



WORKING PAPER

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IRRIGATED AGRICULTURE AND IRRIGATION LABOUR:

A Study of the Cumbum Valley,
Madurai District
with particular reference to
Gokilapuram Village

by
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(Paper presented at the conference on
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Introduction

The Cumbum Valley is located in South Western Madurai district. It is a distinct geographical and agricultural unit within the district and one with a relatively developed level of agricultural technique, particularly on surface-irrigated and lift-irrigated land.

The western boundary of the Valley is marked by the Western Ghats, whose watershed also marks the boundary with Kerala; the eastern wall of the Valley is formed by an off-shoot of the Ghats -- the High Wavy and Erasakkanayakanur Hills. The Periyar river enters the Valley from its south-western apex and runs in a south west to north east direction towards Theni, which is just north of the Valley.

In terms of administrative divisions, the Valley covers Uthamapalayam taluk and a few villages in the Theni block of Periyakulam taluk, about 55 villages in all. Uthamapalayam taluk lies between $9^{\circ} 34'$ and $10^{\circ} 10'$ N and longitudes $77^{\circ} 10'$ and $77^{\circ} 28'$ E, and has a total area of 1,426 sq. km. The population of the taluk in 1981 was 485,899 persons.

My specific field of study has been the socio-economic characteristics of agricultural labourers in the Cumbum Valley and, in particular, in Gokilapuram, a predominantly surface-irrigated village about 5 kilometres east of the taluk centre at Uthamapalayam.^{1/} This research concern is reflected in the theme of this paper.

The objective of this paper is to study the terms and conditions of employment in the contemporary period of workers employed at tasks associated with irrigation on surface- and lift-irrigated land and to compare the systems

^{1/} Gokilapuram Village: Area of Village : 418.76 hectares; population (1981) : 3,945 persons; agricultural labourers as per cent of all main workers (1981) : 59.97 per cent.

that exist in these two sectors of agriculture. This study is located in the context of changes that have taken place in the agricultural economy and, in particular, in the systems of surface and lift irrigation in the Valley.^{2/}

Over the last two decades the agrarian economy of Tamil Nadu has reported a remarkable rise in the incidence of agricultural labourers in the working population.^{3/} Data from successive censuses indicate that the incidence of agricultural labourers (defined as the percentage of agricultural labourers to total working population) in the rural areas of Tamil Nadu increased from 21.80 per cent in 1961 to 39.88 per cent in 1981. It has been noted that one of the factors associated with this increase is change in the extent and reliability of irrigation^{4/}, and, we add, concomitant changes in cultivation.

The Cumbum Valley, where there are significant sectors of surface and lift irrigation and where there have been significant changes in farming and cultivation practices on irrigated land, is a particularly interesting area of study in this respect. The incidence of agricultural labourers in the rural areas of Uthamapalayam and Periyakulam taluks together^{5/} increased from 25.97 per cent in 1961 to 58.55 per cent in 1981. The incidence of agricultural labourers in

^{2/} A first report on the data we have collected in Gokilapuram and the Valley is in V.K.Ramachandran, "Inequality in the Distribution of Land Holdings and Assets among Households in Gokilapuram Village A Report from a Field Survey," MIDS Working Paper No.31, June 1983.

^{3/} See S.Subramanian and V.K.Ramachandran, "Agricultural Labourers in the Working Population of Rural Tamil Nadu : Preliminary Results from the Censuses of 1961, 1971 and 1981", MIDS Bulletin, April 1982.

^{4/} See V.K.Ramachandran, "Agricultural Labourers in the Working Population of Tamil Nadu: Some Results from the Censuses of 1961 and 1971 and the World Agricultural Census 1970-71", MIDS Bulletin, March 1980.

^{5/} At the Census of 1961, Uthamapalayam was not an independent taluk; it was part of Periyakulam taluk.

the rural areas of Uthamapalayam taluk alone in 1981 was 60.46 per cent, which is the second highest incidence among all taluks in the State (after Thiruvavur in Thanjavur district). In this paper, we have attempted to explore changes that have taken place in irrigation in the Valley and their impact on certain aspects of the agrarian economy, namely cropping pattern and farming practices, and in this context, to study workers engaged in irrigation and water management. Put differently, our attempt in this paper is to study, in the overall context of a changing agrosystem and of the proletarianisation of an expanding labour force, irrigation labour under different irrigation and crop regimes.

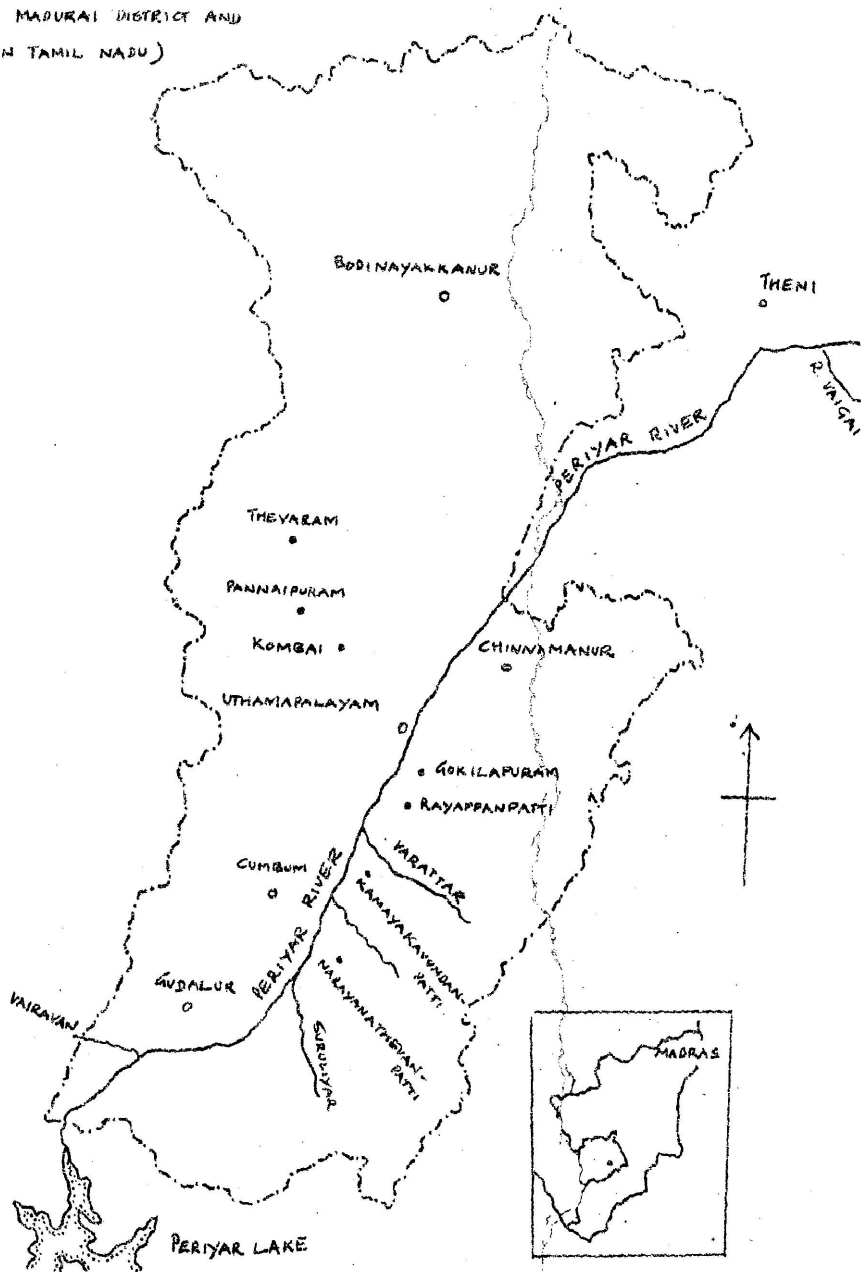
The paper comprises four sections. Section I contains a description of the systems of irrigation in the Valley and changes that have taken place in these systems. We deal separately with surface and lift irrigation and briefly discuss the continued existence of a large sector of unirrigated land in the Valley. Section II takes up what must be counted as among the primary community responses to irrigation: changes in cropping patterns and farming practices on different irrigation-types of land. These two sections are rather longer than necessary for sections that are introductory to the section on irrigation labour; given the scope of this conference, however, we decided to leave it that way, since changes in the irrigation system and cultivation on different irrigation-types of land may be of independent interest to participants.

Section III deals with the socio-economic characteristics of agricultural labourers who work at irrigation tasks. In this section, we present in some detail the results of a case study of irrigation workers in the surface-irrigated areas of Gokilapuram. This case study is not a historical study of changes in the organisation of irrigation labour. Although

We have referred to changes over a longer period, the data relate basically to the two points of time at which they were collected, 1977 and 1981-82. In Section III, we also briefly contrast the terms and conditions of irrigation work on lift-irrigated land with the conditions that prevail in surface-irrigated areas.

UTHAMAPALAYAM TALUK

(INSET: MADURAI DISTRICT AND
CITY IN TAMIL NADU)



THE SYSTEM OF IRRIGATION IN THE CUMBUM VALLEYThe Periyar System

The system of surface irrigation in the Cumbum Valley is part of the Periyar system of irrigation, of which we indicate certain basic features.^{6/}

The Periyar Dam and lake are located at Thekkady in the Western Ghats in Kerala State, about seven kilometres from the border with Tamil Nadu, on land that is on lease to the Tamil Nadu Government. This masonry dam, completed in 1895, was built across the Periyar, a river that earlier flowed westward and into the Arabian Sea, across an area where rainfall is abundant. A lake has been created where the river has been dammed, and the water of the Periyar diverted, through a tunnel cut through the watershed, to the plains in the east, particularly (almost entirely) in Madurai district.

It was written by the Collector of Madurai in 1808^{7/} about the waters of the Vaigai and its tributaries that

tradition had from generations back handed down the belief that the waters of this river, of such value to so many districts and about which such feuds have at different times arisen between the Rajahs of Ramnad and Shevaganga, might be beneficially augmented by turning from the interior of the mountains certain streams which run in a westerly or southerly direction into the sources of Shooruliar (Suruliar).

^{6/} Published accounts of the Periyar project are in A.T.Mackenzie, The Periyar Project, Government Press, Madras, (reprint) 1962 and W.Francis, District Gazetteer, Madura, Madras, 1914.

^{7/} Report of Mr.Hodgson on the Dindigul District, March 28, 1808, Madurai Collectorate Records, Volume 1255, p.17.

According to records, the idea of diverting the waters of the Periyar was suggested in the late eighteenth century by a court official of the Raja of Ramnad, who sent "twelve intelligent men" to survey the area; it was suggested again in 1808, though the plan was then considered "impracticable". It was revived in the 1860s, in the wake of what has been called the general euphoria in respect of irrigation in South India that followed the work of Arthur Cotton in the Kaveri and Godavari deltas. The plan for a masonry dam and lake, investigated and designed primarily by John Pennycuik, was finally approved in 1884; work began in 1887 and water was released from the lake to the eastern tracts in 1895.^{8/}

The Periyar descends from the lake into the Cumbum Valley, the first and best-served part of the command area of the Periyar system. After leaving the Valley, the Periyar is joined by the Vaigai river a few kilometres north of Theni. The combined flow of the two rivers is dammed and their water stored at the Vaigai Dam, located between Theni and Andipatti. Below the Vaigai Dam, the Periyar Main Canal irrigates a double crop and a single crop region in Melur, Sholavandan and Nilakottai taluks and near Madurai, and a new single crop extension to Thirupathur taluk in Ramanathapuram District is planned. The Thirumangalam Main Canal irrigates a single crop in Thirumangalam taluk.

8/ The following are certain salient features of the Periyar dam and lake:

Length of the main dam	-	1200'
Height of the main dam	-	155'
Full reservoir level (f.r.l.)	-	152'
Lowest level upto which water can be drawn	-	104'
Useful storage at f.r.l.	-	10150' mcf.
Area of water spread	-	10.21 sq. miles

Source: Records available at the Office of the Assistant Executive Engineer, Uthamapalayam Subdivision, Periyar Division, at Uthamapalayam, 1981 (hereafter FWD, Uthamapalayam, 1981).

The Periyar system is a canal and tank system. Channels branch off from the main river; there are openings to agricultural lands directly from these channels, and the command area of such vents/sluices is called the direct ayacut of the system. Channels lead into storage tanks -- these systems tanks, which have little independent catchment, constitute the reservoirs of the Periyar system -- and the area irrigated by the tanks is called the indirect ayacut of the channels.

The command area of the entire Periyar system is 1,66,880 acres.^{9/}

The Periyar System in the Cumbum Valley

The Cumbum Valley, as has been noted, is the first section of the command area of the Periyar system. In the Valley, the river follows, in general, the main water course of the river system that existed before 1890. Directly as it enters the Valley, the Periyar is joined by a non-perennial river, the Vairavanar, a left-bank tributary. The river then swings east and north; it is joined by three right bank tributaries, the Suruliyar, Koothanachiyar and Varattar, the latter two being today little more than rainwater channels during the monsoon. As a consequence of deforestation along the hill slopes in the east of the Valley there has been considerable silting of the beds of these two rivers; at certain places the old water courses have almost been obliterated. In addition, the flow in these rivers is reduced as a consequence of the fact that the catchment along the High Wavy Range, the eastern wall of the Valley, is now being channeled at the watershed into the Suruliyar, along whose course a hydro-electric plant has been established.

South of Theni the Periyar is joined, from the west, by the Theniar.

There are 16 anicuts across the Periyar in the Cumbum Valley subdivision (before the Vaigai Dam); 21 channels branch off from the river from these anicuts. These have a total ayacut of 14,784 acres^{10/} of double-cropped land. There are 19 system tanks fed by these channels; the total indirect ayacut of 3,959 acres constitutes 26.78 per cent of the total ayacut in the Valley.^{11/} The period of release of water, which is of different intensity at different times of the year, is from June 1 to March 1^{12/}.

The present channel and tank system built on foundations that were laid in the pre-Periyar period. Before the Periyar, there were 16 channels having the necessary anicuts leading from the Vairavanar-Curuliya and its tributaries; up to 1922 many of the channels had open heads and all of them were unsluiced.^{13/} The pre-Periyar system was a canal and tank system and the number of storage tanks at that time was, in all likelihood, greater than today. (Some of the tanks have subsequently been used for cultivation; some have been rendered naturally obsolete with the coming of a more abundant water supply.)

^{10/} Ibid.

^{11/} Ibid.

^{12/} One village, Chinnamanur, where sugar cane and betel vines are important crops on Periyar-irrigated land, receives intermittent releases of water from March through May as well.

^{13/} B.H.Chave, A Monograph of the Periyar System, Thallakulam, 1937.

It has been recorded that in pre-Periyar times the "Suruliyar was probably the most reliable irrigation source in the district"^{14/}, irrigating about 12,000 acres in the Cumbum Valley. What must be noted is that irrigation as a whole was less reliable and that a substantial portion of the ayacut was single-cropped (it was estimated in 1915 that not more than half the ayacut in the pre-Periyar period could have been irrigated for more than two crops)^{15/}. There was no source of surface irrigation to provide for the dry months from June to September, and over much of the land where the first irrigated paddy crop is now planted in June, fields were either left waste or planted with a dry crop.

Surface irrigation in Gokilapuram village: the Palayamparavu Channel

Gokilapuram village is irrigated by the Palayamparavu channel, the longest (about 15 k.m.)^{16/} of the Periyar channels in the Cumbum Valley. This is a right bank channel, branching off from the main river near Narayanathevanpatti village, about 24 k.m. from the point where the Periyar enters the Valley. It irrigates land in 5 revenue villages: Narayanathevanpatti, Kamayakavundanpatti, Gokilapuram and Karunkattankulam and the eastern wet land tracts of Uthamapalayam.

Recomputation from revenue records of 1980-81 show the direct ayacut of this channel to be 1566 acres (52.89 per cent of

^{14/} "Proposals for Resettlement of Madura District", Resettlement Report, Madura District, BP 117 (Sett.) April 29, 1915 (Pres.), p.26.

^{15/} Ibid.

^{16/} FWD, Uthamapalayam, 1981.

the total ayacut) and the indirect ayacut to be 1395 acres (47.11 per cent), a total ayacut of 2,961 acres.^{17/}

We now deal with the sluices, subchannels and tanks of this subsystem, illustrated on the village map.

There are 8 sluices with direct ayacuts before the channel reaches Gokilapuram village. The southern tip of Gokilapuram village is about 4 k.m. south of the village settlement; a long stretch of the wet land of the village is contiguous to the village settlements of Anaipatti and Rayappanpatti villages. There is no wet land in the revenue jurisdictions of these villages and the surface-irrigated holdings of landowners in these villages are located within Gokilapuram revenue village.

Uptil point A on the map, there are 5 direct ayacut left bank sluices. Between A and B (uptil B, the channel runs through Gokilapuram and contiguous to Rayappanpatti and Anaipatti) there are 2 direct ayacut left bank sluices. From B, one left bank branch channel goes to Thamaraikulam tank, whose command area of about 543 acres^{18/} is located in Uthamapalayam village. Before reaching Thamaraikulam, there are 5 left bank sluices whose ayacut is in Gokilapuram.

Returning to the main channel, there are 6 sluices at C and D. Four have direct ayacuts, one channel leads to Kalaneerkulam tank, whose ayacut of about 105 acres^{19/} is in Gokilapuram, and another to Karunkattankulam tank, which is the terminal point of our channel and whose ayacut, in Karunkattankulam village, is about 755 acres^{20/}. In the

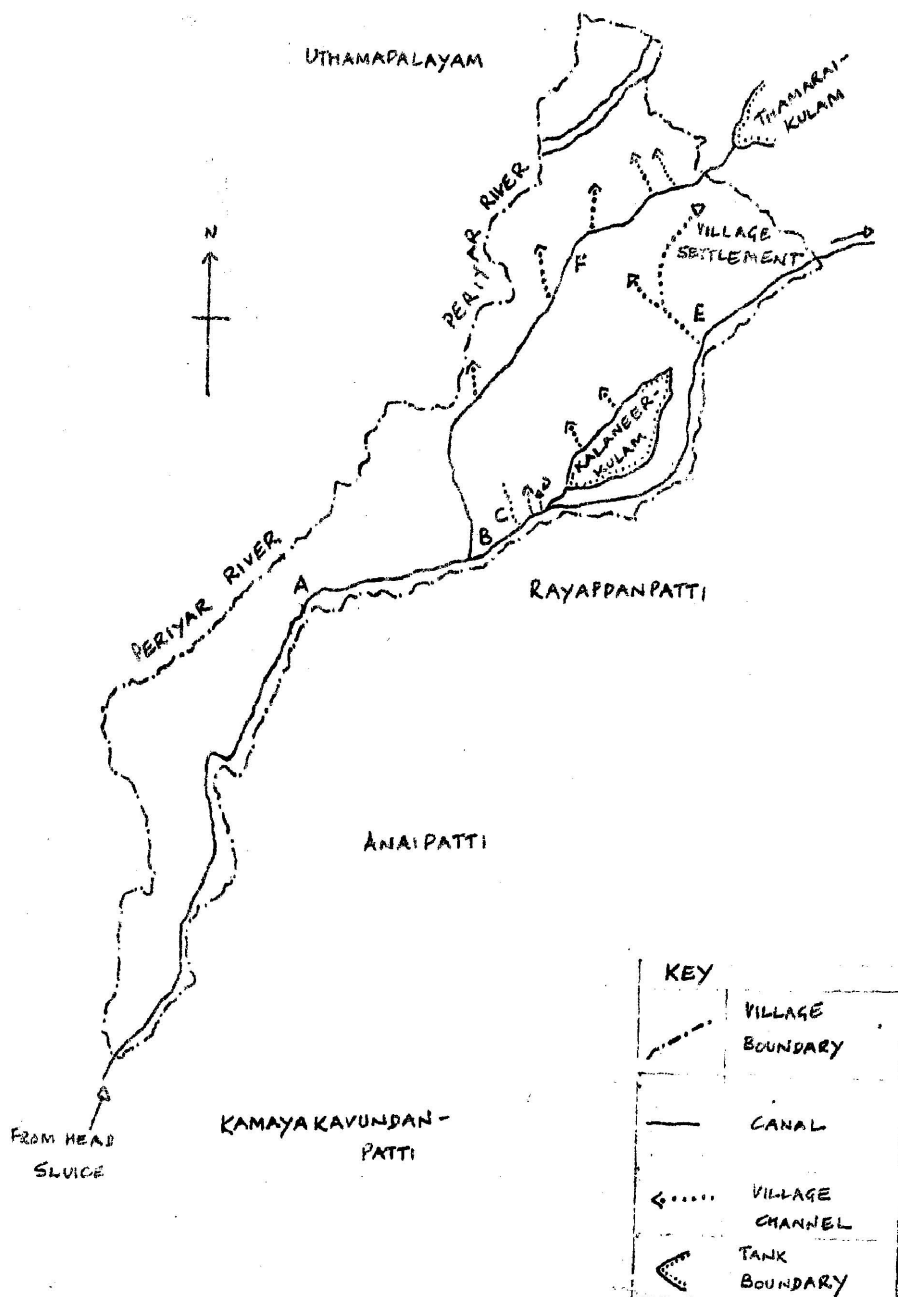
^{17/} Taluk Records, 1980-81: We note here the divergence between these and the corresponding figures available from the PWD, where data relating to actual ayacut extent is severely out of date: PWD records state that the direct ayacut of the Palayamparavu channel is 915 acres and the indirect ayacut 1422 acres. (PWD, Uthamapalayam, 1981).

^{18/} PWD, Uthamapalayam, 1981.

^{19/} Taluk Records, 1980-81.

^{20/} Ibid.

GOKILAPURAM VILLAGE



upper reaches of the channel to Karunkattankulam a left bank sluice at E opens out into Gokilapuram village.

After 1978, a new channel, the PTR channel,^{21/} beginning from Karunkattankulam, has been commissioned. In order to feed this channel, which draws mainly on Periyar water, more water than before is released into Karunkattankulam, and consequently, into Palayamparavu channel.

To sum up, there are 17 sluices with direct ayacuts in Gokilapuram village.^{22/} These irrigate about 580 acres in all, although the extent irrigated by individual sluices varies widely, from 3 acres through one of the sluices at D, to 180 acres through the sluice at E. The indirect ayacut, through two sluices in Kalaneerkulam, is 105 acres. The ayacut consists of land that is almost entirely cropped with paddy -- the returns for 1980-81 show a gross cropped area under paddy of 1369 acres (net sown area 684.50 acres) and no other crop on surface-irrigated land.

Irrigated land in the pre-Periyar village was located in the ayacut of the tank, and of the three present-day sluices, at C, E and F. Of these, only in the land fed by the tank could two irrigated crops be raised; even in good years the other land irrigated by the Vairavanar-Suruliya-Varattar system had only a single annual irrigated crop.

^{21/} Named after P.T. Rajan, a big Mudaliar landlord and Justice Party Minister, whose family has vast wet land holdings all along the Periyar tracts. Their holdings -- of surface-irrigated, lift-irrigated and dry land and of groves and plantation land -- are located in different parts of the Valley and district; the family seat is at Uthamapalayam.

^{22/} The PWD records show only 10 sluices along the entire Palayamparavu channel; we have seen that there are 17 in Gokilapuram alone.

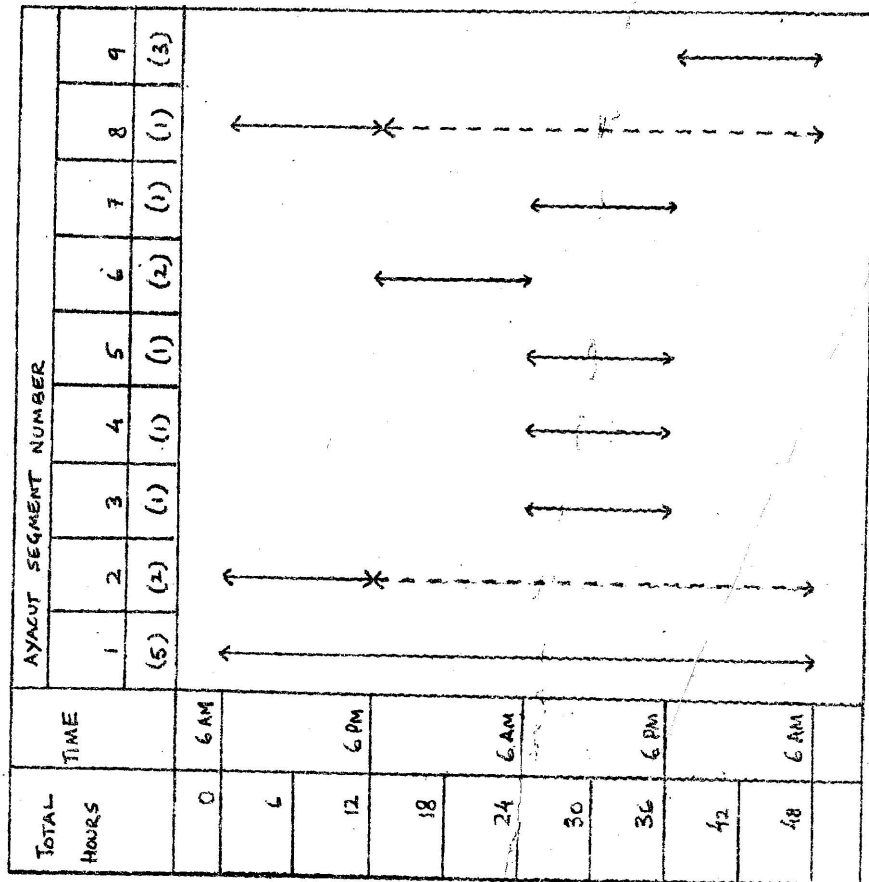
The increase in the volume of irrigation water in the period that followed the release of Periyar water, and upto the village resettlement of 1917-18 stimulated an important process of intensification of irrigation in tracts that were formerly poorly irrigated. In an area where water supply was irregular and scanty, and over large portions of which water was available only for a single crop, it was now abundant and available for two crops. Some extension of cultivated land also took place, although we do not have the data to be able to record the precise acreage.

The revenue returns for 1980-81 show that 685 acres were under canal and tank irrigation in the village. Since the resettlement, anicuts have been repaired and the channel fitted with a head sluice and sub-sluices along its course. There has also been new land brought under irrigation (although net sown area has remained about the same since the resettlement). One period of such increase -- when a stretch of fields and fallow land was brought, en bloc, under canal irrigation -- was in the early and mid-sixties. Land improvement was undertaken in the tract between the river and the canal south of A; this improvement consisted of land levelling and breaching the canal to irrigate the fields. Big and medium landlords of Rayappanpatti and Gokilapuram have holdings in this area, and continuous efforts were made at considerable expense to convert the land into registered wet land, to record it as part of the regular ayacut of the Palayamparavu channel. These efforts have partly paid off -- irrigation has been regularised in that the penal rate on irregular water utilisation has been minimised.

Water is distributed along the channel by a turn system. There are first, turns between the three villages that receive water below Gokilapuram: Uthamapalayam (through Thamaraiikulam), Karunkattankulam and Gokilapuram itself. These villages receive water by rotation, for 48 hours each. (In a year when there is

DIAGRAM OF IRRIGATION MURAI IN GOKILAPURAM : THE DISTRIBUTION OF A 48-HOUR.

TURN BETWEEN AYACUT SEGMENTS



KEY:

↑ : VENT/SLUICE FULLY OPEN; FULL FLOW OF WATER

↑ : VENT/SLUICE PARTLY OPEN; RESTRICTED FLOW OF WATER

↓ : UNMARKED SPACES INDICATE CLOSURE OF VENT/SLUICE

↓ : FIGURES IN BRACKETS INDICATE NUMBER OF VENTS/SLUICES IN EACH SEGMENT

no shortage, Karunkattankulam and Thamaraiikulam, by agreement with wet land owners from Gokilapuram, exceed their 48-hour limit somewhat in the first few turns, since preparation of seed beds in these villages generally begins before Gokilapuram.)

There is also a turn system (murai) within the village, between the 17 sluices and the tank, with 2 sluices. The volume of water allowed through each vent is a function of the extent of ayacut of each. Sluices are either shuttered (these are generally open for a specified period) or are fitted with open pipes (most of them are continuously open for 48 hours, the flow being restricted only by the diameter of the pipe). The diagram illustrates the murai within the village over the 48-hour village turn. It should be noted that the area south of A, which does not have the same status as registered wet land in the village records as other areas, receives water equally in the village murai; the owners in this area have sufficient clout to ensure that.

In a year of scarcity, access to irrigation water depends greatly on two factors: the proximity of a field to the head reaches of a channel or sluice and the position of a landowner in relation to other owners in the ayacut, his ability to block other outlets and take water to his field. In an area which also has the feature that the land holdings of powerful landlords is scattered across the ayacut, it is not surprising that the strictness with which the murai is enforced varies inversely with the availability of irrigation water.

We have been told that the present turn system was put into effect

about seven years after the PWD took charge of the canals. Before that, in years of scarcity, only those whose lands were in the upper reaches or those

who could threaten others and take water to their fields could irrigate their crops.^{23/}

It is noteworthy that the year mentioned, which is about 1930, is the year following 1928 and 1929, "which were years of very severe drought in the (Periyar) Delta -- perhaps the two worst years in the history of the Delta."^{24/}

In an earlier period (uptil five years ago), irrigation workers and others from the village would go to the head sluice of the Palayamparavu channel, divert channels with sand-filled fertiliser sacks, and walk down the entire length of the channel, blocking irregular channel breaches. Two crop years in the recent past, 1973 and 1975, were years of shortage: while we have not been able to get records concerning the losses in these years, persons in the village estimate that in 1975, 375 to 400 acres in the village were affected. During this period there was a more rigorous enforcement of the murai: inadequacy demanded a more careful husbanding of the scarce resources. (This did not make for a more equitable distribution of water between all ayacutdars, however. In 1975, the restriction on tapping ground-water in the Periyar ayacut was lifted, and bore-wells fitted with diesel motors were permitted to be installed for that year. All those who installed borewells in the 300-acre area abutting the village whose names we were able to record were prominent big or medium landlords.)

^{23/} Interview with Raphael Udayar, 84 years old, of Rayappanpatti, corroborated by others. Raphael Udayar's father made the southern-most breach in the canal wall in 1907; his son, tenaciously litigious, regularised their claim to canal water in 1921.

^{24/} J.F.Hall, Officer on Special Duty in connection with the Periyar System of Irrigation, Report on the Result of the Investigation Directed by Government in G.O.No. 2734-I, dated 29-9-1929, Collector's Office, Madurai, 12-5-1930 (hereafter Hall's Report), p.58.

Conversely, in years of ~~low flow~~, the murai loosens. Since 1978, the year the PTR channel was commissioned, there has been an increase in canal flows. During the first crop in 1981-82 (when much of the material for this paper was collected), for instance, while the 48-hour turns between villages was maintained, the rules of the murai within the village were hardly put into effect.

/At this point, we must draw attention to a significant lacuna in this presentation. It is clear that irrigation statistics that deal with irrigation solely in terms of area irrigated are very inadequate; accurate analyses of irrigation require data also on the volume of irrigation water required and available and the time-spread over which water is available. We have no firm data, at this point, on this aspect. We know however, that the rate of consumption of irrigation water in the Cumbum Valley is higher than in other parts of the Periyar system, and that the fact of a much lower duty on water in the Valley has been recorded in earlier other reports.^{25/7}

A specific feature of surface irrigation in the Cumbum Valley and, in particular, in the ayacut of the Palayamparavu channel, is that the ayacut is not flat, but slopes downward from the contour channel toward the river (thus it can be seen on the map that all the sluices along the channel after the channel enters the village are left bank vents). Given this slope, and given that water management in paddy fields requires that fields be flat, the division of the total ayacut into plots for farming are a function of the subdivision of land into ownership/operational holdings as well as of the line of contour. (On many plots, these factors, combined with problems of inaccessibility, make it difficult -- in some cases impossible -- to take a tractor to the individual field.)

As a consequence of the slope of the ayacut

- there is, in general, no problem of drainage from paddy fields in Gokilapuram (this feature of farming in the village contributes to the fact that cultivators stick to paddy);
- there is considerable return flow of irrigation water from the fields to the river: this is in the form of surface run-off from outlets leading from field channels and as groundwater that seeps below from channels and fields.

The system of surface irrigation in the village (and the Periyar system in general) is a channel-to-field system and not field-to-field. While this is the general rule, the extent of field-to-field irrigation has increased, because of changes in the pattern of ownership of land.

In 1937, it was noted that

Owing to the extension of cultivation on hill slopes consequent on the wholesale cutting of trees -- the natural water courses, which some years ago brought little silt...now flow down laden with heavy coarse sand and pebbles and fill up the channels within a few hours.... This state of affairs is most pronounced in the case of the Uthamuthu and Palayamparavu channels....26/

While we do not have specific data on the extent of silting today, it is clear that field channels and tank beds get silted every crop season (although, in a normal year in the present period, it is unlikely that, as in the 1930s, the Palayamparavu channel gets silt-clogged in a matter of hours), and that there are seepage losses and a considerable squandering of labour-time consequent upon such silting.

26/ Chave, op.cit., emphasis added.

There are also evaporation losses from tank surfaces: Cumbum Valley tanks are shallow, with a large waterspread. We have learnt that the fact that tank floors are at a higher level than the fields is a check against dead storage and against waterlogging, but that evaporation is high. In at least one of the tanks near the village, trees that provided shade and checked evaporation over a large part of the waterspread until 25 years ago have now been cut.

In 1930, the officer on special duty in connection with the Periyar system of irrigation, J.F.Hall, suggested that the possibility of altering the present system of channels into a properly regulated system be investigated and that the costs and benefits of such alteration be made the subject of special study in order that the duty of irrigation water in the Valley be increased and that, in general, the use of irrigation water in the Valley be optimised^{27/}. As far as we are aware, no such study has been made.

It appears that a more rational system of water use in the village -- and of the use of labour power in surface irrigation tasks -- will have to include a system of shuttered and lined channels (including field channels) that are regularly dredged and remodelled on the ground in a manner that makes for the most efficient use of water. It must also include a change in farming practices: the consolidation of seed-beds at the head-reaches of channels, for instance, has been mentioned even in the early literature^{28/} as more efficient than the present practice of dispersing seed beds -- and consequently taking water --- to every field in the ayacut of a sluice. Changes such as these, however, are likely to be more than the present system of ownership and control of land can bear.

27/ Hall's Report, pp. 46 infra., especially paragraph 39.

28/ By a Mr.Dowley, Executive Engineer, PWD at Madurai, cited in Hall's Report, pp.36 ff.

Lift Irrigation in the Valley

The lands irrigated by the Periyar form the rich green core of the Cumbum Valley; to the east and west is its garden land, land irrigated by wells that are mainly fitted with electric motor pumps. (Interspersed with the garden land, and stretching beyond it to the base of the hills that form the boundaries of the Valley are the unirrigated agricultural tracts of the Valley.)

The major stimulus to the spread of lift irrigation came in the 1950s and 1960s, with extension of rural electrification. The process involved the conversion of land previously irrigated by wells with water drawn manually and with bullocks to electric-pump irrigation and the conversion of land that was hitherto unirrigated to well-irrigation, accompanied, in most cases, by the consolidation^{29/} and improvement (including levelling) of individual dry land plots.

The process of land improvement and conversion to modern garden land involves, of course, heavy private investment. The hugely increased and uncoordinated exploitation of ground-water resources has caused a fall in the water table, particularly in the western tracts of the Valley; in one case reported from Pannaipuram village to the west of Uthamapalayam, the water level fell from 20' in 1953, when electric pumps were first introduced, to more than 80' in 1977. This has also led to the need for considerable investment in well deepening, which in many cases must be undertaken every two years, and to disuniformity in the quality of well-irrigation available in different parts of the Valley and to different classes of cultivators.

^{29/} Consolidation here is affected by periodic purchases of, and fore closures of mortgages on, contiguous plots of thottam and dry land and not consolidation by legislation. (Tamil Nadu does not have any legislations on consolidation of land holdings.)

The growth of the highly commercialised sector of garden cultivation, characterised by heavy initial and running expenditures, new systems of cropping and crop rotation that keep the fields of use all year round, and a new demand for hired labour, has led to significant changes in agricultural production and technique and the nature of production relations in the region, some aspects of which are discussed in the sections that follow.

Trends in Irrigation in the Seventies

Official data from the 1970s on irrigation in the taluk provide an update on trends that had begun to work themselves out in an earlier period.^{30/} (See Tables 1 and 2)

While the bulk of net sown area still remains without any form of irrigation -- a large unirrigated and relatively backward sector that constitutes a major drag on agricultural development -- the data also indicate an increase in the area under some form of irrigation, an increase over the decade from 1970-71 to 1980-81 of almost 40 per cent. The economic significance of the area under irrigation is indicated by the fact that gross cropped area under irrigated crops as a per cent of total gross cropped area was 51.18 per cent in 1980-81.

Area under surface irrigation increased marginally, and occupied about 13 per cent of the total net sown area in 1980-81. As we have seen, this thirteen per cent is a particularly weighty segment of total agricultural land, being largely (65 per cent of all surface irrigated area) part of

^{30/} As we have mentioned, official sources of data on irrigation are limited in that they do not provide data on the actual water availability from individual sources of irrigation, a problem that is particularly true of area under wells. In respect of wells, there is also a problem of undercounting of the number of energised wells and of inaccurate recording of the area served by wells.

the Periyar system and receiving water for nine months (two paddy crops) in the year. Land in the Periyar/^{tract} is the highest priced in the Valley; the importance of surface-irrigated land is also indicated by the fact that paddy, mostly grown on these tracts, occupies the largest share of any individual crop in the gross cropped area of the taluk.

In respect of area under wells, it is seen that the increase in area irrigated by wells was the highest for different types of land (surface irrigated, lift-irrigated and unirrigated) over the decade; the major contribution to increase in irrigated area was made by land under well-irrigation. The data thus indicate a continuation of the trend of increase in well-irrigation that began in an earlier period. The extension of well-irrigation, however, cannot be an untrammelled process, particularly given the problem of a falling water-table in the Valley and the widely differing qualities of wells as irrigation sources.

Irrigation-Based Classification of Land^{31/}

The distinction between three types of cultivation, with the source of irrigation as the main determinant, is of great significance to the agrosystem of the Cumbum Valley; in this section we introduce the terms associated with such an irrigation-based classification.

It is to be emphasised that the implications of such a classification relate to distinct variations in the scale and type of agriculture: including, for instance, in the number and type of crops grown on the land and methods of cultivation used.

^{31/} This section draws heavily on MIDS Working Paper No.31, op.cit.

Table 1: Area under different sources of irrigation, Uthamapalayam Taluk,
1970-71 and 1980-81

Year	Area under canals and tanks	Decadal varia- tion	Area under wells	Decadal varia- tion	Area under other sources	Net irri- gated area	Decadal varia- tion	Net unirri- gated area	Decadal varia- tion	Net sown area	Decadal varia- tion
1	Acres	Per cent	Acres	Per cent	Acres	Acres	Per cent	Acres	Per cent	Acres	Per cent
1970-71	17234	3	4	5	6	7	8	9	10	11	12
						(24+6)				(7+9)	
1970-71	17234	23669	1023	41926	101917	143843					
1980-81	19623	13.36	39024	64.87	0	58647	39.88	97760	(-) 13.89	146407	1.78

Table 2 : Net irrigated area under different sources and
unirrigated land as a per cent of net sown area,
Uthamapalayan taluk, 1970-71 and 1980-81

(in per cent)		
<u>Area under:</u>	<u>1970-71</u>	<u>1980-81</u>
Canal and tank irrigation	11.98	13.41
Well irrigation	16.86	26.65
Other sources of irrigation	0.71	0
Unirrigated land	70.85	59.94
<u>Total</u>	100.00	100.00

to produce them, in the degree to which the productivity of labour has developed and the intensity and forms of employment of agricultural labour, and in the extent to which the produce of the land is sold on the market.

Well-entrenched in popular perception, the classification is as follows:

Nanjai, or fields that are irrigated by canals and tanks^{32/} of which the bulk of the acreage in the Valley is under the Periyar system. The predominant crop on nanjai is HYV paddy, a large part of which goes to the market. In some of the lower-lying villages, betel, sugar cane and other minor crops are grown, although on a small scale. Some paddy lands are planted with manure and fodder crops during the dry months from March to June.

Punjai, or unirrigated, rainfed land -- land that "looks up to the sky." The quality of punjai in the Valley varies: from the more productive groundnut and sesamum growing punjai in the south of the Valley near Gudalur, on which cultivation has acquired a substantial degree of commercialisation, to -- what is the most familiar type of punjai -- dry and low-yielding land. In such tracts, punjai represents the backward, traditional sector of agriculture. In years when the rain fails, agriculture is reduced to being pursued as traditional craft, near a state of ruin -- the soil is scratched with a plough, seeds broadcast and little care taken of the crop until the time comes for a meagre harvest. Households whose holdings consist entirely of punjai plots

^{32/} This refers to land actually under surface irrigation and not merely land registered in the revenue records as "wet".

must allocate their labour-time elsewhere -- generally to labouring out for others -- for subsistence. The crops grown on punjai are generally coarse grains of traditional varieties -- cholam, ragi, varagu, samai and irungucholam and on some fields, unirrigated groundnut. Cumbu is also grown, particularly in the northwest of the Valley. Pulses are planted as intercrops.

Thottam, lift irrigated or garden land, where wells are the source of irrigation. Thottam is planted with a diversifying variety of commercial crops, such as banana, cotton, h.y.v. and traditional cholam and ragi, vegetables, chilli and fruit, cultivated on an increasingly intensive scale.

While there are variations within these three types that have to do with the quality and reliability of irrigation (particularly important in the case of thottam), soil types and fertility and the location and topography of fields, these are secondary to the main nanjai-punjai-thottam classification, which helps to stamp cultivation (and the landlords and peasants involved in different sectors of cultivation) with distinct labels.

IICROPPING PATTERN

In this section, we take up cropping patterns on different irrigation-types of land in the Valley.^{33/}

Nanjai

Paddy is the specialised and dominant crop on nanjai in the Valley, the entire area under paddy (32,493 acres) being planted, in 1980-81, with high-yielding varieties. Paddy is grown in two seasons, the first (kodai) from June through October, and the second (kalam) from October through February.

In 1980-81, paddy also occupied the largest cropped area among cereals (38.22 per cent of all area under cereals was under paddy and 73.18 per cent of all irrigated cereals was under paddy) and the largest area under any single crop in the taluk (19.16 per cent of total gross cropped area and 37.42 per cent of irrigated gross cropped area). All other crops grown on nanjai are localised and the area planted with these crops constitute only a very small segment of total cropped area: area under sugar cane and betel vine occupied 0.64 per cent of gross irrigated area and 0.33 per cent of total cropped area.

While paddy has been the dominant crop on nanjai for a considerable period, cultivation practices in paddy farming on surface-irrigated land have developed considerably in the past forty years.

^{33/} For trends in the cropping pattern of Tamil Nadu as a whole over the period 1950 to 1975, see C.T.Kurien, Dynamics of Rural Transformation: A Study of Tamil Nadu 1950-1975, particularly Chapter III, and for a more detailed description of cropping patterns in the Cumbum Valley in the 1970s, see MIDS Working Paper No.31, op.cit., pp. 10 infra.

We take an example of changing farming practices from a case study of the nanjai farming in the household of one nanjai landlord in Gokilapuram village. Gokilapuram is endowed with a combination of natural conditions -- in terms of soil, climate and topography -- greatly suited to the cultivation of paddy. At the harvest of the first crop in 1980-81, paddy production on the better tracts of surface-irrigated land was about 7.66 tonnes per hectare and over most of the surface-irrigated land was about 6 tonnes per hectare.^{34/}

SNR, who heads the landlord household that has the largest nanjai holdings among households resident in the village (22 acres in 1977 and 30 acres in 1981), has been supervising paddy cultivation on the family nanjai since 1950. In the 1940s, they grew two crops of paddy, parurnel (in the kodai season) and samba (in the kalam season), with a yield per crop of about 483 to 580 kilograms per acre.^{35/} A part of the land was leased out, and the family had 9 tenants (kuthagaikkarar, paying a fixed rent) working their nanjai. By 1950, paddy yield had risen to about 967 kg. per acre. This was not because of the application of any special fertiliser or pesticide, but because, with the price of grain rising, landlords saw to it that each operation was performed with greater care, and were no longer haphazard. Manure was spread evenly, bunds built more firmly, weeding was more thorough; this itself helped to increase yields on nanjai.

^{34/} By way of comparison, in the official crop-cutting survey estimates, the standard yield of rice in kilograms per hectare on all tracts in 1978-79 was 2468 kg. for Madurai District and 2017 kg. for Tamil Nadu (Government of Tamil Nadu, Season and Crop Report, 1978-79, Table V-A, p.85).

^{35/} The local measurement is in terms of kalam (a volumetric measure equivalent to 58 kg. of dry paddy) per kuzhi (roughly equal to 0.60 acres).

In 1955, sulphate produced in Sindri began to be sold in the Valley, and SNR used it for paddy cultivation. In 1965, he began to apply urea (imported from Japan) to the nanjai. By 1960, paddy yield had risen to about 1160 kg. per acre and by 1966, to about 1450 kg. per acre. Meanwhile, from 1950 onwards, the family had begun to evict the tenants who worked the land, and by 1960, they had "not more than six" tenants.

SNR remarks that it could not be said that in 1965, a very big change had come about in paddy cultivation on surface-irrigated land. The application of urea and sulphate, combined with more carefully conducted farming operations, had made a difference to nanjai cultivation and to yields, but the crop pattern and the pattern of employment of labour had not changed, and the major change in paddy cultivation for this landlord household was yet to come.

In 1967, the parunnel-samba crop pattern was broken; SNR began to have ADT-21 planted. This made some difference to yields, which went up to 1740 kg. per acre. Again, SNR said that he would not say that 1967 was the year of big change in agriculture. It was only when new seeds were accompanied by new fertilisers, pesticides and large-scale Government loans for agriculture that a big change came about in cultivation. Until then, they introduced sulphate and later urea, and even new seed varieties, but the real development was after 1968, and particularly after 1970, when there was all-round development in nanjai cultivation and, with it, in thottam cultivation.

After 1968, SNR began to take agricultural loans, and took a close interest in publications and broadcasts on agriculture and in the information provided by Agricultural Extension Officers. By 1970, the yield from nanjai land was about 2417 kg. per acre, with new varieties being planted in both seasons.

Regular use of pesticides began in 1970. Since then, SNR has taken care to find out whether pests are developing immunities to particular pesticides, and tries to use substitutes when he feels that particular brands are not effective. From the 1971-72 season, he began to use NPK in addition to sulphate and urea, and in 1976, bought a Massey-Ferguson tractor with a cage wheel, tiller, disc plough and trailer. Between 1967 and 1970, SNR also evicted all the tenants from his land, except one, who has a leased-in holding of 0.60 acres and who has, in addition, to work at supervising cultivation of the household as a whole. The economies of an establishment, with hired labour and on an expanded scale, had become apparent. "It was wasteful to let out the land on kuthagai," SNR said. "We would lose a lot of income if we allowed tenants to take half the produce."

In 1981-82, on the better tracts of SNR's nanjai holdings, the first harvest yielded about 3095 kg. per acre.

In the preceding paragraphs, we have tried to outline some of the changes that have taken place in paddy cultivation on surface-irrigated land in the post-Independence period. The most important change in cropping pattern and in farming practices on surface-irrigated land over the past century, however, considerably predates the changes described above, and was a consequence of the coming of Periyar water to the village. We have below (Table 3) the returns for gross cropped area under different crops in Gokilapuram village at three points in time: in 1887, prior to the Periyar irrigation scheme; in 1917-18, at the time of the revenue resettlement; and in 1980-81. (Two important gaps in the data are the absence of figures on net sown area in 1887 and of disaggregated figures for irrigated and unirrigated land in 1917-18).

The conclusions from the Table can be briefly stated:

- After the coming of Periyar water, irrigated cropped area increased (it was 77.47 per cent of gross cropped area in 1887 and is 97.93 per cent in the present period), and areas which were classified as "irrigated" were provided with abundant and timely water supply.
- The consequence for cropping pattern was that paddy began to wipe out all other field crops, particularly coarse cereals. In 1887, paddy occupied 12.14 per cent of gross cropped area, and in 1980-81, 94.41 per cent of gross cropped area.
- The third conclusion from the data is an intensification of cropping. Gross cropped area increased 84.33 per cent over the period 1887 to 1980-81.^{36/} There was an increase of 12.40 per cent in gross cropped area from 1917-18 to 1980-81; this period, as has been discussed, was a period of changing over to more modern methods of cultivation on surface-irrigated land.

Thottam

If nanjai has been a sector that has specialised in the cultivation of a single crop, high-yielding paddy, thottam has been the main arena of crop diversification in the Valley. On thottam, where wells were low and unreliable, coarse grains used to be an important crop. A significant feature of recent development in lift irrigation is that it has led to steep increases in the gross cropped area (GCA) under irrigated non-food crops (INFC).^{37/}

^{36/} The assumption is that the expansion of net sown area was considerably lower.

^{37/} See MIDS Working Paper No.31, pp.10-16, and Appendix of Tables, Table 9, pp.5-6, for details of this process.

Table 3: Gross cropped area under different crops, Gokilapuram Village : 1887, 1917-18 and 1980-81

(in acres)

Crop	Irrigated Area			Unirrigated Area			Total Gross Cropped Area		
	1887	1917-18	1980-81	1887	1917-18	1980-81	1887	1917-18	1980-81
Paddy	97		1369	0			97	975	1369
Other cereals	481		2	113			594	144	2
Pulses	-							94	
Oilseeds	11			8			19		
Banana	6						6		
Cotton	10			9			19	10	
Coconut	5		31				5		31
Pararind and other thope	0			32		30	32	42	30
Others			13					25	18
Gross cropped Area	619	n.a.	1420	180	n.a.	30	799	1290	1450
Net sown area							n.a.	772	766

Note: 1. There is a discrepancy in the 1887 data between the sum of area under individual crops and aggregate gross cropped area, of 9 acres in the case of irrigated area and 18 acres in the case of unirrigated.

2. For 1917-18, we do not have separate figures for irrigated and unirrigated gross cropped area.

Sources: 1. Survey and Settlement Register, 1887, Madurai District, Descriptive Memoirs, Gokilapuram Village.

2. Descriptive Memoir of Gokilapuram Village of the Periyakulam Taluk of the Madurai District, 1327 fasli (1917-18).

3. Uthamapalayam Taluk Office Records, 1980-81.

From 1970-71 to 1980-81, GCA under INFC increased from 17,395 acres to 41,470 acres, or by 138.44 per cent; the share of INFC in irrigated GCA increased from 25.35 per cent to 47.76 per cent. This increase has been at the ~~expense~~ of irrigated coarse cereals (cholan, cumbu, ragi and other cereals), area under which declined from 22,038 acres to 11,907 acres (a decline of 45.97 per cent); the share of irrigated coarse cereals in irrigated GCA declined from 32.11 per cent to 13.71 per cent.^{38/}

Within the category of INFC, there has been an increase in every crop sub-category except condiments: in orchards (GCA increased 201.82 per cent from 1970-71 to 1980-81), vegetables (247.27 per cent), cotton (97.61 per cent), groundnut (402.76 per cent) and coconut (234.02 per cent).

Certain features of commercialised cultivation are most pronounced in the thottam sector, the sector where modern agricultural technique is relatively advanced.

Successful thottam cultivation generally requires high initial investment. This includes the costs of land improvement, particularly land levelling and the consolidation of plots (often contiguous plots or erstwhile punjai); the sinking of a new well or improving and deepening an old one; and installing an electric pump. Certain crops also require particularly high initial costs: examples are banana, grape and coconut.

^{38/} From our observations in the Valley -- there are no specific data from official sources on the subject -- it is clear that "irrigated" cultivation of coarse grain often represents a very poorly irrigated crop, grown on land that has a well from which water supply is irregular or scanty. More abundant water supply generally makes the way for diversification to INFC.

Most thottam crops involve high running costs, including costs of fertiliser, seed and pesticides and of high inputs of labour -- cotton, banana and grape come in this category (vegetable crops and flowers also draw heavily on hired labour, particularly for digging irrigation ditches, weeding and harvesting). Cultivation of these crops are also risky ventures: plant disease at the last stages of, say, a cotton or banana crop can ruin a small cultivator.

An important factor in the diversification of cropping pattern on thottam has been the development of transport. Many thottam crops are perishable -- such as flowers (which are sent to Madurai, Tiruchi and to smaller temple-towns); vegetables; banana (marketed mainly in Bangalore and also in Tiruchi) and other fruit -- and their cultivation has developed in areas to which truck transport now has access.

The maintenance costs of a field in thottam are also generally very high. Electricity bills must be met, pumps kept in good repair and wells deepened and improved. Crop rotation (and switching crops in response to price changes) also contribute towards making the minimum viable size of plot for profitable cultivation larger than on nanjai.

Punjai

Except in the south of the Valley, where groundnut and sesamum are commercial crops on unirrigated land, punjai represents the sector where agriculture is backward and relatively unchanged. Meagre harvests of coarse grain and backward farming practices characterise most of the punjai in the Valley: in 1970-71 and 1980-81 foodgrain and oilseeds together occupied 90.69 per cent and 87.99 per cent respectively of GCA on punjai.

To sum up : the cropping pattern on nanjai is marked by the specialised cultivation of double-cropped, high yielding paddy, to the (almost complete) exclusion of every other crop. Thottam is characterised by crop diversification and, in particular, by an increasingly diversifying pattern of irrigated non-food crops; cultivation is generally commercialised, it requires heavy investment, and is often price-responsive and risk-exposed. Punjai cultivation (with qualifications) represents the backward sector of agriculture, with a relatively unchanging concentration on coarse grains and oilseeds.

IIIWATER MANAGEMENT AND IRRIGATION LABOURA Case Study of the Canal-Irrigated Tracts of Gokilapuram

The management of irrigation water in the village -- the system by which this important resource is taken to the field -- has distinct features; it is also a specific subsystem of the social structure of the village as a whole. In this section, we shall discuss the irrigation workers (neerpaichi) and guardsmen (kavalkarar) in canal-irrigated tracts in Gokilapuram; the ground that we shall attempt to cover shall include a brief description of the ownership of nanjai, the method of appointing neerpaichi-kavalkarar, the extent of land covered by them, the tasks of these workers and certain features of the conditions of work, and changes that have taken place in the last few years in the irrigation work-system.^{39/}

Reference year

The basic reference year for this section is 1977. As it happened, the agricultural year 1977-78 was the last year in which the system existed in precisely the manner that is described here; in the later parts of this section we shall outline the changes that took place between 1978 and 1981.

Distribution of nanjai ownership holdings^{40/}

The pattern of distribution of nanjai between households of different classes and castes has a significant bearing on

^{39/} The material in this section consists of information collected through interviews conducted in Gokilapuram and other villages in the Cumbum Valley in 1981, data collected in the household survey in Gokilapuram in 1977, and case-study material collected in 1977.

^{40/} There is a detailed discussion of land ownership and distribution in the village and the class categories that are used in this section in MIDS Working Paper No.31, op. cit.

the methods by which the irrigation system in the village is controlled. The following is a brief summary of the data on this distribution.

Of the 643 households resident in the village, there are 76 (11.81 per cent) that have ownership holdings of nanjai. In the top two size categories, of households owning more than 4 hectares (about 10 acres) each, there are 4 households: they constitute 0.62 per cent of all households in the village and 5.26 per cent of all nanjai owner-households. Together they own 37 per cent of the area of all nanjai ownership holdings. A striking feature of the distribution of nanjai is the continued existence of small units of production: of all nanjai owner households, 68.42 per cent own less than half a hectare each; together they own only 17.70 per cent of the total extent of nanjai ownership holdings. Their holdings are, on the average, 0.59 acres (0.24 hectares) each.

Concentration of ownership of nanjai, then, is very high; the Gini coefficient for the distribution of nanjai ownership holdings among households -- it must be remembered that this excludes the households that are landless -- is 0.6521.^{41/}

Of the total area of nanjai operational holdings, 21.84 per cent is leased in. This is mainly from owners outside the village; owners resident in the village generally operate their land with family and/or hired labour. (Major landlords resident in the village lease out only 5.14 per cent of the area of their nanjai ownership holdings; the rest is cultivated by hired labour.) Tenants are concentrated among the working peasantry.

^{41/} By another classification of households, used in MIDS Working Paper No.31, *op.cit.*, the 11 major landlord households of the village, (who constitute 1.69 per cent of all households resident in the village) together own 60.17 per cent of the area of all nanjai ownership holdings.

The largest single nanjai landholding in the village is held by a non-resident family -- the family of the late P.T.Rajan (see footnote 21). Among the castes resident in the village, the Maravar caste was, up to the 1960s and early 1970s, the largest nanjai land-owning caste, and the big Maravar landlords had the largest individual ownership holdings of nanjai land among households resident in the village. The position in the distribution of nanjai in the village (along with the fact of the numerical preponderance of Maravar households in the village population and the fact that they are, by popular account, the original settlers of the village) has been a major contributory factor to the dominant position of the prominent Maravar landlords in the social life of the village, and their particular role in the system of water distribution.

The position of Maravars in nanjai land ownership has, however, been severely eroded in recent times, particularly by Catholic Udayar landlords from Rayappanpatti, Rowther landlords from Uthamapalayam and Telugu Chettiar landlords from Gokilapuram itself. In 1977, Maravars, who constituted 28.77 per cent of all households resident in the village, also constituted the large majority -- 61.84 per cent -- of households actually owning nanjai; these households together owned 41.97 per cent of the area of owned nanjai. Telugu Chettiars constituted 10.73 per cent of all households that are residents in the village and 19.74 per cent of households owning nanjai; together they owned 48.27 per cent of all nanjai ownership holdings, a share that is larger than that of the numerically preponderant Maravars.

Today, the two largest household ownership holdings from among households resident in the village belong to Telugu Chettiar households, while the loss of land by Maravar land owners, particularly small owners, continues.

Method of recruiting irrigation workers

Uptil 1978, a meeting of all nanjai holders would be called in May and held in the courtyard of the cooperative society in the village. The meeting included all nanjai owners and mortgages; tenants would not be represented. Owners from other villages would generally not attend the meeting and would be informed of the proceedings later. The number of households represented at the meeting would be over 100; with the persons coming to watch what was happening, the total attendance would be about 150. At the meeting a committee to represent nanjai owners would be proposed; village landlords would have met earlier and decided the composition of the committee. The honorary head of the committee was a representative of the P.T.Rajan family and the other persons on the committee were -- and represented the major groupings among -- prominent Maravar and Chettiar landlords from Gokilapuram. This group was in charge of the surface irrigation system in the village, of making representations to the FWD and, when necessary, collecting money for the maintenance of the channels. The meeting would also appoint two agents, who had to be Maravar landlords, to be in charge of organising irrigation work.

The 'minutes' of this meeting were then recorded in a notebook, and the nanjai owners signed their names in ratification -- an interesting example of how an outward sign of routine democratic procedure can be pressed into service to ratify, after the fact, a decision of the landlords. The custom was for the first and second places in the minutes book to be kept for the signatures of the representative of the P.T.R. household and for Savarimuthu Udayar, a rich and prominent landlord with considerable nanjai holdings and resident in the neighbouring village of Rayappanpatti.

The agents, on a day following the meeting, would announce among Maravar agricultural labourer families that irrigation workers would be chosen. In general, not more than 20 or 22 would come, since most of those who would be chosen would have been irrigation workers in the previous year. Eighteen agricultural labourers would be chosen to be irrigation workers; as we have mentioned, all of them belonged (as they do to the present day), like the agents, to the Maravar caste. (Some belong to households with small punjai plots or with a small plot -- generally on some form of lease -- of nanjai land. In any case, the time of the neerpaichi himself cannot be occupied by the tasks of a cultivator.) The modal age of the neerpaichis in 1977 was 35-40 years; about 4 of them were more than 50 years old.

The working year of the neerpaichi would begin soon after -- the picture of the irrigation worker, metal-tipped staff in hand, emerging from his hut and moving out to the sluices on the canal early in the morning of the first water-turn in June, is one of the most representative images of the beginning of the new agricultural year in the Periyar-irrigated tracts.

Area covered

The nanjai owners resident in Gokilapuram do not control irrigation over the whole extent of the revenue village of Gokilapuram. The tasks of the workers who were appointed by the common agreement previous to 1978, and who are directly employed by ayacutdars today, are confined to the command area of five sluices (with direct ayacuts) with a total coverage of 297 acres of the nanjai land that is located closest to the village settlement. The responsibility for irrigation duties over the rest of the ayacut (which includes the whole command area of the tank) rests with nanjai owners resident in Rayappanpatti, whose nanjai holdings are located in the revenue jurisdiction of Gokilapuram.

Tasks of the neerpaichi-kavalkarar

The tasks of the neerpaichi-kavalkarar can be broadly divided into those concerned with irrigation and cultivation and those concerned with guarding the risen crop. In Gokilapuram upto 1978, both these sets of tasks were done by the same persons.

The main shutters and sluice gates that are on the Palayamparavu channel are opened and closed by PWD laskars^{42/}, in accordance with the turns between villages. The internal control of irrigation water in the field channels of the village is the responsibility of the neerpaichi. The neerpaichi must

- open the sluices to field-channels in accordance with the village murai;
- clear the channel that water may flow to the field that is to be irrigated;
- open the water inlet -- pipe or channel -- that leads to each field; allow water to reach the level that the particular stage of the crop requires; close the inlet after the requisite level is reached; ensure that the level of water required is maintained;
- (when the level of a field is higher than the channel) dam the water in a channel in order that water be lifted to the field;
- block breaches in the field bunds and holes in them made by rats, through which water flows out of the field (when peasants and agricultural labourers construct or strengthen

^{42/} Before the main channel came into the charge of the PWD in 1922, and were under the control of "irrigation panchayats", the task of controlling the outlets on the main channel was that of the group referred to in revenue records as village "servants" -- the neeranikkam. The neeranikkam was from a Pallar family and there was a service maniyam -- of which the family has long been dispossessed -- in the name of the neeranikkam.

bunds at the beginning of each crop season, the neerpaichi is generally at the field to assess and criticise the work -- a shoddily constructed field bund will add considerably to his work load over the season);

- prevent tampering with field walls and block breaches made by persons who try to drain water from a freshly-fertilised field to an adjacent one;
- construct and trim the border wall for the seed bed of the second crop (the nursery for the second crop is generally raised in a corner of a field before the first crop is harvested in the rest of the field);
- prevent cattle from grazing on paddy fields and see that grass from field bunds is not cut by persons other than the owner of the field; and
- guard the crop after it has risen, until the last field has been harvested (this is the kaval task, the task of guarding the risen crop).

In addition to this wide range of what may be called the regular tasks of irrigation and guarding, the neerpaichis also

- do the top-dressing of the paddy crop for all fields;
- sow the seeds in the nursery for some of the landowners; and
- do all minor hoe-work repair jobs (kudimaramath) on field channels.

(When major work is to be done on field channels, each owner is asked to contribute labour for repair of the channel in numbers proportionate to the size of the holding in the ayacut of the channel. When major repairs are to be undertaken on the Palayamparavu channel, the three villages -- Uthamapalayam, Karunkattankulam and Gokilapuram -- contribute labour.)

When the common agreement was in existence, in times when there was a shortage of water -- this could be at different times of the year, for instance, in June at the beginning of the first crop, or in December-January, during the growth period of the second crop -- the neerpaichis would go to the head sluice with the agent. They would pack empty fertiliser sacks with sand and make bunds in the river to divert water into the channel. They would then walk along the channel to the village, closing any illegal water-exit along the way. There were years when neerpaichis have had to stand guard at points where water could be diverted.

Uptil 1978, one or two persons from among the neerpaichis were assigned, every year, the task of announcing, from street to street, the temple festival in the Chithrai (April-May) month at the Kaliyamman temple. At this and the other major temple festival, the neerpaichis would help with tasks connected with organising the rituals and regulating the crowds when the rituals were on.

The working year of the neerpaichis begins with the opening of water on June 1, and is complete with the second harvest, in early March. Even before 1978, they were not bound by the common agreement during the slack season, from March to June. During the season when the nanjai land is unirrigated, some neerpaichis contract with individual owners to work on the fields, and among the tasks that they may do in this period are:

- keeping guard over fields in which green manure or fodder crops are grown;
- keeping guard over manure heaps laid out in the nanjai fields;
- odd jobs, particularly involving hoe-work, in the village;
- manual tasks on nanjai, such as hoe-work or helping with basal manuring.

It must be noted that under the terms of the common agreement before 1978, there was little respite for a neerpaichi; he was on call throughout the year on nanjai. He was not allowed to go for any other wage-work in the village even on the few occasions that he might have been able to do so.

Allocations of work and meetings with the agent

Before 1978, when the common agreement was in force, the agents would allocate work between the neerpaichis. Each neerpaichi would be allotted a set of fields irrigated by a particular field channel, each person being allotted from 12 to 24 acres, the extent varying according to the work load that the nature of the area, particularly its topography, demanded. (Where the land has ups and downs and where there are fields that are above the level of the channel, there is relatively more work for the neerpaichi than where the land is flat.) If there were to be complaints that the load on a neerpaichi was too great in the kodai season, he would be given a new area in the kalam. For kaval work over the risen crop, the entire area would be divided into zones (this practice for kaval work continues), and these zones allocated between all but two of the neerpaichi-kavalkarar, who would do the rounds every night. The beats would be changed every week.

The neerpaichis and agents would meet regularly, generally once every three or four days and at least once a week. At their meetings they would discuss their work and problems that may have arisen; if a person had broken a field bund, encroached on another's field, tried to interfere with the irrigation, grazed his cattle on the fields, drained another's field soon after top dressing was done, or tried to steal or tamper with another person's crop, it would be raised at the meeting. If there were complaints by a landowner about the

work of an individual neerpaichi, it would be raised at the meeting by the agent. The neerpaichis would also report on the state of the crop to the agents (and lazy landlords who hardly watch their crop considered this obligatory for them) -- when it was time for transplantation, when weeding was overdue, when fertiliser for top dressing was not bought, when leaves in a field began to show signs of plant disease, or when a ripened crop remained uncut.

Work schedule

The following is a work schedule for a person who combines the tasks of irrigation worker and guardsman (as was the case upto 1978) on the surface irrigated tracts of Gokilapuram.

Sl. No.	Task	Number of days	Hours per day	Total number of hours
1.	Construction of nursery wall	4	2.5	10
2.	Sowing	2-3	11	27.5
3.	Nursery irrigation (i)	3	14	42
	(ii)	1	11	11
4.	Preparation for wet land ploughing (i)	2	14	28
	(ii)	2	14	28
5.	Checking bunds, repairing bund walls, etc.	57	6	342
6.	Irrigation: from transplantation to first weeding	8	10	80
7.	Top dressing			
8.	Irrigation: from first weeding to second weeding	10	10	100

contd...

Sl. No.	Task	Number of days	Hours per day	Total number of hours
9.	Top dressing			
10.	Irrigation: after second weeding	10	10	100
11.	Guarding the standing crop	35	18.5	647.5
12.	Cutting the seed bed for the second crop	(i) 2	8	16
		(ii) 4	7	28
13.	Guarding the seed bed for the second crop	4	9	36
14.	Nursery irrigation (i)	3	14	42
	(ii)	1	11	11
15.	Preparation for wet land ploughing (i)	2	14	28
	(ii)	2	14	28
16.	Checking bund walls, repairing bund walls, etc.	57	6	342
17.	Irrigation: transplantation to first weeding	8	10	80
18.	Top dressing			
19.	Irrigation: from first weeding to second weeding	10	10	100
20.	Top dressing			
21.	Irrigation: after second weeding	10	10	100
22.	Guarding the standing crop	35	18.5	647.5
TOTAL NUMBER OF HOURS:				2795.50
Of which irrigation and other tasks constitute:				1499.5
And guarding the standing crop constitutes				1295.00

Note: (i) The total number of hours is adjusted for overlapping between tasks 11 and 12 and between tasks 21 and 22.

(ii) The time taken for top dressing is merged with other tasks.

This work year is distributed over about 280 calendar days in a year. The work accounted for in the schedule is not, of course, of uniform intensity: guarding the standing crop, which takes up a large part of the work-time, does not involve the kind of manual labour that irrigation and other tasks do; it requires that the worker guard the field through the night and be in the vicinity of the field and on call during the day. Even within the category of 'irrigation and other tasks', the work is of varying intensity. With these qualifications, the average daily work-time of a worker is about 10 hours per working day; in the work-year irrigation and other tasks take about 54 per cent of the work-time and guarding the standing crop about 46 per cent.

Some conclusions on tasks of neerpaichis

Some conclusions emerge from the preceding sections on the tasks of neerpaichis:

The duties of irrigation workers, while centring on the task of water management in fields, encompass a wide variety of other tasks. These include hoe-work on field bunds and channels, application of chemical fertilisers, work connected with the nursery stage of cultivation and, in some cases, with the construction of bunds and basal manuring. In some years, they would go the head sluice, divert water into the channel and prevent water from being drawn off illegally.

The irrigation worker must have a close knowledge of the irrigation system, of the field and channel layout of the village and of the particular features of cultivation in each segment of the ayacut. He must know the water requirement of the paddy crop at each stage of its growth. He must be able to monitor the crop at every stage, to follow its progress and detect symptoms of plant disease when they appear -- there must be a comprehensiveness in his perception of paddy cultivation in the village.

- There have been changes in the tasks of irrigation workers over time: changes in cultivation practices and water management that accompanied the introduction of new varieties are an example. There have also been important changes, as we shall discuss further on, in job-allocation to neerpaichi-kavalkarar and in the method by which nanjai landowners recruit neerpaichis and allot them work. However, corresponding to the fact that certain major features of cropping pattern and surface irrigation technology have remained intact over an extended period, it must also be noted that there exist important elements of continuity in the skills required for tasks connected with irrigation and water management in the canal-irrigated tracts of the village.
- The combination of irrigation tasks and guarding work represents a heavy work load: an average of about 10 hours per day during the actual cultivation period of about 280 calendar days, about 54 per cent of the work time being spent on irrigation and other tasks and 46 per cent at guarding the standing crop.
- While the work load is heavy, the task is not such that labour time is optimally or uniformly distributed over the working year. For the individual worker, there is a discontinuousness about the scheduling of work time over a work period; the nature of the task and the system of field channels and cultivation also make for a considerable squandering of labour time. To take an example: on a day on which there are two small (0.10 acres each) seed beds to water at the end-reaches of a field channel, a neerpaichi may have to spend two hours up and down the channel -- dredging the channel at several points between sluice and field, packing the channel walls, and blocking or regulating (with earth, stones, banana tree trunks) the flow at every branch

and field inlet -- in order to get water to the seed beds. And where plots are fragmented and farming operations not synchronised, if another plot -- and one alone -- is to be watered the next day, the entire procedure will, in all likelihood, have to be repeated. Fragmentation clearly makes for waste in the patterning and consequent utilisation of field channels; neerpaichis themselves point out, for example that the consolidation of seed beds for the ayacut of a single channel at a single or a few specific points would save considerably on water and labour time.

Remuneration

Basic remuneration

In 1977, the basic payment that cultivators made for irrigation and kaval on nanjai was 2 kalam (one kalam = 58 kg of dry paddy) per sey (2.40 acres) per crop, or about 48 kg of paddy per acre per crop or 96 kg per acre per year. This amount was collected at the end of each crop from all cultivators, and to this fund was added whatever ilam or extra payment that a landowner would add to the regular payment. The total collection was divided into 19 shares: one each for the neerpaichis and one for both the agents. In 1977, the neerpaichi-kavalkarar got about 13 bags of paddy each per harvest, which is 26 bags (or 1508 kg) of paddy per year. The market price of 26 bags of paddy in 1977 was Rs.1560.

There had been changes, over the years since 1966, in the basic remuneration.

In the period immediately preceding the common agreement (i.e., in 1966: the system as it existed in 1977, with irrigation and kaval tasks being done by the same persons under

the common agreement, began in that year), the payment for irrigation work was at the following rate:

1 kalam (58 Kg) of paddy per sey (2.40 acres) per crop, or 24 Kg of paddy per acre per crop plus one sheaf of grain per sey after the harvest, which, upon threshing, would yield about 2 Kg per acre per crop plus what remained of the seed-paddy that is brought out to sow in the nurseries, about 2 Kg per acre per crop, plus grain received at the time of preparation of seed beds for the second crop, about 2 Kg of paddy per acre -- a total of about 58 Kg per acre per year for irrigation tasks.

Kaval work, which was separate, was paid at a rate equivalent to about 4 Kg per acre per crop or 8 Kg of paddy per acre per year.

In 1966, immediately after the introduction of the system in which irrigation and kaval tasks were merged, the rate was changed to the equivalent of 24 Kg of paddy per acre per crop plus one sheaf of grain, or the equivalent of about 2 Kg per acre per crop plus leftover seed-paddy, about 2 Kg per acre per crop -- a total of about 56 Kg per acre per year (excluding the grain amount for preparation of the seed bed, which some workers received on an individual basis) for irrigation and kaval tasks.

A few years later, the neerpaichis asked that since the amount that could be threshed from a sheaf varied, it be substituted by a standard half-bag payment -- the basic rate then became the equivalent of 72.50 Kg per acre.

The rates of 1977 were introduced in 1973 or 1974, after the new varieties had completely altered the levels of production in the village.

There was also a change in the number of persons employed as neerpaichis over the period. For 2 to 3 years after 1966, there were 12 neerpaichis; after that the number was raised to 18

To sum up the data on basic remuneration:

- When the tasks of irrigation and kaval were merged, workers lost out in the merger of remuneration for these tasks; the sum of the rate per acre for irrigation and kaval was about 66 kg of paddy per acre per annum in the period immediately preceding 1966, and the rate for irrigation and guarding was 56 kg per acre when the new system was introduced in 1966.
- From 1966 to 1977, there was an increase in the rate per acre paid to neerpaichi-kavalkarar, from about 56 kg of paddy per acre per year to about 96 kg per acre per year, and an increase in earnings per worker from about 1279 kg of paddy per worker per year, an increase of about 17.35 per cent.
- Over this period, the share of the amount paid to neerpaichi-kavalkarar in total product marginally declined: assuming production to have been 1.45 tonnes per acre in 1966 and 3.00 tonnes in 1977, the share paid to them was 3.86 per centⁱⁿ/1966 and 3.20 per cent in 1977.
- In 1977, the cash equivalent of the basic remuneration, with additions as inam, was Rs.1560. Setting this alongside the work-schedule (and reintroducing the qualification that work-intensity over the year is uneven), the remuneration per eight-hour day was about Rs.4.47 per day. The wage rate for an eight-work day at hoe-work in the village (although such work is generally not available to the individual worker throughout the agricultural year) in 1977 was Rs.7.50.

Other remuneration

There were certain other elements in the remuneration of irrigation workers over this period.

Duck keepers are permitted to let their ducks graze on the nanjai land before sowing on payment of lease money to the village nanjai owners. This money used to be divided between Gokilapuram and Rayappanpatti and part of the share kept in Gokilapuram would be used by the agents

- to pay an allowance to the workers when they had to take a bus and go upstream to do manual work at points on the canal near Rayappanpatti or at the head sluice;
- to pay, on occasion, for hoe-work on the channels: neerpachis would not be paid at the normal daily rate for hoe-work, but deliberately less (they were paid Rs.5 against the regular Rs.7.50) -- the agents' explanation being that those who receive a total annual wage "could not expect" to be paid at the regular daily wage rate for such tasks;
- to buy batteries and bulbs for the neerpaichis' flash-lights and to buy them whistles for their kaval work; and
- to buy a dhoti, shirt and towel cloth for each worker at Thai Pongal.

During the first crop, neerpaichis got 10 ducks' eggs each. Some of them also received, from individual owners, a small amount of grain during the preparation of seed beds for the second crop.

There were two components of the total earnings that were knocked off during this period. Neerpaichis were paid some money, a rupee in some cases and not more than five rupees, from landholders after the neerpaichis had scattered

fertiliser over the crop. This was an informal payment, and one that the agents stopped. For about ten seasons after 1966, neerpaichis were allowed to fish in the channels. This was later disallowed.

Penalties, fines

The agents said that in the early period of the common agreement, they could use group pressure as punishment -- 'punishment' merely by exclusion from the group. Fines and suspensions, however, quickly became regular forms of punishment after 1966. (An agent said: "Earlier we could just say 'sit aside for two days' and that itself was like a punishment; now we have to suspend or charge fines.") Punishment was imposed for violating the ban on fishing; for not coming to work, particularly during the murai, without letting the agent know; for sleeping on a kaval job; for permitting a field wall to crumble or cattle to graze or a person other than the owner to cut grass; for not preventing a person from tampering with the crop of another, and so on.

Changes in the system after 1978

The system of recruitment and allocation of work as has been described above was in effect from 1966 to the end of the agricultural year 1977-78.

Uptil 1966, with a three year gap between 1960 and 1963, kaval tasks in the fields were done by a group of workers under the terms of a common agreement (although the specific terms under which kaval was done changed over time). Irrigation tasks were done by individual peasant cultivators for the plots that they cultivated and by agricultural labourers hired for the task of irrigating fields. In 1966, the system that we have described was instituted; at the suggestion of the head

of the PTR family, the system was made roughly similar to that of neighbouring Karunkattankulam, where the PTR family has vast nanjai holdings and where irrigation and guarding tasks were done by the same workers. From 1966 to 1978, the system in Gokilapuram was extended to cover irrigation and kaval tasks.

From 1978, irrigation work and kaval have been separated. Irrigation workers now contract with individual cultivators for employment, and are no longer appointed by agents who are chosen by the committee that is formed at the meeting of nanjai owners. Kaval on nanjai is still done by common agreement; two Maravar agents are appointed by the committee and the agents appoint 6 agricultural labourers from Maravar households as kavalkarar to guard the standing paddy crop.

Even this system has not been smooth-functioning. The agents appointed in 1978 were not reappointed before the beginning of the next agricultural year -- they continued to act as agents for five consecutive seasons without the common meeting being held. After that, the common nanjai kaval did not exist at all for one crop; it was revived in the agricultural year 1981-82.

None of the old neerpaichi-kavalkarar are kavalkarar under the present system. Of the 18 workers who were employed for irrigation and guarding tasks before 1978, 14 to 15 still do neerpaichi work. There are no new entrants to the job; a single person who attempted to join the irrigation work-force after 1978 -- a person from Narayanathevanpatti, south of Gokilapuram -- left because of his unfamiliarity with the irrigation pattern of the village.

While contracts are between workers and cultivators (in some cases, two workers take their contracts together), these are taken in such a manner that individual workers (or pairs of workers who have teamed together) irrigate plots of land

that are contiguous and irrigated from the same sluice. Although contracts are now individual, it is still the case (as it was not before 1966) that no cultivator, even a poor peasant, does irrigation tasks with family labour; all of them employ and pay neerpaichis for irrigation work.

As we have mentioned, the tasks of the neerpaichi no longer includes guarding the risen crop. The number of acres irrigated per worker has risen marginally, with 15 workers now irrigating the area formerly irrigated by 18 workers. There has been, as can be expected, a decline in the rate per acre paid to neerpaichis after the separation of kaval tasks -- they are now paid at the rate of about 72.50 kg per acre per year. Payments from the common fund are no longer made to the neerpaichis and they also do not have any tasks at the Chithrai festival in the local temple.

An important change for the neerpaichis is that they are now free to work at tasks other than those connected with nanjai land -- in the process of change they have acquired, in part, the status of daily casual labourers. When time permits, some of them (particularly those who are young or who have a relatively small extent to irrigate) work at tasks such as hoe-work on punjai and thottam land, ploughing, guarding thopes and thottam and irrigating thottam and some even work at heavy manual operations in the tamarind groves.

In short: after 1978, contracts have become individual and a common system across 300 acres has been modified ayacut-wise; at the same time, irrigation tasks are still done exclusively by irrigation workers. While irrigation tasks have been separated from kaval, the specific tasks of irrigation and the deployment of labour-time at these tasks remain essentially the same, although traditional functions such as those at the Chithrai festival are no longer part

of the job. Wages are only for irrigation and are collected by neerpaichis directly from their employers; some of the older elements in the remuneration are no longer there. As was not possible under the common agreement, neerpaichis now also work as daily wage workers at a variety of tasks in the village.

We shall briefly outline some of the factors associated with the dissolution of the system in 1978.

In a period of changing socio-economic conditions in the village, the old system, with its rigidities, was becoming obsolete. Maravar owners were losing their traditional place of pre-eminence in the ownership of land, and nanjai owners of different castes, no longer in the same position vis-a-vis the Maravars in the distribution of ownership of nanjai land, had no similar stake in the continued existence of the system. After the opening of the PTR channel (which is an extension of the Palayamparavu channel: see p.11) a new and unprecedented level of water supply began to be received by the village, there was a consequent loosening of the murai, and one technical rationale for a common system -- the restricted availability of water -- also became less pressing. For their part, individual Maravar landlords were either unwilling to work as agents or were unable to work together. For a year, four agents were appointed instead of two, but even this could not continue. Nor would they agree to relinquish the task of being agents to persons of other castes in the village.

A reason frequently stated by Maravar landlords for breaking the old system is that the neerpaichis no longer "showed the same respect", and that they thought that the neerpaichis had to be "taught a lesson." One landlord and agent said that the neerpaichis had begun to run their own "underground" -- the reference being to the fact that a group from among the neerpaichis had begun to meet on occasion without

the agent and that on one occasion all the neerpaichis had met without the agent to plan a demand for higher wages.

Irrigation workers in Gokilapuram have not, as a matter of fact, been unionised or formed or joined any regular organisation of irrigation workers, as was the case with irrigation workers in some villages in the southern part of the Valley in the early 1970s.^{43/} There have, however, been instances of neerpaichis in the village acting together spontaneously and as a group^{44/}, and in a village situation where the market for hired labour based on simple contracts between employers and workers has seen significant expansion in the recent period, the kind of subordination and code of conduct that landlords expected of the irrigation workers is quickly going out of date. The obverse of a common agreement by landowners (an agreement formulated and implemented mainly by village landlords) to organise irrigation is the recognition on the other side of a common identity as workers.

Irrigation labour on thottam

In contrast to nanjai, the nature of irrigation labour on thottam is determined, in the first place, by the fact that the source of irrigation is privately owned and the utilisation of water controlled by the decisions of individual cultivators. The other important feature of thottam in this regard is the fact that the crops grown vary from field to field; it is also often the case that a single well irrigates different segments of a single consolidated operational holding that are planted with different crops.

^{43/} See Annexure I

^{44/} See Annexure II

There are two field operations connected with irrigation on thottam. While these tasks demand certain skills associated with particular operations, they do not involve overall understanding of the entire process of cultivation of the crop, as irrigation work on nanjai does -- irrigation work on thottam is more operation-specific. The first task is an operation that involves field preparation for irrigation: cutting and forming irrigation channels and plant beds. The size and pattern of channels and plant beds vary from crop to crop -- they depend on the crop (or crops, where there is intercropping) grown, the size and spread of the plant, the spacing of plants in the field, the type of soil and the slope of the field. This task is done by men working with hoes (even small cultivators generally hire in workers for this task). Male workers are employed at a time-rate, and are generally paid 8 rupees for an 8-hour day's work. In villages where thottam cultivation is advanced and is the dominant sector of cultivation and where the demand for labour for field preparation is high, fields are often given out on contract by those who do not work the fields themselves: a worker is given a certain amount of money (generally the equivalent of the wages for five to six persons working for an 8-hour day) and he calls together a group of men to complete the operation on a specified field in a day. The members of the group share the money equally, working more intensively than when the task is daily-rated, in order that the individual share be higher.

The second operation is, of course, that of irrigating the field itself. This is done when the electricity is on and involves dredging and clearing the channels while water flows. Some landlords hire workers on a permanent or semi-permanent basis for this task, paying the worker monthly wages: often such workers look after the pump room (many make it a part-time residence), perform irrigation tasks, guard the field and crop and supervise labour employed for other operations on

the field. In the case of peasant families working thottam, whose members are themselves engaged in the major manual operations on the land, irrigation tasks and guarding the crop in most cases (particularly among poorer households) consume the highest share of male family labour on thottam. It must be emphasised that in contrast to nanjai, there are no systems of irrigating or guarding the fields in common on thottam, where tasks are done exclusively by hired labour in the case of households whose members do not work on the land (such as those of the landlords), or by family labour, or in some cases, by a combination of both hired and family labour.

IVCONCLUSIONS

The surface-irrigated lands of the Cumbum Valley are part of the Periyar system of irrigation, which was commissioned in 1895. The Periyar system, which brought to the Valley an unprecedented supply of water, sufficient for nine months (or two paddy crops), built on foundations that existed in the pre-Periyar period: on the existing Suruliyar-Vairavanar irrigation system, and a tradition of careful husbandry of water by means of a canal and tank system. Consequent on the release of Periyar water, there was an extension of irrigated area; there was also a significant process of intensification of cultivation in surface-irrigated tracts.

The commercial cultivation of paddy had an early start in the Valley, and paddy became the major crop on surface-irrigated land in the post-Periyar period, pushing out other crops, particularly coarse cereals. We have traced, in the paper, changes in farming practices in paddy cultivation over the past thirty years. In recent years, surface-irrigated land has become an area of the specialised cultivation of double cropped, high-yielding paddy, to the exclusion of almost every other crop.

There has been considerable activity in the market for surface-irrigated land, particularly in recent years (we have not dealt with this in any detail in the paper). At the same time, a high degree of concentration of ownership of nanjai is a continuing feature of the ownership structure, as our data from Gokilapuram village suggest. Surface irrigation has been an important aspect of the agrarian economy of the village, and the dominant position of the major landlords in the ownership of nanjai is an important attribute of their socio-economic position in the village.

While cultivation on nanjai is mainly 'direct' cultivation, by hired labour (supplemented, in the case of peasant households, by family labour), tenancy remains a significant though secondary feature of land tenure on nanjai. Nanjai cultivation draws heavily on the large force of agricultural labourers resident in Cokilapuram and other villages of the Valley.

Surface irrigation involves the private utilisation of a public -- or government controlled -- resource. The PWD regulates and controls the supply of water until it reaches the main water-gates for a village, and it is the flow in village channels that must be organised by ayacutdars. At present, surface irrigation is characterised by the less than optimal use and often by waste of water. The system of field channel patterning is not the most efficient and farm operations are not planned in a way that water is most economically used.

When representations about surface-irrigation facilities are made to the PWD or Government, however, they are generally made jointly, "on behalf of the ayacutdars" of a channel or sluice. In many instances, nanjai cultivators enter into some kind of common agreement to organise irrigation over ayacuts that are largely -- in most cases exclusively -- planted with paddy. The system of irrigation labour that we have described in the paper is one that was, in a sense, embedded in the traditional social structure of the village. While there are important elements of continuity in the specific tasks of irrigation and water management performed by irrigation workers, there have also been changes -- in the context of changes in the socio-economic milieu of the village -- in the manner in which irrigation is organised, and in the terms and conditions of the work of irrigation workers.

The major impetus to lift irrigation came after rural electrification in the 1950s and 1960s; the growth in acreage under lift irrigation continued in the 1970s.

Lift irrigation (whose development has been heavily supported by official credit) is at every stage -- at the stage of prospecting the source, in the exploitation of the resource and in the actual utilisation of water -- privately owned and controlled.

The lift irrigated tracts of the Valley are the major area of crop diversification in the Valley. There has been, in recent times, an expansion of cropped area under irrigated-non-food crops on lift-irrigated land, and of almost every crop sub-category within this category. This expansion of the highly commercialised cultivation of irrigated non-food crops has taken place mainly at the expense of area under coarse cereals, formerly grown on land that was dry and is now converted to garden land, and on erstwhile thottam where the source of irrigation was less reliable.^{45/}

This sector of relatively advanced development in agriculture is characterised by costly technical requirements of cultivation: it involves heavy investment on land improvement and the installation of electric pumps, on the maintenance of fields wells and pumps and on costs of cultivation that are relatively high. Fields are generally in use throughout the year, and thottam cultivation demands hired labour around the year and on a substantial scale. Successful thottam cultivation involves a change over to a technology which prices out the poor.

^{45/} The consequences of this aspect of changing cropping patterns in terms of a decline in the total availability of millet and other coarse grain and of fodder are issues that have been raised in the literature; we have not discussed these in the paper.

Tasks associated with irrigation on lift-irrigated land are also privately managed by individual cultivators. Some owners, particularly landlords, hire workers for field preparation for irrigation on a daily-rated or piece-rated basis and for irrigation on a daily basis and in some cases on a longer term. In the case of the working peasantry, hired labour has most often also to be employed for field preparation; in the case of the peasant families operating thottam, the specific tasks of irrigation and guarding are generally the tasks that absorb the highest share of male family labour in cultivation.

In this paper, our focus has been restricted to workers at tasks associated with irrigation; there remains, of course, the larger and crucial question of the impact of changing irrigation and crop regimes -- or, more generally stated, of changes in the scale and type of agriculture -- on the market for hired labour as a whole. This is an issue we are attempting to deal with in the course of our current research.

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ANNEXURE - I

These are accounts of two incidents when the neerpaichis joined together, in defence of the rights of a tenant in one case, and for payment in good quality grain in the other.

1

Servar, head man of the Parayar caste group in the village, is a respected member of the village community. He is experienced in traditional veterinary medicine and goes to great pains to take care of sick and disabled animals -- he is willing to answer calls at any time of the day, even when the owner of the animal does not have money or grain for immediate payment. From 1954 to 1976, Servar was a tenant-at-will on hereditary trust property controlled by a landlord family of Rayappanpatti.

In 1976, a new trustee took over on the death of the old. Without letting Servar know, the new trustee had the land ploughed. Servar appealed to the landlord to permit him to continue for at least another year -- the previous year had been a bad one and he had incurred debts of more than 2000 rupees. Servar completed the nursery ploughing and preparation of the seed bed. On a day when he was out of the village, the landlord had the seed bed ploughed over. Servar complained to others in the village against the landlord and also filed a complaint against him at the police station.

At this point, the neerpaichis intervened, and told the agent that Servar ought to be permitted to continue for another year. (Even the agents of that year recall that it was because of the intervention of Rayar, the oldest and most experienced of the neerpaichis and the other neerpaichis

that Servar's tenancy was saved for a year.) For each operation, the landlord sent his workers; they were prevented from entering the field by the neerpaichis. It was also recalled that weeding was done by two sets of people: Servar's own and people employed by the landlord. When the crop was cut and threshed, the landlord still claimed the crop. Rayar and other neerpaichis kept guard over the crop, not allowing the landlord's men to move it until a compromise was worked out. Ultimately, Servar cultivated the land for the whole year free of rent and was paid Rs.2500 as 'compensation' for the loss of the 23-year tenancy. It is also recorded that Servar, in gratitude to the neerpaichis, added to the inam that went with their payment for irrigation workers that season.

2

At the end of each harvest, two neerpaichis, on behalf of all the neerpaichis, would go from house to house collecting the paddy wage due to them from cultivators. In one season, when after the harvest they had to collect grain, they went as usual to the house of SNR, the Chettiar landlord who has the largest nanjai holdings among households in the village. When the grain was being measured out they found, to their dismay, that SNR was paying them in very poor paddy, taken from the second threshing and full of husk and broken grain. Paddy such as this yields very little whole rice, and these were wages being paid by one of the richest landlords in the village -- his reputation for being a miser was certainly being proved.

Neither of the neerpaichis said anything, however. They took the grain to the other neerpaichis, showed it to them and told them who had measured out such poor grain and then together worked out a plan for the next day.

On the morning of the next day, the two bags in which SNR's grain was filled were taken to a place near the Vinayaka temple in the centre of the village, and kept there with two neerpaichis stationed beside them (they took turns by the bags, which stayed there the whole day, until the evening). The place they chose is the busiest cross-road in the village -- it is also the village bus-stop -- and is a point which almost every person in the village passes at least once a day. And when people passed on that day, they invariably stopped by the sacks and asked the neerpaichis -- "What are you doing with these two sacks of husk and broken grain in this place?" And the neerpaichis would answer, deadpan, "Oh these? -- this is the paddy that SNR measured for us as wages this season."

From morning till evening, people passed the crossroad; each asked the same question and got the same reply and each person went away laughing at the stinginess of the man.

From the next season, SNR paid the neerpaichis in whole grain.

ANNEXURE - IIUnionisation of Irrigation Workers in the Cumbum Valley

In 1971-72, during a period of general militancy among agricultural labourers in the Valley, activists of the All India Kisan Sabha and CPI(M) in the Valley called a meeting of irrigation workers at a place near Gudalur in the south of the Valley. The meeting was attended by irrigation workers from Gudalur, Cumbum, Narayanathevanpatti and Kamayakavundampatti villages. They later formed a union, the Cumbum Area Irrigation Workers' Union (which was active through the first half of the 1970s.

Their major demands concerned an increase in wages, standardisation of measures in which grain wages were paid, separate payment for tasks other than those directly concerned with irrigation, payment in paddy of good quality and security of employment.

Wage increase and standardisation of measures: In the regular volumetric measure, 4 padi ('Madras measures') comprise one marakkal, and 12 marakkal comprise a kalam, which is equivalent to 58 Kg of dry paddy. A regular kalam thus consists of 48 padi. A coolie marakkal, which is used specifically for wage payment, however, contains only 2.50 to 3 padi, and one kalam comprised of 12 coolie marakkal contains only 30 to 36 padi*. The union demanded that irrigation workers be paid 2 kalams per sey (2.40 acres) in the regular marakkal and not the coolie marakkal.

*In certain areas, rent is collected in a kuthagai (rent) marakkal. This measure, predictably, holds more than the regular marakkal -- about 5 padi.

Separate payment for tasks other than irrigation: The union demanded separate wage payment for all tasks other than specific irrigation tasks; for instance, a payment of Rs.8 per sey for top dressing, similar wages for applying pesticides and a regular daily wage for hoe-work such as construction and maintenance of field bunds.

Paddy quality: The union demanded that paddy wages be paid in grain obtained from the first threshing and not, as was the practice, from the second threshing.

Protection against dismissal: Most neerpaichis are men with many years of irrigation labour behind them. The union demanded that landowners not be allowed to hold out the threat of dismissal against them.

The first demand, relating to payment in the regular marakkal, was generally won; the other demands were generally not gained.

While canvassing membership for the union, its activists exposed a case of bondage. Suruli, an agricultural worker of Cumbum, took a loan of poor-quality cholam ("that not even an animal would eat") from Buddhiyappa Gounder, medium landlord, Congress Party man and secretary of a local charity hostel. Suruli was made to repay the debt by working on Buddhiyappa Gounder's nanjai land. His debt began to accumulate, and by the time he was contacted by activists of the union, Suruli had not been paid for seven harvests. The union demanded of the landlord that Suruli be paid. Their demand was eventually successful: they had him pay 105 padi of paddy to Suruli as back wages.
