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Muniandi Jegadeesan^{*} and Koichi Fuijta^{**}

Abstract

Agriculture which plays a crucial role in providing employment opportunities for rural poor in Tamil Nadu is drastically declining as profitability and dependability of doing agriculture is getting reduced due to various risk associated with it. The prime most risk is availability of water and inputs. Because of irrigation water shortage average yield was about 30 – 35 percent lower in rainfed farming than irrigated farming. Considering the frequent aberration of rainfall, the state provided with numerous numbers (40,319) of irrigation tanks constructed in ancient times to conserve and store the rainfall and later it is used for irrigation and other domestic uses. Deterioration of these irrigation tanks due to various socio-economic, political and institutional factors adversely affect the livelihood opportunities of the rural people in Tamil Nadu. This paper primarily aims to understand first, the social class structure of farming community, the constraints imposed by it on paddy production and its effects on indebtedness of farmers in Tamil Nadu. Secondly, it attempts to identify the role of tank irrigation system on the agricultural production and the livelihood opportunities of the villages in Tamil Nadu. It provides empirical information about socio-economic and institutional factors responsible for deterioration of tank system and livelihood strategies employed by the local people as a result of deterioration of irrigation water resources. This is based on our field survey on 195 farm households in 3 villages in Madurai district of Tamil Nadu. It concludes households in the rural Tamil Nadu have differing in asset endowment and livelihood strategies. Opportunities for off farm work tend to be limited in these areas and household strategies that combine on farm with off farm work earn higher income. Abandon of traditional way of management of tanks and structural changes happened within and between social classes at the village level is the possible reason for deterioration of irrigation tanks.

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Introduction

The prosperity of Tamil Nadu depends on the development of rural areas. As per the 2001 Census, Tamil Nadu's rural population was 36.2 million, amounting to 58% of the total population. Of these 90 percent are earning their livelihood through agriculture and allied activities. The agricultural situation in Tamil Nadu largely depends on the quantum of rainfall received during seasonal rainfall of South West and North East monsoon. North East monsoon which occurs around September to November is more crucial as South West monsoon which will give enormous rainfall to other Indian states is blocked by Western Ghats. So Tamil Nadu is receiving low rainfall and it also comes in three to five heavy showers during October and November. This limits the wet period (good condition for cultivation) to two to five weeks for the whole season. The wet period is further shortened by fast wind and soil type in some area. Thus, the success of the crop is largely determined by one's capacity to exploit the short wet period. Even though the Tamil Nadu is relatively better position in tapping available ground water resources (92 percent of potential has been tapped), 82 percent of the well is owned by medium and large farmers who is only 10 percent of total cultivators. About 74.3 percent of marginal farmers and small farmers have very limited access to water. Hence they are fully depended on public funded water resources like tank. Thus, the tank irrigation system has been developed since ancient time to conserve available water for agricultural production and for all water related need for the villagers. The small earthen bunds are formed across the small streams and rivulets wherever feasible to form tanks in which water is collected and stored during monsoon period and let down for irrigating small command area controlled through sluices and distributaries. Mosse (2003) described that the tank irrigation system is one of the vast network of thousands of water bodies that constitute a distinctive landscape which is medieval in origin but still the basis of livelihood in the dry southern plains.

It is true that tank irrigation significantly contributes to agricultural production in India in general and in particular Andhra Pradesh, Tamil Nadu, Karnataka and parts of West Bengal, Uttar Pradesh and Rajasthan as these states account for 63 percent of the total area under tank irrigation. Over the years more modern form of irrigation such as canal irrigation and energized well irrigation have pushed back the tanks from their place of prominence. While the large farmers supplemented their water need through energized well, the hardest hits are the poor and marginal farmers who depend on common property resources like tanks for their livelihood. During Tenth Plan Period (2002-2006), the state is aimed an annual growth rate of 4% and hoped for sustainable agricultural development through assured water supply, employment generation and poverty eradication. As failed in achieving most of the Tenth Plan goals in agriculture, the union planning commission is planning to achieve these goals in Eleventh Plan (2007-2011) (Swaminathan, 2006). Besides the government's policy intervention to make agricultural sector still economically viable, the present situation in the rural Tamil Nadu is not adorable. The increasing trend of fallow lands which was 2.3 million ha during 1990-91 has increased to 3

million ha in 2003-04 (Policy Note, 2006). The cropping intensity also reduced from the average level of 120 percent in the state to 112.4 percent. In Southern dry district the intensity of cropping is still low and hovering around less than 100 percent. This situation displaced million of farmers who were solely dependent on farming forced to think about alternatives and feared to lose their habitual livelihood opportunities. Apart from the farmers, the landless labourers and farm women still in high numbers have lost their employment. Studies showed that reduced cropped area coupled with farm mechanization have already reduced 50 mandays available to the rural poor. While opportunity for work in agriculture is seasonal and it is highly unstable due to various factors, the farmers and landless labourers are searching employment within 10 to 20 km radius from the villages. These changes have potential to create unprecedented eco systemic and socio-economic imbalances among rural society in Tamil Nadu. Thus, the present study is designed to capture current scenario of agriculture in Madurai district of Tamil Nadu. Three villages namely Kadaneri, Koovalapuram and K.Meenachipuram in the southwest part of Madurai district were studied. This study is an attempt to identify how different households with varied resource base formulate strategies to surmount their social and economic pressure of their daily life.

In the study villages the land is considered to be single most important productive asset, the farmers who have little land and highly insufficient water and other input resources faced continuous crop failure and their hope in agriculture in future is bleak. Most of the farmers and labourers start migrating from villages as industrialization has been running at uneven but increasing pace during last 15 years. Our field survey villages directly or indirectly affected since it lies close to the Sivakasi – Rajapalayam industry belt which major center for match box, fireworks and cotton industry. Thus the prospect of agriculture is shrinking, the opportunities for off farm work tend to be limited in this area and households strategies that one person from family migrate out from the village and remaining member seek on farm and off farm employment within and close to the village to earn additional income is increasing.

Acknowledging this, the government of India and Tamil Nadu are implementing National Rural Employment Guarantee Programme (NREGP) which envisaged providing 100 days employment per year for one person from every willing household. Apart from this Govt. of Tamil Nadu also provides food and other groceries through Public Distribution System (PDS) with highly subsidized prices. Hence, the objective of this paper is to find livelihood and employment profile of farmers and landless labourers with varied asset endowment, profitability of paddy cultivation in this water starved region and analyse causes and consequences of crop failure and finally to probe availability of nonfarm employment and type of employment and its seasonal variation in the vicinity of study villages. This paper thus organized into six parts as first part elaborates general characteristics of study villages, second part gives details about landholding status of

different class of farmers and their crop cropping pattern, wage employment structures, third part about economics of paddy cultivation, fourth part about issues in the irrigation tank and condition of tank water institutions, the fifth part discusses about availability of nonfarm opportunity and type of nonfarm opportunities around the study area and final part consists of concluding comments and suggestive policy measures.

Methodology

Madurai district of Tamil Nadu has been purposively selected for this study as it is the most urbanized, less industrialized and resource poor dry district in the state. Average rainy days in the state are 56 days and the highest is 102 days in Nilgiris and the lowest is 48 days in Western Madurai district and South and Central Ramanathapuram. Madurai district is increasingly urbanizing and the conditions for practicing agriculture is becoming miserable and three village located western part of this district has been selected. Three villages has fully depended on tank for irrigation and located on same administrative unit (Taluk and Block) which facilitate us to collect secondary data relatively easier from the government offices. After indentifying the study villages using secondary data the farmers list has been prepared based on the land holding in the tank *ayacut* (command) area. The fifty percent of the farmers having land in tank *ayacut* is considered as sample and additionally to represent landless labour, 10 percent of landless labour from every village is included in the sample. Thus total sample has been constituted about 195 households (Kadaneri 85: Koovalapuram 50: Meenachipuram 60). The data has been collected through pre-tested, semi structured interview schedule, paying personal visit to the villages. The data were collected through personal interview; focus group interaction and discussion with opinion leaders and village informal heads. This study has been conducted during Sep. 2007 to Feb. 2008.

General Characteristic of the Study Villages

The Table 1 presented general characteristics of the selected study villages. The study villages Kadaneri, Kovalapuram and Menachipuram are located in T.Kallupatty block and Peraiyur *taluk* of Madurai district. All the selected villages are predominantly dependent on agriculture and allied activities for their livelihood. The fate of agriculture is determined or influenced through rain fed tank irrigation system in the villages. The major crops cultivated are paddy, cotton and pulses. Mostly they limit with single crop and rarely going for second crop. The farmers in the study villages opined that even in the mid-1990s they cultivated two crops; i.e. paddy followed by cotton or pulses and sometimes go for a third crop using summer rain. But after 1996, most of the farmers find it very difficult to cultivate even a single crop. From 1996 to 2004 there existed continuous drought in this area and tanks in these villages are not filled to the capacity. Consequently this affected agriculture and this is the starting point of farmers and landless labourers in these study villages to think about alternative livelihood measures. Further, in the

last 10 years there was no intervention on these tanks to improve its performance. As a result, employment generated through tank irrigated agriculture is in terminal decline. In recognition of this, the government of Tamil Nadu, brought these villages under the National Rural Employment Guarantee Scheme (NREGS) to provide supplementary non-farm employment to assist them (BDO, 2007).

Table 1: General Characteristics of Study Tank Villages

Characteristics	Kadaneri	Koovalapuram	Meenachipuram
Total population	2234	520	440
Command area (ha)	41.60	62.26	7.94
Management authority	Public Works Dept.	Public Works Dept.	<i>Panchayat</i> Union
Type of Institution	Traditional	Govt. sponsored	NGO Sponsored
Basin Location	Vaipar	Vaipar	Vaipar
Tank capacity (mcft)	14.0	17.66	9.20
Source of water supply	Rain fed	Rain fed	Rain fed
No. of sluices	1	2	1
No. of supply channels	2	2	2
Extent of encroachment (ha)	0.21	Not available	Not available
No. of wells in command area	12	18	1
No. of castes in village	9	5	2
Total No. of households	387	133	110
Farming households	214	67	53
Landless Agricultural labourers	148	43	42
Non farming households	25	23	15
Major cropping pattern	Paddy, Pulses	Paddy, Cotton, Pulses	Paddy
Schools	Middle School (Up to 8 th STD)	Primary school (Up to 5 th STD)	Primary school (Up to 5 th STD)
Connected by Road	Yes	Yes	Yes
Public Distribution Shop	Yes	Yes	Yes
Tank intervention in last 10 years	No	No	Yes. By NGO (2006)
Tank performance (farmer's perception)	Moderate	Poor	Moderate

Out of three tanks, two tanks are managed by Public Works Department, and one is coming under *Panchayat* Union management regime. Density of wells in the study villages is low. In Kadaneri out of 12 wells 8 wells are in tank command and remaining four wells located in dry land. In Koovalapuram all the 18 wells are in tank command but only 12 wells are functioning. In Meenachipuram only one well in the Tank command but it is community well. Other than this community well, there is no well in the command area. Most of the wells are owned by (94 percent) large and medium farmers and only six percent of the wells are owned by small and marginal farmers. Even in this six percent, three to four farmers are sharing one well. This is crucial because when water availability from the tank is vanished, the large and medium farmers

able to supplement their water need and save the crop. But small and marginal farmers are not able to provide supplement irrigation in time hence they face relatively high crop loss.

It is noticeable from the Table 2 that in all three villages more than 50 percent of the households are occupied by upper caste and equally by Scheduled Caste or Dalit (Former Untouchable). In the village Kadaneri most of the lands is owned by the caste viz., Gounder, Naidu, Muthaliar and Devendrar. The same trend is continued in Koovalapuram also. In the case of Meenachipuram, it is a single caste dominant village, with all the land is owned by Yadava community. It is interesting to learn that Devendrar community which is being considered as a lower caste is getting increasingly access to land in the above two villages.

Table 2: Caste Distribution in the Study Villages

Caste *	Caste Definitive Occupation	Kadaneri		Koovalapuram		Meenachipuram	
		No	%	No	%	No	%
Gounder (BC)	?	50	12.92	-	-	-	
Naidu (BC)	?	60	15.50	-	-	-	
Yadava (BC)	Herdsman	35	9.04	-	-	95	86.86
Pandaram (BC)	Florist, Temple priest	-	-	6	4.52	-	
Devar (BC)	Farming/Labour	-	-	5	3.76	-	
Muthaliyar (FC)	Weaver	35	9.04	-	-	-	
Chettiyar (BC)	Merchant	4	1.03	-	-	-	
Pillai (FC)	Accountant	4	1.03	-	-	-	
Asari (BC)	Artisan	5	1.30	4	3.00	-	
Reddiyar (BC)	Dominance	-	-	56	42.11	-	
Pallar/Devendrar (SC)	Labour, Tank watch man, Waterman	174	44.96	57	42.85	-	
Others (SC) (Vetiyan, Vannan Paraiyar and Sakkiliyar)	Drummer, Scavenger, Washer man, Cremation ground attendant, Barber And leather worker	20	5.18	5	3.76	15	13.64
Total		387	100	133	100	110	100

* BC: Backward caste, FC: Forward Caste, SC: Scheduled Caste. This is Govt. classification based on their social status in order to provide reservation and other privileges.

We found from our field survey that earlier most of the land in the Kadaneri fully occupied by Gounder and Mudhaliar and in Koovalapuram it was occupied by Reddiyar and Bramin community. After 1970s these upper community tend to move out from farming as their children got education and settled in cities. Consequently, Government's policy on land sealing under Zamindar abolishment act and redistribution of land to tenant and landless famers was fueled this process. Hence, once lower caste who longed to own the land have a chance for it. Slowly the upper caste farmers sold their land to their tenant or to permanent labourer of their farm. It could be found from the table 2 that in Koovalapuram once dominant caste called Bramin is not at all

in the village now. The farmers also disclosed that the Reddiyar households are also shrinking as most of the farmers start settled with their children in the nearby cities. The other caste people like Asari, Chettiyar, Pandaram are doing their caste occupation as carpenter, gold Smith, business and flower marketing. In Meenachipuram, all the lands are owned by Yadava community. It is believed that traditionally they reared livestock for their livelihood. Pallar community was looking after the lands of Upper Caste people as permanent labour and serving as 'irrigator' and 'water man' for the local tank resources. Slowly these caste peoples also start buying land but still doing the work of water man and guarding the tank resources in the two villages.

Table 3: Land Distribution among farmers in the Study Villages

Meenachipuram	Household *				Land Holding				Farming land (Ac) **		A.I (Rs)	
	No	%	Wet	Ac	Wet	Ac	%	Dry	Wet	Dry	A.I (Rs)	
Koovalapuram	Household *		Land Holding				Farming land (Ac) **		A.I (Rs)			
	No	%	Wet	Ac	Wet	Ac	%	Dry	Wet	Dry	A.I (Rs)	
Kadaneri	Household *		Land Holding				Farming land (Ac) **		A.I (Rs)			
	No	%	Wet	Ac	Wet	Ac	%	Dry	Wet	Dry	A.I (Rs)	
Crieteria	Household *		Land Holding				Farming land (Ac) **		A.I (Rs)			
	No	%	Wet	Ac	Wet	Ac	%	Dry	Wet	Dry	A.I (Rs)	
Large Farmers	17 (5)	4.4 (1.3)	27	38	25 (93)	36 (94)	21	189	-	-	39488	
Medium Farmers	62 (15)	16 (4)	38	43	36 (94)	284 (75)	42	380	109 (80)	-	18139	
Small Farmers	70 (40)	18.1 (11)	43	43	40 (93)	110 (72)	17	153	80 (94)	12 (60)	17165	
Marginal Farmers	128 (96)	33.1 (25)	45	45	43 (95)	145 (83)	20	175	43 (96)	10 (63)	17048	
Landless Laborers	75	19.4	-	-	-	-	-	-	-	-	16515	
Non farm HH	35	9	-	-	-	-	-	-	-	-	19110	
Total	387 (156)	100	153	153	-	-	-	897	-	-		

2.0 Land Distribution in the study villages

There are five classes of farmers in the study villages. Based on the size holding, the farmers in the village were classified as Large farmers, Medium Farmers, Small farmers, Marginal farmers, Landless labourers and Nonfarm Households.

Large Farmers: Large farmers are those who own over 10 acres of land and cultivate with the help of hired labour. They also often leased out some of their land. They are the most dominant class in the all three villages but numerically they are very few. For instance, of 630 households in all three villages only 37 (5.8%) are large farmers (Table 3). However, they are dominant in these villages as they own nearly 50 percent of the total land.

Medium farmers: Medium farmers are those who own 5 to 10 acres of land. They are next to large farmers in the asset position and resource base for investing in agriculture. Most of the medium farmers are imitative of large farmers and have established good relationship with large farmers. This relationship make them better position when they are in need of water for supplement. These farmers are relatively well off both in their ability to meet their consumption requirements and in their ability to hire labour whenever in need. Some of the farmers in this class are constantly seeking ways to expand their operational holding and they usually leased in more land.

Small farmers: Small farmers are those who operate 2.5 to 5 acres of land. But most of the farmers are having less than 3 acre for operation. Small farmers are often engaged in attempts to replace hired labour with their family labour. Besides calling upon family members for work to replace hired labour, they also involve their close relatives to share their labour and implements – a system known as *Mattal* (Labour exchange)¹¹ *Mattu Yer or Mattu Porul* (exchange the plough or other agricultural implements). This type of mutual assistance is more prevalent in ancient days but still this custom has been followed in some extent. Some farmers are exchange their plough animal and bullock cart for manuring. During important crop operation like sowing and harvesting, as all the farmers are using their labour and implement, this exchange is least followed in these time. There are instances that they earn additional income by selling out labour.

¹ Exchange of labour between relatives is often practiced by small and marginal farmers. In paddy cultivation they were used for mostly weeding and manuring. In the case of cotton and black gram they were used for weeding, manuring and harvesting and threshing work. Mostly women and children from farm family were used in this kind of labour work. They did not provide any salary but the children are provided with their favorite food item like Parata.

Marginal farmers: Marginal farmers own less than 2.5 acre of land. In practical, most of the farmers own less than 1 acre of land. These class farmers are more in number in the study villages (Table 3). These farmers are also practicing exchange of labour and implement with fellow farmers.

Marginal farmers are earning about 70 to 80 percent of their income through labour work. Most of the farmers found difficult to cope with farm income as they operate less than 1 acre of land. They usually borrow money from others to invest in farming. At the end of the each harvest, they find that they are actually still in deficit as much of their output has gone towards settling old loans.

Landless labourer: They do not own land at all. They fully depend on their labour power for earning. If the farmers are cultivating two crops, they would normally get employment for 100 to 120 days. But in recent years, water availability in tank is limited for one crop. These labourers try to augment their income through livestock rearing and do other seasonal employment like collecting Neem seed and selling it in local market.

Nonfarm Households: There are few households who are not doing farming related occupation. Generally this class household in the village belongs to scheduled caste and expected to do their caste occupation like hair cutting, washer man, working in cremation ground and as scavenger. Apart from this household who work in organized sector also belong to this category. The households who run small petty shop or tea shop also coming under this category. This class household is serving as money lender to small, marginal and landless labour household.

Cropping pattern

The data regarding average cultivated area presented in the Table 4 are based on the estimate in last two year 2005 – 2007. We first estimated cultivated area through revenue registers in the village. We noted the fact that these register tend to understate or overstate the acreage. So we report it through our personal interview with 162 farmers in all the villages and also considered the irrigation potential of tanks during tank season for cultivation. The basic assumption behind this method is that a farmer would not forego an opportunity to cultivate if water is available. Our experience in these three villages also did not contradict this assumption. Table 4 showed that paddy is the most important crop in all three villages. 91.5 percent of tank command area

Table 4: Cropping Pattern and area under different crops in the study villages

Cropping pattern		Kadaneri		Koovalapuram		Meenachipuram	
Tank season	Dry season	Area cultivated (Acre)	% to total area	Area cultivated (Acre)	% to total area	Area cultivated (Acre)	% to total area
Paddy	Pulses	110	72	98	66	22	63
Paddy	Cotton	5	3.5	6	4.5	0	0
Paddy	Sorghum	25	16	12	8.5	0	0
Sugarcane	-	8	5	10	7.5	0	0
Banana	-	5	3.5	4	3	0	0
Paddy	Fallow	0	0	4	3	13	37

Source: Author's field survey Sep–Nov 2007

in village Kadaneri has been occupied by Paddy, in the village Koovalapuram, it was 82 percent and in Meenachipuram it was 100 percent. We were informed that 10 year before most of the farmers opted for cotton cultivation after Paddy (instead of going for Pulses). But because of increased cost of cultivation (due to increased pesticide application) labour demand during cotton picking and relatively longer duration would make farmers to opt for pulses. In the mean time Govt. of Tamil Nadu also promoted pulse cultivation through subsidies and incentives. Some of the farmers also cultivating sorghum and number of farmers cultivate sorghum is increasing as it has good demand in market and need very less water. Some farmers are cultivating sorghum for fodder. Only large farmers who own well and investment surplus would go for long duration crops like sugarcane and banana. Sugar factories promote sugarcane cultivation in this area by providing buy back mechanism and arrange loan from bank. They also provide all the inputs needed for the cultivation. Labour for harvest and transportation are also arranged by sugar factory. After detecting all the cost it paid to the farmers, the remaining money would be given to the farmers soon after harvested canes are sold. It is usually consumes time, most of the small and marginal farmers even if water is available would not prefer to cultivate sugarcane as they need cash immediately. Considering water shortage in this area Government promote maize cultivation. Farmers in the tail end of the tank command have gone for maize cultivation. Maize has better market demand as it has more demand in poultry industry. Whenever the farmers opt for non rice crop, the landless labour and marginal farmers are starving for wage employment opportunity since Paddy cultivation relatively engages more labour than other crops (table 5&6).

Labour Demand and Wage System

This calculation of demand for labour in paddy cultivation was based on farmer's own estimate of amount of hired labour required for different operations.

Table 5: Demand for hired labour in Paddy cultivation in study villages during Tank season (Per Acre)

Name of operation (Paddy)	Period	Kadaneri			Koovalapuram			Meenachipuram		
		M	F	Total	M	F	Total	M	F	Total
Preparing seed bed	25 Aug – Sep 15	4	-	6	5	-	5	5	-	5
Main land preparation	Sep 15- Oct 15	10	5	15	8	6	14	10	3	13
Leveling and bund blastering	-Do-	4	-	4	4	-	4	4	-	4
Transplanting	Oct 16- Nov 1	4	16	20	2	16	18	2	16	18
Weeding (3 times)	Nov 1- Jan 10	-	30	30	-	24	24	-	24	24
Fertilizer & pesiticide application	-Do-	2	-	2	2	-	2	2	-	2
Harvesting and threshing *	Jan 12- Feb 1	10	25	35	10	25	35	10	20	30
Second threshing **	-Do-	1	1	2	1	1	2	1	1	2
Total		34	77	111	32	72	104	34	64	98

* If the farmer opted for manual harvest , ** threshing the left out grains after first threshing using bullock or tractor

It could be very important to notice that small and marginal farmers are hiring labour much lower than medium and large farmers. It is believed that small and marginal farmers are hiring 15 to 25 less labour than medium and large farmers. It is mainly because of small and marginal farmers are supplementing their labour need with family labour. Some of the small and marginal farmers are also adopt broadcast method rather than transplanting which need higher labour requirement. Table 5 clearly indicated that maximum demand for labour would occur in two periods. First, it was during October and November (the transplanting period) and second one in January, (the harvest season). Almost 60 percent of the total annual employment opportunities are available in the above two periods. Hence, there existed a heavy labour demand. For example, in the village Kadaneri, farmer with one acre of land need atleast 30 labour for mainfield preparation and transplanting. The total command area of the village 104 acre is requiring about 3120 labour. This is very critical in the perspectives of small and marginal farmers since they all are expecting tank water to initiate field preparation. Whereas the large farmers prepared the field in advance using well water and relatively better position to hire labour. Most of the landless labour would prefer to work for large and medium farmers rather than small and marginal farmers. This is because they would get more and regular employment opportunities from large farmer than small farmer. Moreover, the medium and large farmers are in a better position to disburse the wages much earlier than the small farmers who are

already resource poor. However, the medium and large farmers started mechanizing their farm operation and rate of hiring labour is significantly reduced.

Table 6: Demand for labour in the study villages during dry season (Per Acre)

Name of operation (Pulses)	Period	Kadaneri			Koovalapuram			Meenachipuram		
		M	F	Total	M	F	Total	M	F	Total
Sowing	Jan 25- Feb 20	1	2	3	1	1	2	1	1	2
Fertilizer application	Feb 10-Mar 25	1	1	2	1	1	2	1	1	2
Weeding (2 times)	Feb 10 – Apr 10	0	30	30	0	30	30	0	30	30
Harvesting	Apr 25- May 7	2	15	17	2	15	17	2	15	17
Threshing and cleaning	May 7- 15	0	5	5	0	5	5	0	5	5
Total		4	53	57	4	52	56	4	52	56

Three farmers in the village Kadaneri and five farmers in the village Koovalapuram used tractor drawn puddling machine instead of hiring women labour and they are also start using herbicide and Cono Weeder for reducing weed infestation and there by avoid manual weeding which needs 30 women labour per acre. Threshers and combined harvester are increasingly used by the farmers as an alternative strategy to avoid labour shortage. On the other hand small and marginal farmers were with severe shortage of labour and other input resources, and hence, divided their land into very small unit like 10 cent. They initiated cultivation in the 10 cent of land with family labour and the exchange labour from their relatives. They do farming in the remaining land also in this way and they take maximum efforts to manage labour shortage. Table 6 delineated the existing labour demand in dry season especially to cultivate pulses. When compared to paddy cultivation the labour demand is evenly distributed over the months except during harvest. In the cultivation of paddy and pulses women could receive more employment than men. Therefore, mechanization of farm operation would largely affect landless labourers and particularly women. Generally farmers prefer women labour than male labour for certain task mainly for two reasons. One is that wage rate is much lower than men (50 to 60 percent less) and secondly flexibility of the time i.e women could do weeding, manuring and other agricultural operations in both morning and evening. Generally men laborers work for 6 hours and wage rate is Rs 100-120. But the women work for five hours in morning at the wage rate of Rs 50 and three hours in the evening at the wage rate of Rs 25-30. Hence farmers opt for women labour who could work more hours with fewer wages. The implication is that seasonal variation in the demand for hire labour play important role in determining the nature of relationship between large and medium farmers and landless labour. While the large and medium farmers did not require large number of labour throughout the year,

they need labour in two crucial periods of sowing and harvesting. This is very important as transplanting should be done in time in order to utilize tank water and the crop has to be cut and threshed within three days before drooping on ground. Hence, this situation provides the relative bargaining power to the labour to establish good relationship with large farmers and get regular employment and other benefits. But at present the landless labour were danger of losing this advantageous position as most of the large farmers were started using transplanting machine and combined harvesters. The innovations of combined harvester and other machineries in this area have hugely affected the employment opportunities of labour. Hence, the small farmer and marginal farmers and landless labour who are threatened to lose employment wander in search of jobs within the radius of 10 km from their villages.

Wage System

The prevailing wage rate of different operation in paddy cultivation is given in the Table 6. It gives a clear picture about standard wage rate for paddy cultivation in the year 2007. It shows that most of the wages for different operation are in kind or combination of cash and kind. The structure of wage rate reveals that traditional way still existed in this area. But this traditional way of wage system rapidly disappearing because of the innovations like combined harvesters. The combined harvester normally came from outside of village vicinity and they are looking for cash. High fragmentation of land, relatively wet condition of the field, lack of approach road and need for paddy straw for livestock makes the most of the farmers still opt for manual harvest. Our field survey showed that even in manual harvest, the landless labour are demanding for cash and reluctant to get paddy grains. This is mainly because from June 2006, the Government of Tamil Nadu has distributed rice through Public Distribution System at the rate of Rs 2 per Kg². Every household who has more than three members in their family are eligible to get 20 Kg of Rice per month for Rs 40. So the labour who earlier opted for grains now looking for cash since converting grains into rice will exceed the price of rice being distributed through Public Distribution System. In some cases the labour are also demanding an additional amount Rs 10 instead of meal. Usually the meal includes Pearl Millet or Ragi Gruel with some vegetable dish or chutney. Some farmer would offer rice also. It varies

² After the election in May 2006, the new government assumed power and announces the scheme of one Kg of Rice for Rs 2 from June 2006. In our field study we came to know that all the households in the study village have utilized this service and they told that it has reduced their financial burden sizably. The same government after two years, in September 2008 has announced still subsidized rice i.e 1 kg for Rs 1. In October 2008 they also decided to provide 10 different kinds of grocery and spices for cooking at Rs 50. The same will cost Rs 100 in Market. Hence these kind policy interventions by the government may directly and indirectly affect wage system in the study area.

depends on farmer's resource base. The labours are served with tea and snacks by the farmers for all the agricultural operation. In the village Kadaneri instead of tea and snacks 250 gm of boiled pulses are being given for the labour who engaged in re threshing work. Re threshing traditionally did by six bullocks.

Table 7: Standard wage rate for different operation in paddy cultivation (Per Day Per Labour)

Operation	Kadaneri		Koovalapuram		Meenachipuram	
	Kind	Cash (Rs)	Kind	Cash (Rs)	Kind	Cash (Rs)
Ploughing	-	300/hr	-	300/hr	Tea and snacks	300/hr
Leveling, triumphing and bund blastering	1 Meal	120	1 Meal	120	1 Meal	110
Transporting seedling	1Meal	100	1 Meal	100	1 Meal	100
Transplanting	1 Meal	1300/Acre	1 Meal	1300/Acre	1 Meal	1300/Acre
Weeding	Tea and Snacks	60	Tea and Snacks	60	Tea and Snacks	60
Harvest and threshing (Acre) (if opted for manual harvest) *	32 Marakal + 4 Marakal + 1 Marakal + 1 Meal	-	32 Marakal + 6 Marakal + 1 Marakal + 1 Meal	-	32 Marakal + 6 Marakal + 1 Marakal + 1 Meal	-
Re Threshing 1 lab + 2 pair of Bullock	4 Marakal + 1 bundle of paddy straw + ¼ Padi of pulses	-	4 Marakal + 1 bundle of paddy straw + Tea and Snacks	-	4 Marakal + 1 bundle of paddy straw + Tea and Snacks	-

* If combined harvester used the charge would be 1200- 1350 per acre. Conventional wage is 32 *Marakkal* for one acre. The four *Marakkal* were given to labour leader (1 *Marakkal*) Neerkatti (2 *Marakkal*) and threshing yard cleaner (1 *Marakkal*). The additional 1 *Marakkal* is given as conventional bonus. 1 Marakal = 4.5 kg: 1 Padi = 1.1kg

This re threshing work usually being done in the early morning and hence the labour would be provided with 250 gm of pulses or “Upma” (a kind of food made from Rava ,Semolina). Bullock owner also receives one bundle of paddy straw per pair. During harvest usual wage rate for an acre is 32 *Marakkal*. But in most of the cases, labourers demanded additionally four to six *Marakkal* of grains. Out of this four *Marakkal* one *Marakkal* goes to local labour leader called as “*Kothanar*” and one *Marakkal* for those who preparing ropes using paddy straw to bundle harvested paddy and to bring to the harvesting yard. This system is locally known as “*Pirinel*”. Most of the farmers have given this additional two *marakkal* to labours. But they refuse to give another two *marakkal* as bonus. Normally, when there is bumper yield this bonus would be granted. Every village has three to four labour groups. Each group consists of 30 to 35 labour (10-15 Men and 20-25 Women) and

headed by a leader (*Kothanar*). It is leader's responsibility to approach the cultivating farmers and avail harvesting work as much as possible for their group. Averagely one group of labour would receive opportunity to harvest 50 acres of paddy in and around the village. For example, one labour group consists of 30 labour in the village Kadaneri in the year 2007-08 have harvested 52 acre of paddy in 15 days and received 1750 *marakkal* of paddy grains as wage. It is roughly equal to 7875 Kgs of grain. The collected wage grain is stored in common place and it is distributed to all the members in front of village temple as soon as harvest season is over. Men labour is used to get two *marakkal* more than women labour. One labour in this group in one harvest season would get around 262.5 Kg of grains. The market price (During Jan 2008) of one bag of paddy (73Kg) is Rs 510 and one Kg would fetch Rs 7. Thus, the labour in one group would normally receive Rs 1845 worth of grains. The landless labour's annual income from on farm opportunities in this study village is around Rs 8000. They received 25 percent of their income from this harvest period. It is understandable that wage grain would give food for two to three month depending on family size. They need to wait for a long time to get this type of continuous employment at least up to next planting season.

In the mean time, in order to meet their family requirement they hardly seek for employment. Limited non farm employment in this area would aggravate this situation. Type of nonfarm employment opportunity available in this area and seasonal variation and wage description will be discussed in final section of this paper. From the farmer's perspective, they have to mobilize labour in order to harvest in time. The estimated loss would be 10-15 percent for delay of one day from date of harvest (TNAU,2006). Hence big farmers and medium farmers would follow different tactics to mobilize the labour in time. One way in which the large farmers ensures the availability of labour is through leasing out, small lands to landless labourers especially to labour leader. Another prevailing tactics is providing additional cash to labour leader or some of the important men workers. This system is locally known as "*Thanni Batta*". Unfortunately this additional cash incentive is being wasted to consume local liquor (Palmyra Toddy). Again some of the farmers offer permanent labour in their farm. This type of permanent labour system was much popular 15 years ago. Presently, this system almost disappeared and only a few large farmers still practicing the permanent labour system. We studied the permanent labour system being practiced by large farmer. He has 14 acre of land, during 1990s, he engaged totally eight permanent labourers to look after his farming. Three labourers were allotted for the management of bullocks and their main responsibility is ploughing and manuring the field. Two persons were engaged for rearing cows, one person for

supervising goats and sheep and the remaining two persons for irrigation. The wage system is very simple. Labours were provided with free food and accommodation and a cash incentive of Rs 1000 per year. During festival (*Pongal*) the labourers and their family were offered with new cloths. This farmer partitioned his land to his two sons in 1996 and after that this system has been abandoned. But since then the permanent labourers developed loyalty towards thier bosses and prepared to work for them in priority, even though there is no guaranteed regular employment offered by their then bosses. The permanent labourers are also expected to look after the household needs of large farmers (i.e other non farming activities like transporting grains to market, milling of paddy grains etc). Earlier this particular farmer had eight men labourers and additionally labour's family members were also expected to work for them. On average he had engaged around 20 labourers and it was very easy for him to plan and execute farming operations in time. The prevailing situation clearly indicates that the large farmers are in a safe position to meet out the labour demands in peak seasons by various ways including mechanization. On the other hand, the landless labours also try to maximize their income using the demand and also augment their resource base to move out from the village for other jobs. The small and marginal farmers are facing trouble since they wanted to cultivate their tiny plots with surmounting labour demand and other challenges and moreover they opt for labour work to earn additional income. They often failed to balance their activities between farming and selling their labour power.

Agricultural Implements for Crop Production

Possession of agricultural implements indicates relative economic strength of different class of farmers. In the study, the instruments considered were plough, levelers, spade, sickle, well, pumpsets and tractor/ bullock carts. The table 8 gives an idea that large farmers are equipped with wells and pumps (100 percent in the both villages) and followed by medium farmers (25 and 50 percent). The two tractors available in the village Kadaneri and three tractors in the village Koovapaluram have owned only by large farmers. Whereas most of the small and marginal farmers possessed larger amount of smaller implements like plough, sickle, spade etc because these class of farmer also go for labour work. Regarding spade all the small and marginal farmers and landless labourers (100 percent) have own spade. This could be interpreted to mean that they are hired by large and medium farmers for bund cleaning, irrigation, making bed and furrow and spreading manure in the field. This spade is also considered as important asset to avail various non farm jobs like construction and earth work. The small and marginal farmers could do all the farming activities by themselves and

thus they all have spade on their own. Further, the results of the table 8 indicates that the large and medium were farmers dominant in accessing larger and expensive assets like well, pumpset and tractor and they expected the hired labourers to come with their own spade or sickle. Regarding the implement plough, 48 percent of small farmers and 72 percent of marginal farmers in the village Kadaneri and 80 percent of small farmers and 66 percent of marginal farmers in the village Koovalapuram and 40 percent and 20 percent of small and marginal farmers in the village Meenachipuram had their own ploughs. Plough once considered as important asset is lost its value after innovation of tractor. This pattern clearly reveals the fact that once the small and marginal farmers are able to operate their small agricultural field using their own plough and the number of plough indicates possession of bullock and other drawn animals of these farmers. But after the introduction of tractors keeping of these animals became non remunerative and add additional burden on small and marginal farmers.

Table 8: Distribution of agricultural implements for production in the study villages

Class	Kadaneri						Koovalapuram						Meenachipuram					
	Plough	Leveler	Sickle Spade	Well Pump	Cart/ Tractor	sprayer	Plough	Leveler	Sickle Spade	Well Pump	Cart/ Tractor	sprayer	Plough	Leveler	Sickle Spade	Well Pump	Cart/ Tractor	sprayer
Large farmers	2 (40)	1 (20)	5 (100)	5 (100)	2 (40)	5 (100)	2 (50)	3 (75)	4 (100)	4 (100)	2 (50)	4 (100)	5 (100)	3 (60)	5 (100)	0	0	0
Medium farmer	3 (15)	1 (12.5)	5 (62.5)	2 (25)	1 (12.5)	4 (50)	3 (37.5)	3 (37.5)	8 (100)	4 (50)	0	1 (12.5)	7 (70)	1 (10)	8 (80)	0	0	0
Small farmers	12 (48)	15 (60)	25 (100)	2 (8)	1 (4)	8 (32)	12 (80)	8 (53)	15 (100)	0	1 (6)	6 (40)	6 (40)	2 (13)	15 (100)	0	0	0
Marginal farmers	18 (72)	16 (25)	25 (100)	0	0	10 (40)	10 (66)	7 (47)	15 (100)	0	0	1 (6)	4 (20)	2 (10)	20 (100)	0	0	0
Landless laborers	3 (20)	2 (13)	15 (100)	0	1 (6)	7 (46)	0	0	8 (100)	0	0	1 (12.5)	0	0	10 (100)	0	0	0

Profitability of Paddy Cultivation

In the study area, existing expenditure pattern on various operations in paddy cultivation and cost of cultivation was worked out through personal interviewing the farmers in all three villages. Small and marginal farmers were found differing in cost in the sense that they would relatively apply less fertilizer than other category of farmers. But most of the small and marginal farmers often spend equal money for hiring water from well owners. On average, it is observed that farmers spend Rs 20,500/ acre for paddy cultivation. The average yield in the study area is about 40 bags. Market rate (Jan 2008) of one bag of paddy (73 Kg) is Rs 510. Thus, the farmer would possibly get the profit of Rs 8429 per acre. The following Table 9 illustrates yield variation among different categories of farmers in the study villages.

Table 9: Yield variation of Paddy among different farmers group in the study villages

Farmer's class	Kadaneri (Bag / Acre)			Koovalapuram (Bag / Acre)			Meenachipuram (Bag / Acre)		
	Max	Min	Average	Max	Min	Average	Max	Min	Average
Large farmers	43	36	40	41	35	38	39	33	35
Medium farmers	41	38	40	41	39	38	39	30	35
Small farmers	38	35	35	39	35	38	35	30	34

1 bag = 73 kg

The maximum yield obtained was 43 bags per acre in the village Kadaneri by a large farmer. The minimum yield was observed in the village Meenachipuram (30 bags). Our field survey exposed the fact that most of the small and marginal farmers skipped second dose of fertilizer application or gone for half of the dose. Similar trend found in pesticide application. This would reduce their cost of cultivation by Rs 1500 to 2000 per acre. However, they spend Rs 500/ acre for hiring water. The reason for lower yield for small and marginal farmers are (i) delayed transplanting with age old seedlings (ii) reduced fertilizer application (iii) water shortage in crucial period of cultivation i.e during and after milky stage and grain filling stage.

The average land holding for large and medium farmers in the study villages are 5.2 acre in Kadaneri, 4.8 acre in Koovalapuram and 4 acre in Meenachipuram. The average annual income of large and medium farmers is around Rs 46000. The average land holding and income distribution of small and marginal farmers in the study villages are presented in the table 10. It could be inferred from the information in the table 10 that average annual income of the small and marginal farmers in the study village is 60 percent less than that of large and medium farmers. It is very important to notice that an average 20 percent of their income came as remittance. Small and marginal farmer's children also work in surrounding establishments in order to support their family. The detailed discussion about this phenomenon has been presented in the final section of this paper. One could conclude from the above information that large farmers are strong in their asset position and other resource base which provide investible surplus. They did not face any investment problem and engaged in full swing of farming if other climatic factors are favourable. They could survive one or two year even if they do not do farming. In the mean time their children provided with good education and they got employment in organized sector. The large farmers are also capable of storing harvested paddy grains for some month and able to sell at better rates than their fellow farmers.

Table 10: Income and asset distribution of small and marginal farmers in the study villages

Sources		Kadaneri	Koovalapuram	Meenachipuram
Average land holding (acre)		0.66	0.80	0.60
Possession of livestock (Ave)	Cow	0.55	0.45	0.83
	Sheep/Goat	5.78	3.47	3.72
Employment (Mandays)	Own farm	30	35	30
	Off farm	52	48	45
	Non farm/ off farm	35	38	32
Remittance/ Month (Rs)		291	387	344
Average annual income (Rs)		18,584	21,872	17,140

The description presented in the table 11 would also substantiate this assumption. In the case of small and marginal farmers they are in resource poor condition. They borrow money from different sources to meet out daily need and also for investing in farming. In order to augment more income their children, they forcibly stop their education and send them for work in companies in the vicinity of the villages. It is interesting to note that most of the income they received as remittance has been reinvested in the farming. Hariss (1981) argued that non farm and other income typically would be

reinvested in farming. Further, number of landless labour in the study villages comes down in the last 10 years as employment opportunity in the agricultural sector is reducing year by year and to cope with this situation they are looking for non farm jobs in and around the villages. The availability for non farm opportunity is limited in this area and they migrate out to nearby towns to seek better employment opportunities.

Table 11: Distribution of storage space among farmers and study villages (Place to store No.of bags)

Class	Kadaneri			Koovalapuram			Meenachipuram		
	Total space available	Ave. storage space per HH	Total storage space of the class as percentage of total storage space of village	Total space available	Ave. storage space per HH	Total storage space of the class as percentage of total storage space of village	Total space available	Ave. storage space per HH	Total storage space of the class as percentage of total storage space of village
Large Farmers	138	28	43.3	129	33	43.1	118	24	44.9
Medium Farmers	65	8	20.4	61	8	20.4	56	5.6	21.3
Small Farmers	53	2.1	16.6	54	4	18	38	2.5	14.4
Marginal Farmers	45	1.8	14.1	42	3	14	34	1.7	12.9
Landless	18	1.2	5.6	13	2	4.5	17	1.7	6.5

1 bag =73 Kg

It could be inferred from the table 11 that large and medium farmers in the study village are predominantly having more space to store the grains. In the village Kadaneri large and medium farmers together enjoy 63.7 percentage of total space available in the village. In the Koovalapuram it was 63.5 percent and in Meenachipuram it was 66.2 percent. Small farmers, marginal farmers and landless labour together share a space of 36.3 percent in Kadaneri, 36.5 percent in the Koovalapuram and 33.8 percent in Meenachipuram. This is significant for large farmers for bargaining a better price. They are selling the paddy three to four month after the harvest in order to get higher price. On other hand small and marginal farmers were not able to follow this practice because of the lack of storage space³ and need of immediate cash to settle down the debt they incurred. It is important to note here that during January 2008 most of the farmers in this area sold their produce at the rate of Rs 510/ bag.

³ Traditionally the small and marginal farmers stored their grains in the “Kuthir”. It is a doom like structure made out of special kind of soil mixed with various medicinal plants in order to prevent storage pest. Presently we could not able to see this structure from any of our respondent’s house. They said that one kuthir will hold 10 to 20 bags of grains. Depending up on the farmers need it would be made.

But the government of Tamil Nadu hiked the minimum support price for paddy as Rs 850/ Quintal during April i.e Rs 620 per bag. Only the large farmers utilized this opportunity since they have storage space and investible surplus. Indebtedness of small and marginal farmers is one of the important reasons to sell out the paddy grains immediately after harvest. Borrowing money from the vender and fertilizer shop owner is common practice here. The venders are providing loan to the small and medium farmers on the condition that they must sell their produce only to them.

Hence, the small and marginal farmers lost their bargaining power and sold their produce to the same vendor to repay the loan. In case if a farmer refuses to sell out their produce to the same vendor, he will be denied loan in future. Moreover, vendors also have their own strong association and identify and isolate such farmers. The credit needs of the small and marginal farmers are satisfied from different kind of sources and also need credit for various purposes.

Hence we made attempt to study the net indebtedness of the farmers along with the source and purpose of the credit. The following Table 12 showed net indebtedness of different class of farmers in the study villages.

Table 12: Net indebtedness among farmers group in the study villages

Class	Kadaneri (Rs)		Koovalapuram (Rs)		Meenachipuram (Rs)	
	Debt	Per HH	Debt	Per HH	Debt	Per HH
Large farmers	461,985	92,397	289,185	72,296	174,540	34,900
Medium farmers	278,432	34,804	202,110	25,263	198,345	19,834
Small farmers	689,241	27,569	456,028	30,401	312,885	20,859
Marginal farmers	615,810	24,632	143,240	9,549	185,960	9,290
Landless laborers	78,142	5,209	78,660	9,832	89,725	8,972

The table 12 indicated that irrespective of the class all the farmers are indebted. National Sample Survey Organization (NSSO, 2003) also reiterated the fact that 74.5 percent of the rural households irrespective of their land possession were found indebted which is much higher than that of all India average of 48.6. Comparatively, the small and marginal farmer were found much indebted than the large farmers. There existed variation with source and purpose of the credit. The Table 14 provided the details of the credit sources for farmers. The credits need of the farmers in these three villages predominantly met by five different sources. Most of the farmers borrowed money from Self Help Groups (SHGs) followed by Co operatives and private money lenders, vendors and village council. The SHG provides

loan to the farmers at very low interest of 1- 2 percent. The procedure is very simple and easy. They can approach and borrow money in time. The only disadvantage is that SHG provides loan only to the members. The co operative banks provides crop loan (Rs 5000/acre) and jewel loan. Farmers preferred to borrow loan from cooperatives simply because the Government of Tamil Nadu often waived the loans⁴. The private money lenders based in various towns like Peraiyur and Kallupatti are other important sources of credit for the farmers. The procedure is simple. Farmers usually takes gold jewels or other expensive utensils and after evaluating the worth of the items, the money lenders disburse the cash not exceeding 2/3 rd value of the item pledged. He issues a receipt, which clearly states that the interest is to be paid every month and if the item is not recovered in six months to one year, the money lender is free to dispose it. The interest varies from 2.5 to 3 percent on gold.

⁴ In the year 2006 the state government waived Rs 6866 Crore (686 Million) worth of loans borrowed by the farmers from Co operative banks. In the year 2008 the union government waived all kind of loans borrowed by the farmers from commercial nationalized banks. Hence now the farmers would think that it is better to borrow from these sources and that will be later waived by the governments.

Table 13: Purposes of indebtedness of different class of farmers in the study villages

Purpose	Kadaveri						Koovallapuram						Meenachipuram					
	LF			MF			SF			Mg. F			LL			Mg. F		
	%	No		%	No		%	No		%	No		%	No		%	No	
Purchase of food/ animal feed	0	0		0	0		0	0		0	0		0	0		0	0	
Agri. expenses	0	0		0	0		0	0		0	0		0	0		0	0	
Rituals	0	0		0	0		0	0		0	0		0	0		0	0	
Settling Old debts	0	0		0	0		0	0		0	0		0	0		0	0	
Repair of pump/land	0	0		0	0		0	0		0	0		0	0		0	0	
Education	0	0		0	0		0	0		0	0		0	0		0	0	
Medical	0	0		0	0		0	0		0	0		0	0		0	0	
Purchase of milch animals	0	0		0	0		0	0		0	0		0	0		0	0	
Durable goods	0	0		0	0		0	0		0	0		0	0		0	0	
For land leasing in	0	0		0	0		0	0		0	0		0	0		0	0	

LF: Large farmers, MF: Medium Farmers, SF: Small Farmers, MgF: Marginal Farmers, LL: Landless Laborers

Interestingly the farmers avoided the commercial bank which also provides similar services with much lower interest of 0.75 percent. Commercial banks provide gold loans only to its account holders. Most of the small, marginal and landless labourers did not have account in commercial banks and could not able to avail this service. As we have discussed earlier the venders also provide credit on the condition that farmer must sell their produce to them. Milk venders also provide credit to those who own milk animal on the condition that the borrower must sell the milk only to them. Farmers normally prefer to borrow money from the Non Farm household than fellow farmers. Usually in the villages the loan are offered against the value of their farm land. Land is mortgaged against the loan. Farmers carefully avoid mortgaging the land to the fellow farmers, since every cultivator has a suspect that once a plot of land is mortgaged to fellow cultivator he may subsequently lose it altogether and thus, they prefer to avail loans from non farm household and the trend in increasing enormously.

Table 14: Sources of credit for farmers in the study villages

Sources	Kadaneri (N=78)		Koovalapuram (N=50)		Meenachipuram (N=60)	
	No (Multiple Response)	%	No (Multiple Response)	%	No (Multiple Response)	%
Private money lender	15	19.23	10	20	5	8.3
Vendors	17	21.79	7	14	0	0
Other farmers	8	10.25	10	20	12	20
Village council	12	15.38	8	16	10	16.66
Non farm HH	15	19.23	12	24	13	21.66
Bank	3	3.84	3	6	6	10
Co operative	18	23.07	24	48	14	23.33
SHG	26	33.33	21	42	31	51.66
Friends and relatives	10	12.82	9	18	11	18.33

Locally the farmers prefer to mortgage their land with washerman or petty shop owner as they do not usually have direct interest in agriculture and hence is no fear of land being lost. However, these persons have very limited money and hence can take only very small plots on mortgage. The village council is also another option for farmers. The temple and festival would generate income. After the festival the remaining money is used for lending with reasonable interest of 1 to 1.5 percent. The village leaders are confident that a loan advanced from the temple fund has hundred percent recoveries since local people feared that it is temple money and the god would punish the defaulters. The village council is disbursing the loan without security. Thus the small farmers and marginal farmers and landless labourers interested in this service. The table 13 offers specific details about the purpose of their indebtedness. Small farmers, marginal farmers and landless labours incur most of their loan towards investing in agriculture, meet out family expenses (ritual) and settling the old debts. Sizable loans were used to purchase milch animals and animal feed. Small farmers and marginal farmers were also used the loan amount to land

management activities. This is because the small and marginal farmers often left the land as fallow and after one or two year it was infested with weeds and they spend more money to remove these weeds and make it fit for cultivation. In the case of large farmers 80 percent in the village Kadaneri, 75 percent in Koovalapuram and 100 percent in Meenachipuram borrowed money for their children's education. Whereas small and marginal farmers spend most of their money in rituals, reinvesting in farming and used to purchase animals. Earlier they also spent money to purchase food items. But presently all the households of small and marginal farmers and landless labourers are used to get food grains from Public Distribution System which is highly subsidized. The main implication is that while small and marginal farmers are intensified their indebtedness for daily needs, the large farmers availed the loan for children's education reveals the fact that not only at present but also in future large farmer relatively better position of improving their life.

Crop Production condition in the study villages.

For successful crop cultivation three resources like land, water and inputs are very important. In this section we could further explore about the condition of water resources in the study villages since we have already discussed about land and input resource base of the farmers. Almost all the farmers we inquired stated that water inadequacy is very important factor for crop loss. The studies also confirmed that 60 percent of the yield loss would result if there is water shortage after milky stage. All the three villages are provided with irrigation tanks having capacity to provide water for 60 to 80 days once it completely filled. Due to various physical, socio economical and political reasons the tanks lost their capacity to supply enough water to the farmers. The following Table 15 provided the information about the basic issues of the tanks in the study villages. The revenue records of the study villages offered data recording tank storage in every year. The data showed that from 1996 to 2004 the tank was filled less than one fourth of its capacity. Thus during that period almost all the lands in the study villages left fallow. Even the large farmers are not able to cultivate as ground water level went down sharply. Even at present farmers in the tail end of the command area feared to cultivate simply because they lost hope of getting enough water for successful cultivation. The average net irrigated area by the tank has decreased from 19.2 ha in 1981-82 to 15.1 ha in 1999-2000. The Tamil Nadu human development report 2003 also cautioned that the shortage of water would result on average about 12 to 16 percent of gross cropped area remains fallow every year. The enormity of this problem is partially aggravated by failure of monsoon. The villagers are opined that usually they receive 50 to 60 rainy days during September to November and tank will fill more than once. It will be sufficient for crop production. Presently the tank hardly fills more than once. In the last 10 year only in 2005- 06 have filled more than once in the study area. Farmers are also cautioned about tank capacity. Earlier if the tank fills one time it comes for 45 to 50 days irrigation. But now even if fill, it comes for only one month. This is due to heavy siltation on the tank bed. The Public Works Department estimated that storage loss due to siltation is around 36 percent in the

rainfed tanks. In reality it will be still more. This is because Government has stopped the programme for complete desilting of the tank bed from 1980s. In the last 25 years is no attempt has been made to revive the tank storage (Dinamani, 2008).

Table 15: Comparison of crop production condition among tank in the study villages

S.No	Basic Issues	Kadaneri	Koovalapuram	Meenachipuram
1	Adequacy in water supply	Inadequate	Inadequate	Inadequate
2	Government intervention	Very rare	Rare	Very rare
3	Water user's association (Institution)	Informal and functioning	Formal and not functioning	Formal and f unctioning
4	Control over water release (by water man)	Yes but occasion based	No	No
5	Efforts to bring water to tank by farmers	Little	No	Little
6	Water release from tank to paddy field	Continuous	Continuous	Continuous
7	Field water management	Field to field irrigation	Field to field irrigation	Field to field irrigation
8	Frequency of maintenance	Rare	occasionally	Rare
9	Conflicts in water sharing	Occasional	Frequent	rare
10	Well density	1 well/ 26 acre	1 well/ 17.5 acre	No well in command area
11	Filling pattern (No.of times in a year)	Less than 1 time	1	Less than 1 time
12	Water availability in tanks (No. of Days)	45	54	30
13	Physical condition of the tanks	Poor. Sluices and supply channels very old and leaky	Poor. Sluices are not in operation and could not able to close fully.	Sluices are well. But siltation reduced capacity of the tank
14	Condition of supply channel	Severely damaged	Severely damaged	Severely damaged and encroached.
15	Performance in paddy production	Poor	Poor	Poor

Hence all the farmers in the command area in all three villages stated that water is inadequate for paddy cultivation. The farmers in tank command earlier organized themselves under village informal leader and made efforts to bring water to tank by cleaning supply channels and removing weed and other barriers in the tank bed. This system called “*Kudimaramathu*”. Tank water management is found to be very effective when tank water institutions are functioning well in the villages. We have a detailed discussion about different type of village water institution and nature of its function and its effectiveness in the contemporary condition in the next section of this paper. The researches emphasized the fact that even the tank lost 30 percent of its capacity it is possible to get successful crop with available water in the tank if the farmers could adopt some

of the water saving techniques like alternative wetting and drying, avoidance of field to field irrigation. In the study villages field to field irrigation is prevalent and irrigation is continuous one. Sakthivadivel et al (1982) observed that water use efficiency in the south Indian tanks declined to as low as 25 to 35 percent in many areas. The reason for low water use efficiency were inadequate maintenance, lack of control over water release (control of water release did by water man (*Neerkatti*) community in the village and it is now disintegrated. Discussion about water man presented in the subsequent section) and excessive use of water in the field level. Palanisami and Easter (2000) found that the simple procedure of closing sluices during rainy days, when there is no demand for water has been shown to increase the net irrigated area by more than 20 percent and minimizing the risk of crop failure at 17 percent. As we have seen earlier these tanks had filled less than one time per year but they had 1.5 to 2 fillings 10 year before. Farmers of these tanks felt that 1.5 filling is needed to have successful crop harvest. One filling could supply water for 50 days. If they have more than one filling per season the available water supply will goes around 75 days which it is sufficient to receive good harvest. The magnitude of this problem is still aggravated by tank siltation and low well density in the command area. In the village Kadaneri one well need to serve for 26 acres, in Koovalapuram it is 17.5 acre and in Meenachipuram it is 35 acre. So it is very difficult for small and marginal farmers to receive supplement irrigation from well owners. Even then the small and marginal farmers spend around Rs 700 to give supplement irrigation for one acre of land. It was estimated that about 38 percent of crop income of the non well owners is paid as water charge to the well owners in Tamil Nadu (Palanisami and Easter, 2000).

Effectiveness of Tank water institutions

The villagers generally have traditional, informal association other than village *panchayat*. These associations have a leader who is respected by villagers, some of them by virtue of their age and service rendered in the past and their social status, wield considerable influence in the village.

Traditional Irrigation Institution

Traditional irrigation institution may be referred to the evolution of principles for collective action of users, for broad spectrum of social responsibilities such as system maintenance, water sharing and conflict resolution (Coward, 1980; Vaidyanathan, 1985 and Janakarajan, 1993). Even today villagers have traditional institution in many villages to manage the tanks effectively as common property resources. Traditional system of water distribution was based on their beliefs, customs and the concept of equality. The water allocation ensured smooth sharing to all its members without any default. The performance of these tank irrigation systems depends on collective decision they made and keep. These institutions are characterized by socio-cultural and contextual arrangement in order to provide services to village community. These institutions

have rules and regulation in the form of ethics and norms as it is resultant of a complex pattern of behavior of large number of people over protracted period of time (Basu, 2000).

Government sponsored institutions

Effective functioning of tank system is simply based on how its different components like physical, technical and institutional parameters are managed. In the earlier days, villagers considered tank as a system. Over a period of time, when government took over these structures, it is failed to considered as system, consequently it is said to be managed by five different departments and acting as a separate entity in different directions. After some period, government concentrates only on physical improvements of the tanks. But still they did not yield fruitful results as there are no institutional structures for its maintenance. Thus institutional problems crop up and hastened by changing social structures, land holding pattern and demographic– population pressure on the lands. After 1980s when international donor agencies funded for tank modernization, they required to form water user association at tank level. As a result, the government has shown interest to form institution at tank level as it was stipulated by donor agencies.

NGO sponsored institution

Many NGOs in India are working with rural people in tank command area, promoting participatory management. They follow different methods to organize farmers and develop institution in the community level in order to provide collective action to tank system management. They employed locally known persons as negotiator to inspire people to participate in the institutions.

Field Observations

The present research demonstrates some specific observations about the difference in strategy, notion, structure and functioning style among all three institutions in the study villages. Overall aim of all the stakeholders involved in this campaign was to create successful local, independent and self-organizing institution at community or village level. But notably, these groups varied tremendously in their values, attitudes and beliefs towards the cooperation and the best means to achieve their desired ends. All initiatives look for the active participation of rural people in working out a better livelihood access for themselves. New policies and schemes have been set in the place both by the government and NGOs to facilitate this process of involvement.

Table 16 shows the nature and way of existence of institution in the villages. Institutional arrangement of management of tank resources has been carefully constructed and designed to serve specific purpose are at the cross roads now. In all three types of institutions, irrespective of its functioning style, its efficiency and activeness are dramatically low. The most important ingredient for the institutional building is a sense of belonging, mutual trust and empathic cooperation. But unfortunately these ingredients are missing or not given due importance.

Table 16: Functioning structure of tank institutions

Criteria	Kadaneri (Traditional)	Koovalapurma (Govt. Sponsored)	Meenachipuram (NGOs sponsored)
Responsibility of organizing villagers	Villagers themselves	Govt. official in charge of village	Facilitator appointed by NGO
Selection of leaders	Villagers	By election	By group opinion & rotational
Functioning style	Informal	Formal	Semi formal
Financial support	Collective contribution	Villagers & Govt.	Villager, NGO and Govt.
Work execution	Regular	Demand based	Regular
Activeness	Relatively Active	Inactive	Relatively Active

Trust building, sense of belonging and social affiliation towards institutions could be achieved only when the villagers perceive that their participation yield good livelihood base for them. Looking at closer view of these institutions, it is important to distinguish between different kind of faith or involvement that people have within their socio-economic and -cultural context such as bonding, bridging and linking with these institutions.

Generally bonding relationship is viewed as strong or thick, while bridging relation is weak or thin (Narayanan, 1999; Onyx and Bullen, 2000; Putnam, 2001; Woolcock, 2001). Thus, bonding relationship is existed in traditional institution, which refers that villagers have close relationship with this institution. These people tend to make close relationship as they have similar interest and common affiliation. Ann Dale and Jennie Sparkes (2007) argued that adhesiveness within “bonding” network is a sense of deep trust held among members, which is often highly relational, personalized and thus, has potential for conflict when their trust and commonalities break down. Once, the tank irrigation system has been considered as a sole livelihood provider. Almost entire village populations were depended on it. During the 1980-81, population depended on agriculture in the study villages was 92 percent. But in 2007, it is 67 percent. (Block statistics, 2007). Over the period of time, due to changes in government policy and education, opens various avenues for villagers. This is aggravated still by frequently failed rainfall. Match box, fire work and cotton industries are coming to exist in nearby towns and they opened opportunity especially for youngsters. They also offered relatively high salary than agriculture. Slowly, youngsters move out from the village to search better opportunities. Consequently, farmers faced with labor shortage as they could not able to attract laborers through competitive wages. Most farmers leased out their land or left as fallow. They are also looking for non-agricultural

employment in the vicinity of the villages and meantime they receive remittance from their son or daughters who have moved out from villages. The government also announced programs like Sampoorna Grama Rozgar Yojana (SGRY), National Rural Employment Guaranty Scheme (NREGS), Swarna Jayanthi Grama Swarozgar Yojana (SGSY) and Ananithu Grama Anna Marumalarchi Thittam (AGAMT). Basic objectives of all these programs are to give supplementary wage employment to rural labourers. Moreover, upper caste farmers who have enjoyed control over lower caste people, lost their control due to changes in social structure and land holding pattern. Hence, once reason for coming united for common goal is broken, the traditional institutions disintegration gets started. As our research shows, the role of people's participation in institution is much diminished now but not entirely forgotten.

In the case of Government sponsored institution, the cohesive force could be termed as "Bridging". This relationship characterized by more impersonal and villagers participation is merely perfunctory not intuitive. It is often viewed as weak and opportunistic tie that facilitate access to resources. "Bridging" occurs when someone from the government try to connect with local people through some agenda (Granovetter, 1973). Here, the trust among members are often thin and tend to break when the bridge from the government side left the village or once his agenda or program completes. This type of institutions tends to provide comprehensive solutions that have tried to exorcize the factors which hinder the progress and simply do not work as expected. It is often conceived as designed to provide comic relief but not constant relief. This system failed to understand the fact that villagers are divided into many groups, based on their caste, income status and land holding etc. To connect or bring them into one group as tank command areas farmers, connecting thread is diluted by communal force and widespread social disparity. Government sponsored institution is not concentrated on this aspect. They try to identify all the farmers as tank farmers. They have time limit to implement program and within these time limit, they could not able or not interested to address this problem.

Regarding NGOs sponsored institutions, the core principle employed is "Linking". They try to mobilize the farmers themselves and made link with government agencies and other financial institutions. The prime objective of this "Linking" is to get accustomed to use government program for the benefit of common. It is also considered as opportunistic ties and viewed as the capacity provider for institution to lever resources, ideas and information from the formal institution (Woolcock, 2001). NGOs showed interest to operate in village only when favorable condition exist or assure to provide. When they find difficulty to operate, they withdraw from these villages and automatically from institution building process. In our experience, in the study village, from 1992-2002, the NGO called ASSEFA (Association of Sarva Seva Farm) came to create sound institutional and regulatory framework as well as enabling environment for people's participation by providing loans. But after the initial involvement they exhibit, they failed to

imbibe a sense of self-help and a sense of sustainable progress. In the long run, villagers attained the mindset that “they will do” mentality. Once conducive environment disappearing, the NGO also slowly came out from the village. There is an argument that NGOs looking for conducive climate to operate on in order to impress their funding agencies. It is easy for the NGOs to operate in new villages rather than operate one village for longer time. After ASSEFA withdraw, another NGO called DHAN foundation came to operate in this village. Considering that relatively small village with single community, the basic platform to launch its program was already initiated by earlier one. This NGO also did its level best to organize the farmers to form tank institution called “Vayalagam”. They showed substantial and positive improvement in tank performance surpassing initial hurdles. Even then priority between farmers and NGO is differing. This system also will not yield good result if they fail to understand in changes happened in the external environment. Bolding (1994) argued that any external involvement, no matter how well intentioned, can be perceived as meddling and even be feared. Hence, what they need to do is not bringing expert from outside, but an awakening of the expertise within the villagers.

Functioning style of institutions

Traditional irrigational institution is functioning as a two tier system. In the top level, there will be commanding position called “Nattamai” (informal village leader) usually occupied by upper caste people. In the lower level, there will be an executing position as irrigation worker called “Neerkatti” (water manager) “Neerpachi” (water distributor) and “Thotti” (field assistant) are employed. All these posts usually hired from scheduled caste household on rotation basis. In government sponsored institution, they is a water user association with membership of all the *ayacut* (tank command) farmers. They are expected to elect three positions like president, secretary and treasurer. Based on the number of villages included in association, they will select members also. Apart from this elected body, this system also employs irrigation workers from scheduled caste households. In case of NGO sponsored institution, the NGO appoint one person as negotiator to motivate farmer to join in irrigational institution. The member farmers elect or select their president, secretary and treasurer. The NGO provide accountant staff to help the farmer to maintain their accounts.

Role Execution

Traditional tank water institution is existing here from the time immemorial. Then, these institutions have complete control over the common resources. The way they approach to the problems are perhaps most incisive and provide constructive contribution to its better performance. Rules and roles that operate, maintain and manage these systems are strongly shaped by caste hierarchy. These institutions took the responsibility of supply channel maintenance, de-silting tank bed (farmers are allowed to remove top fertile layer of silt for their

manure need), strengthening of tank bund, maintaining of tank physical structure (sluice and surplus weir), water distribution, resolving dispute and conflict resolution. However, the present situation is that most of the functions are not executed as external environment explicitly changed. Farmers are not allowed to take silt from the tank as social forestry program implemented by the government. Due to this misplaced priority, regular de-siltation did by farmers are stopped. As a result, every year about 2 percent of tank capacity is lost due to silt accumulation. Supply channels and catchment area are also encroached and but these institution have no power to deal with them. Thus, at present majority of the tank water institution have only limited responsibility that too not regularly (Janakarajan, 1993 and Palanisami, 2006).

Table 17: Role execution of Institutions

Roles assumed	Traditional	Govt. Sponsored	NGO Sponsored
Supply channel cleaning	Occasionally	Occasionally	Yes
De-silting tank bed	No	No	No
Strengthening tank bund	No	Yes	No
Sluice and weir maintenance	Yes	Occasionally	Yes
Outlet channel maintenance	Yes	No	Yes
Water distribution	Yes	No	No
Conflict resolution	Yes	No	No

Table 17 delineated that the gap between perceived roles and performed roles is large and illuminating. In government sponsored institution, water user association was active only during tank rehabilitation program implemented in 1996-1998. After completion of this European Economic Community assisted program, officials responsible for water users association, failed to maintain its tempo of their members (Palanisami et al, 2007). Farmers also complained that they spent much money on tank structures. The main problem is that its catchment and supply channel has been encroached upon, and nothing has been done about it. Farmers also opined that they are motivated to participate in ongoing process but hardly vested with any power. These kinds of participation are often criticized as tokenist, giving participant with no power (Smith, 1998). It is assumed that people provided with option of passive participation. Certainly, farmers who are expected to participate in institutional building should provide with power to make decision and their priority and choices of investment. If it is not ensured, it is mere sophistry to say that it is participation and institutional success. Pearce and Stiefel (1980) concluded that the promotion of participatory institutional building may be regarded as no more than rhetoric unless communities have some degree of power over the services. Smith (1998) also argued that passive participation in the name of consultation is the weakest form of participation in decision making, is often said to be a mean of indoctrinating the public in the values and priorities of the planner to ensure that they obtain public endorsement of their decision, rather than understanding of local needs and priorities.

As we discussed earlier, due to the government policy transfer of land holding is happened from upper caste to lower caste people. It is not simply considered as land transfer but also power transfer. Power sharing is not viewed in right way by upper caste people. They physically accept but are mentally and emotionally much reluctant and not ready to accept that lower caste farmers empowered through land. Upper caste people also leased or sold their lands to landless labourers and lower caste farmers. Villagers those who entirely depend on mercy or goodwill of large or upper caste farmers for employment, became self-employed. In the mean time, the entry of more and more caste based political party into the village system damaged the village cohesiveness and consequently wipes off cooperative attitude within and between farmers and villages. This could be a possible reason for dismantling traditional institutions. Disintegration of joint family, promotion of education, development of cottage industry have hastened the process. As Agarwal (2001) rightly pointed out that if farmers have earning activities that are not reliant on common resources, their incentives to the collective management will be reduced. The degree of dependency on small scale irrigation will depend both on farmer's capacity to exploit it and on what alternative livelihood options are available to them. Our observation confirmed that farmers are slowly losing their ability to exploit potential benefit from tank irrigation system because of their weak institutional power. When compared to Government sponsored institution, traditional and NGO sponsored institution showed incremental increase in the delivery system. In these two organizations farmers strive continuously to subjugate impossibility and then try to succeed.

Role execution of irrigation functionaries

An institution, irrespective of its nature or governance, is assisted by a group of irrigation workers called "Neerkatties" (water man) who are generally hired from scheduled caste house hold in rotation in the tank village. If a particular tank village does not have that particular scheduled caste community, they employed "Neerkatties" from nearby villages. The discussion about "Neerkattis" becomes important, considering the service they render to tank institution. They are the specialist in water management, having rules to allocate water in the time of scarcity, on the basis of detailed knowledge of the needs of individual wetland fields, thus mitigating usual tension between head and tail-enders (Mosse, 2006) The "Neerkatties" are omnipresent who work almost in all the tank villages making their livelihood based on their services like sluice operation, irrigation to the field, protecting tank resources and so on. In the mean time, like any other institution, tank as an institution, has also changed a lot and similarly profiles of these functionaries also changed. In many cases, our field experience showed that, such changes have played havoc with their lives, but still many are thriving by adopting themselves to the changes (Vasimalai, 2003). Among the study villages, two villages have "Neerkatti" community and one village did not have "Neerkatti" community. By custom, the "Neerkatties" are expected to execute some responsibilities (Table 19). It is clear from the table 3 that mere existence of "Neerkatti" family in the village is of no guaranty for the execution of expected work. During our interview with "Neerkatties" in the village, they accepted that they

are not doing jobs what their father or grandfather as a “Neerkatti” did. They spelled out some the reasons for their hesitance.

Dependency: In the past 10 years, because of the uncertainty and insufficient rainfall, tanks have not received water enough to cater farmers need. Studies showed that only 2 years in the last 10 years tanks received water to its full capacity. As a result, most of the farmers ended with crop failure or left fallow. One “Neerkatti” needs to work for at least 30 acres of farmers’ field as water man to get justifiable income. When this falls down, he encountered with insufficient income and struggles to maintain family. Thus, he preferred to go out for other agricultural or non-agricultural jobs.

Table 18: Role execution of Neerkatti

Assumed Roles	Kadaneri (Traditional)	Koovalapuram (Govt. Sponsored)	Meenachpuram (NGO Sponsored)
Mobilize village farmer	Yes	No	Yes
Watch and ward of tank asset	No	No	No
Water management	Yes	No	No
Farm management	No	No	No
Arranging religious ceremony	Yes	Yes	Yes
Sluice operation	Yes	No	Yes
Moderator of dispute between farmers	Yes	No	Yes
Common fund collector	Yes	No	Yes
Announcer	Yes	Yes	Yes
Directing Neerpatchi and Thotti	No	No	No

Payment: Usually after the crop harvest, the “Neerkatties” are entitled to get 12 kg of grain per acre. This type of payment is applicable only during normal tank season. When tank fails or partially performed they are not sure about their payment. Again some farmers, even if they have reaped good harvest are reluctant to come forward to pay their due to “Neerkatties”. This type of problems cropped up day by day. They have often involved in quarrel with “Neerkatties” about their work execution. These all dissipate the custom of payment to “Neerkatties”. Hence, they are reluctant to perform their duties as they perceived. Another reason would be as we discussed earlier that the disintegration of caste based hierarchy and dismantling of institution. The majority of them were not able to produce enough income through agriculture and start doing or searching on wide array of off-farm activities to supplement the income gap. When they opted out non-agricultural opportunities, they could not fully concentrate on “Neerkatti” work as they did earlier. It is imperative that tank irrigation system is capable of satisfying all the water need of villagers and thereby provide assured employment opportunity to the small farmer, marginal and landless labour household. But it was inactive due to various socio economic and institutional factors. Small and marginal farmer’s involvement in farming with their insufficient resources base and uncertainty of tank water supply leads to indebtedness. Hence, the small and

marginal farmers looking for alternative strategy to earn additional income or commensurate the income they lost because of crop failure. Most of the farmers and labours are rearing livestock. Still they are looking for non farm opportunity in and around their villages. When compare to other districts in Tamil Nadu, Madurai district is relatively less industrialized. The following section provides information about the type of non farm opportunities and type of industry establishment available in the study area.

Non Farm opportunities

Madurai district is one of the most urbanized districts in the state but less industrialized. Off farm and non farm opportunities are found to be limited in this area. This section briefly discusses about the prevailing non farm opportunities in and around these study villages.

Table 19: Type of industry available in the study villages

Type of Industry	Location	Distance from study villages	Kadaneri (No. of Person)	Koovalapuram (No. of Person)	Meenachipuram (No. of Person)
Cotton and textiles	Kunnathur, Tirumangalam, Rajapalayam	20 -50 Km	23	5	3
Garments	Peraiyur, Madurai	5- 50 Km	17	3	-
Match box	Peraiyur, Koovalapuram, Sivakasi	5-40 Km	-	30	12
Fire crackers	Sivakasi	40 Km	15	6	6
Power grid	Kadaneri	1- 7 Km	25	-	-
Hotel and food	Peraiyur, Kallupatti	7-10 Km	4	5	2
Timber	Peraiyur	7 Km	-	2	-
Total			84	51	23
Percentage to Total HH			21.70	38.34	20.90

The data have been collected from village occupational and revenue records and reconfirmed through interview with farmers and village leaders. The information furnished in the table 19 showed that industries located in the vicinity of 50 Km of the study villages. After 1991 Government of Tamil Nadu has encouraged private investors to initiate various industries in backward district like Madurai. They are provided with subsidized electricity and free land for construction. Hence, during late 1990s cotton and textile mill were begun to come around Tirumangalam. In this way 12 cotton and textile mills were established in between T.Kallupatti and Tirumangalam which is 20 Km away from the study villages. Considering the cheap labour availability, the industrial sector is blooming and growing day by day. There are 23 persons from Kadaneri and nine from Koovalapuram and three from Meenachipuram employed in these industries. The wage rate for skilled labour is Rs 150 and for unskilled labour it is Rs 75-100. Power production unit is under establishment in Kadaneri and it provides regular but temporary

employment for 25 persons from Kadaneri. Apart from this, the match box and fire industry located near Peraiyur is providing employment for 30 persons from Koovalapuram and 12 from Meenachipuram. Majority of the person worked in these industry are school drop outs or after finishing schools. Some of them worked as skilled labour after finishing diploma in electrical or mechanical engineering. In Kadaneri there is one Industrial Training Institute (ITI) which offer diploma course on electrical, mechanical, fitter and wireman. This may be reason that more number of person from Kadaneri acquired employment in cotton industry. Wage rate in the all of the above industry would ranges from 75 to 150. They provide regular employment. Hence, the farmer's children after completing schools mostly try to find a job in these industries. We could also observe trend of seasonal migration towards Coimbatore and Tirupur district which highly industrialized districts in the State.

Table 20: Type of Non Farm work available

Type of work	Duration of availability	Kadaneri (No. of person)	Koovalapuram (No. of person)	Meenachipuram (No. of person)
Construction	Seasonal	10	12	8
Department stores, Tea and Bakery	Round the Year	4	9	2
Driver	Round the Year	3	2	4
Stationary and Photocopy center	Round the Year	1	2	-
Courier Agency	Round the Year	1	1	1
Teacher (Private Kinder Garden)	Round the Year	2	1	-
Real estate	Round the Year	-	2	2
SHG's Business activities	Seasonal	5	-	2
Total (Percentage to total household)		26 (6.71)	29 (21.80)	19 (17.27)

We learned from our field visit that cotton and textile industries have special scheme for attracting rural unskilled women labour. The programme called “*Kalyana Seer Thittam*” which mean programme for assisting marriage expences. Under this scheme, the women need to work for atleast 3 years. They are provided with free food and accommodation and a minimum subsistence allowance of Rs 500-1500 per month. After 3 years they are eligible to get Rs 30,000. Most of the parents are interested in this scheme and encouraged their girl children to join. It is understandable that prevailing dowry system make them to choose this option. Besides this organized sector, there are some opportunities in unorganized sector in and around the villages. The Table 21 presents the details of type of unorganized work available for these village households. The opportunities mentioned in the table 20 is relatively low paid job but available in nearest town Peraiyur and Kallupatti which is 5 Km away from study villages. Usually after completing school education (10 or 12 year of schooling) women are interested in this type of opportunities. This is because the parents wanted some additional income through their children

until they marry. After marriage a woman is expected to work for her in laws. Men may choose to work as driver, assistant in departmental store and stationary and photo copy center. In the village Kadaneri SHG members are producing candle, agarbathis and handicrafts. They could provide opportunities for 5 women to market these products. The average wage in this unorganized sector is around Rs 100 per day. It could be concluded from the table 20 and 21 that village Koovalapuram relatively in a better position in harnessing non farm employment in both organized and unorganized sector followed by Kadanari and Meenachipuram. It is evident that the percentage of household seeking employment opportunities in non farm sector is increasing as demand in the agricultural sector is decreasing. The government understands the scarcity of employment opportunities in the rural area and designed and initiated some employment programmes for rural poor. The type of programmes initiated by the Government is given in the Table 21.

Table 21: Government Initiated Labour Programmes

Programme Name	Duration	Description
National Rural Employment Guarantee Programme (NREGP)	April 2008-March 2010	100 Mandays/ Family / Year
Our Village programme (<i>Namathu Gramam</i>)	April 2007 – March 2009	Construction and Road works
Constituency Empowerment Programme	April 2006-March 2010	Construction Work

The National Employment Guarantee Programme (NREGP) introduced in 2005 by union government aims to provide unskilled employment for 100 days in a year for one person from every household in the village. This programme is introduced in the study village in April 2008 and it will last for 2 years. In this programme village president is provided with Rs 20 Lakh (Rs 2 Million) per year. Depending up on the village need they are free to do any development work. Wage rate is Rs 80 per day. All the three villages are implementing this programme and thus 100 persons per village are provided with unskill employment. Another programme called “Our Village” is also implemented through village panchayat. This programme also receives Rs 10 Lakh (1 Million) per year. They could do construction work like building compound wall to the schools and making road. It also provides some seasonal employment for local villagers. Constituency Empowerment Programme is also offering construction work. Through these programs one household may get additional 100 days work. Hence, the farmers and landless labour augment additional income by participating in these programmes and also sending their children to work on organized and unorganized sector. These government initiated programmes are time bounded one and could not generate employment opportunities beyond this time limit. Hence it is wise to promote agro based industries using these funds which would provide more and stable employment opportunities to the villagers.

Summary and Conclusion

Three villages studied are similar in certain aspects and differ in some. The large and medium farmers who are generally from upper caste are dominant in the study villages as they enjoy better asset position and equipped with irrigation well and other important inputs necessary for farming whereas small and marginal farmers are resource poor and entirely depending on tank for water. We observed that the large farmers are ready to move out from the farming stating its non remunerative. On the other hand a small and marginal farmer seems to invest more in agriculture. While the large and medium farmers are doing farming using hired labour, the small and marginal farmers are doing with household members. When the children of large farmer's family are slowly leaving from agriculture, the children of small and marginal farmers are revolving around agriculture with highly fragmented land. Employment opportunities for landless labour are shrinking since intensity of agriculture is decreased. In the case of paddy production, the water is considered to be limiting factor for all class of farmers. Tank irrigation system once supported livelihood base of these villages is deteriorated over the period due to mismanagement.

The traditional water institution which played crucial role earlier is also disintegrated due to complex socio economic and political factors. It affected small and marginal farmer more since they do not have their own well. The large and medium farmers are doing farming with their investible surplus whereas small and marginal farmers borrowed money from various sources as loan and invested in the farming. Hence, the crop loss due to water shortage or other reason are capable to push them to indebtedness. The griming of their struggle is intensified by the fact that they try to cling to their land desperately. During the last 10 years 12 farmers from these villages lost their land to the creditors. The large farmers are also indebted to some extend. However, their position is not irredeemable since they possess enough resources to repay the loan in future. As the availability of non farm opportunities seems to be limited and rate of migration have increased mainly, involving the landless and small and marginal farmers. They are not only pulled by prospects of better wage in non farm sector but also pushed out from agrarian economy where their opportunities are seemingly disappered. They also send more number of their household members to non farm activities as a part of income earning activities and the consequence is that non farm income sources is gaining important. The state government made some policy intervention which makes small and marginal farmers breathe easy is not a permanent one. The government should promote agro based industry which would generate more employment opportunities and better marketing price for farmers. It is clear from our discussion in this paper that the government's policy on agriculture after 1970s increased food production but induced jobless or job loss growth resulting in the expansion of urban slum in the main cities in the state. Government's policy intervention made some improvements over existing agricultural distress in the state. However, they need a change in the mind set from considering farmers as beneficiaries of government programme to treating them as partner of development

and custodians of food security. Integrated action in the following area would possibly help to get our agrarian based rural economy back on the track.

Firstly, the promotion of water harvesting, conservation and efficient and equitable use of water by empowering existing Grama Panchayat to function as water institution and enable them to amend its rights provided by the Indian constitution. Such a water based institution should foster the establishment of community based tank irrigation system and recharge the local aquifer. A sustainable water security system should be put in a place particularly in rainfed areas in order to ensure successful crop cultivation. It is doable and affordable since most of the rainfed villages in the state are provided with enough number of water harvesting structures like tanks and ponds. For example, in Koovlapuram Panchayat has two irrigation tanks and 13 small ponds in the vicinity of 5 Km. Unfortunately non of these structure are in good condition to augment water need of farmers and villagers.

Secondly, initiation of immediate credit reforms. As our study showed that only less than 10 percent of the rural household access credit from formal financial sources and more than 90 percent of them borrowed money from informal sources which made them indebted. Hence, the farm families' agricultural, health and domestic credit needs should be attended in holistic manner through formal financial institutions.

Thirdly, the promotion of literacy about the importance of crop insurance among the farmers should be given priority. Our field experience showed that most of the farmers are not aware about crop insurance. Those who aware about crop insurance are very reluctant to use it since administrative formalities are complicated and the farmers could not able to follow it up. The large farmers are also complained that they find it very difficult to get their insurance money after their crop failure during 2004. Hence, the crop insurance system should be made simple. Adequacy and timeliness of releasing insurance money are vital for insurance to be meaningful to the small and marginal farmers. It is also important that the small farmers should not be subjected to experiment in the area of crop diversification without assuring established market facilities for new commodities. In the study area we could able to observe the innovation of Jatropa, Maize and fruit crops cultivation in the tail end of tank command area especially by small and marginal farmers which is promoted by government sponsored agencies.

Finally, the storage and marketing facilities in rural area should be enhanced. The small and marginal farmers do not have sufficient storage space to store their produce and market it in the

appropriate time as the large farmers are doing. There are warehouse and regulated market in the Madurai city but it is inconvenient for petty peasants to utilize these services since it brings additional financial burden for farmers who are already in exacerbation. Hence, it is good to promote warehouse and regulated markets at the taluk or block level which is come within the reachable distance for farmers. If these facilities ensured to all the farmers in the rural area will substantially reduce the gap between what rural producer gets and the urban consumers pays. The innovation of *Uzhlavar Santhai* (Farmer's Market) in the state is good enough to substantiate this assumption. Agriculture in India is based on the technology of production by the masses. As consequences, it is back bone of countries livelihood security system. The Indian tragedy of extensive poverty and deprivation of agriculture are not irredeemable if government promotes public participated policy intervention in the mentioned area.

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