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CHANGES IN IRRIGATION MANAGEMENT IN SMALL COMMUNITIES: A TANK AND ANICUT SYSTEM IN MONERAGALA DISTRICT, SRI LANKA

BY

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ABSTRACT

This paper is based on field data collected on a tank and an anicut irrigation system in Moneragala district. It attempts to understand the differences in institutional arrangements for irrigation water management as a consequence of differences in water source. Tracing the importance of the water source for community interaction patterns, the paper shows how with State penetration the institutional apparatus for irrigation management introduced at the local levels by the State has resulted in the blurring of differences that could have been attributed to the irrigation source. The paper also demonstrates how State penetration has contributed to a diminishing of the importance of the irrigation system from a social point of view while conversely increasing its importance from an economic point of view, not the least because of the increased value which irrigation has given to paddy land. The question which remains to be answered is what the consequences of increased State involvement, in irrigation system refurbishment and in subsequent irrigation management are for issues of irrigation efficiency and equity in distribution.

INTRODUCTION

Moneragala district, one of the remotest regions in Sri Lanka, is characterized by small and scattered villages which are mainly agrarian communities. This is due to the size and location of water resources available for cultivation. The types of water resources around which small communities have developed in the district are generally either small tanks or reservoirs where water is artificially impounded, and small anicut systems which divert small streams/rivers and thereby provide water for cultivation.

In this paper, we attempt to ascertain differences in community organization which might arise due to differences in water source and their management. We were interested in understanding not only existing institutional arrangements for irrigation management, but also hoped to find out how the community perceived these arrangements and thereafter contributed to their persistence over time. For our analysis we obtained information through observation as well as through interviews with those residing in a tank and an anicut community in *Moneragala* district.[1]

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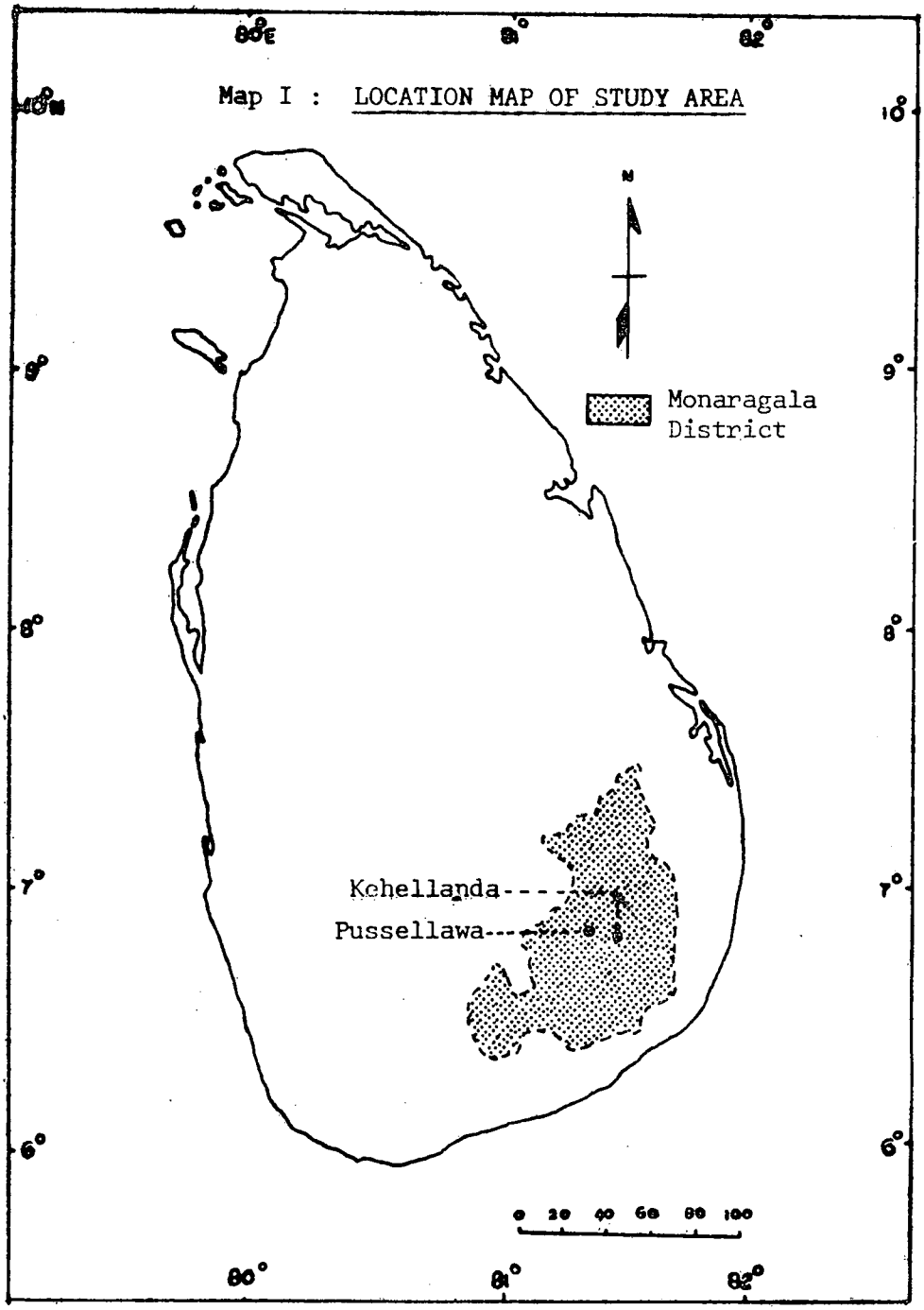
1. See forthcoming monograph on Selected Tanks and Anicut Systems in Moneragala District (ARTI). The research study for the Village Irrigation Rehabilitation Programme (VIRP) is funded by the World Bank/Department of Irrigation/Department of Agrarian Services.


Map I : LOCATION MAP OF STUDY AREA
80°E
81°
82°
10°N
10°
9°N
9°
8°N
8°
7°N
7°
6°N
6°
N
Monaragala District
Kehellanda
Pussellawa
0 20 40 60 80 100
80°
81°
82°

One important phenomenon we observed and which forms one of the foci of this paper, is the increasing intervention of the State in the form of developing and thereby changing the institutional arrangements for irrigation management during the last 40 years or so. In the two communities studied, the water sources were refurbished by the State two years ago, with the objective of enhancing agricultural productivity and the socio-economic conditions of the peasants. We hypothesize that this recently accelerated State penetration has tended to make institutional mechanisms for water management that existed under tanks systems and anicut systems more similar while also diminishing the importance of the water source *per se* as the basis of community organization.

THE TWO VILLAGES STUDIED : GENERAL PROFILE

Kehellanda tank is an 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 and residential areas. This agricultural community consists of about 86 households, cultivating 140 acres of paddy. While refurbishment of the tank promised a second crop of paddy, the latter has not been feasible to date and only other field crops such as chillies and green gram 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 State-owned 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 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 sharpening of community differences. For the purpose of this study, we will concentrate on the agricultural community.

The second irrigation system is *Pussellawa* anicut, a part of a string of anicuts, the fourth in fact, among seven anicuts on the *Kuda Oya*. *Pussellawa* is an agricultural community which depends primarily on paddy cultivation with water from the anicut, and on sugar cultivation which is rainfed. *Pussellawa* 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 more acres of paddy in both the *Maha* and *Yala* seasons. While *Pussellawa* constitutes one of seven anicut systems dependent on the same stream, we hardly observed any interdependence among the anicut communities in terms of irrigation activity.

COMMUNITY : RIGHTS AND OBLIGATIONS TO LAND AND WATER

The pattern of community dispersion in the area suggests that the water source is fundamental to the emergence and survival of a community. Moreover, it is apparent that the size of the water supply sets limits on the size of the community. Since the water sources for irrigation in this area are primarily man-made, those who constructed them and their descendants maintain that they have a legitimate claim over the land that can be cultivated using water from these sources. As a result, these rights have become the primary bases for community organization, while the physical unit, the irrigation system, provides them with a social identity. This identity is 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 conveys several meanings. The first meaning is a physical area, which consists of the water source and the potential area that can be irrigated by this water source ; the second is attributed to a group of people who have exclusive rights over these two resources, viz ; the water source and the land under its command. The third definition encompasses the first and the second, such that they are an identifiable group of people who share and claim rights over a water source and its command area.

From our study of the two communities, we observed that it is in the community's interest to develop exclusive proprietary rights over the amount of land that can be irrigated by the water supply. It is essential for the community to institutionalize these proprietary rights to ensure the community's continuity. In the process of institutionalization of these rights to land and water, the community has developed a set of obligations that serve to maintain and manifest these rights. These obligations are of several kinds : the obligation to keep the irrigable land within the community, which is mostly accomplished by customary laws of inheritance ; the obligation to undertake physical maintenance work on the irrigation system, such as repairs to the bund and channels as determined by the extent of land owned ; and the obligation to adhere to a common cultivation and irrigation schedule.

With the growth of population and pressure on land, there emerges a need for now mechanisms to both accommodate new entrants and safeguard rights to land and water. While ownership rights were co-extensive with use-rights to land and water in an earlier period, the new pressure on resources, combined with the

persistence of a community subsistence ethic, has resulted in a system of share tenancy where ownership rights to land and water have become different from use-rights to the same. The point is that limits continue to be set by the amount of water that can irrigate a given acreage of land, while the community has had to adopt its economic activities accordingly. Hence the rules that come to be enforced are (*a*) that share-tenants have the rights, plus the obligations of the owner-cultivators and (*b*) that fellow-villagers should be given preference in tenancy arrangements.

In both *Kehellanda* and *Pussellawa* the above point is aptly demonstrated by the following tradition: When an outsider wants to obtain a piece of land for cultivation, he has to obtain a temporary right from the community to have access to the land and the water resources that go with it. This permission is granted if the following criteria are met : (*a*) sufficient water must be available to meet the cultivation needs of the farmers of the community (viz ; those who have customary rights to use water); (*b*) there must be a surplus over and above (*a*) ; (*c*) in the event of there being a surplus, those having customary rights over land and water must give their consent at a community gathering.

An important aspect of these traditional rights and obligations is the interpretation of them by the community as pre-requisites to its survival. In the past (pre-1958), since villages were comparatively more isolated than now, adherence to obligations was stricter since there were no alternative institutional mechanisms to maintain the group as a community. However, with the increasing penetration of State control into villages, the need to adhere to these obligations has become less important as several other bases of village identity have surfaced such as, for example, the administrative appraratus which defines the boundaries of a village independent of any notion of rights and obligations in the economic sphere, But conversely, State penetration in the form of physical refurbishment of the irrigation system has decreased the tasks relating to irrigation maintenance.

In both villages, maintenance of headworks is now done by the State. This has led to a certain amount of ambiguity in the minds of the villagers as to who is responsible for the maintenance of the rest of the irrigation system. We observed this ambiguity in both *Kehellanda* and *Pussellawa*, in terms of maintenance of the down-stream works. Many field channels and bunds, for example, appeared to be in a state of neglect and this was attributed by the farmers to negligence on the part of the State rather than their own although, traditionally, the farmers themselves have been fully responsible for maintenance work.

As a result the State has been compelled to introduce a new mechanism of maintenance incorporating traditional and modern forms of management and in which a system of punishment and rewards plays a prominent role. Hence a system of fines has been introduced for non-compliance with obligations of maintenance and a system of rewards to officials (*Vel Vidane*, Cultivation Officer or Farmer's Representative) who oversee all maintenance work on behalf of both the State and the community.

DIAGRAM 2 : KEHELLANDA TANK - IRRIGATION LAYOUT

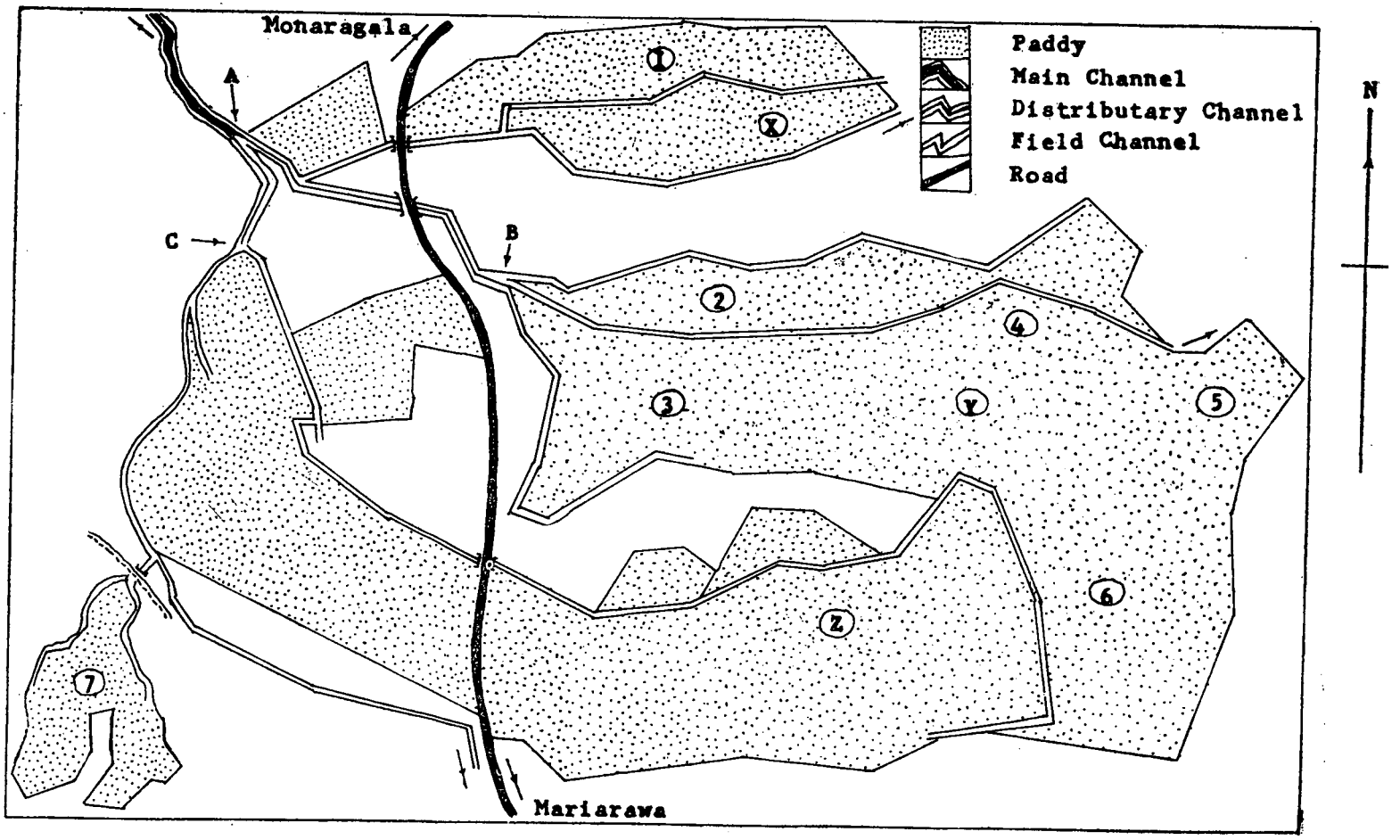
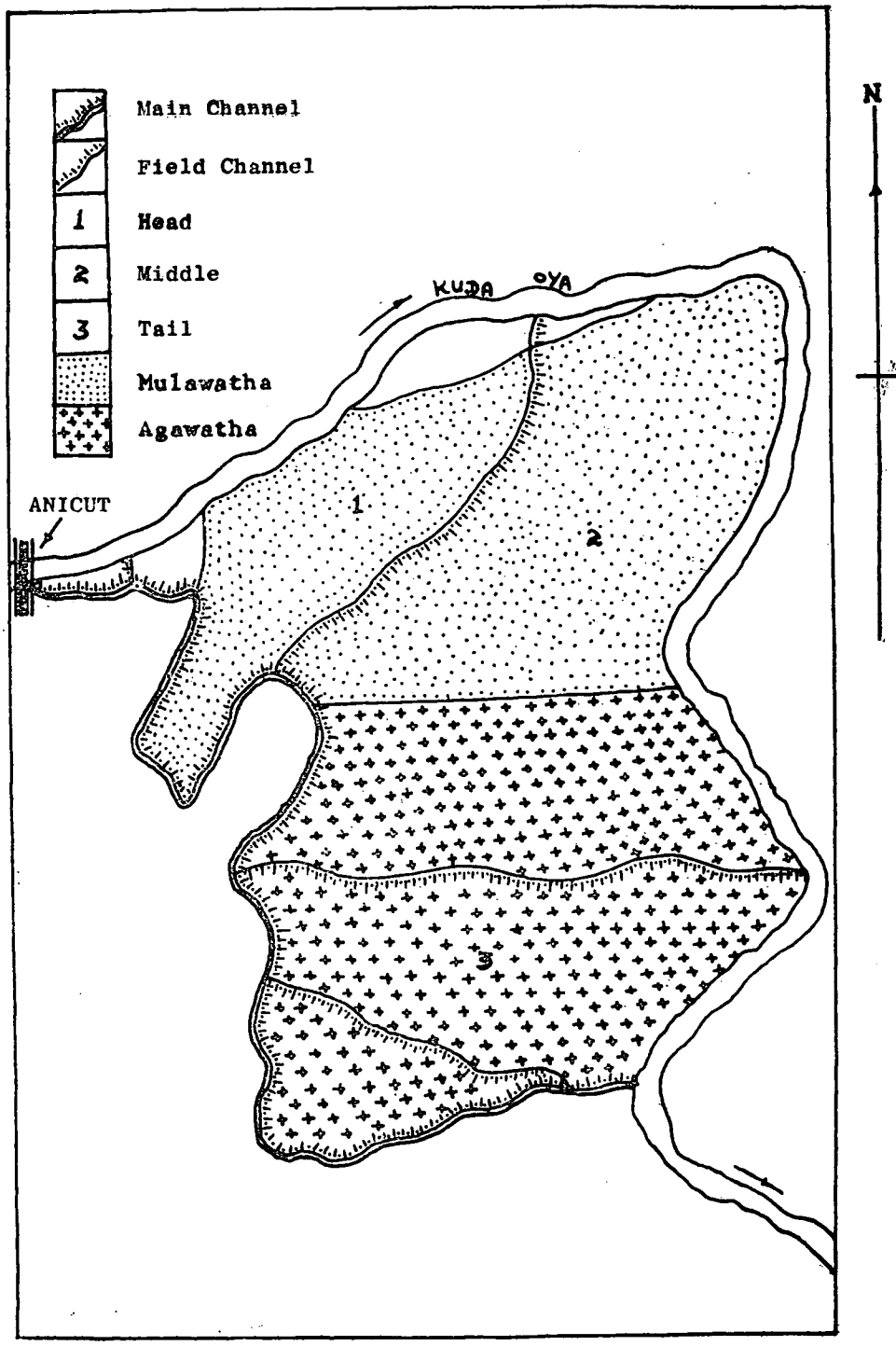


DIAGRAM 1: PUSSELLAWA ANICUT - IRRIGATION LAYOUT



WATER MANAGEMENT AND DISTRIBUTION

In the discussion so far we see two factors emerging . First, in both communities water decided the existence of the community, setting the limits to cultivation and determining interaction patterns among its members. Secondly because water is scarce institutional mechanisms were introduced for its management and distribution, thereby ensuring the persistence of the community.

In this section, the mechanisms for water management in *Kehellanda* and *Pussellawa* will be described especially focussing on the different institutional arrangements that have evolved over time.

Village Level Water Management: *Historical Overview.*—Until the 1940s, the British ruled Sri Lanka with a system of "indirect rule". The native Headman system, resting on social standing and property ownership administered the rural areas. The native officers did their best to keep the *status quo* by emphasising the traditional rules and practices of irrigation management. Until 1940, the *Vidane* was appointed by the native chieftain, called the *Rate Mahatmaya.* In the appointment of the *Vel Vidane* the *Rate Mahathmaya* obtained the approval of the *Korale* (divisional chief) and the Village Headman. Generally, the richest man or the most influential person in the village was appointed to the post of *Vel Vidane.* However, the *Rate Mahathmaya* had to obtain the consent of the *pangu* (share) holders of the village estate to remove him from the post. The *Vel Vidane* made the decisions over water issues and informed the farmers in his village through notices displayed in public places and through word of mouth. He also began the season's paddy activities and others followed suit. According to farmers, the practice of holding *kanna* meetings to discuss the cultivation schedule, water issuing time table, etc. for the entire village paddy tract started in 1940 with the appointment of a civil servant called the Divisional Revenue Officer (DRO) in place of the *Rate Mahathmaya.*

Under him there was a salaried government official called "the Guardian"* who was put in charge of a cluster of village water resources while there were two irrigation headmen, the *Ela Vidane* (canal headman) and the *Vel Vidane* for each village. They were not paid a salary except for the *ruwandiram*, a payment in kind, made by the farmers at the end of each cultivation season. The *Ela Vidane* and the *Vel Vidane* could be removed by the DRO, if the farmers by consensus asked for it.

According to the Paddy Lands Act of 1958, water management and distribution were entrusted to the Cultivation Committee (CC), whose members were to be elected by the farmers from a group of villages which constituted the Cultivation Committee's area of operation. One important aspect that was carried on from

* Translated literally means the custodian of the village water resource-i.e. the village tank or the anicut. This post is not known to exist in other parts of the country. We presume that the Guardian was known in other areas as the Wew Lekam who supervised a group of *Vel Vidanes.*

the traditional water management bureaucracy was the legal requirement that the farmers who owned land should do the fencing of fields and cleaning of the field channels. In the 1960s several farmers were prosecuted and fined for not doing maintenance work and the fines so collected were used to hire labour by the Cultivation Committee to do the work.

In the early 1970s, members of new Cultivation Committees were appointed by the Minister of Agriculture and Land on the recommendation of the Member of Parliament of the area. It was entrusted with the same duties and responsibilities as the old Cultivation Committee. The new Cultivation Committee covered both paddy and highlands in its area of operation. Between 1977—1979 there was a hiatus in irrigation water management leadership. Under the Agrarian Services Act of 1979, a salaried permanent officer called the Cultivation Officer (CO) was appointed to be in charge of an area which constituted several villages. In 1981, the Government decided to resuscitate the traditional *Vel Vidane* system by allowing farmers in each paddy tract (*yaya*) to elect their own Farmer Representative (FR). The Farmer Representative was expected to carry out the functions of the traditional *Vel Vidane* although his area of operation now consisted of only a paddy tract.[1] The Farmer Representative was not entitled to any remuneration until 1983 when the Government reintroduced the *ruwandiram* payment, which was calculated on the basis of one *kuruni* per quarter acre.[2]

Water Distribution : In *Kehellanda* the manner, the amount, and frequency of water distribution are decided at the *kanna* meeting attended by farmers, and Agriculture and Irrigation Department officials. The main decisions with regard to water distribution for the following season are made on the basis of two main criteria : (*a*) the amount of water available in the reservoir, and (*b*) the amount of land the farmers want to cultivate in that season. Once decisions are taken, they are carried out by a nominee of the community (Farmer Representative) or by a Government official (Cultivation Officer). (Before 1958, *Vel Vidane* and the Guardian respectively carried out those decisions). This person is not supposed to change the decisions of the *kanna* meeting without consulting the farmers.

In the *Maha* season, land preparation starts with the available water in the tank and in anticipation of rains. The amount of water that can be retained in the tank has been increased since 1982 when the entire tank irrigation system was refurbished by the State under the Village Irrigation Rehabilitation Programme (VIRP) funded by the World Bank. The tank dam and spill were raised and fortified; irrigation canals were desilted and the tank sluice was enlarged. Under VIRP a new water management programme was introduced that divided the paddy tract into seven farmer groups, each headed by an elected farmer to assist the Farmer Representative. The *Kehellanda* tank feeds three separate sub-tracts which comprise the *Kehellanda*.

1 A paddy tract may constitute only a part of a village or it may extend to cover more than one village.

2 A *kuruni* equals 10 measures of rice/approximately 10 kgs.

paddy fields. Thus one can identify several points of water management along the main channel. The main channel is divided into 3 distributary channels at point A on diagram 2. The Farmer Representative issues water on rotation to the 3 sub-tracts marked X, Y, Z. The Y sub-tract is the largest and at point B, 3 field channels originate and the rotation is done from that point by the Farmer Representative in consultation with the farmer leaders (designated as 2, 3, 5, and 6). If the rains do not come in time, a water rotation system is followed. Under a rotation system, water is issued first to paddy plots closest to the tank. In the *Yala* season, paddy is often not cultivated as no water is available and farmers resort to *chena* cultivation

However in the *Maha* season when a limited supply of water is available, an indigenous system of cultivation is practised, called *bethma*. *Bethma* is practised in sub-tract X which is closest to the tank. Under *bethma* a limited acreage of paddy is cultivated, the acreage determined mainly by an estimation of water available in the tank for that season. When it is decided at the *Kanna* meeting to do *bethma* cultivation, a portion of land immediately adjacent to the tank is demarcated by the Farmer Representative as the area that will be cultivated by the entire community for that season. One important aspect of *bethma* is the exclusion of tenants, leaseholders and mortgagees from the farming activity. The permanent boundaries of each *pangu* (share) are ignored for the time being and the group collectively cultivates the area that has been demarcated. The harvest is thereafter divided according to the size of the *pangu* (share) each group member holds in the entire paddy tract. The basis of this indigenous co-operative cultivation system is the acceptance that water rights are coterminous with land rights and its function is to provide the *pangu* owners with at least the next season's seed paddy.

In *Pussellawa*, all paddy lands are dependent on the anicut for cultivation, even in the *Maha* season. At the *kanna* meeting, where all the owner-cultivators gather at the begining of the season, the water rotation schedule is decided. In the 1930s, the villagers built a temporary anicut and cultivated paddy in the *Maha* season. Having built the anicut themselves, they also maintained the anicut, as a community. The Government however stepped in, in 1946 and constructed a permanent anicut to replace the temporary anicut and the former has been repeatedly refurbished since then. In 1982 under the VIR Program the bund was raised by 18 inches and this brought a further ten acres under cultivation. This meant a doubling of the original acreage.

Today decisions taken at the *kanna* meeting on water distribution are based on a combination of the following :

(i) Folk wisdom ;
(ii) Expected intensity and frequency of rainfall for that season based on past experiences ;
(iii) storage capacity forecast, and
(iv) The speed of water flow at the head of the main channel.

To implement the water distribution schedule, the paddy tract fed by the anicut is divided into three sections ; head, middle and tail, and each section has a farmer elected to help the Farmer Representative and to act as a check on any infractions on the latter's part. However maintenance of headworks and the issue of water remains the sole responsibility of the Farmer Representative. He is empowered by law to obtain the services of all the water-users, including tenants, to maintain the anicut system. *Kanna* meetings are attended by all land operators of the particular season and any changes to *kanna* meeting decisions are decided by the Farmer Representative.

While under the earlier system, the *Vel Vidane* was in a position to bring to trial and prosecute irrigation infringements, neither social nor legal sanctions are currently available to the Farmer Representative to prosecute violators. In fact, outsiders engaged in gemming close to the headworks and who are harming irrigation structures especially the dam, continue to be unchecked.

COMPARISON OF THE TWO SYSTEMS

While institutionalized and more *formal* mechanisms for water management are today similar for tank and anicut systems, differences between anicuts and tank irrigation systems come to the fore in terms of more *informal* arrangements for water distribution which have arisen mainly as adaptations to water scarcity.

Under the *Pussellawa* anicut system, the availability of water in a given season cannot be precisely gauged since water is not impounded and hence is less "visible" than in a tank system. In the *Maha* season, as in the tank system, less management is needed as water is generally abundant. However in the *Yala*, some control becomes necessary so as to distribute the scarce water supply.

Yala cultivation of paddy under the anicut system is a recent phenomenon, which started with the State refurbishment of the anicut in 1982 that allowed more water to be impounded and hence to be available for a second paddy crop. However in *Yala*, water is still not assured and therefore the community as a group has had to devise its own mechanism to use the available water both efficiently and equitably. Unlike with *bethma* under the tank system, the mechanism used at *Pussellawa* gives preference to the land furthest from the main channel. This portion of land is known as *agawatha* (tail-end) and the system of water distribution works from the bottom of the *yaya* (viz., tail-end) towards the top-end (*mulatha*) (diagram I).

This method of water distribution is premised on the fundamental fact that distinguishes tanks from anicuts. In the latter, an estimation of the available water supply and hence the acreage of land that can be cultivated is less precise. Therefore it makes sense for water, when it is plentifully available at the beginning of the season, to be first issued to the lands farthest from the main channel (viz :

the tail-end) and thereafter as water becomes less, to work up the system towards the head-end. The decision to keep expanding the acreage under irrigation upwards towards the head-end is generally made by the three farmer leaders who represent the head, middle and tail-areas of the paddy field.

This system of water distribution looks after the entire community's subsistence requirements, optimizing on the available water and getting over the problem of not being able to estimate the available water supply precisely. (Conversely if the area to be cultivated is to be curtailed, due to lack of water the tail-end is also the first to be abandoned in favour of the middle and head-end). It should be noted that unlike in the tank system where a single decision is made at the beginning of the season over the extent of land to be cultivated, under the anicut system a process of continuous management is necessary as adjustments have to be made continuously according to the water available at a given time.

From our study it was evident that under a tank system the community had a more reliable water supply as the water could be impounded and gauged. This also gave the community more flexibility as to when and with what frequency they wished to irrigate their crops. In the anicut system, on the other hand, water had to be used when available and the excess could not be stored for future or more prolonged use. This inflexibility and unpredictability has also decided the cropping pattern. Sugar cultivation in *Pussellawa* ideally fits the inflexibility which irrigation for paddy imposes in ways that *chena* cultivation cannot. In a social sense too, we find that the tank system is more accommodating so that it is better able to look after the subsistence requirements of every landowner in the community (as we observed with *bethma*) even in situations of scarce water supply.

CONFLICTS AND CONFLICT RESOLUTION

In both communities the causes of conflicts are similar and are generally in the areas of water piracy, tenancy, *pangu* boundaries, and gemming, and in the case of *Kehellanda*, the juxtaposition of two communities with diverse and conflicting economic interests (fishing versus agriculture).

In the past, many of these causes for conflict were not present simply because the nature of the agrarian community mitigated such conflicts. However, now the fragmentation of land, the increased entrance of outsiders into the community, with resultant demands on land and water, and the increased profitability of paddy farming, have all contributed to increased conflicts in the community. Now we see several different groupings which are differentiated on both social and economic criteria : paddy land owners versus *chena* cultivators ; tenants versus landless ; non-agricultural government employees versus businessmen ; speculators and so on. In this context, one can perhaps observe the emergence of conflicting classes, at least at their incipient stages, from what were earlier primordial loyalties.

Increased State penetration has also resulted in diminishing the accepted norms and traditional leadership roles that regulate use of community resources (e.g. irrigation water). The traditional leadership roles are now being increasingly taken over by the lower rungs of the State bureaucracy thus incorporating the village with the outside.

Indeed, the increased involvement of the State in the community's affairs has created a base for more enduring conflicts. For example in *Kehellanda.* the Government's attempt to develop both aquaculture and agricultural production around the village tank, has contributed to unanticipated consequences. The fishing community, in pursuit of its livelihood, wishes to have the tank water level at its lowest while the agricultural community wishes to conserve as much water as possible so as to cultivate two seasons. Thus the fishing community makes every attempt to release water from the tank, and this naturally leads to open confrontation with the agricultural community.

While State penetration has transformed the bases for conflict within these communities, it has also transformed the mechanisms for the resolution of these conflicts. Traditionally the community had its own means for conflict resolution-traditional authority figures or a forum of elders such as the *gamasabhava* (village court) – which were able to resolve conflicts within the community. Today the villagers have to take their conflicts to persons and institutions outside the community, as the latter has become opened to the outside through a process of incorporation into the national system. As a result, criminal offences for example are dealt with by the police located in urban centers while agricultural or irrigation–related con flicts are taken to district or divisional–level officers.

As efficient or as impartial as these regulatory mechanisms may be, most farmers were quick to point to a general decline in community norms and identities and especially to a reluctance in undertaking community work such as fencing or clearing of field channels. Vertical links along political party lines moreover have made villages merely pockets of regional political systems thus contributing to an erosion of community - based duties and obligations. Thus we find that the entrance of the State into remote areas has not only led to the creation of more frequent and more enduring conflicts within the community, but also provided extra-village arenas for the resolution of these conflicts, which because of their impersonal character have a lesser regulatory hold over transgressors within the community. According to the villagers, this process also allows more room for favouritism, nepotism and corruption, and this according to them is one reason for their non-participation in maintenance of village irrigation works.

CONCLUSION

The foregoing discussion has shown the differences that exist between tank and anicut systems. These differences have originated from the unique nature of the two water sources. However, the institutional apparatus for irrigation water

management introduced by the introduction of an irrigation bureaucracy, regularization of customary tenure, modernization of the traditional irrigation system–has resulted in a more uniform system of water management across the two systems, such that the social and economic consequences of differences in water supply have been mitigated.

The second salient point that emerges is that the bases of social solidarity in village communities have changed. In the earlier period, 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, beliefs and customary laws served to regulate their interactions to form a close community and to keep the land intact from outsiders. Today with increased incorporation of remote village communities into the wider socio-economic system, the prominence of water sources in the lives of the community has diminished and has been replaced by more outwardly-oriented identities. At the same time, the same process of ncorporation has brought more capital into the area in the form of irrigation system refurbishment, which has increased the value of paddy land. Thus while the social importance of the irrigation system and its associated lands has diminished, their economic importance has increased. One major consequence of this has been the necessity of increased activity for management of water resources. Thus we see the introduction of uniform water management programmes plus added regulatory institutions and officers as the State has taken over more and more of what were once community roles and functions in the area of irrigation management.