

CHAPTER - VII

AGRICULTURAL ENGINEERING

1. Introduction

Agricultural Engineering activities are taken up in Tamil Nadu to meet the needs of farmers through sustainable land and water management programmes so as to bring about quantifiable increase in the production and productivity in Agriculture. In compliance of this vision and to supplement the aim of achieving 4% annual growth in the agriculture during the XI Five Year Plan period, the Agricultural Engineering Department has been constantly engaged in the conservation, development and management of land and water resources through Watershed Management, Water Management and Agricultural Mechanisation programmes. Besides, the department takes up machinery hiring programmes to farmers for Minor Irrigation and Land Development activities.

2. Watershed Management

Soil and Water are the two vital natural resources of the watershed which are to be conserved effectively for improving productivity in agriculture. Soil and Water Conservation programmes on watershed basis will not only prevent soil erosion but also conserve soil and soil moisture for sustainable agriculture. Also, as the rain water is the key input for the dry land agriculture, the maximum retention of rain water in the soil will have a tremendous influence on agriculture production. Hence, harvesting rain water in appropriate time and location plays a major role in sustainable agriculture. Soil and water conservation measures and rain water harvesting structures such as contour bunding, check dams, percolation ponds, farm ponds, village ponds, recharge shafts etc. are taken up in

river valley catchments, hill areas of Nilgiris, tribal hill areas, western ghat areas and in plains with the main objectives of preventing soil erosion, improving soil moisture, rain water harvesting and recharging of ground water. Soil and Water Conservation programmes on watershed basis will improve the productivity on a sustainable basis and ensure the livelihood of the farming community.

2.1. Soil and Water Conservation in River Valley Project Catchments

The River Valley Project is being implemented in the interstate river valley catchments of Tamil Nadu with the objectives viz., prevention of soil loss from the catchments, to reduce siltation of multipurpose reservoirs, prevention of land degradation in the catchment areas, improvement of land capability and moisture regime in the watersheds, promotion of land use to match land capability. Under this programme, soil and water conservation measures are taken up in the watersheds identified by the Soil and Land Use Survey of India (SLUSI) and approved by Government of India. This scheme is implemented under Macro Management of Agriculture with the financial assistance from the Centre and State Governments on 90:10 basis. Under this programme, soil and water conservation measures are taken up with 100% grant. However, works to individual farmer such as land levelling, farm ponds etc., are executed with 25% farmer's contribution. During 2009-2010, it is programmed to take up soil and water conservation works under this scheme in south pennaiyar and mettur river valley catchments in Vellore, Tiruvannamalai, Dharmapuri, Krishnagiri and Villupuram districts in an area of 12,403 hectares and to construct 1,970 structures at a cost of Rs.1,487.52 lakhs. So far up to February 2010, works have been completed in an area of 11,775 hectares and 1,970 structures have been constructed at an expenditure of

Rs.1,151.01 lakhs and the balance works are under progress. The programme will be continued during 2010-2011 at an outlay of Rs.1,800.00 lakhs.

2.2. Rain Water Harvesting and Run off Management Programme

Rain water harvesting and runoff management works on watershed basis are taken up to improve the moisture regime of the watershed for increased land use. Under this programme, the beneficiaries are required to contribute 10% of the cost of works executed in community lands (it is 5% in case of SC/ST) in cash which will be deposited in the name of the Village Development Association / Watershed Association and the accrued interest will be utilised for the maintenance of assets created in community lands. Works in patta lands are taken up with 90% grant and the remaining 10% is collected as beneficiary share (it is 5% in case of SC/ST) in the form of Cash / labour / material. During 2009-2010, it is programmed to construct 626 rainwater harvesting structures at an outlay of Rs.500.00 lakhs. So far up to February 2010, construction of 628 rain water harvesting structures have been completed at a cost of Rs.494.84 lakhs and further works are under progress. During 2010-2011, it is proposed to continue this programme with an outlay of Rs.1,812.00 lakhs.

2.3. Soil and Water Conservation in Tribal Areas under Integrated Tribal Development Programme

Development of tribal agricultural lands by adopting suitable soil and water conservation measures is one of the major objectives under Integrated Tribal Development Programme. The programme is implemented with multi sector approach in the tribal areas of Jawadhu hills (Vellore

and Tiruvannamalai district), Kalrayan hills (Salem and Villupuram districts), Shevaroy hills (Salem district), Sitheri hills (Dharmapuri district), Kolli hills (Namakkal district) and Pachamalai (Trichy district). Under this programme, soil and water conservation measures such as land levelling, construction of contour rubble bunds, contour stone walls and check dams are taken up by the department in the lands of the tribal farmers with 100% grant. During 2009-2010, it is programmed to take up soil and water conservation works in an area of 768 hectares of tribal lands at a cost of Rs.156.20 lakhs. So far up to February 2010, works have been completed in an area of 774 hectares at a cost of Rs.153.40 lakhs and further works are under progress. The programme will be continued during 2010-2011 at an outlay of Rs.171.80 lakhs.

2.4. Western Ghats Development Programme

Western Ghats Development Programme is being implemented involving various departments to ensure eco-restoration, eco-development and eco-protection in western ghats areas. Under this programme, soil and water conservation measures are taken up on watershed basis in the western ghats areas of Coimbatore, Erode, Dindigul, Theni, Madurai, Virudhunagar, Tirunelveli and Kanyakumari districts. The beneficiaries are required to contribute 10% of the cost of works taken up in their patta lands and it is 5% in case of SC/ST beneficiaries. For community works, 5% of the cost of works is collected as beneficiary contribution. During 2009-2010, it is programmed to construct 1,874 structures at a cost of Rs.747.00 lakhs. So far up to February 2010, 1,703 structures have been constructed at an outlay of Rs.612.64 lakhs and works are under progress. During 2010-2011, the programme will be continued at a total outlay of Rs.990.50 lakhs.

2.5. Hill Area Development Programme

Hill Area Development Programme is implemented with an aim of restoring and maintaining the ecology of the Nilgiris District. Under this programme, soil and water conservation measures are taken up by the department through integrated watershed development approach. Soil and water conservation works and landslide preventive measures are being taken up in the priority watersheds in Nilgiris district. The beneficiaries are required to contribute at the rate of 10% of the cost of works taken up in their patta lands and it is 5% in case of SC/ST beneficiaries. For community works, 5% of the cost of works is collected as beneficiary contribution. The landslide treatment measures are executed with 100% grant. During 2009-2010, it is programmed to construct 436 structures and landslide preventive measures at a cost of Rs.436.20 lakhs and works are under progress. During 2010-2011, the programme will be continued at a total outlay of Rs.479.82 lakhs.

2.6. Dry land development works under NADP

In order to increase the production and productivity under dry land crops such as millets, pulses, oilseeds etc., Government have sanctioned a sum of Rs.268.65 lakhs under NADP 2008-2009 towards implementing dry land development works in selected 30 blocks covering Sivaganga, Pudukottai, Virudunagar, Theni, Thirunelveli, Cuddalore, Vellore, Trichy, and Erode districts and so far up to February 2010, compartmental bunding works have been completed in an area of 4,295 ha. and 193 farm ponds have been constructed at a total cost of Rs.178.32 lakhs. The remaining programme is under progress. In addition to this, a sum of Rs.250.00 lakhs have been sanctioned during 2009-2010 under NADP towards construction of 556 farm

ponds in drought affected districts and so far up to February 2010, 557 farm ponds have been constructed at a cost of Rs.246.73 lakhs. The remaining works are under progress.

2.7. Scheme for Artificial Recharge to Ground Water

Artificial ground water recharge structures are constructed under the State scheme from 2008-2009 onwards to augment the ground water aquifer so as to improve the ground water table. During 2009-2010, it is programmed to construct 3,180 Nos. of groundwater recharge structures at a cost of Rs.2,500.00 lakhs. So far up to February 2010, construction of 2,820 structures have been completed at a cost of Rs.2,030.30 lakhs. Further works are under progress. The programme will be continued during 2010-2011, also.

3. Water Management

3.1. Command Area Development and Water Management Programme

Command Area Development and Water Management Programme is being implemented with farmers participation in various commands in the state with an aim of improving the water use efficiency and ensuring equity distribution of water among the farmers. The programme is implemented with the financial assistance from the Centre and State Governments on 50:50 basis. At present, this programme is being implemented in Wellington Reservoir Project in Cuddalore district, Thirukoilur Anicut Project in Villupuram district, Kodiveri Anicut Project in Erode district, Gundar Chittar Karuppanadhi Project in Tirunelveli district, Vaniyar Reservoir Project & Ichambadi Anaicut Project in Dharmapuri district. Government have also approved this programme for implementation in new command namely South Vellar Project in Pudukottai district from the year

2009-2010. Under this Programme, on-farm development works such as Construction of Field Channels, Rotational Water Supply, Construction of Field drains are taken up in the command areas. One time functional grant at the rate of Rs.1,000/- (State Government share of Rs.450/-, Central Government share of Rs.450/- and Farmers share of Rs.100/-) per hectare is given to farmers council for the maintenance of the OFD works. During 2009-2010, it is programmed to take up on farm development works at a total outlay of Rs.4,720.52 lakhs which includes construction of field channel in an area of 22,585 hectare, construction of field drain in an area of 1,100 hectare and rotational water supply in an area of 21,035 hectare. So far up to February 2010, works have been completed at a total outlay of Rs.3,175.66 lakhs which includes construction of field channel in an area of 15,047 hectare, construction of field drain in an area of 651 hectare and rotational water supply in an area of 13,385 hectare and further works are under progress. During 2010-2011, it is proposed to implement the programme with a total outlay of Rs.5,013.60 lakhs. Government of India have also approved, in principle, to take up the programme in Vaigai command area covering Madurai, Sivagangai and Ramanathapuram districts and Kudaganar project area in Dindigul and Karur districts during 2010-2011.

3.2. World Bank aided Tamil Nadu IAMWARM project

The World Bank aided Tamil Nadu Irrigated Agriculture Modernization and Water bodies Restoration and Management (TNIAMWARM) project is being implemented in Tamil Nadu. The project has been commenced during 2007-2008 and to be completed by 2012-2013. During this period, it is programmed to implement various programmes such as micro irrigation, farm ponds, farm mechanisation, pipe laying, information, education, communication and

capacity building programmes in 63 sub-basins. During 2009-2010, it has been programmed to implement the programmes in 25 sub-basins at a cost of Rs.2,891.09 lakhs and the works are under progress. During 2010-2011, it is proposed to continue the programme in 20 more sub-basins at a total outlay of Rs.3,931.50 lakhs.

4. Agricultural Mechanisation Programme

The Agricultural Engineering Department is keen on spearheading an agricultural machinery revolution in the State to overcome the difficulties arised due to the shortage of agricultural labourers. The Agricultural Mechanisation programme is being implemented in the State with an aim of popularising the agricultural machinery among the farmers so as to supplement the available farm power, to meet out the shortage of agricultural labourers, to ensure timeliness in carrying out various farm operations and to increase agricultural production. Also, demonstration of newly developed agricultural equipments and machinery is taken up in the farmer's fields. In order to increase productivity and income of the farmers, trainings on new technology in the field of Agricultural machanisation are imparted to the various levels of man power engaged in agriculture. Also subsidy assistance is provided to farmers for replacing their old inefficient pumpsets with new pumpsets with an aim of saving electricity and improving pumping efficiency.

4.1. Agricultural Mechanisation Programme under Macro Management Mode of Agriculture.

The Agricultural Mechanisation Programme under Macro Management Mode is implemented with the assistance shared between Centre and State Governments on 90:10 basis. Under this scheme, 25% to 40% of the cost of the machinery or the ceiling limit prescribed by Government of India, whichever is less is provided to the

farmers as subsidy to purchase agricultural machinery and equipments like power tillers, tractors, rotavators etc. During 2009-2010, it is programmed to provide subsidy assistance of Rs.990.45 lakhs to the farmers for procuring 165 tractors, 2,000 power tillers and 81 rotavators and so far up to February 2010, subsidy assistance of Rs.949.95 lakhs has been provided to the farmers for procuring 75 tractors, 2,000 power tillers and 81 rotavators. The remaining programme is under progress. The programme to provide subsidy assistance to farmers for procuring agricultural machinery / implements will be continued during 2010-2011 also.

4.2. Agricultural mechanisation Programme under National Agriculture Development Programme (NADP)

Much importance is being given to increase the pace of agricultural mechanisation in the State under NADP. Subsidy assistance is provided to the farmers for purchasing agricultural machinery / implement as detailed below.

- Distribution of agricultural machinery / implements at 33% subsidy subject to maximum ceiling limit of Rs.4.00 lakhs to the Agricultural Machinery Service Centre / Agri.Clinic at Block Level for hiring out to farmers.
- providing 50% subsidy assistance to farmers for the purchase of agricultural machinery / implements subject to the ceiling limit prescribed for each implement.
- providing 50% subsidy assistance subject to maximum ceiling limit of Rs.4.00 lakhs to farmers for the purchase of High cost Farm Machinery / Implements.

- providing 50% subsidy assistance to farmers for the purchase of Gender friendly equipments limited to Rs.5000/- for each implement.

Government have sanctioned a total sum of Rs.44.69 Crores towards Agricultural Mechanisation programme under NADP during 2008-2009 and 2009-2010. This sanction includes provisions for the following items;

- a. Rs.18.08 Crores under NADP 2008-2009 towards subsidy assistance to farmers and so far up to February 2010, a sum of Rs.17.17 Crores was provided to farmers for purchasing 7,983 farm machinery and implements and the remaining programme is under progress.
- b. Rs.2.00 Crores towards subsidy assistance under NADP-Drought Mitigation Programme during 2009-2010 and accordingly subsidy has been released to farmers for purchasing 245 power tillers, 53 power weeders, 13 paddy transplanters and 310 rotavators.
- c. Rs.16.21 Crores under NADP 2009-2010 towards subsidy assistance to farmers for purchasing farm machinery and implements and so far up to February 2010, a sum of Rs.8.48 Crores was provided to farmers for purchasing 1,815 farm machinery and implements and the remaining programme is under progress.
- d. Rs.8.40 Crores towards purchase of 60 laser land levellers, 430 Agricultural machinery / implements for custom hiring to farmers.

The programme is proposed to be continued during 2010-2011 also at an outlay of Rs.55.00 Crores.

4.3. Demonstration of newly developed agricultural equipments and machinery

Demonstration of newly developed agricultural equipments and machinery is taken up in the farmer's fields with the financial assistance from Central Government. During 2009-2010, it is programmed to conduct 578 demonstrations at an outlay of Rs.12.90 lakhs and to purchase farm implements at a cost of Rs.18.80 lakhs for the purpose of conducting demonstrations. So far up to February 2010, 528 Nos. of demonstrations have been conducted at a cost of Rs.11.17 lakhs and the remaining programme is under progress. It is proposed to continue the programme at an outlay of Rs.34.00 lakhs during 2010-2011.

4.4. Training programme to farmers in the field of Agricultural Mechanisation

Training programmes on new technology in the field of Agricultural mechanisation are conducted to farmers with the financial assistance from the Central Government. During 2009-2010, it is programmed to conduct 120 training programmes for 2,400 farmers in handling and maintenance of Agricultural Machinery / Implements at an outlay of Rs.32.40 lakhs. So far up to February 2010, 109 training programmes have been conducted at a cost of Rs.29.02 lakhs and the remaining programme is under progress. During 2010-2011, it is proposed to conduct 130 training programmes to farmers at an outlay of Rs.35.00 lakhs.

4.5. Replacement of Old Pump sets

With an aim of saving electricity and improving pumping efficiency, subsidy assistance is provided to farmers for replacing their old inefficient pump sets with new pump sets. Subsidy assistance of Rs.12,000/- or 50% of the cost of the new pumpset, whichever is less, is given to SC/ST farmers and Rs.10,000/- or 50% of the cost of the

new pumpset, whichever is less, is given to all other farmers. During 2009-2010, it is programmed to provide subsidy assistance of Rs.1,000.00 lakhs to farmers for replacing 9,600 old pumpsets. So far up to February 2010, subsidy assistance of Rs.734.05 lakhs has been provided to farmers for replacing 8,404 old inefficient pumpsets. The remaining programme is under progress. It is proposed to continue the scheme during 2010-2011 to provide Rs.1,000.00 lakhs as subsidy assistance to 9,600 farmers for replacing their old pumpsets with new pumpsets.

5. Machinery Hiring Programmes to farmers

5.1. Minor Irrigation Machinery.

The department is having a fleet of minor irrigation machinery viz., 29 Rotary Drills, 13 Percussion Drills, 22 Mini Drills, 95 Hand Boring Sets, 7 Long Hole Equipments and 45 RB units for hiring out to the farmers for minor irrigation activities of sinking of new Borewells / tubewells and revitalisation of dried up wells. Besides, the services of 17 A.C.Resistivity meters and 3 Electrical Loggers are provided to farmers for locating well sites and aquifers. The programme for hiring of Minor irrigation machinery will be continued during 2010-2011 to provide 1,500 tubewells / borewells in areas where there is ground water potential.

5.2. Land Development Machinery.

Land Development Machinery viz. 85 bull dozers, 165 tractors, 28 combine harvesters and 2 hydraulic excavators are available in the Agricultural Engineering Department for hiring out to farmers towards Land Development works. Besides, the machinery are engaged in reclamation of lands and for reclaiming the damages caused due to flood and natural calamities. The programme for hiring of Land Development machinery will be continued during 2010-2011 also.