates, the head-enders are not always in the best position; 56% of respondents in D-4 reported that head-enders receive the most water, 10% identified middle-enders, and 17% identified tail-enders (with access to drainage) as receiving most water. At the turnout level, farmers report that TOs 1 and 2 receive the most water, TO 4 in the middle range, and TOs 3 (tail) and 5 (head) the least. The latter case is due to the elevation being slightly high.

Dewahuwa. In Dewahuwa, formal rotations are not practiced either during Maha or Yala. All 70 sample operators gave consistent answers. Instead, rotations are sometimes practiced among F-Channels or among D-Channels; in either case, all farmers within a given TO take water simultaneously, or (for tail-enders) during the night, but on the average, water issues were four days in a week. In Tract 5 water was served to the tail-end allotments (24-49) during the first two days, and to the head-end allotments (1-23) during the last two days. In addition, a number of allotments are served directly from the D-Channel; these allotments tend to take water throughout the 4-day period of issue.

Many (47%) sample farmers felt that the allotments along the middle TO of Tract 5 receive the most water, due to a large TO gate and steep slope in the channel. Other farmers (44%) felt that the head-end TO receives the most water. Farmers were nearly unanimous (91%) that the tail-end TO receives the least amount of water.

Farmers' perceptions of more water at the head-ends of Tract 5 in Dewahuwa and D-4 in Mahaweli reveal both structural inadequacies as well as problems in farmer cooperation. The length of the Tract 5 D-Channel, for example, would be less of a problem if it were not combined with unusually large TO gates upstream, and farmers taking direct water issues without heeding rotations. In D-4, the head-enders of the tail-end TO are the most water scarce partly for physical reasons, but also because of the inability to rotate water effectively throughout the D-Channel. In both Dewahuwa and Mahaweli, tail-end water scarcity has prompted organizational responses. The case of TO 3 in Mahaweli has already been mentioned. In Dewahuwa, a small group of tail-end operators, including two lessees, have established routine night-time irrigations by closing upstream TO gates and/or pipe outlets to bring more water to the tail.

Cleaning and Maintenance

Maintenance of the F-Channels and the TO Gate is the responsibility of farmers and the FR under the guidance of the Unit Manager (Mahaweli) of Technical Assistant (Dewahuwa).

Dewahuwa. Cleaning of the F-channels in Dewahuwa is normally (61% of sample farmers) done before the start of the Maha season in September. Cleaning is nearly always done eventually, however; the remaining 39% of sample farmers reported that their F-channels has been cleaned after the start of the season. Late cleaning has largely been due to lessees who live outside the area and come only for specific agricultural operations such as plowing, land preparation, and irrigation; it has been difficult for project management to exert pressure on operators who are seldom present. Another problem is that head-enders can obtain water without much concern for cleaning. Nearly all operators (94%) knew when their F-channel had been cleaned, even if they themselves did not participate. The actual work is generally performed by individuals (79%) but in some cases several farmers (11%) or a group of farmers (11%) may work together. There is no penalty for failure to clean the channels.

Mahaweli. One third (35%) of the sample operators cleaned their channels sometime before the first water issue and the rest did their cleaning during October (41%) or did not know when the channel had been cleaned (24%). In general, operators who are leasing-in do not maintain channels and do not participate in channel cleaning, nor is the owner willing to clean channels when he is not farming the land. Most farmers were unable to identify an individual who organized the cleaning activities, but of those cases (n=20) where one person was clearly the motivating force, in 9 cases it was the FR, and in 7 cases a tail-end farmer.

Operation of Structures

Structures at the tertiary level have been entrusted to the farmers and FRs to operate and maintain. In both schemes the TO gates are generally kept open and are not adjusted.

Dewahuwa. In Tract 5 the Technical Assistant (TA) instructs the Irrigators to open and close the few turnout gates which are adjusted, though in other Tracts the FRs do this. At the level of the individual allotment, 31% of the sample farmers reported that the Irrigator had responsibility for opening the allotment intake; most cases comprise direct off-takes from the D-Channel.

Mahaweli. The Unit Manager and his Field Assistant have responsibility for opening and closing TO gates. According to interview data, however, 57% of the farmers reported that their TO gate is always open.

Conclusion

Operators appear to be confused by the constant re-scheduling of water rotations and issues. Their response is to seek hidden solutions to their water shortage. Lack of penalties for these acts encourages this behavior of using maximum water when it is available. Hidden tenancies further aggravate this situation; failure to clean and maintain channels is not punished.

Proper irrigation schedules require a well-maintained system. This condition is largely lacking in both schemes at least with regard to turnout gates, where opportunities are provided for farmers to use water continuously. When management deviates from previously announced schedules, farmers must be informed of the changes. On the other hand, farmers, through the FRs, should inform the management of their problems and help management by following the procedures laid down. In the absence of such interactions, the operators, endowed with a sense of individual self interest, act on their own to use water in a way to bring them maximum benefits when water is available.

CHAPTER 3

MANAGEMENT INTERACTION BETWEEN FARMERS AND OFFICERS

The practice of irrigation necessitates human intervention in the development and operation of irrigation systems. This intervention by the agency (officers) and users (farmers), which manifests as management and organizational processes, is examined in this section. The ideal usage of the F.R. system in the Mahaweli and Dewahuwa are described first, to understand the norm.

At the tertiary level, F-channels have turnouts (TOs) as issue points, which are grouped into allotments. In Mahaweli they consist of 15-20 allotments and in Dewahuwa a few more. Water distribution among allotments with the turnout is the responsibility of the farmers. To assist in this a system of farmer representatives (FRs) was introduced to be the link between users and the agency.

The Turnout Groups of Mahaweli

The design of field channels to supply water to a group of allotments facilitated the development of turnout groups in Mahaweli. The turnout group as known today had its origin in the late 1970s through the work of Shoaib Sultan Khan (see S.S. Khan, 1982). His approach was modified in 1981 to the present system when Unit Managers (UMs) were introduced to Mahaweli H. Each UM is responsible for about 250 farmers, seeing to their irrigation, agricultural and community development aspects. FRs were selected to help distribute water within turnouts.

The basic components of this system was the linkage between: 1) Recruitment, 2) Training, 3) Formation of turnout groups, and 4) Dissemination of information to farmers. Of these the training component loomed large in the earlier model with proposals for bi-weekly and monthly training of farm leaders.[7]

The System of Farmer Representatives at Dewahuwa

Dewahuwa is one of about 42 schemes where an integrated project approach called the "Integrated Management of Agricultural Settlements" (INMAS) is used by the Irrigation Management Division of the Lands and Land Development Ministry (INMAS Information Booklet No 2 1984). This program is

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[7] Shoahib Sultan Kahn - First Review of the Project officers and Farmer Leaders (H1, H2 & H7). Training program in community development April 1980, UNICEF, Colombo, page 4.

being implemented in major schemes/systems) which have over 2000 acres of irrigated land.[8]

Dewahuwa turnouts are not always based on supplies from field channels; a number F-channels are fed directly by the main channel. Hence the turnout group formation for the F.R. system are based on contiguous areas rather than exclusively on hydrological units. The size of turnout varies between 10-23 allotments, each 5 acres. As in the Mahaweli model, members of a turnout group are limited to legal land owners. There are 28 turnout groups for the system and each turnout has a farmer representative. Tracts are divided into three groups for the purpose of management.

Tracts #1 - #4 (1 - 9 turnouts)
Tracts #5 - #7 (10 - 20 turnouts)
Tracts #8 - #9 (20 - 28 turnouts)

Each Tract group is represented by a "Tract Committee" (sometimes called the sub project committee). Each of the three committees has on the average 9 farmer representatives of which it may elect 4 FRs to the Project Committee. The organization functions on a series of meetings beginning at the tract committee level every first Friday and third Friday of the month. The Project Committee meets every month.

The tract committee discusses problems in each tract. The tract committee president is a farmer rep, but he does not normally preside over the meetings. Earlier the secretary was a farmer rep, but recently it has been given over to middle level officers like the Technical Assistant (T.A.), the Cultivation Officer (C.O.) and the Krushi Karma Viyapthi Sevaka (KVS). These officers preside at the tract meetings; usually the A.I. presides for tracts 1-4, the T.A. for tracts 5-7, and the Project Manager for tracts 8-9. In addition to farmer-officer relationships developed here, communication in written notices, progress reports and field visits form the mode for obtaining knowledge about field conditions.

The function of the Project Committee is to co-ordinate the activities of the various line agencies such as Agriculture, Irrigation, and Agrarian Services which are in some way involved in the irrigation system. This function is carried out by the Project Manager in consultation and interaction with other officers. The functions of the FR's are to supervise channel cleaning, distribute water within the field channel with the assistance of irrigators (open and close gates), initiate rotations, help settle disputes that farmers report regarding construction defects in structures, and serve as liaison between officers and farmers.

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[8] The organizational structure and the management by committees via farmer representatives are described in the INMAS handbook (Farmer Organization in Major Schemes - IMD Booklet No 3, February 1985.

In tract 5 there should be 3 farmer reps. but due to the resignation of one there are two in the following manner.

Allotment 1 - 14 - 1 FR
Allotment 15 - 49 -]
Allotment 50 - 65 -] 1 FR

The Precept in Practice in Dewahuwa and Mahaweli

This section examines the data obtained through a questionnaire, informal interviews of Project Assistants and the writer during the Maha of 85/86 in both schemes. The questionnaire examined recruitment of FR's, their functions, duration of their office, mechanisms for changing, their interactions with officers from the perspective of farmers knowledge.

Dewahuwa. The irrigation role played by the FR is not of great importance in the view of most farmers. One fifth of the farmers did not know how the FR was selected, or how many years he has served. There was considerable confusion as to farmers' authority to replace their FR; two thirds (67%) claimed they did not have that authority, while one third felt they did. Farmers who said they were not involved in selecting the FR gave as reasons that they had not attended the meetings, or that they were not legal land owners.

Farmers were in general agreement (84%) that the FR plays a useful role, and there was nearly unanimous agreement (97%) that there are no other farmer leaders to turn to in his place. According to farmers, the FRs are needed to prevent quarrels about water use, to protect tail-enders from head-enders in water distribution, and to get help in operating TO gates.

Mahaweli. In response to the question of who can help the farmer with irrigation matters other than the FR, 80% of the farmers said there is no one; at the same time, however, 75% of the farmers did not know where there FR was. Most of the FRs have been in their posts only one season; the longest duration reported was 3 years. A majority of farmers (54%) felt they did not have the authority to change the FR. Slightly less than half (48%) felt that the FR was clearly necessary; reasons given included informing the UM of illicit irrigation and representing farmers at meetings with the UM.

The correlation between farmers who meet their FRs at least occasionally and farmers who are owner-operators is striking; Of the 21 farmers who meet their FR, 71% are owners; of the 26 farmers who do not even know the FR, only 12% are owners. Many operators (29%), most of them lessees, live outside Block 305 and commute to their fields; hence they seldom come in contact with the FR. Less than half (45%) the farmers could identify their D-Channel Rep (DC Rep), although all but 2% were at least aware of such a position.

Analysis

The data reported on here are primarily reported by farmers and hence reflect farmers' views and not necessarily total empirical reality. Nonetheless a comparison of the views of Mahaweli and Dewahuwa farmers offers some interesting insights on the two schemes.

The process for selecting FRs is unclear in both schemes. Mahaweli responses ranged from Not Aware (75%) to selection by the UM (14%) to farmers' election (11%). In Dewahuwa 20% were Not Aware; 29% thought the Project Manager appointed the FRs, and 51% said farmers elected the FRs. The role of the PM in selecting FRs became evident at Dewahuwa, Tract 5, when one resigned and a new appointment was made by the PM. Later on in the season, the PM forced all the FRs to offer their resignations and become reappointed at his discretion. Thus, it can be seen that interventions by project management can be brought upon the FR system in both schemes.

Because of the uncertainty of the FR's role, farmers often bypass him and take their concerns directly to the project management. The project officials, on the other hand, have difficulty obtaining cooperation from FRs since their loyalty is divided. Turnover of FRs in Mahaweli is much higher (38% per season) than the 5% originally anticipated. As farmers deal directly with project officials rather than channeling their concerns through the FR, the position of the FR becomes undermined; at the same time the relations between farmers and project officials take on the character of patron-client relations, as farmers become increasingly dependent on the officials for routine assistance and special favors. In such an environment, the communication expected between farmers and the FRs fails to be achieved, and conveying information about rotations and water issues becomes problematic.

In both systems, but particularly in Dewahuwa where the "turnout" groups are not based on hydrological units, the operators who have been designated a "group" in the eyes of the project management do not view themselves with the same identity. In Dewahuwa farmers could identify less than a quarter (21%) of the other operators in their turnout. In Mahaweli, although the turnout groups are clearly hydrological, the various operators of the three turnouts studied belong to 3 different hamlets (Mawathegama, Namal gamuwa, and Kallankuttiya). They present divisions of caste, time of arrival, and patterns of land alienation. Thus, similar physical features of a turnout does not necessarily result in social cooperation.

The organization at the D-channel level also seems very loosely structured. In Dewahuwa, in fact, there is no D-channel level; the Tract Committees take on this function. In Mahaweli, where each D-channel has a DC rep, only 54% of the farmers were able to identify him.

Farmer-Officer Interaction Process

This section examines the interaction between farmers, FRs, and officers at both formal and informal levels. Formal contexts include kanna and pre-kanna meetings, project and tract committee meetings, and field visits. Informal contexts include unscheduled meetings (e.g., when in the field), friendships, and neighborly contacts.

Dewahuwa. In Dewahuwa the pre-Kanna and Kanna meetings are held at the Tract 7 temple premises; the whole scheme is represented. This provides an opportunity for the farmers to meet the Government Agent (or Additional Government Agent) and other officers of the district and region who are working with the scheme. The significant meetings that farmers (rarely), FRs (usually) and officers (usually) attend are Committee meetings (tract and project committee). The tract committee meetings are held every 1st and 3rd Friday of the month and the project committee meetings once a month on a Friday. Only 6% of the farmers reported ever attending a Tract Committee meeting; no one mentioned attending a Project meeting.

Tract Committee meetings are primarily an opportunity for FRs to relay farmer complaints and in turn collect information from the project management which they are to pass on to farmers. Although an FR is supposed to preside at these meetings, the PM generally takes on this function, while the secretary is a middle-level officer such as a KVS. Decisions taken at such meetings are not effectively conveyed to farmers. On one occasion the PM instructed the FRs to prepare a list of repairs which would be needed for water control structures, in consultation with farmers (and using the O&M fees). When the PM and other officers visited the field to inspect the locations, they found only a few farmers present; the others apparently had not been informed. Another problem with Tract Committee meetings is that the TA, who has is the major authority figure with respect to irrigation (the PM notwithstanding), is often not present to hear FRs' complaints.

The problems of legal land owners receive priority under the existing structure, yet many of the actual operators are farming under hidden tenancy agreements, and their problems are not heard. It is these tenants, many of whom are sons of owners, who are often implicated in cutting bunds and damaging locks (usually at night) in order to take more water. Some of these younger generation farmers also possess important leadership qualities, but their role in meetings can only be as observers.

The project committee meetings are presided over by the PM and in general show the same trends of official authority. An example was the PM asking two FRs to resign, without having informed them prior to the meeting.[9] In another instance, the TA refused to hand over the TO gate keys to the FR, claiming that it would lead to illegal practices. Farmers were told to consult the Irrigator (supervised directly by the TA) rather than the FR.

Field visits are another form of interaction between farmers and officers. In Dewahuwa it was observed that officers generally seek out the older, more traditional farmers, even though they may not be the actual operators. Similarly the FRs selected by the officers tend to be conservative and reflect official opinion rather that farmer opinion. As a result, FRs do not convey an accurate view of farmers' attitudes, and the water issues are thus based on faulty information of the crops farmers intend to grow and the times they intend to plant.

In Dewahuwa 68% of the farmers had not met either the PM, the TA, or the Irrigator, two months into the Maha season. Thus, communication is largely through the kanna and pre-kanna meetings, or through Tract Committee meetings where only FRs are present. Field visits by project officers do not reach a large number of farmers. Other than the quasi-official FRs, the officer who appears to have the greatest contact with farmers is the KVS (agricultural extension agent); roughly half (49%) the farmers reported that they see him regularly.

Mahaweli. In Mahaweli the kanna and Pre-kanna meetings are held at the beginning of each season to plan the area to be cultivated, crops to be grown and type of water issues and timing. These meetings are held at two places for the 5 Kallankuttiya administration blocks: (1) 306,307,309 and (2) 305 & 308. The meetings become an opportunity for farmers and farmer reps to meet the block level officers such as the Block Manager, Irrigation Engineer, and others. When asked which officers they met most frequently 54% of the farmers named the UM, who is often met on the field, and 33% the BM, who is generally found at formal meetings. The UM is also the person most likely to receive complaints from farmers who visit him in his office. Farmers reported that the Unit Manager typically claims that their complaints have been forwarded to the BM, thereby evading personal responsibility for any follow-up.

FRs are supposed to meet informally with farmers and convey their views to the project management, yet such behavior is rare; Farmers claim that FRs do not consult with them before meeting with officers. Non-owner operators have no voice in the selection of FRs and have little incentive to attend meetings where they are selected, or to follow the FR's instructions (e.g.,

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[9] The FRs' view was that the PM was opposed to their joining a Small Farmer Development Association in Tract 7, organized by Agrarian Services. P.M's view in that they are inefficient.

to clean the channel). On the other hand, owners can benefit from the absence of such tenants by blocking their outlets to take more water (cf. R. Moragoda's report of 3-11 January 1985).

Tenants who have complaints are less likely to turn to the FR, and more likely to seek help directly from the UM or other officers. In response, the UM may issue instructions directly to the farmers, bypassing the FR (as was the case in TO 3 described above). In TO 5 a contractor is encroaching land and obtaining water by a special channel to his fields, thus depriving legitimate farmers from water. This encroachment is taking place under the patron-like protection of the UM.

The UM's task is certainly not an easy one; farmers often come to his office to complain, while on their way to their fields. The Project Assistant reports that in one of her visits to the UM's office there were many farmers complaining about broken turnouts and illegal farm outlets, and threatening not to pay their maintenance fees. The UM's response was that these are routine complaints and that he is not to blame, as the problems stem from structural defects. His only recourse is to pass on the information to the BM and RPM.

As the UM becomes a vehicle for conveying information up from and decisions down to the farmers, there is a danger that he becomes isolated from field conditions. However, nearly half the farmers report meeting the UM on a daily basis, and another 20% "quite often" suggesting that the UM plays a central role in the lives of most farmers.

TABLE 4
"When did you last meet the Unit Manager?"

	No of farmers reporting	Percent
Everyday	19	46
Often	08	20
Yesterday	05	12
Last week	05	12
Last month	03	7
Not at all	01	2
Total	41	100.00

The lack of communication of a constructive nature may have widened the gap of confidence between farmer and officer; the IE (at block office) reported that farmer in his view are highly individualistic; they do not prepare fields well leading to water logging, they are not present at issues, and use excess water, and only attend meetings where there is a pressing problem.

Conclusion

Although FRs have better access to farmers, and vice versa, than do the project officers, FRs have little power to help farmers. The FR tends to side more with the officers than with farmers, and provides a means whereby officers can gain information about the field without themselves having to visit. In Mahaweli the UM takes on this function; the Mahaweli FRs play very little role, either with the UMs or with other farmers.

At the beginning of the seasons, kanna meetings provide a way for farmers and officers to participate in planning irrigation and agricultural schedules. However, sudden deviations and changes in water schedules bring confusion to the farmers, and their recourse is to act in an individualistic manner, taking whatever opportunities become available for their individual benefit. The FR system in both schemes falls short of expectations for improved water usage and distribution because of the ambiguous nature of FR recruitment and authority.

In Mahaweli there does not seem to be a functional turnout group in an organized form to enforce sanctions and obtain cooperation. In Dewahuwa turnout groups are submerged in the committee system where a FR system is linked to official authority functions. Yet in both schemes officer-farmer interaction occurs as a form of top-bottom-top information flow device. Farmers are left to manage the tertiary level but with the intervention of an irrigation bureaucracy that feels farmers need to be guided, cautioned and closely watched.

CHAPTER 4

CONCLUSIONS

In both schemes most of the land is still legally with the original owners, but population increase and socio-economic reasons have influenced most owners to resort to hidden tenancy. This situation results in operators who are non-owners. The non-owner operator has no legal status to be included in the RF system, and enjoys rights to water only at the owner's discretion. Therefore the management cannot hold him legally responsible to pay irrigation O&M fees, to clean the channels, or to prevent illegal forms of water usage. He is not much aware of the FR system or other irrigation management responsibilities. He is not much interested in the overall system since he may cultivate this season but not the next. Adhering to water schedules or rotations, or keeping up with the cultivation calendar is no concern of this; rather, he hopes to obtain maximum benefit within a short time. This type of operator is not conducive to a well managed irrigation system.

Operators' involvement in water use is determined by the opportunities offered by the project management. Sometimes poor design and bad construction prevents the intended water delivery. Sudden rescheduling of issues may be taken by the management due to lack of rain, or to combat irregular behavior of the farmers. This tends to be done with little prior communication to farmers.

Operators respond to these measures by wasteful and excessive use of water and poor maintenance of the infrastructure. Behavior tends to be individual rather than cooperative due to lack of opportunities for coming together. Because of the artificial nature of land settlement and the lack of social bonds among farmer groups, cooperative action becomes problematic. This, combined with inconsistent policy lead the operators to utilize water when it is available, and indulge in practices that are not always in line with management directives.

The management strategies taken in both Dewahuwa and Mahaweli have been imposed from above to obtain farmer compliance rather than participation. The system of committee meetings in Dewahuwa and the FR system in Mahaweli are ambiguous in composition, and the intermediary project functionaries (FRs in Dewahuwa and the UM's field assistant in Mahaweli) do not suffice to elicit true participation; rather they provide a channel for passing information from Top to Bottom and Bottom to Top without adequate opportunities for decision making by farmers.

The kanna meetings provide a rare opportunity for farmers and officials to discuss copping plans, water issues, etc. but here too it is the compliance of farmers rather than their active participation which is sought. The committee system in Dewahuwa with tract committees at the tertiary level recognizes the farmer representative as the President, but is being conducted by the officials. Authority and decision making power lies with the

Bureaucracy. In Mahaweli the FR system is neither formalized nor informal entirely. It is formalized to the extent that FR's are to be chosen by farmers and expected to function in assisting to make proper use of water, but informal to the extent that the turn-over of FRs is so great that many farmers do not know who the current FR is.

In Dewahuwa the FR's owe allegiance to three agencies: (1) The Agrarian Services Department under whose act they are elected, (2) The Irrigation Management Division which views them as FRs for irrigation purposes, and the Agriculture Department for whom the FRs serve as Contact Farmers. In practice the Project Manager holds authority for initial nomination. The FR system and tract committee serves to comply and co-operate to decisions taken by the Project Manager and middle level officers.

In Mahaweli the blending of the formal and informal comes in to conflict and makes the system collapse into 'ad hoc' implementation practices. There is no turnout group existing socially or economically, but only on a physical hydrological unit. As in the case of Dewahuwa, it has become a system which supports a two-way flow of information, with directions and instructions from officers and complaints and demands by farmers. Limited results are shown where farmers agree to a program for rotational issues and channel maintenance at the outset, but are not consulted regarding successive issues.

Although Jayantha Jayawardena (IIMI/IMD 1986) cites evidence that a strong relationship exists between officers and farmer leaders, our data show that in most cases the farmer goes directly to the Unit Manager since the farmer feels by experience that the FR does not have authority to attend to his problems, and in anyway the FR also takes the problem to the Unit Manager eventually. What is seen in both Dewahuwa and Mahaweli are directions & instructions to comply and co-operate, and responsibility without authority to the users.

This study is limited to one Maha season, and three turnouts each in Dewahuwa and Mahaweli at a single distributary channel. The focus was on social aspects of water management by farmers, and the interactions that occurred between farmers, farmer representatives and officials. The areas that have been studied are only a minute portion of the 1,730 turnouts in the whole of Mahaweli System H; therefore these conclusions are specific to the 6 turnouts studied in both systems as there may be differences among turnouts. Yet in both schemes the settlement plan, physical infrastructure, topography, and water issues are to a certain extent common. The lessons derived from the six turnouts discussed in this report can certainly viewed as illustrative, if not necessarily representative, of the general conditions in Dewahuwa and Mahaweli H.

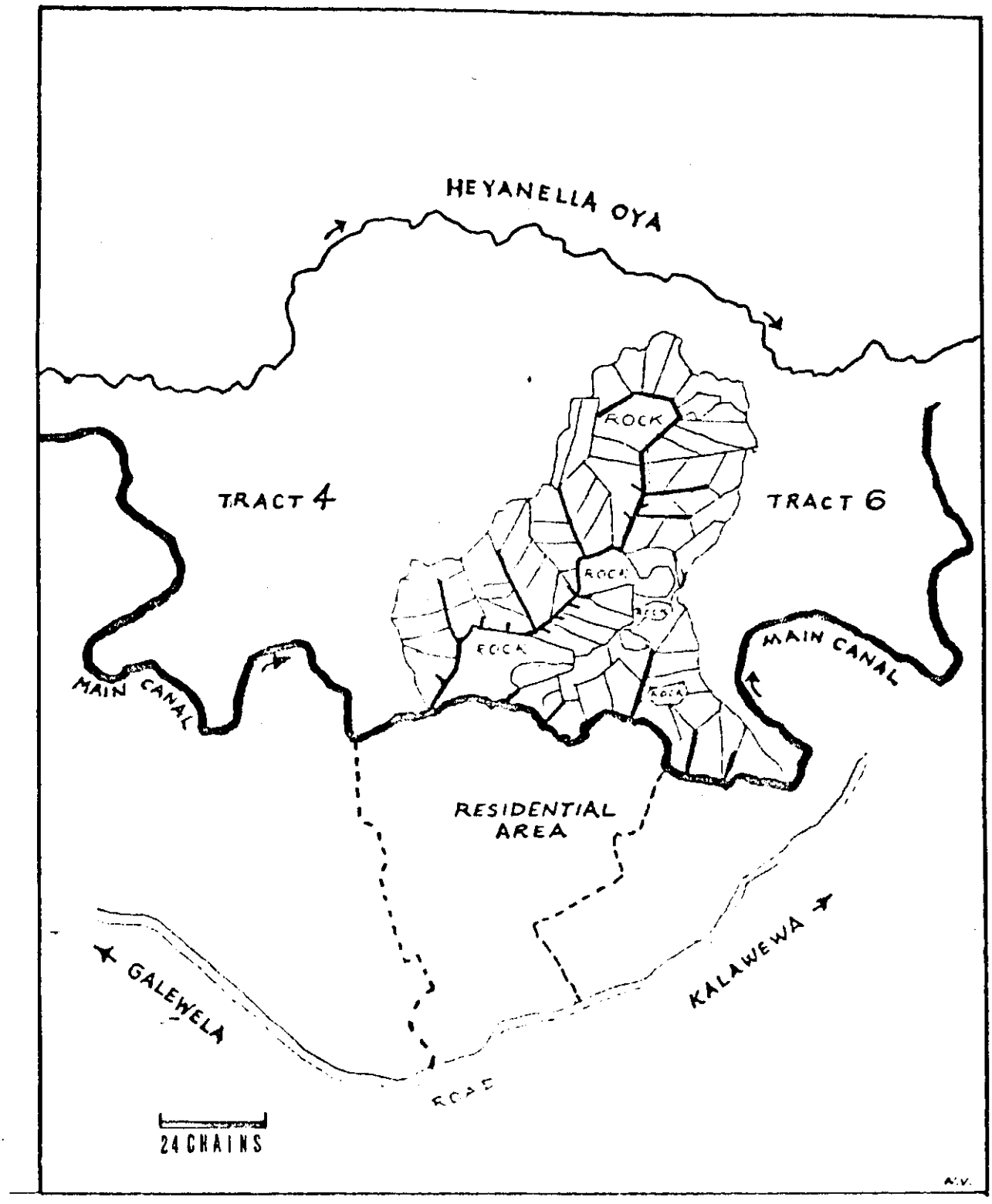
MAPS

MAP 1 - Dewahuwa Sample Area (Tract 5)

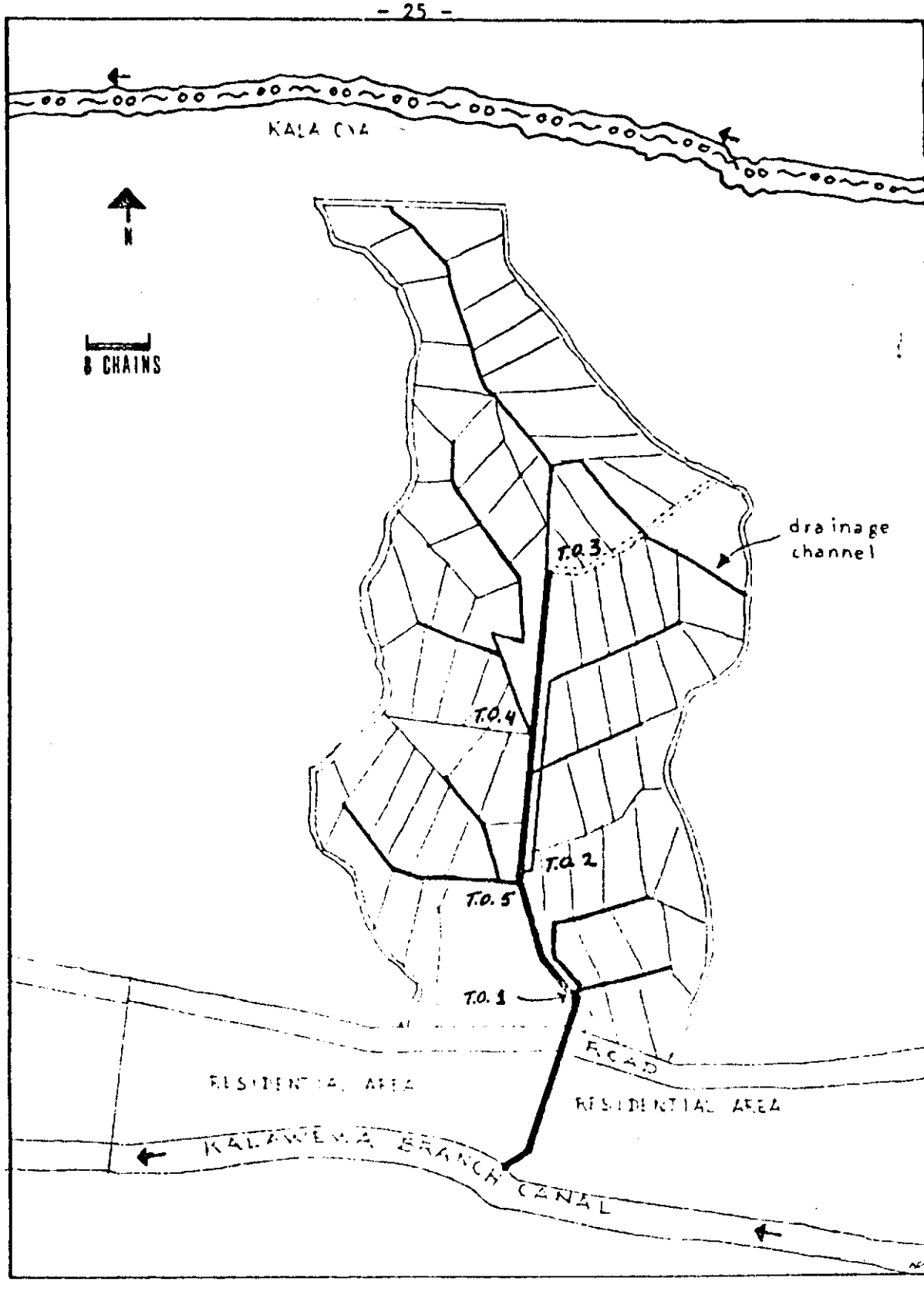
MAP 2 - Mahaweli System H2 Sample Area (Block 305, D-4)

MAP 3 - General Map of Dewahuwa Scheme

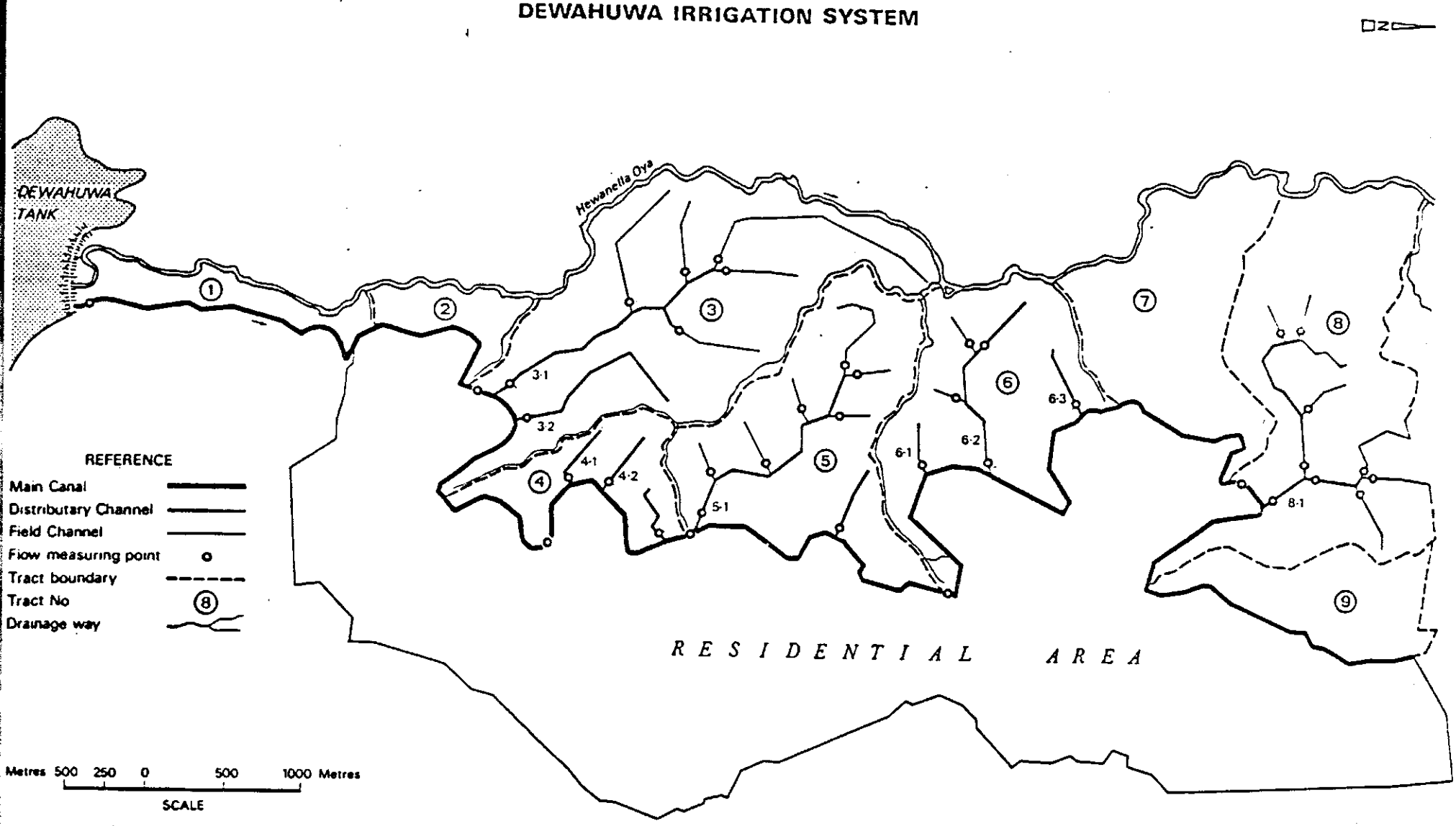
MAP 4 - General Map of Kalankuttiya Block (Mahaweli H-2)



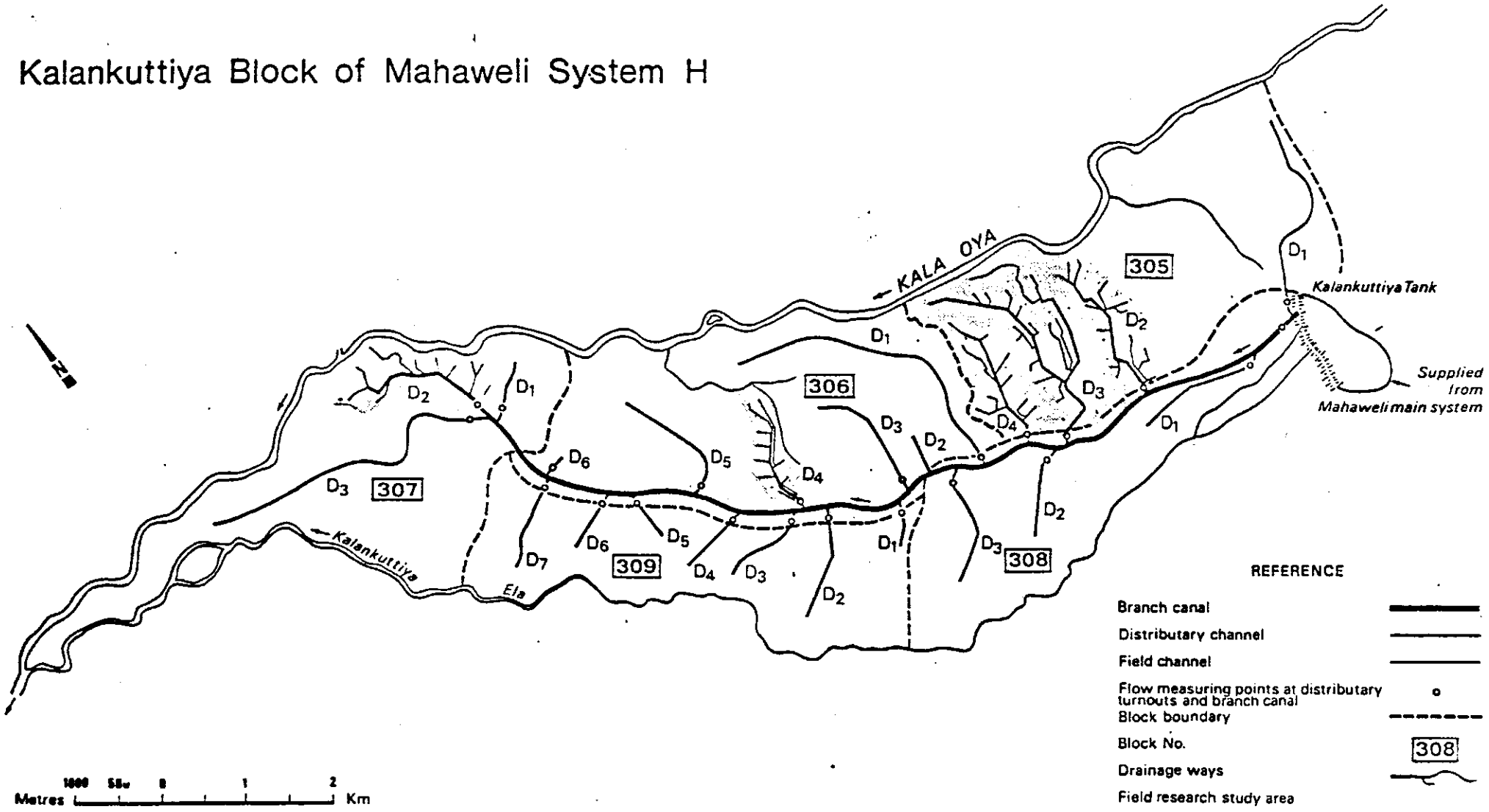
Map 1. Dewahuwa Sample, Area (Tract 5)



Map 2. Mahaweli System H2, Sample Area (Block 305, D-4)



Map 3. General map of Dewahuwa Irrigation System showing distributary channels



Map 4. General map of Kalankuttiya Block in Mahaweli System H2

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