EVALUATION OF THE RICE PRODUCTIVITY IMPROVEMENT PROGRAMMES IN TAMIL NADU WITH SPECIAL REFERENCE TO SYSTEM OF RICE INTENSIFICATION

1. INTRODUCTION

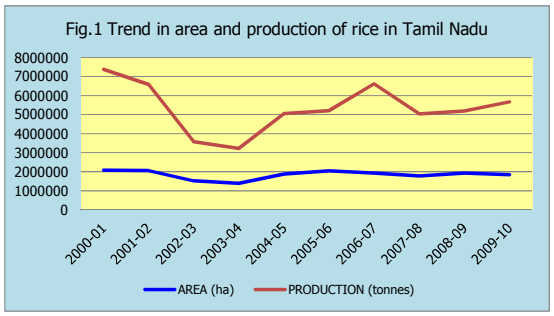
Rice is the main source of food for more than half the world's population and its cultivation secures a livelihood for more than two billion people. The introduction of high-yielding varieties, fertilisers, pesticides and irrigation has improved rice yields significantly and expanded the area under which rice is cultivated. However, in the last 20 years yields and the area under rice have stagnated. The two most significant reasons for this stagnation are the lack of adequate water for irrigation and the increased costs of cultivation. It is estimated that India will need to produce more rice if it is to meet the growing demand, likely to be 130 million tonnes of milled rice in 2030. Since there is not much scope to increase the area of rice cultivation (due to urbanisation and severe water constraints), the additional production will have to come from less land, less water and less human labour (Gujja and Thiyagarajan, 2009).

Rice cultivation is a very water-intensive activity. It is estimated that to produce one kilogram of rice requires 3,000-5,000 litres of water. About two or three times more water is needed for rice cultivation than other irrigated crops. Evidence shows that the irrigated rice receives 34-43 per cent of the world's irrigation water (Bouman *et al*, 2007).

Rice is staple food in most of the Indian states and plays a major role in Indian economy. Ninety per cent of the rice produced is consumed within the country. The area under rice has increased from 31.29 million hectares in 1953-54 to 42.56 million hectares (125.73 million hectares of foodgrains) in 2010-11, where as the rice productivity increased from 902 kg/ha to 2240 kg/ha during the above period. The area under rice accounts for 33.85 per cent of India's food crop and 42.79 per cent of its cereal crop areas during 2010-11.

The area under rice occupies around 61 per cent of the net irrigated area and 53 per cent in gross irrigated area state of Tamil Nadu during 2008-09) and is grown on 2 million ha in

different seasons throughout the year, depending upon water availability. This availability is declining, with a projected gap in water supply versus demand for irrigated crops of about 21 billion m¡3 by 2025 (Palanisami and Paramasivam , 2000). The rice cultivation faces challenges across the world and India is no exception, with a reduction in area in most of the regions, fluctuation in production and productivity, stagnating yields and ever increasing input costs. The cost of cultivation of paddy has consistently been increasing owing to the increased costs of seeds, fertilisers and labour. With increasing labour scarcity due to urbanisation, sustaining the interest of farmers in rice cultivation has become a challenge. Thus, there is an urgent need to produce more output with a drop of water owing water scarcity.



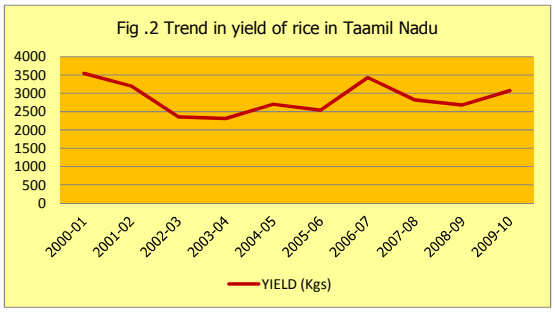
In order to meet the growing demand for rice, and increase rice production, the Government of Tamil Nadu has been implementing various programmes. As millions of rupees spent on different programmes, it is essential that these programme be successful in terms of achieving the targets. Keeping these, issues in view, efforts have been made to assess the performance of different rice productivity improvement programmes implemented during the XI Plan with a major focus on Systrem of Rice Intensification (SRI) in Tamil Nadu state.

2. RICE ECONOMY OF TAMIL NADU: A SCENARIO

Rice is a staple food in Tamil Nadu and the state is one of the rice growing states in India. The rice area in Tamil Nadu accounts for 4.24 per cent of the area under rice in the country and 5.17 per cent in production with an increased yield of 23.2 per cent during 2008-09 (Fertilizer Association of India, 2009-10). The rice area in the state shows that the area under rice is almost stagnating over the years where as there is a significant fluctuation in rice yield and production. The total rice area in TE 2009-10 is 18.55 lakh hectares. During TE 2009-10, the season wise area under rice indicates that 16.61 per cent (3.08 lakh ha) in kuruvai (April-

July), 76.54 per cent in samba (14.20 lakh ha) (Aug.-Nov.) and 6.84 per cent in navarai (1.27 lakh ha) (Dec.-March). Rice is grown in all 31 districts of the state except Chennai and the top five districts with a higher rice area are Thiruvarur (8.9 %), Thanjavur (8.8%), Nagapattinam (8.7%), Villupuram (7.9 %) and Ramanathapuram (6.9 %). The total paddy rice production is 52.96 lakh tones in TE 2009-10. The rice production 50.4 lakh tones during 2007-08, which slightly increased to 51.8 lah tones in 2008-09 and further increased to 56.65 lakh tones during 2009-10.

Rice productivity in Tamil Nadu has always been the above the national average. For instance, the average yield of rice in the state is 2510 kg/ha during 2008-09 which is 324 kg/ha higher than the national average of 2186 kg/ha. Over the last decade, average productivity ranged from 2308 kg per ha to 3541 kg/ha. The decadal trend in area, production and yield of rice indicates that the co-efficient of variation is worked out 12.39 per cent in rice area, 24.26 per cent in production and 14.96 per cent in yield. However, productivity enhancement is required to fill ever-increasing demand. Water scarcity is a major problem, its availability being dictated by the monsoon. There is an urgent need to reduce water consumption for rice cultivation while enhancing productivity.



The trend in rice production in the state over the recent decade indicates that rice production has come to a stagnation due to many constraints. With almost no hope for increasing area under rice, only way out for production increment is to increase the productivity of rice lands in future. The hope to realise higher productivity in rice also seemed to be gloomy in the context of yield potential of the rice varieties reaching a plateau, stagnation in farm yields of rice with everlasting confrontation between farmers and manyfold production constraints and limited potentials of available production technologies in solving the constraints to reach higher yields in rice (Ramasamy *et al.* 1993).

The use of human labour and animal power for various crops declined dramatically over the years. For instance, in rice, the human labour use declined from 1041 hours per hectare in 1993 to 825 hours per hectare in 2005. Similarly, the use of animal power also registered a downtrend and declined from 75 hours per hectare to 20 hours per hectare during the above period. This is mainly because of the use of machinery for different operations particularly operations like ploughing and puddling the paddy fields by tractors, harvesting and threshing by combined harvester. This is evidenced by the use of machinery which registered an increasing trend over the years. The machinery use increased from 7.6 hours per hectare in 1993 to 14.7 hours per hectare in 2005 (Chandrasekaran et al., 2008).

Cropping pattern refers to the proportionate area under different crops in a year. It is evident that the gross cropped area has decreased from 63.38 lakh hectares in 2000-01 to 55.72 lakh hectares in 2009-10 (Table 1).

Table.1. Cropping pattern in Tamil Nadu

Crop	2000-01		2009-10	
	Area (ha)	%	Area (ha)	%
Food Crops				
Paddy	2080010	32.8	1845553	33.1
Jowar	331349	5.2	238476	4.3
Bajra	129256	2	54427	1.0
Ragi	126955	2	82335	1.5
Other millets	145287	2.3	277514	5.0
Pulses	687931	10.9	535819	9.6
Sugarcane	315316	5	293329	5.3
Other food crops	719418	11.4	770637	13.8
Total food crops	4535522	71.6	4098090	73.6
Non-food Crops				
Cotton	169917	2.7	104095	1.9
Groundnut	699389	11	413011	7.4
Gingelly	103988	1.6	62677	1.1
Coconut	323485	5.1	400466	7.2

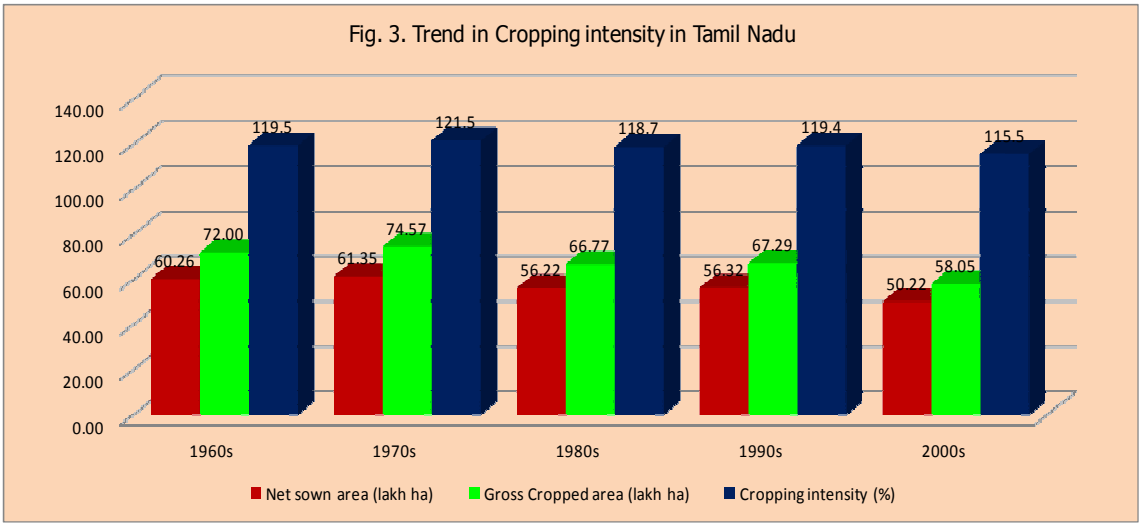
Other oilseeds	42167	0.7	26506	0.5
Tobacco	8270	0.1	7051	0.1
Fodder crops	187940	3	172726	3.1
Coffee	33740	0.5	30720	0.5
Other non-food crops	233691	3.7	256368	4.6
Total non-food crops	1802587	28.4	1473620	26.4
Total food and non-food crops	6338109	100	5571710	100

Source: Season and Crop Report of Tamil Nadu (different issues), Department of Economics and Statistics, Government of Tamil Nadu, Chennai.

The area under food crops accounted for 73.6 per cent and that of non-food crops accounted for 26.4 per cent in 2009-10. It could be seen that the area under food crops shows a slight increase from 71.6 per cent in 2000-01 to 73.6 per cent in 2009-10, whereas the area under non-food crops has slightly decreased during the above period. Among the different food crops, the paddy forms a predominant crop in the state. Though there is a slight declining trend in the area under paddy over the years, it continued to be a major crop in the state.

2.1. Cropping intensity

The land use pattern in the state indicates that the net sown area consistently declining over the years. It is evident that the net sown area has declined from 60.26 lakh ha during 1960s to 61.35 lakh ha in 1970s, 56.32 lakh ha in 1990s and further to 50.22 lakh ha during 2000s. Around 10 lakh ha has declined over five decades. Similarly, the gross cropped area has declined from 72 lakh ha during 1960s to 58.05 lakh ha during 2000s with a reduction of around 14 lakh ha. This clearly indicates that in addition to reduction in net sown area, the area sown more than once has also declined substantially.



This is reflected in the cropping intensity[1] as it is evident that the cropping intensity has reduced from 119.5 per cent to 115.5 per cent over a period of five decades. Thus, the irrigation potential in the state may be given more emphasis so as to increase the net sown area, area sown more than once and hence the cropping intensity.

3. RICE IMPROVEMENT PROGRAMMES IN TAMIL NADU

3.1. Different schemes and programmes on rice improvement

3.1.1. Area coverage and production programmes: In order to increase the area and production of rice, the Department of Agriculture fixes target for rice area and production. Though these efforts have been taken to improve the production and productivity of major crops in the state, some of the efforts relating to increase rice production and productivity are discussed here under. The soil health management include balanced fertilizer application through soil Health Card, restoring the soil health by encouraging organic farming, green manure application, composting and use of farm and municipal waste, application of vermicompost, Blue Green Algae, Azolla, biofertilizer etc., reclamation of saline and alkaline soils and to increasing the production, balancing micro nutrient deficiency and increasing the productivity.

[1] Cropping intensity is defined as the ratio of gross cropped area to net sown area and expressed in percentage.

The water management include wider adoption of System of Rice Intensification in the state. The Crop Management includes supply quality inputs, area expansion, mechanization, technical guidance and extension. The supply of quality inputs to farmers was achieved by ensuring availability of quality seeds in time to farmers for increasing productivity improvement, training to farmers on seed production to ensure availability of required quantity of quality seeds of paddy under Seed Village Programme, increasing Seed Replacement Rate through Seed Village Programme and encouraging private seed entrepreneurs, ensuring availability of quality fertilizers and pesticides to farmers, promoting the usage of biofertilisers and micro nutrients to pave way for soil health improvement and productivity enhancement, sufficient credit in time and interest free crop loan for those who repay their loan promptly through co-operatives. Efforts have also been made to increase the area by increasing rice production by expanding SRI technology in larger extent.

Area target was 21.50 lakh hectares and the production target was 81.50 lakh tonnes (rice) during the year 2010-11. The strategies to increase production in 2010-11 include proper crop management through soil health management, water management, quality input distribution, area expansion, mechanization,technology management, research and extension (http://www.tn.gov.in/policynotes/ default.htm).

Table.2. Target and achievement of Area coverage and production programme

Area : lakh hectares

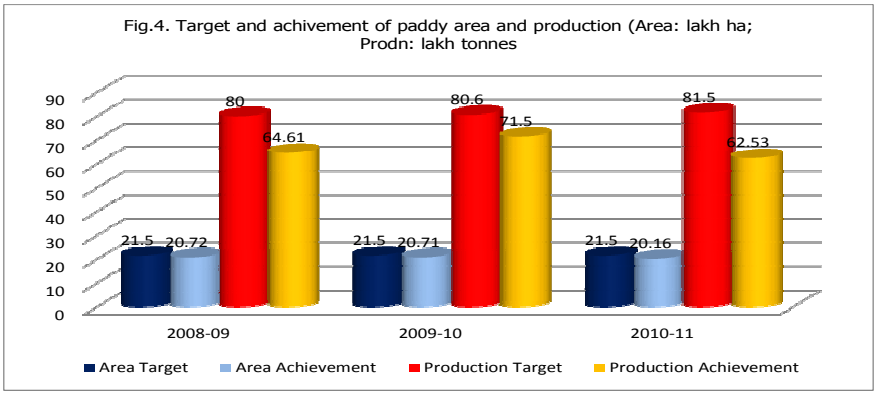
Production : lakh tonnes

Year	Area		Production	
	Target	Achievement	Target	Achievement
2006-07	21.70	20.91	NA	NA
2007-08	22.10	19.31	NA	NA
2008-09	21.50	20.72	80.00	64.61
2009-10	21.50	20.71	80.60	71.50
2010-11	21.50	20.16	81.50	62.53

During 2008-09, there is significant reduction in production which is mainly due to flood. The heavy rains from 19.11.2008 to 28.11.2008 due to cyclone NISHA had caused severe damage to paddy. It is estimated that the area affected by the flood is 471246 hectares and the number of farmers affected are 716087. Similarly, the production loss due to the flood was estimated as 12.817 lakh tones (GoTN, Policy Note 2008-09). The year 2009 started with poor rains besides late receipt of South West Monsoon. Due to this, the Mettur dam for Kuruvai cultivation was opened on July 28th instead of scheduled date of June 12th. Thirteen districts recorded poor rains during South West Monsoon.

Hence, there was a shortfall of 3.6 L.Ha. under area coverage of all crops including paddy during Kharif season. As the North East Monsoon was favorable, to increase the crop productivity during Rabi season, quality inputs, required technologies and sufficient credit are extended in time through various schemes. Due to poor rains and drought, though the area is achieved, the targeted production could not be achieved during 2009-10.

The gap between the target and achievement in production during 2010-11 was as follows. Though the rains were initially favourable for Rabi crops, heavy and scattered rainfall during



third and fourth week of November, 2010 resulted in crop inundation in 26 districts. The low depressions formed at frequent intervals wrecked havoc in all the coastal districts of Tamil Nadu. Due to this, the Samba Paddy crop raised during August, 2010 was severely affected and the yield loss was more than 50% in most of the districts especially in Cauvery delta regions. The gap between the target and achievement in rice area is worked out to 3.63 per

cent in 2008-09, 3.67 per cent in 2009-10 and it further widened to 6.23 per cent in 2010-11. The shortfall is much more in the case of rice production. It is 19.24 per cent in 2008-09, 11.29 per cent in 2009-10 and increased to 23.28 per cent in 2010-11.

3.1.2. Seed multiplication Scheme (Paddy)

This is being implemented as part of the scheme assistance to farmers for quality seed production. In order to encourage the farmers and to offset the special efforts taken by them incentive is provided for all the seeds produced by the farmers. Premium for the production of Certified class seeds Rs.2/- per kg of seed. All farmers who produce and supply the seeds to the Department of Agriculture on Contract basis are eligible to enroll and register their seed farms under this programme. Separate allocation will be provided to SC/ST seed growers. Preference will be given to farm women groups, Farmers Interest Groups. The required source seed will be supplied by the Department of Agriculture through the Agricultural Extension Centres on payment of the Cost of the seed as per the sale price fixed by the Department. The seeds supplied will have the Certification Tag issued by the Department of Seed Certification. The farmers should follow the guidelines given by the field level functionaries / Seed Certification officers to maintain the Quality. The seed Farms should be registered by the Seed Producer viz., the Assistant Director of Agriculture of the respective Blocks on payment of the requisite fees. On satisfactorily fulfillment of the field standard during the entire period of the crop, the produce will be declared fit at the field level. This produce is called the Field Run Produce. This produce has to satisfy the standards of physical/ genetic purity, moisture levels and germination percentage as prescribed in the Certification standards. The produce after inspection by the Seed Certification Officer and with due permission will be moved to the nearest Seed Processing Unit owned by the Department of Agriculture. The farmer should bear the transport cost for the transport of the seed to the Seed Processing Unit. After moving the seed to the Seed Processing Unit, initially the farmer will be paid 90 per cent of the Minimum Support Price as declared by the Civil Supplies Department. The seeds will be processed in the Seed Processing Unit in the presence of the Seed Certification Officer. On completion of the processing, sample will be drawn by the Seed Certification Officer to test the quality.

This sample will be sent to the concerned Seed Testing Lab for testing. The test results will be declared on completion of the testing at the Seed Testing Labs If the seed lot fails to

confirm the standards, the farmer has to repay the entire advance paid to him / her in one installment before getting back the stock. On declaration of the results by the authorities as standard the produce will be considered as Seed material. Now the farmer is entitled for full payment of the cost for seeds as per the Procurement price fixed for each crop and its class. The farmer will be paid the difference of cost between the full cost eligible and the amount of advance paid as 90%.

Under the seed multiplication scheme, the seed farms are organized by the Department of Agriculture. It is seen that in most of the year the achievement in terms of organizing seed farms exceeds the targets. This is mainly because of the consistent efforts taken by the Department of Agriculture. For instance, during 2007-08, with a target of 6200 ha, it has been achieved 6455.4 ha. The achievement exceeds around 4.12 per cent over the target. It is interesting to note that the per cent exceeds over the target increases over the years. The per cent exceeds target is 23.65 per cent in 2009-10 and further to 32.64 per cent. The increased achievement in organizing seed farms helped the department to achieve procurement and distribution of seeds more than targeted in most of years.

Table.3. Physical target and achievement of Organising seed farm

Year	Hectares	
	Target	Achievement
2006-07	7200.0	7071.3
2007-08	6200.0	6455.4
2008-09	7200.0	7747.5
2009-10	7200.0	8903.0
2010-11	7200.0	9550.0

Table.4. Seed multiplication Scheme of paddy : Physical and financial target and achievement

Physical : tonnes

Financial : Rs lakhs

Year	Physical				Financial	
	Procurement of seeds		Distribution of seeds			
	Target	Achievement	Target	Achievement	Target	Achievement
2006-07	18000.0	18222.4	18000.0	17267.6	1878.95	1876.01
2007-08	18000.0	14800.2	18000.0	18036.2	2317.97	2389.13
2008-09	18000.0	17755.6	18000.0	16217.6	2875.72	2711.10
2009-10	18000.0	19271.0	18000.0	18609.0	3644.27	3654.84
2010-11	18000.0	20081.0	18000.0	19304.6	4143.40	4128.43

Table.5. Physical target and achievement of Paddy seed stock position

Year	Tonnes	
	Target	Achievement
2006-07	18000.0	17267.6
2007-08	107500.0	61883.2
2008-09	107500.0	54260.0
2009-10	34170.0	63718.0
2010-11	35475.0	62122.0

3.1.3. Assistance to farmers for increasing Crop Productivity:

3.1.3.1. Cereals Development Programme: Macro Management Mode Scheme:

The Cereals Development Programme is a centrally sponsored scheme which has three major components. They are (i) distribution of certified seeds of paddy, (ii) popularization of System of Rice Intensification on cluster basis, and (iii) Integrated Pest Management demonstration and training.

a. Distribution of Certified Seeds of Paddy: A subsidy of Rs.2 per kg of paddy seeds will be allowed in the sale price at the time of purchase at the Agricultural Extension Centers

b. Popularizing System of Rice Intensification Technology on cluster basis (10 Ha.per cluster): A subsidy of Rs.2000 on inputs per Ha. of a Demonstration through cluster approach Rs.20,000/- earmarked for one cluster of 10 Ha.

Farmers Training: -50 farmers / Agricultural labourers will be trained in a cluster with the financial assistance of Rs.5000/- per training.

c. Integrated Pest Management Demonstration cum Training at 30 farmers per training (Farmers Field School) - A lumpsum provision of Rs.17,000 is allowed towards Demonstration of 40 Ha. each and Training per Farmers Field School through cluster approach.

All farmers are eligible to avail the subsidy under this scheme. Preference will be given to Small/Marginal women farmers and 30 per cent flow will be assured to SC/ST. This Scheme is in operation in all the districts of the state except Chennai, Nagapattinam, Tiruvarur, Sivagangai, Ramanathapuram, Pudukkottai and The Nilgiris districts where National Food Security Mission is under implementation.

It could be seen that in most of the years the physical target is not achieved in the case of distribution of certified paddy seeds. While in IPM there is no significant shortfall in achievement. However, the SRI crop demonstration is concerned the achievement is more than targeted in most of the cases.

Table.6. Macro management Scheme: Integrated Cereal Development Programme

Financial : Rs in lakhs

Particulars	Target/ Achievement	2006-07	2007-08	2008-09	2009-10	2010-11
Distribution of certified paddy seeds @ Rs2/kg (tones)						
Physical	Target	14928.0	15000	12020	11142	12000
	Achievement	14421.5	13279.5	9177.6	10061	11630.08
Financial	Target	298.56	300.00	240.40	557.08	600.00
	Achievement	288.93	265.69	297.48	574.46	581.50
Integrated Pest Management (no of demonstrations)						
Physical	Target	509	590	1003	541	550
	Achievement	508	590	985	532	547
Financial	Target	86.53	100.30	170.51	91.97	93.50
	Achievement	86.21	99.19	167.33	90.36	92.57
Crop Production Demonstration in SRI (Nos.)						
Physical	Target	4500	1132	4035	20000	20000
	Achievement	4688	1169	3930	19711	20274
Financial	Target	90.00	283.0	831.00	600.00	600.00
	Achievement	93.52	290.4	808.16	591.32	596.29

Note : IPM demonstration is @ Rs.17000/demonstration and SRI demonstration is @ Rs.2000/domonstartion

In order to prevent the production loss from pest and disease attack, farmers are taught about technologies on Integrated Pest Management by conduct of Farmers Field School on all crops. Tamil Nadu is the pioneer State in implementing this programme. The aim of the scheme is to monitor the pest and disease attack at field level, besides status of its natural enemies and to adopt appropriate control measures through proper training. This reduces the cost of cultivation apart from protecting the environment. This reduces the harmful effect of the residues in the harvested produce besides preventing resurgence of pest. During 2009-10, a total number of 744 Farmers Field Schools were organized and 22320 farmers were trained with an expenditure of Rs.126.46 lakhs (http://www.tn.gov.in/policynotes/ default.htm).

3.1.4. Assistance to farmers for improving soil Health

To improve and maintain soil health farmers in Tamil Nadu were extended support in the form of (i) Supply of Micro Nutrient Mixtures for all crops at full cost – Paddy Rs.18.75 per Kg, (ii) Supply of Biofertilizers at full cost – Azospirillum,Rhizobium and Phosphobacteria each Rs.6/- per packet of 200 gms and (iii) Supply of Blue Green Algae at full cost – @ Rs.2.75 per Kg.

Among the three supports, the Blue Green Algae forms important. It is seen that the most of the year, the scheme achieved close to targets both in terms of physical and financial. The achievement in production of BGA varied from 94 per cent to 100 per cent whereas the distribution of BGA shows that the achievement is varied from 95.7 per cent to more than 100 per cent. Similar trend is seen in financial achievement.

Table.7 Physical and Financial target and achievement of Blue Green Algae

Physical : Tonnes

Financial : Rs. lakhs

Particulars	Physical				Financial	
	Production of BGA		Distribution of BGA			
	Target	Achievement	Target	Achievement	Target	Achievement
2006-07	525.0	525.0	525.0	534.8	15.02	14.58
2007-08	525.0	496.5	525.0	502.2	18.97	14.54
2008-09	525.0	520.0	525.0	505.0	18.65	15.44
2009-10	525.0	520.0	525.0	518.0	22.91	19.62
2010-11	525.0	525.0	525.0	518.0	24.25	16.47

3.1.5. Seed Village scheme

Paddy seeds are distributed to farmers at 50 per cent subsidy. All the farmers in the State who are willing to grow seed farms and distribute quality seeds to other farmers are eligible under this scheme.

Table.8. Seed Village Scheme state level : Distribution of Seeds

Physical : Tonnes

Financial : Rs in lakhs

Year	Physical		Financial	
	Target	Achievement	Target	Achievement
2006-07	1144.0	1583.6	101.06	101.23
2007-08	3075.0	2129.0	215.25	143.499
2008-09	1357.0	1503.0	95.0	105.21
2009-10	1600.0	2687.0	160.0	269.85
2010-11	3000.0	4722.0	270.0	495.9

3.1.6 National Food Security Mission : Rice

With an objective to increase the production of rice and pulses, 'National Food Security Mission' programme is under implementation since 2007-08 as a direct funding scheme of Government of India with 100 per cent assistance. National Food Security Mission – Rice is implemented in five districts of Nagapattinam, Thiruvarur, Pudukottai, Ramanathapuram and Sivagangai. The five districts where the rice productivity is less than the State average taking 2003-04 as a base year and have more than 50,000 hectares of area under rice viz., Nagapattinam, Thiruvarur, Pudukottai, Ramanathapuram and Sivagangai have been identified by the Government of India to implement rice programme under National Food Security Mission.

Under National Food Security Mission – Rice, activities viz., demonstration on improved technologies, SRI techniques and Hybrid Paddy seed production and distribution, subsidized distribution of quality High Yielding varieties, seed mini kits distribution, micro nutrients, distribution of conoweeders / other implements, distribution of plant protection Chemicals and bio inputs, training through Farmers Field School, 50 per cent subsidy for pumpsets, seed drills, rotavators, knap sack sprayers, power weeders are carried out. Besides, power tillers are distributed at 25 per cent subsidy subject to a maximum of Rs.45000 and rice transplanters are distributed at 50% subsidy. This scheme was implemented with an allocation of Rs.2969.27 Lakhs.

The salient features of the scheme are:

- Inputs for the Demonstration on improved package of practice @ Rs.2500/-Demo of 0.4 ha
- Inputs for the Demonstration on SRI @ Rs.3000/- Demo of 0.4 ha
- Inputs for the Demonstration on Hybrid rice technology @ Rs.3000/- demo of 0.4 ha
- Production incentive Hybrid rice seeds @ Rs.1000/-qtl
- Distribution subsidy of Hybrid rice seeds @ Rs.2000/-qtl
- Distribution subsidy of High yielding variety seeds @ Rs.500/-qtl
- Incentives for Micro Nutrients @ Rs.500/-ha

- Incentives for Conoweeder and other Farm Implements @ Rs.3000/- implement per farmer
- Plant Protection Chemicals and Bio-Pesticides @ of 50% subsidy or Rs.500/-ha whichever is less.
- Farmers' Training at Farmers' Field School pattern @ Rs.17000/- training of 30 farmers group

Under this scheme, all farmers in the National Food Security Mission Rice districts are eligible. About 33 per cent of the allocation to SF / MF / Women farmers. 16% of the total allocation to SC farmers and 8% to ST farmers. Assistance limited to two hectare per farmer

3.1.7. National Agricultural Development Project (NADP):

The National Agricultural Development Project is being implemented in the state with the support from Government of India. Under this scheme, many activities are performed to increase crop productivity of major crops. In the case of rice, the activities such as production and distribution of hybrid rice, SRI demonstration, application of zinc sulphate to paddy crop @ 50% subsidy, strengthening state seed farms etc.

Table.9. Physical Target and achievement of rice productivity improvement under NADP

Particulars	2008-09		2009-10		2010-11	
	Target	Achivt	Target	Achivt	Target	Achivt
NADP - Hybrid Rice Seed Production (tonnes)	71		71	44.200		
NADP - Hybrid Rice Seed Distribution (tonnes)	200		200	24		
System of Rice Intensification Demonstration (hectares)			40000	40369	50000	54165
Application of Zinc sulphate to Paddy crop @ 50 % subsidy (hectares)			35295	35911.8	100000	95198

STRENGTHENING OF STATE SEED FARMS						
I)Irrigation Facilities A) Open Well renovation						
B) NEW Bore Well	54	54				
C)NADP- Land Development and shaping, Reclamation	565.31					
D)strengthening of quality seed production in state seed farms	78.000	1.482				
STRENGTHENING OF QUALITY SEED PRODUCTION IN STATE SEED FARMS FARM MECHANISATION a)POS	42	42				
b)Electric Motor	57	57				
c) Power tiller						
d) Paddy Transplanter						

Table.10 Financial target and achievement of rice productivity improvement under NADP

(Rs.lakhs)

Particulars	2008-09		2009-10		2010-11	
	Target	Achivt	Target	Achivt	Target	Achivt
NADP - Hybrid Rice Seed Production	35.50		35.500	8.008		
NADP - Hybrid Rice Seed	100		100.00	11.705		

Distribution						
System of Rice Intensification Demonstration			1200.0	1180.650	1500.00	1492.56
Application of Zinc sulphate to Paddy crop @ 50 % subsidy			150.00	146.083	426.400	418.384
STRENGTHENING OF STATE SEED FARMS						
I)Irrigation Facilities a)Open Well renovation	38.451	38.451				
b)New Bore Well	140.859	140.661				
NADP- Land Development and shaping, Reclamation	66.961	65.702				
STRENGTHENING OF STATE SEED FARMS I)Irrigation Facilities a)Open Well renovation						
STRENGTHENING OF QUALITY SEED PRODUCTION IN STATE SEED FARMS	78.000	1.482				
STRENGTHENING OF QUALITY SEED PRODUCTION IN STATE SEED FARMS FARM MECHANISATION a)POS	2.3587	2.3587				
b)Electric Motor	30.70	27.90				
c) Power tiller	45.261	39.703				

Realising the significance of SRI, under the NADP, major thrusts are being given for popularization of SRI through crop demonstration. It is evident that the scheme has achieved targets both physically and financially.

3.1.8. TAMIL NADU IRRIGATED AGRICULTURAL MODERNIZATION AND WATER BODIES RESTORATION AND MANAGEMENT (TN-IAMWARM)

Irrigated Agriculture Modernization and Water-Bodies Restoration and Management (IAMWARM) – '*a multidimensional project that envisages to bringing about positive changes in the context of Irrigated Agriculture and Farm ecology & economics, involving multiple stake-holders both at facilitation and implementation levels'* – has been planned to be implemented in 63 Sub-basin in Tamil Nadu. The Project intends to expand the area under Irrigated Agriculture through effective and efficient Irrigated Water Management practices in order not only to grow more crops per drop, more meat and milk per drop, and more fish per drop but also to facilitate the farmer for fetching him more income per every drop of water that he uses for agriculture. Negotiations for this project were held at World Bank, Washington from 11-12-2006 to 17-12-2006 and the Bank Board had approved the project for US$566m with loan component of US$ 485m of which US$ 150 m will be credit under IDA. Of this US$ 75 m will be treated as grant from GOI for the RRR sub component in this project, which contemplates rehabilitation of P.W.D tanks in the selected Sub-Basins. On 12.02.2007 at New Delhi, the officials of the Government of India, Government of Tamilnadu and the World Bank signed the legal agreements, thus paving the way for commencement of the project on 09.04.2007.

This is a unique project integrating the activities of the eight departments in the Water Sector (viz, PWD/WRO, Agri-Engineering, Agriculture, Agri-Marketing, Horticulture, TNAU, Animal Husbandry and Fisheries) with the main objective of improving the irrigation service delivery including adaptation of modern water saving irrigation technologies and Agricultural practices and with ultimate vision of the enhanced farmer income .The project covers an area of 6.17 lakhs hectares spread over 63 sub basins out of 127 sub-basins in the State (Government of Tamil Nadu, 2008).

One of the important components under TN-IAMWARM is the System of Rice Intensification. System of Rice Intensification (SRI), an emerging alternative to conventional

water and chemical intensive rice cultivation, has been promoted in Tamil Nadu under the IAMWARM Project. Farmers across the State are adopting System of Rice Intensification, as it gives equal or more produce than the conventional rice cultivation; with less water, less seed and less chemicals. The net effect is a substantial reduction in the investments on external inputs.

3.1.8.1. Paddy SRI (1 ha) 100% subsidy (or) Rs.6,000/-

Under TN-IAMWARM project, two important activities are carried out to popularise SRI in Tamil Nadu across river basins. They include crop demonstrations and distribution of SRI implements like cono weeder and markers. It could be seen that the physical target is achieved with 100 per cent in all the years for crop demonstrations and distribution of implements.

Table.11. Physical Target and achievement of SRI in Tamil Nadu under IAMWARM

Crop demonstration : Area in hectares

SRI implements : numbers

Particulars	2008-09		2009-10		2010-11		Total	
	T	A	T	A	T	A	Total	A
Crop demonstration	1934	1934	4485	4485	9433	9433	15852	15852
SRI implements- Cono weeder and marker	1934	1934	4485	4485	9433	9433	15852	15852

Note : T : Target; A : Achievement

However, financial targets and achievements show little difference between the target and achievement over the years.

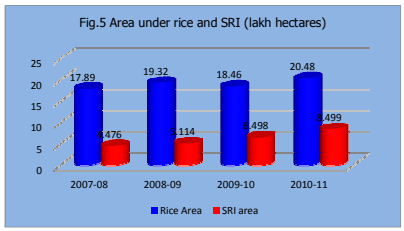
Table.12. Financial Target and achievement of SRI in Tamil Nadu under IAMWARM

Rupees in lakhs

Particulars	2008-09		2009-10		2010-11		Total	
	T	A	T	A	T	A	Total	A
Crop demonstration	116.04	114.001	391.65	380.27	836.97	825.4	1344.66	1319.671
SRI implements-Cono weeder and marker	33.853	33.75	78.49	76.74	165.09	152.26	277.433	262.75

Note : T : Target; A : Achievement

3.1.8.2. Extent and coverage



The Department of Agriculture of the Government of Tamil Nadu has included SRI in all existing and new schemes that focus on increasing food production. These include the Integrated Crop Development Programme (ICDP), the Agricultural Technology Mission Agency (ATMA), the National Agricultural Development Programme (NADP), the National Food Security Mission (NFSM) and the Tamil Nadu Irrigated Agriculture Modernisation and Water Bodies Restoration and Management Project (TN-IAMWARM). It is estimated that the area under SRI cultivation has been increasing every year. From a coverage of 4.476 lakh hectares in the year 2007-08, it increased to 5.114 lakh hectares in 2008-09 to 6.498 lakh hectares in 2009-10 and 8.499 lakh hectares in 2010-11 (Commissionerate of Agriculture, 2012). It is evident that the area

under SRI in the state is consistently increasing over the years mainly because of the efforts taken by the Department of Agriculture, Government of Tamil Nadu. The area under SRI was 25.02 per cent to the total rice area in 2007-08, which has increased to 26.47 per cent in 2008-09 and further to 35.20 per cent of the total rice area.

Table.13. Target and Achievement of SRI area coverage

(lakh Hectares)

Year	SRI area		Percentage of achievement %	Area under rice	Percentage of SRI to total rice area (%)
	Target	Achievement			
2006-07	..	..	..	19.31	
2007-08	7.955	4.476	56.30	17.89	25.02
2008-09	7.5	5.114	68.20	19.32	26.47
2009-10	7.5	6.498	86.64	18.46	35.02
2010-11	8.5	8.499	99.99	20.48	41.50

Source : Season and Crop Report of Tamil Nadu

Commissionerate of Agricutlure, Chennai.

4. SYSTEM OF RICE INTENSIFICATION

4.1. Over view of technology

The System of Rice Intensification (SRI) ia an innovative method comprising uncomplicated management practices that allow rice growers to attain higher productivity. Similar to the central principle of sustainable agriculture which seeks to make optimal use of naturally available resources as functional inputs, SRI too works by integrating invigorative processes such as optimum plant population, transplanting single young seedlings, wider square planting, mechanical weeding at 10 DAT (Days after Transplanting), keeping the soil moist but not inundated, using Leaf Color Chart (LCC) based nitrogen management schemes, using compost, FYM or green manure to the greatest extent possible and converting all of these resources synergistically to achieve higher yield from the rice crop. The synergy between

these practices helps to produce more healthy and productive plant phenotypes and subsequently to obtain higher returns. SRI also minimises the use of high cot external inputs that are detrimental to the environment. However, the success of SRI depends on knowledge and skills of the farmers and how productively ther are able to employ them (Pandian, *et al*, 2011).

The SRI was initially developed in Madagascar in the 1980s by Fr.Henri de Laulanie, in association with a non-governmental organisation called Association Tefy Saina (ATS) and many small farmers (Pndian *et al* . 2011). Since then it has spread to many countries. The emergence of SRI in India was slow as compared to other rice growing countries. The first on-station experimental evaluation of SRI in India was carried out in Tamil Nadu during 2001-02 at Tamil Nadu Agricultural University, Coimbatore (Senthilkumar *et al.* 2008). The states like Andhra Pradesh, Tirupura and Tamil Nadu are leading the adoption and popularisation of SRI in India. Efforts are also being made by the states like Bihar, Jharkhand, Orissa and Chhatisgarh (Pandian, *et al*. 2011)

SRI is a whole package of agronomic approaches which together exploit the genetic potential of rice plants; create a better growing environment enhance soil health; and reduce inputs (seeds, water, labour). It is argued that SRI can increase farmers' rice yields, while using less water and lowering production costs (WWF, 2004). It uses all the usual agronomic practices for transplanted rice—raising a nursery, transplanting, irrigating, weed management and nutrient management—but there are some drastic differences in how these are carried out. SRI has emerged as water saving rice cultivation technique in which nearly 50% of the irrigation water can be saved by limited irrigation intervention strategy.

Creating awareness on advantages of SRI on the water economy, improved crop husbandry practiced like use of young seedlings (14 days old), less seed rate, square planting and use of cono weeder will be helpful in improving the yield of rice. The agricultural technologies are being developed day to day and disseminated to the farming community for adoption and increased agricultural production. The farmers are to be trained so as to adopt the latest techniques for which skill demonstration, method demonstration and hands on training in the field for enhancing the technical competence of the farmers

The System of Rice Intensification (SRI) fit the bill neatly and thus became an important focus for agricultural research and extension. SRI has been made known to the Tamil Nadu Agricultural University (TNAU) through an informal email communication from Plant Research International (PRI), Wageningen, in early 2000. The innovative concepts led to an explorative evaluation immediately. The results clearly showed the applicability of wider spacing and non-flood irrigation. At this juncture, PRI initiated a collaborative research project 'Waterless Rice' of which TNAU was part. SRI principles were introduced in the experiments of this project. The result of the first experiment itself threw light on the impact of weeder operation and water saving. There was a significant increase in yield (630 kg /ha) due to the use of the weeder, which generated a lot of interest. There was no yield difference due to less irrigation. Further research continued at Coimbatore, Aduthurai, Thanjavur, and Killikulam not only by scientists but also postgraduate students.

Based on the field experiments conducted in Coimbatore during 2000-2002, a package of SRI practices were evolved. Nursery preparations were modified. The package was tested in 100 farmers' fields in 2003 through a state Government initiative to evaluate the performance in comparison with conventional cultivation in two river basins viz. Cauvery and Tamiraparani. The results showed an average increase in grain yield by 1.5 t ha-1 in both basins. SRI was thus officially recommended for adoption by farmers in 2004. By this time some farmers had already embraced SRI. In 2004, Government of Tamil Nadu implemented a pilot project funded by World Bank in Adavinayinar river basin (part of Tamiraparani basin) in which enhancing water-use efficiency was a key objective. TNAU was involved in this project and SRI was demonstrated to farmers both by TNAU and the Department of Agriculture. Positive results from this pilot project paved the way for the implementation of a fiveyear project, Irrigated Agriculture Modernization and Waterbodies Restoration and Maintenance (IAMWARM) by World Bank in 63 river basins from 2007, with a budget allocation of Rs.24,000 million. SRI was included in this project as a major thrust in the agriculture component. In the first phase, nine basins were covered during 2007-08. Sixteen more were covered from 2008-09 and the remaining 38 basins will be taken up from 2009-10. In this programme, enlisted farmers are given training, inputs, SRI tools (weeder and marker), technical assistance and constant monitoring to implement SRI.

The Department of Agriculture of the Government has included SRI in all existing and new schemes funded by Governement of India that focus on increasing food production. During

2007-08, SRI was demonstrated in 11,320 ha under the Integrated Cereal Development Programme (ICDP) by extending a subsidy of Rs.2000 per ha and imparting training to 56,600 farmers. This led to the spread of SRI in 0.42 million ha during that year. Triggered by the success during the previous year, the Department has embarked on scaling up SRI in 0.75 million ha during the current year (2008-09).

The first experimental result conducted at Coimbatore in 2000 showed statistically higher yield (10.9%) due to weeder-use and paved way for further evaluation. The adaptive research trials in farmers' fields in Tamiraparani basin with a package of practice showed that grain yields recorded under SRI and conventional cultivation ranged from 4214 to 10655 kg per ha and 3887 to 8730 kg per ha, respectively. The mean grain yield was 7227 and 5657 kg per ha, respectively, showing an average yield advantage of 1570 kg per ha under SRI. Nearly 31 farmers recorded yields of more than 8 tonnes per ha under SRI against three farmers using conventional cultivation. The maximum yield advantage recorded by a farmer in SRI was 4036 kg per ha (70% higher than conventional cultivation). Further trials conducted at Aduthurai and Thanjavur showed that adopting all SRI components resulted in 48.8 per cent higher yield at Aduthurai and 35.8 per cent higher yield at Thanjavur when compared with conventional cultivation. A systematic study also showed that among the SRI components, the major effect was by weeder-use followed by single seedling per hill. With shallow irrigation in the experiments conducted during 2000-2002 at Coimbatore, there was 39-52 per cent water saving with water productivity increase of 53-96 per cent. The grain yields in SRI obtained by farmers taking part in IAMWARM project ranged from 2948 kg per ha (Aliyar basin) to 9987 kg per ha (Upper Vellar basin). The per cent increase yield in SRI over conventional cultivation ranged from 16.3 to 46.5. The state Department of Agriculture has reported a maximum grain yield of 14.2 tonnes per ha by a farmer in Dindigul district (ICRISAT-WWF Project, 2008).

4.2. Government schemes promoting SRI

The scaling up of SRI, outside the research system began in Tamil Nadu for the first time through the Department of Agriculture. Beginning August 2004, SRI was promoted under the Integrated Cereal Development Programme-Rice with a target of 9000 acres to be covered in 2004-05 under the system. State Department of Agriculture has planned for 2,60,000 ha of

paddy area in Tamil Nadu under SRI paddy cultivation, which would be completed during 2008 to 2009.

Department of Agriculture (DoA) promote SRI through cluster approach involving Farmers Interest Groups (FIGs), Tamil Nadu Women in Agriculture (TANWEB) etc, (Rs. 20,000/- per cluster for promotion of SRI technology + Rs.5000 per cluster for training of farmer and labour in each cluster of 10 ha.) with financial outlay of 283 lakhs under innovative scheme. The district joint directors of agriculture are authorized to draw the amount of Rs. 5000/- per cluster for conduct of training to farmers/laborers in cluster. Basically there is the Central Government sponsored macro management of agriculture. Under that, there are two schemes 1) Integrated cereal development program and 2) promotion of SRI under cluster approach, that promote SRI in Tamil Nadu. As per Tamilnadu GO (GO Ms no.284 dated 16.07.2007) budget allocation for SRI promotion is Rs. 7 crores for 2007-08 out of 38 crores for Agriculture department.

A study found that as the clarity in terms of area to promote SRI is lacking. It solely dependent on the way it would be implemented where the actual area would be covered, the training plan and the input supply (marker and weeder) etc would be the deciding factors to assess the budget requirement. But one thing is clear that the allocated budget amount (Rs. 7crores) if worked out for one ha keeping 2,50,000 ha as base, the actual amount can be spent for one ha is Rs. 280/- only which is not possible to support farmers with inputs like cono weeder, marker etc (Krishnan, 2008).

4.3. Impact of SRI

4.3.1. Evidences from experiments

A number of on-farm evaluations in farmers' fields have been conducted by research institutions, extension departments and civil society organisations in Tamil Nadu. One such evaluation was done with 100 farmers in Tamiraparani basin, Tamil Nadu. The average yield increase due to SRI was 1,570 kg/ha. The biggest yield advantage achieved by a farmer was 4,036 kg/ha. The farmers also reported lodging resistance and an absence of rat damage in SRI crops (Water Technology Centre, 2009).

Table.14 SRI and Conventional rice yields compared

Particulars	Conventional	SRI
Trial area (m^2)	25	25
Grain yield -minimum (kg/ha)	3887	4214
Grain yield- maximum (kg/ha)	8730	10655
Mean grain yield (kg/ha)	5657	7227
Standard deviation	1108	1379

Source : Thiyagarajan et al. 2005

Therefore, there is potential for India to increase its foodgrain production by concentrating on enhancing rice yields. SRI can improve productivity significantly. Besides increased paddy production, the enormous savings in water and seed resources are very appealing. The yields, reported at 14% moisture, ranged from 4.21 to 10.66 tons per ha for SRI, and from 3.89 to 8.73 tons per ha for conventional cultivation (Table.15). The respective average grain yields of 7.23 and 5.66 tons per ha showed an overall yield advantage for SRI, even with incomplete utilization, of 1.57 tons per ha (27.8%).

Table.15. Comparision of Yield, labour requirement, cost of cultivation and net returns

(per hectare)

Particulars	Conventional	SRI	% Difference
Grain yield (tonnes)	3.89 – 8.73	4.21-10.66	+ 8.4 - +22.1
Average grain yield (tonnes)	5.66	7.23	+27.8
Male labour requirement	50	83	+66.0
Female labour requirement	222	167	- 24.8
Total labour requirement	272	250	- 8.1
Cost of cultivation (Rs.)	21424	19060	-10.0
Net returns (Rs.)	11149	23868	+114.1

Source: Satyaranayana et al, 2007

As seen from the bottom line of Table.16, with SRI methods there was a doubling of farmers' net returns per ha with an 8% reduction in overall labor requirements. Men took over weeding operations, because these are 'mechanical' with SRI. This reduced the time that women had to devote to rice production, which was also reduced by their needing less time for transplanting. Usually SRI methods have been thought to *add* to farmers' total labor requirement. The lower labor requirement together with higher yield means that SRI increased labor productivity (rice kg day¡1) by almost 40%. The 40–50% reduction in water use reported means that water productivity (kg rice m¡3 water) was raised by > 130%. The benefits reported by TN farmers from using SRI practices, similar to those reported by AP farmers, were the following:

1. Drastic reduction in seed rate, from 60–75 to 7.5 kg per ha.
2. No need to use herbicides.
3. Multiple advantages from using rotary weeders: better weed control, less time required for weeding, incorporation of top-dressed fertilizer, aeration of the soil, incorporation of weeds and their nutrients back into the soil, and increased tillering.
4. Water savings of 40–50%.
5. Increased number of panicles m¡2, grains panicle¡1, grain yield, and straw yield.
6. Higher net profits for farmers.

Planting in a square pattern was the only difficulty that farmers singled out, noting that their traditional method of random planting is quicker, but it gives less yield. The results of SRI evaluations conducted through this large set of ARTs paved the way for getting support from extension staff and leadership of the state's Department of Agriculture. Demonstration trials have now been laid out in all rice areas of the state, which should speed the adoption of SRI by still more farmers. From conversations with farmers, one of the reasons making them more receptive to SRI is the opportunity that they see now to reduce their water requirements. Not only will SRI reduce labor and costs, but it can also lessen conflict with neighbors when water is scarce. This matter of reducing conflict over water weighs heavily in the thinking of political leaders as well as farmers, in Andhra Pradesh as well as Tamil Nadu.

Table.16. Comparison of grain yield between SRI and Conventional

Studies	SRI	Conventional	% increase
Thiyagarajan et al, 2005	7227	5657	27.75
Satyanarayana et al,2007	4210-10660	3890-8730	8.4 - 22.10
TN-IAMWARM, 2008 (Varaghanadhi sub-basin)	7528	5120	47.03
TN-IAMWARM, 2009 (Karumaniar, Sevalaperiyar, Ongur and Nallavur sub-basin)	6406	5284	21.23
Pandian, 2010	7058	5139	37.30
TN-IAMWARM, 2008 (Arjunanadhi sub-basin)	6326	5163	22.5

4.3.2. Survey results

In order to study the impacts of SRI on yield and resource use, several researchers across the state made attempt. The experiences of those results are discussed here.

4.3.2.1 Paddy productivity under different irrigation sources and seasons

The detailed analysis of the paddy yield under the SRI was done for 2008-09. During *Kuruvai* season, higher paddy yield of 5.84 t/ha in SRI was recorded in Trichy district (Table 17). However, higher productivity advantage of 15.56 per cent due to SRI was recorded in Thanjavur with the paddy productivity of 5.42 t/ha under SRI against 3.26 t/ha under the conventional practice. The average yield increase was about 9 %. In ***samba*** season, Thiruvarur district recorded higher yield advantage of 20.38 per cent under SRI practice, with the average SRI yield of 4.99 t/ha against 4.14 t/ha under conventional practice. The average yield increase in the season was about 12%. Among the irrigation sources in *Kuruvai* season, maximum yield was recorded under **surface water** with 5.53 t/ha, with an yield increase of about 8.7%. however about 11 per cent yield advantage was recorded under conjunctive irrigation.

Table 17. Yield under SRI in different seasons in 2008-09

District	Kuruvai				Samba				Summer			
	NSRI t/ha	SRI t/ha	% inc	CV %	NSRI t/ha	SRI t/ha	% inc	CV %	NSRI t/ha	SRI t/ha	% inc	CV %
Cuddalore	4.73	5.18	9.53	11.25	4.72	5.30	12.41	11.01	4.76	5.14	8.00	7.26
Kancheepuram	5.00	5.46	9.34	11.55	5.01	5.71	14.03	9.32	5.27	5.89	11.75	9.49
Pudukkottai	4.76	4.85	1.83	11.49	5.18	5.10	-1.54	9.93		5.19		
Tanjore	4.69	5.42	15.65	12.50	4.62	5.23	13.38	12.52	4.95	4.94	-0.18	14.00
Thiruvallur	5.01	5.34	6.60	17.39	4.59	5.18	12.96	17.66	4.92	5.13	4.40	26.99
Thiruvannamalai	4.80	5.46	13.70	11.25	4.69	5.38	14.64	11.56	5.37	5.76	7.13	
Thiruvarur	4.80	5.49	14.33	11.73	4.14	4.99	20.38	30.54	4.78	5.29	10.74	11.76
Tirunelveli	5.12	5.46	6.73	15.58	4.93	5.24	6.32	8.94				
Trichy	5.31	5.84	9.94	21.75	4.98	5.58	12.20	16.29		4.51		
Villupuram	4.86	5.21	7.24	23.49	5.07	5.61	10.77	10.73	5.19	5.83	12.35	
Total	4.90	5.34	9.09	15.95	4.77	5.34	11.94	15.57	5.07	5.42	6.79	11.82

Source : Karunakaran, 2011

Under the surface irrigation the maximum additional yield was 474kg per ha by adopting three components *viz.,single seeding, square planting and cono weeding* . Under groundwater, the two core components, viz., single seedling with square planting (SS+SP) generated an additional yield of 1161 kg/ha (Table. 18). In conjunctive irrigation, the higher additional yield of 712 kg /ha was obtained when all the four core components were followed.

Table. 18 Additional Yield in SRI paddy under irrigation sources and farm types

	SW	GW	CU	Marginal	Small	Large	All
AG	122	443	456	46	364	587	412
SS	243	570	610	454	402	687	614
SP	213	610	633	102	391	766	501
CW	99	633	435	359	213	801	386
AG+SS	309	444	535	278	461	674	516
AG+SP	250	742	382	446	245	848	291
AG+CW	227	916	451	419	370	848	487
SS+SP		1161	560	480	394	953	697
SS+CW		995	465		343	857	746
SP+CW	348	633	435	458	213	801	386
AG+SS+SP		1542	411		373	833	576
AG+SP+CW	474	916	451		373	833	487
AG+SS+CW		1542	465	591	370	848	646
SS+SP+CW	415	633	682		467	1005	386
AG+SS+SP+CW		1542	712		467	1005	646

Normal yield under SW, GW and CU was 5054 t/ha, 4896 t/ha and 4782 t/ha. Average yield was 4863 t/ha while the normal yield under Marginal, Small and large category farmers were 4893 t/ha, 4863 t/ha, 4858 t/ha and 4863 t/ha

Large farmers had more advantage in adopting various components of SRI. A maximum additional yield of **one t/ha** over conventional (4.86 t/ha) was realized by the large farmers. Similarly, small farmers could be able to achieve the additional yield of 461 kg per ha while adopting square planning of the single seedlings with cono weeding. In the case of marginal farmers, the maximum additional yield of 591 kg per ha while adopting 14 day old single seedling with a cono weeding component (AG+SS+CW).

It is found that the yield under SRI is worked out to 6.25 tonnes when compared to conventional paddy cultivation which is 5 tonnes per hectare with an increase of 25 per cent. Similarly, there is a significant reduction in the total cost of cultivation incurred by farmers. It

is evident that the total operation costs incurred under SRI is Rs. 28285 per hectare as against Rs. 31850 per hectare under conventional method of cultivation, which is 12.6 per cent higher over SRI. Thus, one can conclude that the SRI being a composite technology, helps in achieving cost reduction and yield enhancement.

Table.19. Cost of cultivation for Paddy between Conventional and SRI method in Cuavery Delta Zone

(Per hectare)

Particulars	Conventional		SRI	
	Quantity	Value (Rs)	Quantity	Value (Rs)
Nursery Preparation and pulling	12.5	3500	2.5	1625
Main field preparation Preparatory		5625		5125
Seed (kgs)	100	1600	10	160
Transplanting	42 W + 10 M	2875	42 W + 15 M	3375
FYM		5000		5000
Chemicals fertilizers		3120		2855
PP chemical		1250		625
Intercultural /Weeding		2125		1875
Harvesting		6755		7645
Total cost		31850		28285
Paddy Yield (quintals)	50	35000	62.5	43750
Straw yield	27.5	9625	32.5	11375
Net income		12775		26840
Cost of Production (Rs/quintal)		445		271

Source: Karunakaran, 2011

The SRI practices have been found to save inputs substantially and to increase returns. Higher return has been attributed to increase in production as well as substantial reduction in cost of cultivation. The most impressive are the savings in water (22-39 per cent) and seed (92 per cent). The organic supplementation due to green manuring and weed incorporation, enhanced soil microbial activities and aeration, use of solar energy and time saving due to early transplantation, are some of the uncommon advantages of SRI. The women employment in specialized operations such as transplanting, harvesting and weedings can lead to gender equity. The estimates of technical efficiency using DEAP has clearly shown that SRI is more technical and economic efficient. Upscaling of SRI strategy will help achieve national as well as household food-security (Barah, 2009).

The cost and returns for SRI and non-SRI farms have been presented in Table 20. The farmers derive multiple benefits from SRI such as higher yield, less input-cost and high income as compared to non-SRI farms. On the whole, the combined effect of reduction in cost and higher yield has resulted in increase in net return to the extent of over 31 per cent. The average cost of production (paid out cost) has been worked out to be Rs 269 per quintal of rice under SRI practice and Rs 365 per quintal under normal practices, an advantage of 26 per cent in cost of production. A comparison has shown that SRI has higher B-C ratio than that of the conventional practice across the districts. The increase in production with reduced cost is the most important trait of SRI, which has induced adoption of SRI by the farmers. Farmers have also realized that the conservation of water and soil ensures long-term sustainability. On account of early transplanting of 8-12 days old seedlings vis-à-vis 30-40 days old in the case of conventional practices, SRI practice reduces the length of growing period. The land vacated at least for 20 days due to early harvest, can potentially enhance crop diversification and crop intensity.

Equitable gender participation: It is an important aspect, which is particularly observed in specialized operations such as transplanting of tender seedlings, harvesting and weeding. Women labourers find the ergonomically manufactured weeders more userfriendly. Moreover, skilled labourers earn higher wage in specialized operations. The use of family labour is higher in SRI which varies from 38 per cent to 49 per cent of total labour-use, while the same varies from 7 per cent to 37 per cent under the conventional practice. The increase in yield has been found to vary from 4 per cent to 26 per cent due to adoption of SRI across farm-size groups. The yield across farm size is neutral to scale under both practices.

However, the yield is 15-20 per cent higher for farmers in SRI than non-SRI practices (Barah, 2009).

Table.20. Comparison of costs and returns with and without SRI in Tamil Nadu

(Per hectare)

Particulars	Coimbatore		Kanchipuram		Ramanathapuram		Tanjore	
	SRI	Non-SRI	SRI	Non-SRI	SRI	Non-SRI	SRI	Non-SRI
Seed cost (Rs)	504	1800	187	2250	562	2160	217	1575
Labour cost (Rs)	9546	12705	7988	11990	4960	9111	10715	11524
Yield (tonnes)	6.52	6.07	6.54	5.41	5.10	4.25	5.06	4.76
Total cost (Rs)	16774	20283	16604	18938	11589	15953	16699	19010
Gross income (Rs.)	33329	34848	34233	32325	27745	25216	31575	31653
Net income (Rs)	16555	14564	17629	13386	16155	9263	14875	12643
Cost (Rs/qtl)	261	335	257	350	229	376	331	400
No of irrigation	24	34	25	34	25	32	20	33
Saving %	28		27		22		38	
Adoption of SRI %	45		18		20		59	

Source: Barah, 2009

A study conducted in Western Tamil Nadu (Anjugam *et al*. 2008) indicates that the SRI method of cultivation produced desired results in terms of increase in yield and reduction in cost of cultivation. It is evident that the grain yield is worked out to 6.723 tonnes under SRI method when compared to conventional method where the grain yield is 5.40 tonnes/ha. It confirms that there is a 24 per cent increase in yield is achieved through SRI method of cultivation. The total operational cost under SRI cultivation is worked out to Rs. 33610 where as it is Rs.36153.0 which is 7.56 per cent higher than the SRI cultivation. Thus, it is clear that the SRI significantly benefits the farmers in terms of increased yield and reduction in cost of cultivation.

Table.21. Comparison of SRI and conventional rice cultivation

(Per hectare)

Particulars	SRI adopters		Conventional	
	Amount (Rs)	Percentage	Amount (Rs)	Percentage
Nursery preparation	688.0	2.05	1083.0	3.00
Main field preparation and transplanting	9612.0	28.60	10521.0	29.10
Seed	301.0	0.90	1447.0	4.00
Fertilizers	3643.0	10.84	4025.0	11.13
Irrigation	1600.0	4.76	1890.0	5.23
Weeding	4769.0	14.19	2866.0	7.93
Plant protection chemicals	642.0	1.91	985.0	2.73
Harvesting and threshing	11589.0	34.48	12511.0	34.61
Interest on working capital	766.0	2.28	824.0	2.28
Operational cost	33610.0	100.0	36153.0	100.0
Grain yield (tonnes)	6.723		5.40	
Price realised by the farmers (Rs/ton)	8426.7		8113.3	
Value of grain output (Rs.)	57034.93		43643.48	
Value of by product (Rs)	7871.07		5471.44	
Gross income (Rs.)	64906.00		49114.92	
Operational cost (Rs.)	33610.00		36153.00	
Net income over OC (Rs.)	31296.00		12961.92	

Anjugam *et al.* 2008

Table 22. Analysis of economic impact of SRI technique - Partial Budgeting

(per ha)

Credit (Gain)	Amount (Rs.)	Debit (Loss)	Amount (Rs.)
Added Return		Added Cost	
Yield: Main product: 13 qtls per ha @ Rs.842 /Qtl	11140.00	Weeding	1903.00
By-product:2qtl/ha@ Rs.150/Qtl	100.00		
Sub total	11240.00	Sub total	1903.00
Reduced Cost		Reduced Return	
Nursery preparation	396.00		
Main field preparation & Transplanting	909.00		
Seed	1146.00		
Fertilizers	382.00		
Irrigation	290.00		
Plant protection	344.00		
Harvesting	922.00		
Sub total	4388.00	Sub total	…
Total Gain	15628.00	Total Loss	1903

Net gain/ benefit (Total gain–Total Loss) = Rs.13725

Significance of different core components: The following components of SRI are considered as core components.

- Young and robust seedling (12-14 days)
- Single seedling per hill
- Square planting with wider spacing (25X25 cm)
- Rotary weeding upto 40 days at 7-10 days interval starting from 10 DAT
- Irrigating at 2.5 cm depth after the disappearance of ponded water
- Nitrogen management through leaf colour chart (LCC)

The above are considered as the core components of SRI (Pandian *et al.* 2011)

Enough efforts have also been made to identify the core components which are very essential for achieving the yield increase and resource saving. It is evident that the research conducted at Tamil Nadu Rice Research Institute (TNRRI), the combined effect of five core components such as: (i) 15-20 days old seedlings (4 leaf stage), (ii) single seedling per hill, (iii) 22.5X22.5 centimeters, (iv) mechanical weeding and soil stirring and (v) intermittent irrigation produced highest grain yield of 7.1 tonnes/ha which is 48 per cent increase over the conventional method of rice cultivation. Similarly another research conducted at Soil and Water Management Research Institute (SWMRI), the grain yield was 6.6 tonnes/ha, an increase of 35 per cent over conventional method of rice cultivation. It is found that the increase in yield under SRI is mainly due to more panciles per unit area (35-49 per cent over the conventional method) and more filled grains per panicle (23-44 per cent over conventional method of rice cultivation).

In order to identify the contribution of core components of SRI towards yield increase, research on the removal of one core component at a time was tried. It is evident that the removal of core component resulted in significant reduction in yield (Table.23)

Table.23. Component wise contribution towards yield under SRI

Components	Yield reduction (%)
Mechanical weeding and soil stirring	18-20
Use of young seedlings	15-17
Planting single seedlings per hill	14
Intermittent irrigation	10

Source : Pandian et al, 2011.

The finding show that the mechanical weeding and soil stirring together are the most important of the five components followed by the use of young seedlings, planting of single seedlings per hill and intermittent irrigation. It is also found that with the adoption of intermittent irrigation, the amount of water used decreased by 33 per cent and grain yield increased by 11-12 per cent. Most significantly, it is evident that the removal of two or three components at a time reduced rice yield significantly by 1.9 to 2.0 tonnes per hectare

compared to the full adoption of SRI. Thus, in order to ensure the targeted yield, the core components should be adopted without any negotiation.

Irrigation studies conducted at different parts of Tamil Nadu revealed that the SRI method produced desired results. A study conducted at Varaghanadhi sub-basin (Villupuram district of Tamil Nadu) in 2007-08 revealed that the irrigation water applied for conventional rice cultivation is 9204 cubic meter per hectare (18 irrigations) as against 4306 cubic meter/ha (13 irrigation) under SRI. Thus, there is a saving of about 41 per cent under SRI method. This also produced increased yield. It is evident that the yield under conventional method is 5.12 tonnes/ha whereas it is 7.528 tonnes/ha under SRI (TN-IAMWARM, 2008).

Similar studies conducted at Therkar (Madurai) and Penniayar (Krishnagiri district) sub-basins during 2008-09 and revealed that 28-44 per cent of irrigation water is saved. The water productivity worked out to be 7.37 and 3.08 kg/ha/mm respectively for SRI and conventional rice cultivation (TN-IAMWARM, 2009).

Experiments conducted during 2010-11 in different regions like Karumaniar sub basin (Tirunelveli district), Devalaperiyar sub-basin (Virudhunagar district), Ongur sub-basin (Chengelpet district) and Nallavur sub-basin (Villupuram district) to examine the impact of irrigation under SRI and conventional method of irrigation.

Table.24. Water requirement under SRI and Conventional methods

Particulars	SRI	CI
No.of irrigation	16	19
Water used (mm)	885	1180
Productive tillers per hill	39	17
Productive tillers per square meter	646	535
Grain yield (Kg/ha)	6406	5284

Source: TN-IAMWARM, 2009.

It is clear from the experiments conducted that the water required under SRI is very low (885 mm) as against 1180 mm under conventional method of rice cultivation. Also the SRI registered a higher grain yield of 6406 kg/ha as against 5284 kg/ha of grain under conventional method.

Mechanical weeding

Effective weed management would help in a big way to achieve the desired yield of crops. It is argued that young single seedling transplantation, wider spacing, alternate wet and dry irrigation conditions, etc are conducive for the germination and growth of weeds. Thus, the full benefits of SRI could be achieved when weed management is properly done. The use of cono weeders or mechanical weeders is recommended in SRI practices. This has the multiple benefits for crop development and yield enhancement and also offers greater scope for effective weed management. It has been found that the combination of mechanical weeding and soil stirring is important for removing weeds. Weeds can reduce rice yield by 18-20 per cent (Balasubramanian *et al.* 2005)

Table.25. Individual and combined effects of SRI components on grain yield

(Per cent)

Components	TRRI Aduthurai	SWAMRI, Thanjavur
Mechanical weeding	24	22
Young seedlings	20	16
Intermittent irrigation	10	12
Synergetic effect	48	35

Source: Rajendran *et al.* 2005

The studies conducted at Aduthurai and Thanjavur revealed that the use of cono weeder and associated soil disturbances significantly increases grain yield 22 to 24 per cent when compared to conventional weeding.

The SRI in Tamil Nadu has produced desired results in terms of increase in yield. It is evident that the beneficiary-wise analysis revealed that most of the farmers reaped the benefits of SRI through increase in yield.

Table.26. Beneficiary-wsie analysis of SRI in Tamil Nadu under TN-IAMWARM

Year	Per cent increase in yield over the conventional						
	<10%	10-20%	20-30%	30-40%	40-50%	>50%	Total no of farmers
2007-08	337	311	363	301	144	..	1456
2008-09	..	568	678	1004	387	392	3029
2009-10	71	567	543	331	2790	943	5245
Total	408	1446	1584	1736	3321	1335	9730

Source Pandian 2010

The increase in yield due to SRI adoption ranged from 28.3 per cent to 37.3 per cent and it is interesting to note that the increase is increasing over the years. This might be due to refinement and full in adoption of SRI technologies.

Table.27. Impact of SRI in Tamil Nadu under TN_IAMWARM during 2007-10

Year	Yield (Kg/ha)		Per cent increase	Area (hectares)
	SRI	Conventional		
2007-08	5709	4465	28.3	1311
2008-09	6710	5035	33.3	2581
2009-10	7058	5139	37.3	4000

Source: Pandian *et al.* 2011.

4.3.2.2. Issues in adoption of SRI

4.3.2.2.1. The intensity of SRI adoption

The share of SRI area to the total paddy area was categorized in to three groups i) <50 per cent; ii) 50-70 per cent; and iii) > 75 per cent. More farmers were falling under the <50% and > 75% category indicating that sensitiveness of the SRI to different farm categories. The 50-75% category remained almost same over years (Table.28).

Table 28. Intensity of SRI area to total paddy area in different season

% Share of SRI to total paddy area	Kuruvai						Samba				Summer			
	2007-08		2008-09		2009-10		2007-08		2008-09		2007-08		2008-09	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
<50	32	34.78	124	37.69	90	23.56	31	32.63	141	35.97	14	48.28	38	39.58
50-75	3	3.26	15	4.56	16	4.19	4	4.21	20	5.10			1	1.04
>75	57	61.96	190	57.75	276	72.25	60	63.16	231	58.93	15	51.72	57	59.38
All	92	100.	329	100	382	100	95	100	392	100	29	100	96	100

The increase in the share was noticed during 2009-10 in Kuruvai season and in 2008-09 in Samba season. This will be correlated with the adoption of the different components of the SRI by different farm categories. Further, the analysis of the farm categories had indicated that small farmers followed by large farmers allocated comparatively more than 75 per cent of area to SRI than others.(Table 6, Fig 2). In 2008-09 both small and large farmers adopted equally. In summer, mostly large farmers allocated more than 75 per cent of the rice area to SRI and this might be due to availability of assured irrigation supplies. Hence for marginal farmers, going for higher area under SRI might be a problem due to resource constraints.

4.3.2.2.2. Changes in SRI adoption status

In order to assess the pattern of adoption in SRI technology in different seasons and in different irrigation situations, a coding procedure was followed to categories the number of rice farmers in each season under different irrigation sources. Considering the area allocation

to SRI over the last seven seasons, SRI sample farmers were categorized into, i) non adopter of SRI under particular season (code 0) in last three years; ii) no change in SRI area allocation in the last three years (Code 1); iii) reduced the area under SRI in 2008-09 over 2007-08 (code 2); iv) increased the area under SRI in 2008-09 over 2007-08 (Code 3).

Only 4.77 per cent of farmers in Kuruvai season were non adopters of SRI. The non adopter percentage was more than 18 per cent in both samba and summer seasons. About 50 per cent of the SRI farmers maintained their proportion of SRI area continuously only in *kuruvai* season. Also in this season both increase and decrease in SRI was reported by about 5.6 and 13.6% farmers respectively indicating the variability in the SRI adoption in kuruvai season. Both water and labour supplies are always a problem in this season. Similarly, Samba and Summer seasons are noted for comparatively higher dis-adoption levels (about 18% in both the seasons)

Table.29 SRI adoption status over the 3 years period (% of farms)

Sustainability Description	Code	Kuruvai				Samba				Summer			
		SW	GW	CU	All	SW	GW	CU	All	SW	GW	CU	All
Non-adopter of SRI (%)	0	1.69	6.58	3.14	4.77	12.33	13.82	28.40	18.65		25.00	14.49	18.85
No change in last 3 years (%)	1	62.71	49.79	50.94	51.84	19.18	17.48	11.24	15.57		21.15	17.39	18.85
Reduced area of SRI in 08-09 over 07-08 (%)	2	6.78	13.99	15.72	13.67	0.00	2.44	0.59	1.43		1.92	2.90	2.46
Increased area of SRI in 09-10 over 08-09 (%)	3	6.78	6.17	4.40	5.64	1.37	2.44	3.55	2.66		1.92	2.90	2.46

Even within the existing SRI adoption, it involves a set of management practices such as a) planting; (young single seedling in wider spacing), b) irrigation - following AWD (irrigate after hairline crack of soil) up to vegetative phase) and continuing stagnation of thin film of 1-3 cm water during reproductive phase, c) weed management start 10 days after

transplanting (DAT,) and d) use of compost against chemical fertilizer in maintaining the soil health. In order to follow these concept,

SRI thus needs to follow up with a set of components, *viz.,* i) planting 12-14 days old 4 leaf stage young seedling which preserves the plants' potential for massive tillering and root growth that is lost by later transplanting. ii) single seedling; iii) square planting with a wider spacing of 22.5 X 22.5 cm which gives competition among plant roots and gives them more room to grow, a critical factor in SRI success (currently 25 x25 cm or 30 x 30 cm spacing are recommended). In order to achieve the above first three components, farmers needs to produce a healthy, robust and young seedlings for SRI method of rice cultivation which forced them to follow another three components; iv) three times of cono weeding on both sides on 10, 20 and 30 days after transplanting which aerates the upper horizon of soil at the same time that it removes weeds, being pushed up and down, and then across the rows, v) 5 kg of seed raised , vi) nursery area of 40 m^2; vii) modified mat nursery method for one hectare of main filed, viii) adopting alternate wetting and drying (AWD) (irrigate at hair line crack stage) up to flowering stage; and ix) N application through Leaf colour charts (LCC) would enable to increase number of productive tillers, yield and quality of grain and straw, beside reducing the establishment cost of nursery and weeding in the main field, reduce more than 60 per cent space and water requirement for nursery and more than 40 per cent of water requirement for main field over conventional rice cultivation.

Any deviation in the level of adopting these components may directly affect the rice yield and alter the cultivation expenses. Considering the importance in complete adoption of core components, SRI farmers were post classified into i) **full adopters** (very close to the SRI defined at least six core components of the SRI) ii) **non adopters** (following little difference from conventional method). A full adopter of SRI is defined as those using less than 10 kg/ha seeds, raised in modified mat nursery method, transplanting less that 15 day old seedling in 22.5 X22.5 cm spacing of square planting method along with more than two times cono weeding. Any deviation from the above category was classified as **non adopters**.

Table.30 Variation in adoptions of core components of SRI technology compared with Conventional method

Concept of Core components	Conventional method	Criteria for Core components of SRI adoption	
		full (SRI)	Non adopter
No of seedlings	>4	1	>3
Nursery method	Flat bed	Mat/ modified mat	Normal
Seed (kg/ha)	80-100	Less than 10	>20
Age (days)	35-45 days	<15	>20
Square planning (cm)	15x10 or 15x 15cm	22.5x22.5	Row planting
Cono weeding	Manual	>2times	1 time

The SRI farmers adopting different core components were grouped in to full adopter and non adopter (based on the closeness to adopting the SRI practices as discussed above) under different irrigation scenarios and three rice seasons. In general, the full adoption was done even by 50 per cent of farmers (Table.31). Only 35.2 per cent of SRI farmers followed modified mat nursery method in general, which was comparatively higher (46 %) under conjunctive irrigation and 31 per cent under ground water irrigation followed by 24 per cent in surface water irrigation, as drainage problems were noticed in the nursery raised under surface irrigation systems. Though, SRI required 5 kg seed for nursery preparation, about 45 per cent of farmers used less than 10 kg of seed and this was even high particularly under the surface water irrigation as farmers feared about poor seed germination. Though 12-14 days seedling is expected to boost yield parameters like productive tillers, grain weight and grain yield, only 28 per cent of farmers could be able to transplant with less than 14 days old seedling (31.79 per cent under conjunctive irrigation and 27.71 percent under ground water irrigation) In the case of square planting, farmers felt that it is laborious and highly skill oriented. Only 17.8 percent farmers followed square planting of 22.5 X 22.5 cm and another 3/4th **farmer just followed the planting** with a row spacing of 22.5 cm between line and 15-20 cm between plants. They expressed that this change is due to lack of skilled labour availability and less risk in wider spacing[i] This practice automatically restricted the cono weeding on both sides.

Table.31 Adoption of core components of SRI under different irrigation sources

	SW (n=75)		GW (n=249)		CU (n=176)		All (n=500)	
SRI components	Full %	Non-adoption %	Full %	Non-adoption %	Full %	Non-adoption %	Full %	Non-adoption %
No of seedlings	21.33	78.67	26.91	73.09	22.73	77.27	24.6	75.4
Nursery method	24	76	30.92	69.08	46.02	53.98	35.2	64.8
Seed (kg/ac)	48	52	41.77	58.23	47.73	52.27	44.8	55.2
Age (days)	14.67	85.33	27.71	72.29	34.09	65.91	28	72
Square planning (cm)	16	84	17.27	82.73	19.32	80.68	17.8	82.2
Cono weeding	9.33	90.67	6.43	93.57	8.52	91.48	7.6	92.4

Note: estimated based on core component followed in all three years

In general, only 7.6 percent of SRI farmers followed three time cono weeding. Many farmers expressed the drudgery and chest pain in the manual cono weeding and requested power operated cono weeders on subsidy basis. The full adoption of cono weeding technology was only 9.33, 8.52 and 6.43 per cent under surface, conjunctive and ground water irrigation sources respectively. The use of single seedling was comparatively higher under ground water and conjunctive irrigation sources. **Number of seedlings and cono weeding were the two important components**, where the non adopters were 61.2 % and 25 % respectively.

A study conducted in Krishnagiri district of Tamil Nadu revealed that most of the farmers are still unaware of most of the scientific information about the SRI (Alagesan and Budhar, 2009). It is found that only 18 per cent of the respondents had adopted the SRI techniques more than five seasons. Additionally, 24 per cent had adopted it for three to four seasons, while more than half (58 per cent) have adpted SRI system for only one to two seasons.

Table.32. Extent of adoption of SRI

SRI components	No.of farmers	Adoption (%)
1. Knowledge on SRI		
Aware	50	100
No aware	..	..
2. Age of seedlings		
12-15	15	30
16-19	28	56
25	7	14
3. Seedlings /hill (no.)		
Single seedling	43	86
Two seedlings	7	14
4. Spacing		
22.5X22.5 cm	21	42
20X20 cm	7	14
Different spacing	22	44
5. Cono weeder operation		
Use of con weeder	21	42
Not used	29	58
6. Use of leaf color chart		
Aware	14	28
Not aware	36	72

Alagesan and Budhar (2009).

It is found that the reason for discontinuance of SRI are: lack of skill in handling 14 days old seedlings (i.e difficulty in pulling and transplanting young seedlings), shortage of skilled labour for mat nursery preparation, lack of appreciation of the importance of cono weeder (i.e

lack of understanding of the advantages of soil stirring, aerating the root zone as well as incorporating the weed matter into the soil), non-availability of LCC. Thus despite efforts made through many outreach programmes, the lack of knowledge limit the wider adoption. Hence, there is a need to train the farmers and to provide them with more information about the advantages of each SRI compoents.

4.3.2.2.3. Constraints and opportunities

The recommended water application for irrigated rice cultivation is 5 cm depth 1 day after disappearance of flooded water. However, many farmers are unable to follow this recommended practice due to difficulties in controlling water flow and uncertain water availability, so they take even more whenever possible. Consecutive failure of the monsoon rains during the past 3 years has affected rice production severely through reduced water availability in rivers, tanks and ground water. Given the confluence of (a) water scarcity, (b) declining area under rice, and (c) continuing increase in population, raising rice productivity has become a serious concern to the government and rice scientists (Satyanarayana et al. 2007).

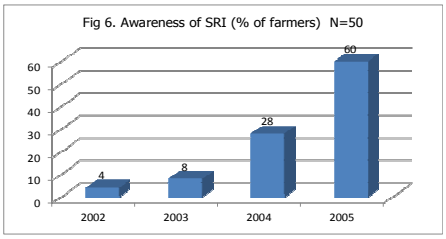
Throughout history humankind has been resistant to change and to the acceptance of new ideas. SRI is no exception. The many new techniques proposed by SRI are often greeted with scepticism by the farmer who has been cultivating rice for decades. Thus, farmers must first be convinced through demonstrations and training. The farmer should then try SRI in a small part of his rice crop, then build up from there. In major rice producing areas, labour shortages are becoming a serious problem. The partial mechanization introduced in SRI should be increased further to reduce labour requirements. In areas where agricultural labourers are still dependent on rice cultivation, efforts to train them in SRI are essential (Gujja and Thiyagarajan, 2009)l.

Some of the common problems faced by farmers in adopting SRI are:

- SRI demands more personal attention and constant involvement by farmers.
- Apprehensions about the new way of raising seedlings, handling young seedlings and square planting.

- Difficulties in leveling the main field properly
- Resistance of contract labourers to planting.
- Labour scarcity for transplanting.
- Drudgery of using a weeder.
- Unsuitability of weeder for some soils.
- Unavailability of weeders.
- Potential pest attack due to lush growth of the crop.

Efficient transfer of technologies and their adoption are key to achieve the developmental objectives like increasing productivity and production, achieving nutritional security etc. Still there exists a wide gap between the technology available at the research level and its adoption at farmer's level. A study conducted in Cuddalore District of TamilNadu revealed that half the proportion (50.67 per cent) of respondents had medium level of adoption followed by 38.00 per cent of the respondents who had low level of adoption. Only 11.33 per cent of the respondents had high adoption level. Out of eight major recommended nursery practices of SRI technology, maximum adoption level was found towards seed treatment with one packet of azospirillum and minimum adoption was observed towards application of 0.5% urea to enhance seedling growth. The study revealed that out of eleven major recommended main field practices of SRI technology, maximum adoption level was found towards first weeding at recommended time and minimum adoption was observed towards maintenance of 5 cm height water level (Balakrishnan and Vasanthakumar, 2010).



The study has revealed that the per hectare cost of cultivation is about 10 per cent lower in SRI than the conventional method. The logit framework has indicated that age, farm size, income of the farm, number of earners in the family and number of contacts with extension agencies are positive and highly influence the adoption behaviour of the farmers. Lack of skilled labour, awareness, training on new technology and experience have been opined as

the main problems in adoption of this technology by the farmers. To sum-up, farmers have been vastly benefited by SRI technology and it has helped them in their socio-economic upliftment. The adoption of SRI technique has helped increase the rice production without increasing the area under its cultivation and has proved to serve as an alternative method for rice cultivation (Sita Devi and Ponnarasi, 2009).

Study conducted by Johnson and Vijayaragavan (2011) revealed that farmers' awareness of SRI happened during 2004-05. It is evident that about 28 per cent farmers aware about SRI during 2004 and it has increased to 60 per cent in 2005. The sources of information include State Agricultural Universities (16 %), State Department of Agriculture (30 %), Friends and neighbours (16 %) and channels and media (38 %). The factors such as risk involved in adoption of new technology, shortage of agricultural labour, psychological fear of loss, poor resource among small and marginal farmers are the major factors responsible for non-adoption of SRI. One of the important issues in SRI adoption is discontinuance of SRI. It has been found that shortage of agricultural labour for timely operations, lack of co-operation from local community to develop drainage channels for alternate wetting and drying, lack of institutional support for subsidies, weed infestation due to wider spacing and difficulty in water management in delta regions are the major factors responsible for discontinuance in adoption (Johnson and Vijayaragavan, 2011)

It is also found that minimum seed requirement, low nursery duration, availability of subsidy, low nursery cost, reduced cost of cultivation, less labour requirement, and extension officals' motivation are the important factors drive adoption of SRI among farmers (Anjugam *et al.* 2008)

- Lack of awareness about the technology
- Lack of technical / institutional support
- Non availability of critical implements like marker and weeders
- Lack of co-operation from the transplanting labourers
- Traditional mindset of the farmers

A study conducted in western Tamil Nadu revealed that the farmers were used on an average 21kgs per acre (10 times higher than recommendation) mainly because of fear in expectation

of yield reduction due to low seed usage. Secondly, not all of them are effectively following the spacing because they are not able to use the markers due to flooding of water from canals and also it needs more labour. Thirdly, they used to plant 2 seedlings per hill rather than one per hill and transplanting seedlings at 20-25th day due to practical difficulties in demand for labour. SRI farmers used cono-weeder for two times followed by two manual weeding because of weed intensity and sprayed plant protection chemicals for one time. Overall, it indicates that there is much scope for further refinement in the technique and promotion according to the field conditions for better adoption among the farmers (Anjugam *et al.* 2008). Difficulty in use of cono-weeder and lack of technical support from the extension officials were the major two constraints faced by the farmers during the course of SRI adoption.

5. CONCLUSION AND POLICIES

It is evidenced from the experiences of studies conducted across the state, the SRI method of cultivation not only increased rice yield but also improves efficiency of water, land and labour use, reduced cost of cultivation and production and increases sustainability. Thus, SRI can play a major role in such a water scarce situation. The current crisis should serve as a timely wakeup call for governments, multilateral organisations and donors to refocus on agriculture. However, there is no need to invest in a second Green Revolution to feed the country in the face of a growing population and shrinking land base for agriculture. Promoting SRI through a sustained campaign must be the most desirable option available now.

We make the following policy suggestions:

- The present system of upscaling and mainstreaming of SRI adoption may be continued through different schemes.

- Though there are few studies carried out to study the adoption, constraints in adoption in the state, still there is a big gap in the literature about the issues in adoption of SRI among the farmers. Therefore, it is necessary to have a comprehensive study to study on the level of adoption of SRI, the factors which limit or enhance the adoption of SRI, the private and social impact of wider adoption of SRI, and identifying policy

options which would help to achieve up-scaling and mainstreaming wider adoption of SRI. Thus, a thorough and detailed exploratory study should be carried out covering the entire state across different production environments.

- The scientists feel that the management practices in SRI are seldom static and must often be adjusted to soil and environmental conditions. There is a need to understand, standardize and propagate interactions between crop varieties, environmental conditions and crop management practices. Thus more resources may be divereted for R&D activities.

- Establish a systematic strategy for effective implementation, large scale capacity building and research backup. This should involve close collaboration among the state agricultural departments, agricultural universities, and public works departments.

- Promote direct seeding with a drum seeder and machine planting (with suitable modifications) where labour scarcity limits SRI adoption.

- Provide farmers with subsidies for adopting SRI and incentives for saving water.

- Field demonstrations, Field days and more exposure visits may be organised

REFERENCES

Alagesan, V and M.N.Budhar (2009). System of Rice Intensification: Exploring the level of Adoption and Problems of Discontinuance, IRRN, 2009. Pp1-3.

Anjugam, M, S.Varatha Raj and S.Padmarani (2008). Cost-Benefit Analysis of SRI technique in Paddy Cultivation, Department of Agricultural Economics, CARDS, TNAU, Coimbatore.3

Balasubramainan, V, R.Rajendran, V.Ravi, N.Chellaiah, E.Castro, B.Chandrasekaran, T.Jayaraj and S.Ramanathan (2005). Integrated Crop Management for Enhancing yield, factor productivity and profitability in Asian Rice Farms. Paper presented at the FAO Vietnam Consultation Workshop on Rice Integrated Crop Management Systems-Rice Check Methdodology for Food Security, Livelihood Improvement and Environmental Conservation, Ho Chi Minh, 28 Feb – 2 March, 2005.

Balakrishnan, T and J.Vasanthakumar (2010). Adoption of System of Rice Intensification (SRI) Technology among farmers in Cuddalore District of Tamil Nadu, Journal of Global Communication, 3 (2): 62-65.

Barah, B.C. (2009). Economic and Ecological Benefits of System of Rice Intensification (SRI) in Tamil Nadu, Agricultural Economics Research Review, 22 : 209-214.

Bouman, B., *et al*. 2007. Rice: feeding the billions. In: Molden, D. (ed). *Comprehensive Assessment of Water Management in Agriculture. Water for Food, Water for Life: A Comprehensive Assessment of Water Management in Agriculture.* Earthscan, London and International Water Management Institute, Colombo.

Centre for Agricultural and Rural development Studies (CARDS), Rice Scientist Meet 2011, Tamil Nadu Agricultural University, Coimbatore.3.

Chandrasekaran M, D.Suresh Kumar, K.Govindarajan, M.Anjugam, and K.Palanisami. Dynamics of Input Use in Tamil Nadu Agriculture, (Coimbatore: Tamil Nadu Agricultural University), 2008.

Fertilizer Association of India (2009-10). Fertilizer Statistics 2009-10, Fertilizer Association of India, New Delhi.

Government of Tamil Nadu (2007-08). Tamil Nadu Irrigated Agriculture Modernisation and Water bodies Restoration and Management Project (TN-IAMWARM), Annual Report, 2007-08, Water Resources Organisation, Chennai.

Gujja, Bikshyam and T.M.Thiyagarajan (2009). New Hope for Indian Food Security? The System of Rice Intensification, Gatekeeper Series, No.143, International Institute for Environment and Development (IIED), London.

http://www.tn.gov.in/policynotes/default.htm

ICRISAT-WWF Project, (2009). SRI Fact Sheet, International Crops Research Institute for Semi-Arid Tropics, India.

Johnson, B and K.Vijayaragavan (2011). Diffusion of System of Rice Intensification (SRI) across Tamil Nadu and Andhra Pradesh in India, Indian Research Journal of Extension Education, 11 (3): 72-79.

Krishnan, J. (2008). SRI in Tamil Nadu : A Status Report, GEO Foundation, salem, Tamil Nadu, India.

Palanisami K, Paramasivam P (2000) Water scenario in Tamil Nadu—present and future. In: Kannaiyan S, Ramasamy C (eds) Agriculture 2000. Tamil Nadu Agricultural University, Coimbatore, pp 36–46

Pandian, B.J. (2010). Review of Experiences and Lessons on SRI in Tamil Nadu. Paper Presented at the National Workshop on “SRI in India-Stock-taking and Future Directions in the context of Food Security and Climate Change, WWF-ICRISAT Project, Patancheru, 21-22 December 2010.

Pandian, B.J, D.Rajakumar and S.Chellamuthu (2011). System of Rice Intensification: A Synthesis of Scientific Experiments and Experiences, Tamil Nadu Agricultural University, Coimbatore.3.

Rajendran, R, V.Ravi, S.Ramanathan, B.Chandrasekaran, T.Jayaraj and V.Balasubramanian (2005). Evaluation of Selected crop Management Components for Enhancing Rice Productivity and Profitability in Tamil Nadu, India In TM.Thiyagarajan, Hengsdijk, H and PS Bindraban (eds) Transitions in Agriculture for Enhancing Water Productivity: Proceedings of an International Symposium held in Killikulam, Tamil Nadu, India, September 23-25, 2003. Tamil Nadu Agricultural Unievsrity, Coimbatore and Plant Research International, Wageningen, Netherlands.

Ramasamy,C. T.R.Shanmugam and D.Suresh Kumar (1993). "Constraints to Higher Rice Yields in Different Rice Production Environments and Prioritisation of Rice Research in Southern India", Department of Agricultural Economics, TNAU, Coimabtore.3.

Satyanarayana, A, T.M.Thiyagarajan and Normal Uphoff. (2007). Opportunities for Water Saving with Higher Yield from the System of Rice Intensification, Irrigation Science, 25: 99-115.

Senthilkumar,K, P.S.Bindraban, T.M.Thiyagarajan, N.de Ridder and K.E.Giller (2008). Modified Rice Cultivation in Tamil Nadu, India: Yield gains and Farmers (lack of) Acceptance, Agricultural Systems, 98: 82-94.

Shanmugam, T.R, K.Mahendran, S.Usha Nandhini and Shibi Sebastian. (2007). Impact Assessment of Agrcultural Research and Technology in Addressing Rice Productivity Constrains in Tamil Nadu, Department of Agricultural Economics, CARDS, TNAU, Coimbatore.3.

Sita Devi, K and T.Ponnarasi (2009). An Economic Analysis of Modern Rice Production Technology and its Adoption Behaviour in Tamil Nadu, Agricultural Economics Research Review, 22 : 341-347.

Thiyagarajan, TM., *et al.* 2005. Evaluation of water saving irrigation and weeder use on the growth and yield of rice. In: TM. Thiyagarajan, H. Hengsdijk, and PS. Bindraban (eds). *Transitions in Agriculture for Enhancing Water Productivity: Proceedings of an International Symposium held in Killikulam, Tamil Nadu, India, September 23-25, 2003*. Tamil Nadu Agricultural University, Coimbatore, and Plant Research International, Wageningen, Netherlands.

TN-IAMWARM (2008). Annual Report of Tamil Nadu Irrigated Agriculture Modernisation and Water bodies Restoration and Management (TN-IAMWARM) project, Water Technology Centre, Tamil Nadu Agricultural University, Coimbatore.

TN-IAMWARM (2009). Annual Report of Tamil Nadu Irrigated Agriculture Modernisation and Water bodies Restoration and Management (TN-IAMWARM) project, Water Technology Centre, Tamil Nadu Agricultural University, Coimbatore.

Uphoff, N. 2005. Possible explanations for the productivity gains achieved with the System of Rice Intensification. In: TM. Thiyagarajan, H. Hengsdijk, and PS. Bindraban (eds). *Transitions in Agriculture for Enhancing Water Productivity: Proceedings of an International Symposium held in Killikulam, Tamil Nadu, India, September 23-25, 2003*. Tamil Nadu Agricultural University, Coimbatore, and Plant Research International, Wageningen, Netherlands.

Water Technololgy Centre. 2009. Report on the Implementation of SRI in Phase I and II Sub-basins under TN-IAMWARM Project. Tamil Nadu Agricultural University, Coimbatore.

WWF. 2007. *More Rice with Less Water - System of Rice Intensification*, World Wide Fund for Nature, Gland. Available at www.panda.org.

ANNEXURES

Annexure:1. Package of practices for SRI

Following are the Integrated Crop Management (ICM) practices for - Rice (SRI) :

Season : Dry season with assured irrigation is more suitable. Difficulty in crop establishment may be seen in areas with heavy downpour (NE Monsoon periods of Tamil Nadu)

Varieties : Hybrids and varieties with profuse tillering capacity

Nursery

Seed rate : 7- 8 kg for single seedling per hill, 12 -15 kg for two seedlings per hill wherever difficulty in establishment of rice is foreseen

Mat nursery preparation

Preparation of nursery area : Prepare 100 m^2 nurseries to plant 1 ha. Select a level area near the water source. Spread a plastic sheet or used polythene gunny bags on the shallow raised bed to prevent roots growing deep into soil.

Preparation of soil mixture : Four (4) m3 of soil mix is needed for each 100 m2 of nursery. Mix

70% soil + 20% well-decomposed pressmud / bio-gas slurry / FYM + 10% rice hull. Incorporate in the soil mixture 1.5 kg of powdered di -ammonium phosphate or 2 kg 17-17-17 NPK fertilizer.

Filling in soil mixture : Place a wooden frame of 0.5 m long, 1 m wide and 4 cm deep divided into 4 equal segments on the plastic sheet or banana leaves. Fill the frame almost to the top with the soil mixture.

Pre-germinating the seeds 2 days before sowing : Soak the seeds for 24 h, drain and incubate the soaked seeds for 24 h, sow when the seeds sprout and radical (seed root) grows to 2-3 mm long.

Sowing : Sow the pre-germinated seeds weighing 90 -100 g / m-2 (100g dry seed may weigh 130g after sprouting) uniformly and cover them with dry soil to a thickness of 5mm. Sprinkle water immediately using rose can to soak the bed and remove the wooden frame and continue the process until the required area is completed.

Watering : Water the nursery with rose can as and when needed (twice or thrice a day) to keep the soil moist. Protect the nursery from heavy rains for the first 5 DAS. At 6 DAS, maintain thin film of water all around the seedling mats. Drain the water 2 days before removing the seedling mats for transplanting.

Spraying fertilizer solution (optional) : If seedling growth is slow, sprinkle 0.5% urea + 0.5% zinc sulfate solution at 8-10 DAS.

Lifting seedling mats : Seedlings reach sufficient height for planting at 15 days. Lift the seedling mats and transport them to main field.

Main field preparation

- Perfect leveling is a pre-requisite for the water management proposed hereunder

Transplanting

- 1-2 seedlings of 15 days old
- Square planting of 22.5 x 22.5 cm (9 x 9 inch)
- Fill up the gaps between 7th and 10th DAT.
- Transplant within 30 minutes of pulling out of seedlings.
- There may be difficulty in crop establishment in areas with heavy downpour (North East
- Monsoon periods of Tamil Nadu)

Irrigation management

- Irrigation only to moist the soil in the early period of 10 days
- Restoring irrigation to a maximum depth of 2.5cm after development of hairline cracks in the
- soil until panicle initiation
- Increasing irrigation depth to 5.0cm after PI one day after disappearance of ponded water

Weed management

- Using rotary weeder / Cono weeder
- Moving the weeder with forward and backward motion to bury the weeds and as well to aerate the soil at 7-10 days interval from 10-15 days after planting on either direction of the rows and column. Manual weeding is also essential to remove the weeds closer to rice root zone.

Nutrient management

- As is being recommended for TRS
- Use of LCC has more advantage in N management.
- Green manure and farm yard manure application will enhance the growth and yield of rice in this system approach.

Anexure.2. District wise details of physical target and achievement of procurement of paddy seeds under Seed multiplication scheme

(tonnes)

Sl. No.	District	2006-07		2007-08		2008-09		2009-10		2010-11	
		Target	Achv	Target	Achv	Target	Achv	Target	Achv	Target	Achv
1.	Kancheepuram	1233	1232.000	1200	1268.762	1200	1204.3	1200	1208	1200.00	1221.00
2.	Thiruvallur	1100	1112.000	1100	1060.900	1100	1180	1100	1262	1100.00	1309.00
3.	Cuddalore	1020	1149.750	1100	801.940	1100	1018.7	1100	1169	1100.00	1330.45
4.	Villupuram	1428	1280.327	1300	725.440	1300	960.735	1300	1462	1300.00	1738.13
5.	Vellore	550	679.000	600	640.000	600	542.07	600	757	600.00	650.73
6.	T.V.Malai	1028	1094.000	1000	869.8	1000	1256.8	1000	1282	1000.00	1398.49
7.	Salem	425	427.138	440	417.450	440	375.832	440	449	440.00	400.99
8.	Namakkal	250	250.322	230	235.600	230	230.195	230	231	230.00	230.45
9.	Dharmapuri	228	205.681	230	220.400	230	291.86	230	146	230.00	249.35
10.	krishnagiri	264	362.000	270	169.038	270	257.15	270	322	270.00	351.28
11.	Coimbatore	86	128.112	80	56.402	80	80	80	93	35.00	21.00
12.	Thiruppur	0	0	0	0	0	0	0	0	97.00	47.88
13.	Erode	479	485.392	480	480.415	480	550.935	480	379	428.00	471.49
14.	Trichy	625	851.870	700	737.601	700	782.23	700	898	700.00	924.74
15.	Perambalur	403	447.700	400	318.690	400	418.75	400	470	120.00	529.85
16.	Ariyalur	0	0	0.00	0.00	0	0	0.00	0.00	280.00	0.00
17.	Karur	157	137.660	160	154.176	160	13.9	160	116	160.00	95.14

18.	Pudukkotai	850	917.815	850	169.130	850	867.635	850	699	850.00	1031.36
19.	Thanjavur	1465	1494.042	1500	1043.662	1500	1426	1500	1432	1500.00	1286.00
20.	Nagapattinam	1407	1572.269	1500	1369.000	1500	1752	1500	1681	1500.00	1729.02
21.	Thiruvarur	1444	1700.750	1500	1532.128	1500	1105.16	1500	1604	1500.00	1589.91
22.	Madurai	665	641.625	700	494.500	700	740.895	700	710	700.00	541.65
23.	Theni	170	163.930	170	120.270	170	179.05	170	175	170.00	175.16
24.	Dindigul	245	261.547	240	275.199	240	255.546	240	226	240.00	319.28
25.	Ramnad	550	398.400	400	220.490	400	397.159	400	489	400.00	417.73
26.	Sivaganga	500	391.840	300	255.815	300	306.18	300	354	300.00	334.51
27.	Virudunagar	300	291.016	350	341.663	350	90.7	350	352	350.00	394.56
28.	Tirunelveli	732	750.960	800	383.640	800	1023.79	800	836	800.00	813.51
29.	Tuticorin	187	185.650	200	236.070	200	246	200	265	200.00	275.35
30.	Kanyakumari	211	211.900	200	202.000	200	202	200	205	200.00	203.00
31.	DA Office	0	0	0	0	0	0	0	0	0.00	0.00
32.	Reserve	0	0	0	0	0	0	0	0	0.00	0.00
	TOTAL	**18000**	**18222.416**	**18000**	**14800.181**	**18000**	**17755.572**	**18000**	**19271**	**18000.00**	**20081.00**

Anexure.3. District wise details of physical target and achievement of distribution of paddy seeds under Seed multiplication scheme

(tonnes)

Sl. No.	District	2006-07		2007-08		2008-09		2009-10		2010-11	
		Target	Achv	Target	Achv	Target	Achv	Target	Achv	Target	Achv
1	Kancheepuram	1232	1232.000	1200	1219.781	1200	1215.600	1200	1222	1200.00	1618.00
2	Thiruvallur	1100	1103.000	1100	1052.090	1100	1116.030	1100	1260	1100.00	1120.00
3	Cuddalore	1020	970.300	1100	1078.910	1100	955.810	1100	1102	1100.00	1230.10
4	Villupuram	1428	1162.400	1300	1041.187	1300	890.402	1300	1312	1300.00	1321.00
5	Vellore	550	552.500	600	714.720	600	585.083	600	633	600.00	573.58
6	T.V.Malai	1028	893.940	1000	791.054	1000	1036.658	1000	949	1000.00	1138.00
7	Salem	425	402.490	440	403.083	440	316.324	440	395	440.00	438.09
8	Namakkal	250	204.104	230	249.420	230	217.713	230	231	230.00	194.22
9	Dharmapuri	228	201.563	230	256.061	230	209.181	230	255	230.00	277.88
10	krishnagiri	263	246.863	270	324.905	270	232.475	270	299	270.00	287.26
11	Coimbatore	85	78.381	80	72.873	80	45.000	80	65	35.00	16.00
	Thiruppur	0	0	0.00	0.00	0	0	0	0	97.00	105.83
12	Erode	479	408.188	480	473.181	480	452.871	480	520	428.00	440.42
13	Trichy	625	626.244	700	726.375	700	660.020	700	653	700.00	811.12
14	Perambalur	403	351.320	400	442.136	400	365.220	400	433	120.00	570.95
	Ariyalur	0	0	0.00	0.00	0	0	0.00	0.00	280.00	0.00
15	Karur	156	157.396	160	172.420	160	170.365	160	174	160.00	162.58

16	Pudukkotai	850	800.718	850	849.485	850	678.620	850	793	850.00	715.96
17	Thanjavur	1465	1670.630	1500	1417.029	1500	1031.000	1500	1525	1500.00	1531.00
18	Nagapattinam	1407	1506.001	1500	1620.000	1500	1587.000	1500	1735	1500.00	1520.00
19	Thiruvarur	1444	1446.415	1500	1555.525	1500	1504.595	1500	1501	1500.00	1502.94
20	Madurai	665	707.100	700	737.455	700	552.508	700	708	700.00	670.55
21	Theni	170	141.480	170	134.950	170	135.925	170	180	170.00	140.24
22	Dindigul	245	222.280	240	298.259	240	262.935	240	238	240.00	270.60
23	Ramnad	550	363.845	400	417.500	400	286.804	400	387	400.00	486.96
24	Sivaganga	500	392.135	300	416.167	300	248.000	300	315	300.00	465.54
25	Virudunagar	300	301.540	350	317.252	350	294.337	350	346	350.00	465.54
26	Tirunelveli	732	718.273	800	793.640	800	801.980	800	837	800.00	785.31
27	Tuticorin	187	197.580	200	258.760	200	222.000	200	340	200.00	269.35
28	Kanyakumari	210	208.960	200	202.000	200	143.150	200	198	200.00	175.55
	DA Office	0	0	0.00	0.00	0	0	0	0	0.00	0.00
	Reserve	0	0	0.00	0.00	0	0	0	0	0.00	0.00
	TOTAL	**18000**	**17267.646**	**18000**	**18036.218**	**18000**	**16217.606**	**18000**	**18609**	**18000.00**	**19304.56**

Annexure:4. Financial target and achievement of Seed Multiplication scheme

(Rs in lakhs)

Sl. No.	District	2006-07		2007-08		2008-09		2009-10		2010-11	
		Target	Achv	Target	Achv	Target	Achv	Target	Achv	Target	Achv
1	Kancheepuram	95.840	95.710	122.324	133.824	151.040	149.282	189.45	189.14	225.270	225.231
2	Thiruvallur	155.420	155.264	139.154	152.042	165.340	113.150	193.49	194.18	231.045	223.711
3	Cuddalore	89.800	89.318	132.446	143.203	122.000	121.564	205.32	204.37	213.811	213.797
4	Villupuram	92.212	92.338	105.515	120.709	127.300	129.915	214.88	219.54	250.940	251.332
5	Vellore	63.390	64.387	96.655	101.639	100.000	100.300	107.89	117.81	159.396	159.364
6	T.V.Malai	94.960	92.850	123.244	134.681	159.390	159.394	171.13	169.97	213.406	220.303
7	Salem	40.147	40.098	59.757	55.862	60.860	60.826	84.75	84.34	86.900	86.636
8	Namakkal	25.860	25.749	34.476	36.553	34.550	34.534	39.70	39.33	39.930	39.907
9	Dharmapuri	22.645	22.640	36.645	36.605	55.200	54.903	57.72	57.48	47.400	47.397
10	krishnagiri	39.470	39.453	30.570	33.480	49.500	49.227	69.73	69.71	72.233	72.215
11	Coimbatore	14.730	15.339	22.964	15.469	20.348	20.000	19.80	19.36	8.073	7.981
	Thiruppur	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	27.990	26.969
12	Erode	45.200	45.051	85.260	69.852	95.513	94.426	101.89	96.04	104.800	92.971
13	Trichy	91.031	91.079	84.135	92.283	119.693	119.624	134.15	134.13	227.205	227.204
14	Perambalur	37.970	37.955	49.451	53.218	60.455	60.996	66.95	66.97	107.790	107.910
	Ariyalur	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

15	Karur	17.930	17.863	26.634	28.120	30.630	29.287	30.79	29.93	49.875	49.842
16	Pudukkotai	77.020	77.014	73.834	73.513	131.800	131.109	192.97	192.80	212.026	211.960
17	Thanjavur	137.943	137.938	159.633	159.419	195.500	191.076	239.53	239.52	312.250	312.214
18	Nagapattinam	167.160	169.755	148.274	158.523	273.040	219.000	421.46	422.58	315.779	314.583
19	Thiruvarur	133.476	131.443	204.274	225.060	187.592	186.907	274.39	274.69	302.241	302.150
20	Madurai	62.415	62.427	108.050	86.349	126.650	127.388	123.72	122.04	141.030	140.888
21	Theni	16.760	16.792	24.665	26.124	27.890	27.901	43.40	43.53	34.050	34.005
22	Dindigul	28.754	28.665	32.909	33.695	44.975	44.797	42.25	42.19	49.660	49.644
23	Ramnad	32.850	32.360	27.537	31.949	62.200	62.487	80.68	80.60	117.743	117.577
24	Sivaganga	40.370	40.319	33.965	37.316	54.725	56.946	75.75	83.86	108.410	109.374
25	Virudunagar	44.230	44.269	45.267	52.921	62.910	18.426	71.95	71.96	68.227	68.175
26	Tirunelveli	71.390	71.689	101.957	93.974	138.585	131.230	142.20	140.77	166.350	166.042
27	Tuticorin	23.120	21.398	27.340	26.677	55.130	54.938	85.12	85.09	73.300	73.055
28	Kanyakumari	20.250	20.238	29.636	24.799	23.610	23.472	32.59	32.46	42.050	41.934
29	D.A. Office	96.608	**96.608**	151.400	151.271	139.296	**0.000**	130.61	130.44	134.220	134.060
30	Reserve			0.000	0.000	0.000	138.000	0.00	0.00	0.000	0.000
	TOTAL	**1878.950**	**1876.009**	**2317.971**	**2389.130**	**2875.724**	**2711.104**	**3644.27**	**3654.84**	**4143.400**	**4128.431**

Annexure:5. Physical target and achievement of Organising Seed Farms

(Hectares)

Sl. No.	District	2006-07		2007-08		2008-09		2009-10		2010-11	
		Target	Achv	Target	Achv	Target	Achv	Target	Achv	Target	Achv
1	Kancheepuram	494	494	400	428.000	480	283.820	480	515	480	484
2	Thiruvallur	440	440	360	257.200	440	487.200	440	489	440	441
3	Cuddalore	408	408	360	429.400	440	540.520	440	671	440	606
4	Villupuram	571	571	440	416.900	520	440.700	520	504	520	730
5	Vellore	220	220	190	233.400	240	300.800	240	263	240	292
6	T.V.Malai	411	411	335	306.800	400	472.140	400	719	400	573
7	Salem	170	170	156	96.800	176	143.440	176	160	176	133
8	Namakkal	100	100	82	68.900	92	76.200	92	90	92	68
9	Dharmapuri	90	90	82	100.200	92	146.400	92	113	92	138
10	krishnagiri	106	106	98	81.000	108	116.800	108	131	108	134
11	Coimbatore	34	34	32	27.600	32	0.000	32	34	14	12
	Thiruppur									38	31
12	Erode	192	192	182	190.400	192	207.200	192	177	172	167
13	Trichy	250	250	270	294.440	280	322.540	280	508	280	1024
14	Perambalur	161	161	140	166.800	160	224.070	160	209	48	211
	Ariyalur									112	0

15	Karur	63	63	59	84.000	64	116.400	64	83	64	74
16	Pudukkotai	340	340	300	304.800	340	312.800	340	318	340	352
17	Thanjavur	586	586	480	402.000	600	638.000	600	405	600	561
18	Nagapattinam	563	563	480	639.000	600	360.105	600	944	600	1064
19	Thiruvarur	577	577	480	644.240	600	868.330	600	913	600	829
20	Madurai	266	266	260	262.500	280	260.600	280	319	280	302
21	Theni	68	68	68	49.400	68	77.400	68	65	68	70
22	Dindigul	98	98	86	84.600	96	102.000	96	110	96	100
23	Ramnad	220	220	160	171.000	160	362.400	160	216	160	217
24	Sivaganga	200	200	120	133.600	120	192.000	120	159	120	230
25	Virudunagar	120	120	140	142.600	140	162.600	140	147	140	174
26	Tirunelveli	293	293	280	348.800	320	298.200	320	326	320	353
27	Tuticorin	75	75	80	91.000	80	152.600	80	111	80	113
28	Kanyakumari	84	84	80	0.000	80	82.280	80	205	80	68
	TOTAL	7200	7200	6200	6455.380	7200	7747.545	7200	8903	7200	9550

Annexure:6. Physical target and achievements of Paddy Seed Stock position

(Tonnes)

Sl. No.	District	2006-07		2007-08		2008-09		2009-10		2010-11	
		Target	Achv	Target	Achv	Target	Achv	Target	Achv	Target	Achv
1	Kancheepuram	1232	1232.000	6930	3390.126	7470	1716	2360	4415	2465	6427
2	Thiruvallur	1100	1103.000	4680	3569.638	4840	2497	1535	4400	1597	4622
3	Cuddalore	1020	970.300	5645	3542.4	6100	2908	1957	2291	2013	3347
4	Villupuram	1428	1162.400	7225	3524.76	8500	1789	2683	1878	2805	2522
5	Vellore	550	552.500	5115	1563.6	3180	971	820	923	1023	900
6	T.V.Malai	1028	893.940	4520	3260.389	5750	1862	1729	1510	1898	1762
7	Salem	425	402.490	2645	655.754	2150	588	660	828	710	774
8	Namakkal	250	204.104	1500	406.01	1400	319	375	402	446	302
9	Dharmapuri	228	201.563	1560	656.061	1400	304	406	418	396	668
10	krishnagiri	263	246.863	1145	752.355	1380	951	450	394	452	766
11	Coimbatore	85	78.381	705	545.873	690	145	155	1518	86	2918
	Thiruppur									256	106
12	Erode	479	408.188	2365	2296.091	2735	1133	893	4359	789	2934
13	Trichy	625	626.244	3397	2460.375	3675	2225	1150	1647	1213	2379

14	Perambalur	403	351.320	2305	990.136	2550	1455	678	593	251	937
	Ariyalur									591	0
15	Karur	156	157.396	845	406.42	880	840	261	392	290	345
16	Pudukkotai	850	800.718	4260	2385.485	4400	2419	1497	2886	1477	3154
17	Thanjavur	1465	1670.630	9100	6397.029	8750	5231	2965	4946	2921	4469
18	Nagapattinam	1407	1506.001	8520	6690.93	8570	4695	2772	8485	2818	3720
19	Thiruvarur	1444	1446.415	7898	6313.525	8475	7867	2640	8402	2828	3414
20	Madurai	665	707.100	4280	1701.455	3250	2733	1053	1978	1073	4878
21	Theni	170	141.480	1230	486.65	1000	647	277	1167	330	400
22	Dindigul	245	222.280	1785	883.439	1155	381	370	864	381	429
23	Ramnad	550	363.845	6450	2717.5	6400	1133	2129	2563	2145	3432
24	Sivaganga	500	392.135	4675	764.167	1700	730	1480	1420	1469	2098
25	Virudunagar	300	301.540	1480	547.252	4450	709	569	684	561	933
26	Tirunelveli	732	718.273	4795	2258.24	4600	6692	1541	3320	1518	2918
27	Tuticorin	187	197.580	760	1062.76	950	647	446	658	314	390
28	Kanyakumari	210	208.960	1685	765	1100	673	322	375	363	179
	TOTAL	**18000**	**17267.646**	**107500**	**61883.23**	**107500**	**54260**	**34170**	**63718**	**35475**	**62122**

Annexure:7. Target and Achievement of Hybrid Rice Programme

(Acres)

Physical													
S.No	Particulars	2006-07		2007-08				2008-09		2009-10		2010-11	
		Target	Achiev	Target		Achieve		Target	Achiev	Target	Achieve	Target	Achieve
				SSF		Private							
1	Kancheepuram	..	..	1.00	0.50	8.00	8.00	..	..	..	..	..	..
2	Tiruvallur	..	..	1.00	1.00	8.00	8.00	..	..	..	..	..	..
3	Cuddalore	..	..	2.00	2.00	0.00	0.00	..	..	..	..	..	..
4	Villupuram	..	..	2.00	2.00	0.00	0.00	..	..	..	..	..	..
5	Vellore	..	..	0.00	0.00	5.00	5.00	..	..	..	..	..	..
6	Tiruvannamalai	..	..	1.00	1.00	8.00	8.00	..	..	..	..	..	..
7	Salem	..	..	1.00	1.00	15.00	0.00	..	..	..	..	..	..
8	Namakkal	..	..	..	..	..	..	..	..	..	..	..	..
9	Dharmapuri	..	..	0.00	0.00	8.00	3.00	..	..	..	..	..	..
10	Krishnagiri	..	..	0.00	0.00	8.00	6.00	..	..	..	..	..	..
11	Coimbatore	..	..	0.00	0.00	15.00	0.00	..	..	..	..	..	..
12	Erode	..	..	1.00	6.00	15.00	10.00	..	..	..	..	..	..
13	Tiruppur	..	..		..	..	..	..	..	..	..	..	..
14	Tiruchirappalli	..	..	0.00	0.00	8.00	8.00	..	..	..	..	..	..
15	Perambalur	..	..	..	..	..	..	..	..	..	..	..	..
16	Airyalur	..	..	..	..	..	..	..	..	..	..	..	..
17	Karur	..	..	..	..	..	..	..	..	..	..	..	..
18	Pudukkottai	..	..	2.00	1.50	5.00	0.00	..	..	..	..	..	..
19	Thanjavur	..	..	..	..	..	..	..	..	..	..	..	..
20	Nagapattinam	..	..	..	..	..	..	..	..	..	..	..	..
21	Thiruvarur	..	..	1.00	1.00	0.00	0.00	..	..	..	..	..	..
22	Madurai	..	..	..	..	..	..	..	..	..	..	..	..

23	Theni	..	..	1.00	0.00	0.00	1.00	..	..	..	..	..	..
24	Dindigul	..	..	0.00	0.00	5.00	4.00	..	..	..	..	..	..
25	Ramanathapura	..	..	..	..	..	..	..	..	..	..	..	..
26	Sivaganga	..	..	..	..	..	..	..	..	..	..	..	..
27	Virdhunagar	..	..	..	..	..	..	..	..	..	..	..	..
28	Tirunelveli	..	..	..	..	..	..	..	..	..	..	..	..
29	Thoothukudi	..	..	..	..	..	..	..	..	..	..	..	..
30	Kanyakumari	..	..	..	..	..	..	..	..	..	..	..	..
31	The Nilgiris	..	..	..	..	..	..	..	..	..	..	..	..
	Total	..	..	13.00	16.00	108.00	61.00	..	..	..	..	..	..

Annexure:8. Physical Target and Achievement of Production of Blue Green Algae

(tonnes)

S.No	Particulars	2006-07		2007-08		2008-09		2009-10		2010-11	
		Target	Achieve	Target	Achieve	Target	Achieve	Target	Achieve	Target	Achieve
1	Kancheepuram	45	45.000	45	30.000	45	45	45	45	45	45
2	Tiruvallur	40	40.000	40	40.000	40	40	40	40	40	40
3	Cuddalore	45	45.000	45	45.000	45	45	45	45	45	45
4	Villupuram	40	40.000	40	40.000	40	40	40	40	40	40
5	Vellore	0	0.000	..	..	-	-	-	-	0	-
6	Tiruvannamalai	20	20.000	20	20.000	20	20	20	20	20	20
7	Salem	25	25.000	25	25.000	25	25	25	25	25	25
8	Namakkal	..	..	..	..	..	..	-	-	0	-
9	Dharmapuri	..	..	..	..	..	..	-	-	0	-
10	Krishnagiri	..	..	..	..	..	..	-	-	0	-
11	Coimbatore	..	..	..	..	..	..	-	-	0	-
12	Erode	30	30.000	..	..	40	33	40	33	40	40
13	Tiruppur			..	..	..	..	-	-	0	-
14	Tiruchirappalli	20	20.000	30	30.000	30	30	30	30	30	30
15	Perambalur			20	20.000	..	..	-	-	0	-
16	Airyalur			..	..	..	..			0	-
17	Karur	20	20.000	..	..	..	..	-	-	0	-
18	Pudukkottai	10	10.000	20	20.000	10	10	10	10	10	10
19	Thanjavur	70	70.000	10	10.000	70	70	70	70	70	70
20	Nagapattinam	40	40.000	70	65.000	40	40	40	40	40	40
21	Thiruvarur	45	45.000	40	40.000	45	45	45	45	45	45
22	Madurai	25	25.000	45	45.000	25	25	25	25	25	25
23	Theni	10	10.000	25	25.000	10	10	10	10	10	10

24	Dindigul	..	..	10	10.000	..	..	-	-	0	-
25	Ramanathapura	..	..	..	..	..	..	-	-	0	-
26	Sivaganga	..	..	..	..	..	..	-	-	0	-
27	Virdhunagar	10	10.000	..	..	10	10	10	10	10	10
28	Tirunelveli	30	30.000	10	10.000	30	32	30	32	30	30
29	Thoothukudi	..	..	30	21.500	..	..	-	-	0	-
30	Kanyakumari	..	..	..	..	..	..	-	-	0	-
31	The Nilgiris			..	..	..	..	..	..	-	-
	Total	525	525	525.000	496.500	525	520	525	520	525	525

Annexure:9. Financial target and achievement of Blue Green Algae production (Rs. In lakhs)

S.No	Particulars	2006-07		2007-08		2008-09		2010-11		2010-11	
		Target	Achieve	Target	Achieve	Target	Achieve	Target	Achieve	Target	Achieve
1	Kancheepuram	0.783	0.7830	0.787	0.787	0.803	0.803	1.085	1.085	0.840	0.840
2	Tiruvallur	0.664	0.6640	0.664	0.664	0.686	0.686	1.100	1.100	0.810	0.810
3	Cuddalore	0.747	0.7470	0.747	0.747	0.771	0.771	1.258	1.258	1.230	1.240
4	Villupuram	0.664	0.6640	0.664	0.664	0.686	0.686	1.022	1.043	1.100	1.100
5	Tiruvannamalai	0.332	0.3320	0.332	0.332	0.343	0.343	0.372	0.372	0.360	0.356
6	Salem	0.469	0.4690	0.475	0.475	0.522	0.518	0.535	0.585	0.550	0.550
7	Erode	0.249	0.4320	0.498	0.498	0.514	0.514	0.814	0.556	0.870	0.587
8	Tiruchirappalli	0.332	0.3320	0.322	0.322	0.343	0.686	0.588	0.588	0.650	0.650
9	Karur	0.332	0.3320	0.322	0.322	0.343					
10	Pudukkottai	0.166	0.1660	0.166	0.166	0.171	0.171	0.166	0.166	0.180	0.178
11	Thanjavur	3.352	4.7049	4.785	4.785	4.570	4.642	6.270	5.198	7.820	2.690
12	Nagapattinam	0.664	0.6640	0.664	0.664	0.686	0.540	0.664	0.664	0.900	0.900
13	Thiruvarur	0.747	0.7470	0.747	0.747	0.771	0.254	0.747	0.747	0.740	0.747
14	Madurai	0.435	0.4300	0.435	0.435	0.460	0.460	0.455	0.455	0.480	0.415
15	Theni	0.166	0.1660	0.166	0.166	0.171	0.171	0.166	0.166	0.180	0.178
16	Virdhunagar	0.166	0.0830	0.166	0.166	0.171	0.170	0.186	0.145	0.180	0.178
17	Tirunelveli	1.984	0.4360	0.538	0.538	0.577	0.577	1.110	1.110	0.910	0.879
18	DA’s office	2.768	2.4300	6.492	6.492	6.061	3.448	6.372	4.385	6.450	4.171
	Total	15.02	14.5819	18.970	18.970	18.650	15.440	22.910	19.623	24.250	16.469

Year wise Data - Physical

Particulars	2008-09		2009-10		2010-11	
	Target	Acht	Target	Acht	Target	Acht
Demonstration of Improved package of practices @ Rs.2500/Demn of 0.4 Ha (at every 100 Ha area of rice)	600	850	1060	1060		
Demonstration of System of Rice Intensification @ Rs.3000/Dem of 0.4 Ha. (at every 100 Ha area)	1200	1535.00	353	353	2000	2000
Support for promotion of Hybrid Rice Seed a) Assistance for production of Hybrid Rice Seed @ Rs. 1000/Qtl or 50% of the cost whichever is less (for 10% area of rice)	3504.00	5.65	800	8.000		
Hybrid Rice Demonstration Rs.3000/Demo.	426.000	469	177	177	353	353
Hybrid Rice Distribution Rs.2000/Qtl.	1356.000	961.05	1700	376.92	440	287.36
Asst. for Plant Protection Chemical and Bio-agent Rs.500/Ha.	67300	68262	66448	72148	25000	24667
Distbn. of Transplanter at the rate of Rs. 70000 per No.	100	100	34	27	20	20
Distbtn. of Power tiller at the rate of Rs.45000 per No.	300	300.00	119	119	191	190
Distribution of rotovator at the rate of Rs.30000 per No	65	80	500	389	537	366
Distribution of seed drill @Rs 15000/ No.	25	25	50	50		
Distribution of Knap Sack sprayer @ Rs.800 per No.	8229	9224	10623	10623	9691	23959
Distbn.of Tarpaulin at 50% subsidy Rs.2100 per No.10x5 mts	500	500.000				

Power reaper at 50% subsidy at the rate of Rs.35000 per	8	8				
SEED DRUM Rs 3000/no	200	200.000				
Distribution of pumpsets @Rs 10000 / No	2492	2522	6548	6456	4833	2663
Distribution of power operated cono weeder @ Rs 15000 per No.	1364	1364	350	200	76	56
Assistance for distribution of HYV's seed @ Rs.500/Qtl.or 50% of the cost whichever is less(for 10.6% area of rice	88280	64006	128571	122430	130000	129200.80
Incentive for micro nutrients (in deficient soils) Nutrient Management @ Rs.500/Ha or 50% of the cost whichever is less (for 9.3% area of rice)	18000	..	30000	29912	40394	40795
Incentive for cono weeder & other farm implements Mechanisation @ Rs.3000 / farmer or 50% of the cost whichever is less	71345	103551	20000	34279	12641	12828
Farmers training - training of farmers at FFS pattern @ Rs.17000/Dem. (full cost) (1 FFS at every 1000 Ha)	120	120	203	203	200	200
Distbtn. of laser land leveller at the rate of Rs.1.5lakhs per No.					30	0.000
Miscellaneous expenditure - Project management team & other miscellaneous expenses at district level @ Rs.6.38 lakh / Dist.,	31.80	0	8.59	1.550	7.87	0.000

Year wise Data - Financial

Particulars	2008-09		2009-10		2010-11	
	Target	Acht	Target	Acht	Target	Acht
Demonstration of Improved package of practices @ Rs.2500/Demn of 0.4 Ha (at every 100 Ha area of rice)	21.250	20.217	26.500	26.500		
Demonstration of System of Rice Intensification @ Rs.3000/Dem of 0.4 Ha. (at every 100 Ha area)	36	45.500	10.590	10.590	60.000	55.005
Support for promotion of Hybrid Rice Seed a) Assistance for production of Hybrid Rice Seed @ Rs. 1000/Qtl or 50% of the cost whichever is less (for 10% area of rice)	17.52	0.0565				
Hybrid Rice Demonstration Rs.3000/Demo.	12.780	13.844	5.310	5.310	10.590	9.763
Hybrid Rice Distribution Rs.2000/Qtl.	27.120	19.221	34.000	7.811	8.800	5.750
Asst. for Plant Protection Chemical and Bio-agent Rs.500/Ha.	336.500	253.631	332.241	329.643	125.000	120.214
Distbn. of Transplanter at the rate of Rs. 70000 per No.	70	49	23.800	18.900	14.000	14.000
Distbtn. of Power tiller at the rate of Rs.45000 per No.	135.00	60.75	53.550	53.55	85.950	85.500
Distribution of rotovator at the rate of Rs.30000 per No	19.500	24.000	150.000	116.700	161.100	109.800
Distribution of seed drill @Rs 15000/ No.	3.750	3.750	7.500	7.500		
Distribution of Knap Sack sprayer @ Rs.800 per No.	65.832	75.1860	84.984	84.984	290.730	296.107
Distbn.of Tarpaulin at 50% subsidy Rs.2100 per No.10x5 mts	10.5	0.221				

Power reaper at 50% subsidy at the rate of Rs.35000 per	2.8	2.8				
SEED DRUM Rs 3000/no	6.000	3.693				
Distribution of pumpsets @Rs 10000 / No	249.200	252.200	654.800	643.167	483.300	264.592
Distribution of power operated conoweeder @ Rs 15000 per No.	204.600	30.690	52.500	30.000	11.400	8.400
Assistance for distribution of HYV's seed @ Rs.500/Qtl.or 50% of the cost whichever is less(for 10.6% area of rice	441.400	320.066	706.596	655.958	650.000	646.004
Incentive for micro nutrients (in deficient soils) Nutrient Management @ Rs.500/Ha or 50% of the cost whichever is less (for 9.3% area of rice)	..	..	150.000	142.585	201.970	198.349
Incentive for conoweeder & other farm implements Mechanisation @ Rs.3000 / farmer or 50% of the cost whichever is less	2140.35	1141.778	600.000	518.834	379.200	374.330
Farmers training - training of farmers at FFS pattern @ Rs.17000/Dem. (full cost) (1 FFS at every 1000 Ha)	20.40	20.213	34.510	34.450	34.00	34.00
Distbtn. of laser land leveller at the rate of Rs.1.5lakhs per No.					45.000	0.000
Miscellaneous expenditure - Project management team & other miscellaneous expenses at district level @ Rs.6.38 lakh / Dist.,	13.87	15.842	20.800	11.874	26.350	24.787

National Food Security Mission - Rice 2008-09(PHYSICAL)

Demonstration of Improved package of practices @ Rs.2500/Demn of 0.4 Ha (at every 100 Ha area of rice)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	150	170	300	300		
2	Thiruvarur	150	280	300	300		
3	Pudukottai	100	100	156	156		
4	Ramnad	100	100	220	220		
5	Sivagangai	100	200	84	84		
6	Head Qtrs	0.00	0				
	Total	600	850	1060	1060		

National Food Security Mission - Rice 2008-09 (FINANCIAL)

Demonstration of Improved package of practices @ Rs.2500/Demn of 0.4 Ha (at every 100 Ha area of rice)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	4.250	4.250	7.500	7.500		
2	Thiruvarur	7.000	7.000	7.500	7.500		
3	Pudukottai	2.500	2.500	3.900	3.900		
4	Ramnad	2.500	2.475	5.500	5.500		
5	Sivagangai	5.000	3.992	2.100	2.100		
6	Head Qtrs	0.000	0.000				
	Total	21.250	20.217	26.500	26.500		

Demonstration of System of Rice Intensification @ Rs.3000/Dem of 0.4 Ha. (at every 100 Ha area) (PHYSICAL)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	400	460.000	122	122	530	530
2	Thiruvarur	400	689.000	122	122	550	550
3	Pudukottai	300	262.000	62	62	340	340
4	Ramnad	50	50.000	20	20	290	290
5	Sivagangai	50	74.000	27	27	290	290
6	Head Qtrs	0	0.000				
	Total	1200	1535.00	353	353	2000	2000

Demonstration of System of Rice Intensification @ Rs.3000/Dem of 0.4 Ha. (at every 100 Ha area) (Financial)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	12.000	13.800	3.660	3.660	15.900	15.900
2	Thiruvarur	12.000	20.670	3.660	3.660	16.500	16.500
3	Pudukottai	9.000	7.860	1.860	1.860	10.200	10.200
4	Ramnad	1.500	1.495	0.600	0.600	8.700	8.700
5	Sivagangai	1.500	1.675	0.810	0.810	8.700	3.705
6	Head Qtrs	0.000	0.000				
	Total	36	45.500	10.590	10.590	60.000	55.005

Support for promotion of Hybrid Rice Seed a) Assistance for production of Hybrid Rice Seed @ Rs. 1000/Qtl or 50% of the cost whichever is less (for 10% area of rice) (Physical)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	600	0	314	3.140		
2	Thiruvarur	600	0	317	3.170		
3	Pudukottai	552	5.65	169	1.690		
4	Ramnad	0	0	0	0.000		
5	Sivagangai	0	0	0	0.000		
6	Head Qtrs	1752.00	0				
	Total	3504.00	5.65	800	8.000		

Support for promotion of Hybrid Rice Seed a) Assistance for production of Hybrid Rice Seed @ Rs. 1000/Qtl or 50% of the cost whichever is less (for 10% area of rice) (Financial)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	6.00	0.000				
2	Thiruvarur	6.00	0.000				
3	Pudukottai	5.52	0.057				
4	Ramnad	0.00	0.000				
5	Sivagangai	0.00	0.000				
6	Head Qtrs	0.00	0.000				
	Total	17.52	0.0565				

Hybrid Rice Demonstration Rs.3000/Demo. (Physical)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	125.000	125	60	60	83	83
2	Thiruvarur	150.000	177	65	65	90	90
3	Pudukottai	50.000	50	29	29	80	80
4	Ramnad	50.000	50	15	15	50	50
5	Sivagangai	51.000	67	8	8	50	50
6	Head Qtrs	0.000	0				
	Total	426.000	469	177	177	353	353

Hybrid Rice Demonstration Rs.3000/Demo. (Financial)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	3.750	3.750	1.800	1.800	2.490	2.490
2	Thiruvarur	4.500	5.310	1.950	1.950	2.700	2.700
3	Pudukottai	1.500	1.500	0.870	0.870	2.400	2.400
4	Ramnad	1.500	1.485	0.450	0.450	1.500	1.500
5	Sivagangai	1.530	1.799	0.240	0.240	1.500	0.673
6	Head Qtrs	0.000	0.000				
	Total	12.780	13.844	5.310	5.310	10.590	9.763

Hybrid Rice Distribution Rs.2000/Qtl. (Physical)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	516.000	115	430	236.4	110	77.82
2	Thiruvarur	528.000	532.6	527	0.000	100	47.56
3	Pudukottai	312.000	312	675	86.84	150	104.00
4	Ramnad	0.000	0.24	16	15.93	40	39.38
5	Sivagangai	0.000	1.21	52	37.75	40	18.60
6	Head Qtrs	0.000	0				
	Total	1356.000	961.05	1700	376.92	440	287.36

Hybrid Rice Distribution Rs.2000/Qtl. (Financial)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	10.320	2.300	8.600	5.000	2.200	1.556
2	Thiruvarur	10.560	10.652	10.536	0.000	2.000	0.947
3	Pudukottai	6.240	6.240	13.500	1.737	3.000	2.080
4	Ramnad	0.000	0.005	0.324	0.319	0.800	0.794
5	Sivagangai	0.000	0.024	1.040	0.755	0.800	0.373
6	Head Qtrs	0.000	0.000				
	Total	27.120	19.221	34.000	7.811	8.800	5.750

Asst. for Plant Protection Chemical and Bio-agent Rs.500/Ha.(Physical)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	17200	17200	9662	9662	8000	8000
2	Thiruvarur	17600	17000	25000	25000	8500	8500
3	Pudukottai	10400	8313	15200	15076	5000	4990
4	Ramnad	13000	13000	10394	10410	2000	2137
5	Sivagangai	9100	12749	6192	12000	1500	1040
6	Head Qtrs		0				
	Total	67300	68262	66448	72148	25000	24667

Asst. for Plant Protection Chemical and Bio-agent Rs.500/Ha.(Financial)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	86.000	86.000	48.311	48.311	40.000	40.000
2	Thiruvarur	88.000	88.000	125.000	125.000	42.500	42.500
3	Pudukottai	52.000	41.565	76.000	73.534	25.000	24.950
4	Ramnad	65.000	24.328	51.970	51.838	10.000	10.684
5	Sivagangai	45.500	13.738	30.960	30.960	7.500	2.080
6	Head Qtrs	0.000	0.000				
	Total	336.500	253.631	332.241	329.643	125.000	120.214

Distbn. of Transplanter at the rate of Rs. 70000 per No. (Physical)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	45	45	10	10	20	20
2	Thiruvarur	45	45	15	15	0	0
3	Pudukottai	10	10	9	2	0	0
4	Ramnad	0	0	0	0	0	0
5	Sivagangai	0	0	0	0	0	0
6	Head Qtrs						
	Total	100	100	34	27	20	20

Distbn. of Transplanter at the rate of Rs. 70000 per No. (Financial)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	31.5	31.5	7.000	7.000	14.000	14.000
2	Thiruvarur	31.5	31.5	10.500	10.500	0.000	0.000
3	Pudukottai	7	4.9	6.300	1.400	0.000	0.000
4	Ramnad	0	0	0.000	0.000	0.000	0.000
5	Sivagangai	0	0	0.000	0.000	0.000	0.000
6	Head Qtrs						
	Total	70	49	23.800	18.900	14.000	14.000

Distbtn. of Power tiller at the rate of Rs.45000 per No.(Physical)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	110	110	20	20	43	43
2	Thiruvarur	130	130	25	25	72	72
3	Pudukottai	30	30	30	30	36	36
4	Ramnad	20	20	22	22	20	20
5	Sivagangai	10	10	22	22	20	19
6	Head Qtrs						
	Total	300	300.00	119	119	191	190

Distbtn. of Power tiller at the rate of Rs.45000 per No.(Financial)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	49.50	49.50	9.000	9.000	19.350	19.350
2	Thiruvarur	58.50	58.50	11.250	11.250	32.400	32.400
3	Pudukottai	13.50	6.08	13.500	13.500	16.200	16.200
4	Ramnad	9.00	4.05	9.900	9.900	9.000	9.000
5	Sivagangai	4.50	2.03	9.900	9.900	9.000	8.550
6	Head Qtrs						
	Total	135.00	60.75	53.550	53.55	85.950	85.500

Distribution of rotovator at the rate of Rs.30000 per No(Physical)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	40	40	111	34	90	90
2	Thiruvarur	0	0	210	210	90	50
3	Pudukottai	25	25	100	66	317	204
4	Ramnad	0	0	0	0	0	0
5	Sivagangai	0	15	79	79	40	22
6	Head Qtrs	0	0				
	Total	65	80	500	389	537	366

Distribution of rotovator at the rate of Rs.30000 per No (Financial)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	12.000	12.000	33.300	10.200	27.000	27.000
2	Thiruvarur	0.000	0.000	63.000	63.000	27.000	15.000
3	Pudukottai	7.500	7.500	30.000	19.800	95.100	61.200
4	Ramnad	0.000	0.000	0.000	0.000	0.000	0.000
5	Sivagangai	0.000	4.500	23.700	23.700	12.000	6.600
6	Head Qtrs	0.000	0.000				
	Total	19.500	24.000	150.000	116.700	161.100	109.800

Distribution of seed drill @Rs 15000/ No.(Physical)

S.No	District	2008-09(Seed Drum)		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	20	20	25	25		
2	Thiruvarur	0	0	25	25		
3	Pudukottai	0	0	0	0		
4	Ramnad	5	5	0	0		
5	Sivagangai	0	0	0	0		
6	Head Qtrs	0	0				
	Total	25	25	50	50		

Distribution of seed drill @Rs 15000/ No. (Financial)

S.No	District	2008-09(Seed Drum)		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	3.000	3.000	3.750	3.750		
2	Thiruvarur	0.000	0.000	3.750	3.750		
3	Pudukottai	0.000	0.000	0.000	0.000		
4	Ramnad	0.750	0.750	0.000	0.000		
5	Sivagangai	0.000	0.000	0.000	0.000		
6	Head Qtrs	0.000	0.000				
	Total	3.750	3.750	7.500	7.500		

Distribution of Knap Sack sprayer @ Rs.800 per No. (Physical)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	1125	1125	3500	3500	2800	7417
2	Thiruvarur	2479	2479	3625	3625	2800	2800
3	Pudukottai	3850	3850	1770	1770	1600	5371
4	Ramnad	250	525	778	778	900	2656
5	Sivagangai	525	1245	950	950	1591	5715
6	Head Qtrs	0	0				
	Total	8229	9224	10623	10623	9691	23959

Distribution of Knap Sack sprayer @ Rs.800 per No. (Financial)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	9.000	9.000	28.000	28.000	84.000	84.000
2	Thiruvarur	19.832	19.832	29.000	29.000	84.000	84.000
3	Pudukottai	30.800	30.800	14.160	14.160	48.000	56.255
4	Ramnad	2.000	4.196	6.224	6.224	27.000	26.996
5	Sivagangai	4.200	11.358	7.600	7.600	47.730	44.856
6	Head Qtrs	0.000	0.000				
	Total	65.832	75.1860	84.984	84.984	290.730	296.107

Distbn.of Tarpaulin at 50% subsidy Rs.2100 per No.10x5 mts (PHYSICAL)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	225	225				
2	Thiruvarur	0	0				
3	Pudukottai	100	100				
4	Ramnad	100	100.000				
5	Sivagangai	75	75.000				
6	Head Qtrs						
	Total	500	500.000				

Distbn.of Tarpaulin at 50% subsidy Rs.2100 per No.10x5 mts (FINANCIAL)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	4.73	4.725				
2	Thiruvarur	0	0				
3	Pudukottai	2.1	0.044				
4	Ramnad	2.1	0.044				
5	Sivagangai	1.58	0.033				
6	Head Qtrs						
	Total	10.5	0.221				

Power reaper at 50% subsidy at the rate of Rs.35000 per No.(PHYSICAL)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	4	4				
2	Thiruvarur	0	0				
3	Pudukottai	4	4				
4	Ramnad	0	0				
5	Sivagangai	0	0				
6	Head Qtrs						
	Total	8	8				

Power reaper at 50% subsidy at the rate of Rs.35000 per No.(FINANCIAL)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	1.4	1.4				
2	Thiruvarur	0	0				
3	Pudukottai	1.4	0.49				
4	Ramnad	0	0				
5	Sivagangai	0	0				
6	Head Qtrs						
	Total	2.8	2.8				

SEED DRUM Rs 3000/no (PHYSICAL)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	50	50				
2	Thiruvarur	50	50				
3	Pudukottai	50	50				
4	Ramnad	25	25				
5	Sivagangai	25	25				
6	Head Qtrs						
	Total	200	200.000				

SEED DRUM Rs 3000/no (FINANCIAL)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	1.500	1.500				
2	Thiruvarur	1.500	1.500				
3	Pudukottai	1.500	0.045				
4	Ramnad	0.750	0.023				
5	Sivagangai	0.750	0.625				
6	Head Qtrs						
	Total	6.000	3.693				

Distribution of pumpsets @Rs 10000 / No (Physical)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	1032	1032	1727	1727	1305	1305
2	Thiruvarur	780	780	1920	1920	1584	204
3	Pudukottai	600	600	1291	1199	962	541
4	Ramnad	80	80	904	904	582	513
5	Sivagangai	0	30	706	706	400	100
6	Head Qtrs	0	0				
	Total	2492	2522	6548	6456	4833	2663

Distribution of pumpsets @Rs 10000 / No (Financial)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	103.200	103.200	172.700	172.700	130.500	130.500
2	Thiruvarur	78.000	78.000	192.000	192.000	158.400	20.400
3	Pudukottai	60.000	60.000	129.100	117.467	96.200	53.113
4	Ramnad	8.000	8.000	90.400	90.400	58.200	51.287
5	Sivagangai	0.000	3.000	70.600	70.600	40.000	9.292
6	Head Qtrs	0.000	0.000				
	Total	249.200	252.200	654.800	643.167	483.300	264.592

Distribution of power operated cono weeder @ Rs 15000 per No. (Physical)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	500	500	200	200	56	56
2	Thiruvarur	714	714	0	0	20	0
3	Pudukottai	150	150	150	0	0	0
4	Ramnad	0	0	0	0	0	0
5	Sivagangai	0	0	0	0	0	0
6	Head Qtrs	0	0				
	Total	1364	1364	350	200	76	56

Distribution of power operated cono weeder @ Rs 15000 per No. (Financial)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	75.000	11.250	30.000	30.000	8.400	8.400
2	Thiruvarur	107.100	16.065	0.000	0.000	3.000	0.000
3	Pudukottai	22.500	3.375	22.500	0.000	0.000	0.000
4	Ramnad	0.000	0.000	0.000	0.000	0.000	0.000
5	Sivagangai	0.000	0.000	0.000	0.000	0.000	0.000
6	Head Qtrs	0.000	0.000				
	Total	204.600	30.690	52.500	30.000	11.400	8.400

Assistance for distribution of HYV's seed @ Rs.500/Qtl.or 50% of the cost whichever is less(for 10.6% area of rice)(Physical)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	22404	13000	37266	34162	34580	34708.80
2	Thiruvarur	23000	28327	31891	34950	34820	35587.60
3	Pudukottai	13704	9516	18900	14846	15000	15826.60
4	Ramnad	17160	2844	20000	19022	25600	25919.20
5	Sivagangai	12012	10319	20514	19450	20000	17158.60
6	Head Qtrs		0				
	Total	88280	64006	128571	122430	130000	129200.80

Assistance for distribution of HYV's seed @ Rs.500/Qtl.or 50% of the cost whichever is less (for 10.6% area of rice)(Financial)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	112.020	65.040	211.992	177.670	172.900	173.544
2	Thiruvarur	115.000	141.630	187.840	187.540	174.100	177.938
3	Pudukottai	68.520	47.580	97.806	79.326	75.000	79.133
4	Ramnad	85.800	14.222	100.000	99.997	128.000	129.596
5	Sivagangai	60.060	51.594	108.958	111.425	100.000	85.793
6	Head Qtrs	0.000	0.000				
	Total	441.400	320.066	706.596	655.958	650.000	646.004

Incentive for micro nutrients (in deficient soils) Nutrient Management @ Rs.500/Ha or 50% of the cost which ever is less (for 9.3% area of rice)(Physical)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	5000	..	9000	9000	12000	12000
2	Thiruvarur	4500	..	8500	8500	15000	15000
3	Pudukottai	3500	..	6500	6556	10000	10018
4	Ramnad	3000	..	3500	4776	2394	3520
5	Sivagangai	2000	..	2500	1080	1000	257
6	Head Qtrs	0	..				
	Total	18000	..	30000	29912	40394	40795

Incentive for micro nutrients (in deficient soils) Nutrient Management @ Rs.500/Ha or 50% of the cost whichever is less (for 9.3% area of rice)(Financial)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	..	..	45.000	45.000	60.000	60.000
2	Thiruvarur	..	..	42.500	42.500	75.000	75.000
3	Pudukottai	..	..	32.500	32.371	50.000	50.092
4	Ramnad	..	..	17.500	17.554	11.970	11.970
5	Sivagangai	..	..	12.500	5.160	5.000	1.287
6	Head Qtrs	..	..				
	Total	..	..	150.000	142.585	201.970	198.349

Incentive for cono weeder & other farm implements Mechanisation @ Rs.3000 / farmer or 50% of the cost whichever is less(Physical)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	26960	63600	7500	10590	5750	5750
2	Thiruvarur	26669	20669	7500	7500	5750	5750
3	Pudukottai	16373	17646	4350	14464	1000	878
4	Ramnad	783	900	400	400	61	300
5	Sivagangai	560	736	250	1325	80	150
6	Head Qtrs	0	0				
	Total	71345	103551	20000	34279	12641	12828

Incentive for cono weeder & other farm implements Mechanisation @ Rs.3000 / farmer or 50% of the cost whichever is less(Financial)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	808.80	238.820	225.000	172.090	172.500	172.500
2	Thiruvarur	800.07	800.070	225.000	225.000	172.500	172.500
3	Pudukottai	491.19	69.476	130.500	101.246	30.000	26.350
4	Ramnad	23.49	26.981	12.000	11.998	1.815	1.515
5	Sivagangai	16.80	6.431	7.500	8.500	2.385	1.465
6	Head Qtrs	0.00	0.000				
	Total	2140.35	1141.778	600.000	518.834	379.200	374.330

Farmers training - training of farmers at FFS pattern @ Rs.17000/Dem. (full cost) (1 FFS at every 1000 Ha) (Physical)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	40	40	58	58	56	56
2	Thiruvarur	40	40	65	65	64	64
3	Pudukottai	20	20	30	30	30	30
4	Ramnad	10	10	20	20	20	20
5	Sivagangai	10	10	30	30	30	30
6	Head Qtrs	0	0			0	0
	Total	120	120	203	203	200	200

Farmers training - training of farmers at FFS pattern @ Rs.17000/Dem. (full cost) (1 FFS at every 1000 Ha)(Financical)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	6.80	6.800	9.860	9.860	9.520	9.520
2	Thiruvarur	6.80	6.800	11.050	11.050	10.880	10.880
3	Pudukottai	3.40	3.400	5.100	5.100	5.100	5.100
4	Ramnad	1.70	1.685	3.400	3.400	3.400	3.400
5	Sivagangai	1.70	1.528	5.100	5.040	5.100	5.100
6	Head Qtrs	0.00	0.000			0.000	0.000
	Total	20.40	20.213	34.510	34.450	34.00	34.00

Distbtn. of laser land leveller at the rate of Rs.1.5lakhs per No.(Physical)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam					5	0.000
2	Thiruvarur					15	0.000
3	Pudukottai					5	0.000
4	Ramnad					0	0.000
5	Sivagangai					5	0.000
6	Head Qtrs					0	0.000
	Total					30	0.000

Distbtn. of laser land leveller at the rate of Rs.1.5lakhs per No (Financical)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam					7.500	0.000
2	Thiruvarur					22.500	0.000
3	Pudukottai					7.500	0.000
4	Ramnad					0.000	0.000
5	Sivagangai					7.500	0.000
6	Head Qtrs					0.000	0.000
	Total					45.000	0.000

Miscellaneous expenditure - Project management team & other miscellaneous expenses at district level @ Rs.6.38 lakh / Dist.,(Physical)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	6.36	0			0	0.000
2	Thiruvarur	6.36	0			0	0.000
3	Pudukottai	6.36	0			0	0.000
4	Ramnad	6.36	0			0	0.000
5	Sivagangai	6.36	0			0	0.000
6	Head Qtrs	0.00	0	8.59	1.550	7.87	0.000
	Total	31.80	0	8.59	1.550	7.87	0.000

Miscellaneous expenditure-Project management team & other miscellaneous expenses at district level @ Rs.6.38 lakh / Dist.,(Financial)

S.No	District	2008-09		2009-10		2010-11	
		Target	Acht	Target	Acht	Target	Acht
1	Nagapattinam	0.00	1.500	3.860	1.480	6.360	5.920
2	Thiruvarur	0.00	6.360	4.860	4.860	6.360	6.360
3	Pudukottai	0.00	0.450	4.360	2.209	6.360	6.360
4	Ramnad	0.00	3.109	3.860	2.620	6.360	5.807
5	Sivagangai	0.00	4.423	3.860	0.705	0.910	0.340
6	Head Qtrs	13.87	0.000			0.000	0.000
	Total	13.87	15.842	20.800	11.874	26.350	24.787

[i] Receiving continuous four days rains with undesirable suitability after single seedling, square planting particularly in Thaladi/ Samba season leads to even complete loss of crops. The practice of gap filling was not able to followed by the farmers in case of partial loss of seedlings due to labour scarcity.