

MECHANIZATION AND TECHNOLOGY

Overview



Farm mechanization is an important element of modernization of agriculture. Farm Productivity is positively correlated with the availability of farm power coupled with efficient farm implements and their judicious utilization. Agricultural mechanization not only enables efficient utilization of various inputs such as seeds, fertilizers, plant protection chemicals and water for irrigation but also it helps in poverty alleviation by making farming an attractive enterprise. The Department of Agriculture and Cooperation is following multi-pronged strategy for promoting Farm Mechanization.

The Dept. is implementing a scheme for Promoting Agricultural Mechanization through **“Outsourcing of training and demonstrations of newly developed equipments”**. The objective of the scheme is to create awareness about agricultural equipment and machinery among the end users and other stakeholders. Through this scheme, State Governments organize demonstration of improved/newly developed agricultural/horticultural equipment as identified by them at farmers' fields so that the farmers get acquainted about their use and utility for production of different types of crops. In the year 2012-13, **an outlay of Rs. 12.08 Crores has been made. Out of total outlay, Rs. 4.00 crores is earmarked for North Eastern States.**

Post Harvest Management being one of the thrust areas for the Dept., a scheme on **“Post Harvest Technology and Management”** is being implemented, with an outlay of Rs. 40.0 crore during XI Plan period. Under the scheme the technologies developed by ICAR, CSIR and those identified from within the country and abroad for primary processing, value addition, low cost scientific storage and transport of agricultural produce are promoted to minimize wastage during post harvesting processes. The main components of the PHT&M scheme are establishment of low cost Post Harvest Technology (PHT) units for transfer of primary processing technology, supply of PHT equipments to end users with Government assistance, demonstration of PHT technologies and training of farmers, entrepreneurs and scientists. **The outlay of 2012-13 is Rs. 12 crores out of which Rs. 3.26 crore is earmarked for North Eastern States.**

Beside above interventions, the Department is promoting Farm Mechanization by making agricultural equipment available among farmers at cheaper rates. A level of 25-50% subsidy on procurement cost is made available under revised **“Macro Management of Agriculture (MMA)”** scheme for different categories of equipment. The subsidy on tractors and power tillers is available on the models approved by the department under institutional financing. Besides tractors and power tillers, combine harvesters are also available to the

farmers as per approved pattern of subsidy. As an individual farmer may not be in a position to purchase high cost equipment on his own, Self Help Group of farmers (SHGs), user groups, cooperative societies of farmers etc are also made eligible for assistance under the programme.

As a result of different programmes implemented by the Government of India over the years and equal participation from Private Sector, the level of mechanization has been increasing steadily over the years. This is evident from the sale of tractors and power tillers, taken as indicator of the adoption of the mechanized means of farming, during the last five years, as given in the Table-1 below:

Table 1 - Year wise sale of tractors and power tillers

Year	Tractors Sale (Nos.)	Power Tillers Sale (Nos.)
2004-05	2,47,531	17,481
2005-06	2,96,080	22,303
2006-07	3,52,835	24,791
2007-08	3,46,501	26,135
2008-09	3,42,836	35,294
2009-10	3,93,836	38,794
2010-11	5,45,109	55,100
2011-12	5,35,210	60,000
2012- till date Dec.2013	4,03,943	32,000

This has resulted in increase in total farm power availability from 0.295 kW/ha in 1971-72 to 1.71 kW/ha in 2010-11.

Training of Farmers & Technicians:



The Farm Machinery Training & Testing Institutes (FMTTIs) located at Budni (Madhya Pradesh), Hissar (Haryana), Garladinne (Andhra Pradesh), and Biswanath Chariali (Assam), have been imparting training to farmers, technicians, retired/retiring defence personnel etc., in the selection, operation, maintenance, energy conservation and management of agricultural equipments. These Institutes have also been conducting testing and performance evaluation of various agricultural implements and machines. During the year 2011-12, 6422 persons were trained till 31st March, 2012 against the annual target of 6000 in different courses. The target of training during the Eleventh Plan has been increased to 28,000 from 25,000 during the Tenth Plan. To supplement the efforts of the FMTTIs in human resource development, outsourcing of the training through the SAUs, Agricultural Engineering colleges, polytechnics, etc., has been approved during the XI plan. For training of farmers, the identified institutions are reimbursed Rs 5200 per trainee per month, which also includes a stipend of Rs 1200 and to and fro travel expenses by normal mode of transport. Against the target of training 10,000 persons by outsourcing during the Eleventh Plan, 8180 persons have been actually imparted training. The physical target for the 2012-13 is to train 6000* farmers. During 2012-13, 3631 persons were trained till 5th March, 2012 against the annual target of 6000 in different courses

Testing and Evaluation of Farm Machinery & Equipment:



The Institute at Budni has been authorized to conduct tests on tractors and other agricultural machines; while the institute at Hissar conducts tests on self-propelled combine harvesters, irrigation pumps, plant protection equipment, agricultural implements and other machines including issuing of CMVR certificate of Combine Harvester. The Institute at Garladinne has been authorized to test power-tillers and also conduct tests on various agricultural implements/equipment components. This Institute is being developed as a specialty institute for meeting the mechanization demand in rain-fed and dry land farming systems. The institute at Biswanath Chariali (Assam) tests bullock-drawn implements, manually operated equipment, tractor drawn implements, self propelled machines and small hand tools . Against the target of testing of 550 machines during the Eleventh Plan, 927 machines have been tested. The four FMTTIs altogether have tested 191 machines of various categories, including tractors, power-tillers, combine harvesters, reapers, rotavators and other implements, till 31st March, 2012 against the target of 165 for the year 2011-12. During 2012-13, 88 machines have been tested till 5th March, 2013.

Demonstration of Newly Developed Agricultural/Horticultural Equipment



For enhancing production and productivity, as well as for reducing the cost of production, the induction of improved/new technology in the agricultural production system is inescapable. Therefore, with this aspect in view, the demonstration of newly developed agricultural equipment including horticultural equipment at farmers' fields has been included as a component of the restructured scheme. The scheme “**Promotion and Strengthening of Agricultural Mechanization through Training, Testing and Demonstration**” is being implemented during the Eleventh Plan. This scheme envisages conduct of demonstration of improved/newly developed agricultural/ horticultural equipment, identified by the State Governments/Government Organizations at farmers' fields, to acquaint them about their use and utility for production of different types of crops. During the year 2012-13 (up to 5th March 2013), the number of demonstrations conducted by the State governments are 16022 .

[[Link to Promotion and Strengthening of Agricultural Mechanization through Training, Testing and Demonstration Page](#)]

Training of Farmers, entrepreneurs and scientists through Outsourcing:- ‘Promotion and Strengthening of Agricultural Mechanization through Training, Testing and Demonstration’ and ‘Post Harvest Technology and Management ’ both the schemes also envisages to conduct on the job training on operation, maintenance and repair of farm power and agricultural machinery through outsourcing training by the State Governments/ Government Organizations. The objective of this component is to develop and improve the technical know-how of the users of agricultural machinery and post harvest technologies for its proper and effective utilization. Under outsourcing of training during 2011-12 , 2400 beneficiaries were trained and during Current year 2012-13 , (till 31st October 2012) 4785 No. of beneficiaries were trained.

Farm Mechanization Programmes under Macro Management of Agriculture schemes:

Assistance in the form of subsidy at the rate of 25-50 percent of the cost with permissible ceiling limits is made available to the farmers for the purchase of agricultural equipment including hand tools, bullock-drawn/power-driven implements, planting, reaping, harvesting and threshing equipment, tractors, power-tillers and other specialized agricultural machines under the centrally sponsored scheme of Macro Management of Agriculture. During XIIth Plan Farm Mechanization component of MMA has been submerged into Sub-Mission of Agricultural Mechanization under national mission on Agriculture extension & technology.

State Agro Industries Corporations:

The Government of India had advised the State Governments in the year 1964, to set up State Agro Industries Corporations (SAICs) in the public sector to act as catalysts in providing access to industrial inputs to farmers, for their use in agriculture. Thus, 17 SAICs were set up in the joint sector with equity participation of the Government of India and the respective State Governments of Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Uttar Pradesh, Tamil Nadu and West Bengal during 1965 to 1970. Many of the State Governments have increased their equity participation as a result of which the Government of India, at present, is a minority shareholder. SAICs have since expanded their basic functions by commencing manufacture and marketing of agricultural inputs, implements, machines, after-sales-service, promotion and development of agro-based units/industries. The Government of India is implementing a policy of disinvestment of its shares in SAICs with a view to giving greater decision making power to the state governments by allowing transfer of its shares to state governments on following guidelines:

- Where the net worth of the SAIC is positive, the Government of India would be willing to consider offering its shares to the State Governments at a price 25 per cent less than the book value of the shares on the basis of the latest available audited balance sheet.
- In the case of SAICs whose net worth is negative, the Government of India would be willing to pass on its stake for a token consideration of Rs 1000 for the value of the shares.

So far, the Government of India's shares in SAICs of Gujarat, Karnataka, Uttar Pradesh, Tamil Nadu, Rajasthan and West Bengal have been transferred to the State Governments concerned. The State Governments of Madhya Pradesh, Assam and Jammu & Kashmir have since agreed, in principle, for transfer of the Government of India's shares held in these SAICs. It is reported that State Govt. had notified closure of the Assam State Agro Industrial Corporation w.e.f 31.08.2006.

Activities in the North-Eastern States:

A FMTTI has been established at Biswanath Chariali in the Sonitpur district of Assam, to cater to the needs of human resource development in the field of agricultural mechanization and also to assess the quality and performance characteristics of different agricultural implements and machines in the region. The Institute imparted training to 806 persons and tested 18 machines up to 31st March, 2012 during the year 2011-12. The details of various programmes launched in the North-Eastern states during the year 2012-13 are indicated in **Annexure - I**

The Scheme on ‘Post Harvest Technology and Management’

The scheme on “Post Harvest Technology and Management” is being implemented with an outlay of Rs. 40.00 crore during XI Plan period. Under the scheme the technologies developed by ICAR, CSIR and those identified from within the country and abroad for primary processing, value addition, low cost scientific storage and transport of cereals, pulses, oilseeds, sugarcane, vegetables and fruits and the crop by-product management shall be given a boost. The Scheme will basically focus on the lower end of the spectrum of post harvest management and processing.

The main components of the PHT&M scheme are as under:

- a) Establishment of units for transfer of primary processing technology, value addition, low cost scientific storage, packaging units and technologies for by-product management in the production catchments under tripartite agreement.
- b) Establishment of low cost Post Harvest Technology (PHT) units/supply of PHT equipments with Government assistance.
- c) Demonstration of technologies.
- d) Training of farmers, entrepreneurs and scientists.

During the year 2011-12 and 2012-13 (upto 5th March, 2013), 7947 and 4808 demonstrations were respectively carried out to promote Post Harvest Technology and Management (PHT) and 1221 and 1128 additional PHT units have been established and 1770 and 3450 trainees trained respectively from the concerned State through outsourcing.

- [\[Link to Post Harvest technology and Management Page\]](#)

Gender Friendly Equipment for Women



Under the Central Sector Scheme – ‘Promotion and Strengthening of Agricultural Mechanization through Training, Testing, and Demonstration, during 2011-12, Under the scheme for Outsourcing of Training and Demonstration of Newly Developed Agricultural Equipment, including Horticultural Equipment at Farmers’ Fields, separate physical targets have been fixed and 10 per cent of the funds have been allocated for women farmers. During 2012-13 a total of 271 women have been imparted training (till December 2012) at Farm Machinery, Training, and Testing Institutes (FMTTIs). A list of about 30 identified gender-friendly tools and equipment developed by the Research and Development Organization for use in different farm operations has been sent to all states and UTs. for popularizing them. State governments have been directed to earmark 10 per cent of total funds allocated for the training for women farmers. (**Annexure-II**)

ANNEXURE-I

PROGRAMMES OF NORTH-EASTERN STATES DURING 2012-13 (UP TO March, 2013)

(Rs. in crore)

S. No	Activity/Program me/Schemes Approved	Details of Activities/Programs/Schemes taken up	Targets	Achievements (upto 31.12.2012)	Budget Allocation	Amount utilized (Upto 5.03.2013)
1.	2.	3.	4.	5.	6.	7.
1.	Promotion and Strengthening of Agricultural Mechanization through Training, Testing and Demonstration (i) Farm Machinery Training & Testing Institute, Bishwanath Chariali (Assam) (ii) Outsourcing of training & Demonstration of Newly Developed Agricultural Equipment including Horticultural Equipment at Farmers' Field (Implemented on all India basis including NER)	(i) Imparting training to the farmers and other beneficiary groups on the selection, operation, maintenance, energy conservation and management of agricultural equipment. (ii) (a) Demonstration of Newly Developed Agricultural Equipment Including Horticultural Equipment at Farmers' Field (b) Training of farmers through outsourcing by identified institutions of the State Governments.	<u>Physical:</u> Training-800 personnel Testing-18 machines Arunachal Pradesh-2405 Manipur-2222 Megalaya -302 Mizoram-2350 Nagaland-50 Arunachal Pradesh-175 Nagaland-150	386 08 Nagaland-202 demo conducted Not reported Not reported	2.40 4.00 -	1.40 Rs.4.00 (Arunachal-0.54, Nagaland-0.53, Mizoram-0.46, Meghalaya-1.55, 0.90 crore by Manipur)
2.	Post Harvest Technology and Management.	(i) Demonstration of PHT Equipment. (ii) Distribution of PHT	Manipur-1750 Nagaland-187 Manipur-		3.27 -	Rs.3.27 (Manipur-1.94, Meghalaya-0.83,

		equipment through subsidies.	145 Meghalaya-82			Nagaland-0.50)
		(iii) Outsourcing of training.	Not released			

ANNEXURE -II

FLOW OF BENEFITS FOR GENDER COMPONENT UNDER DIFFERENT SECTORS/SCHEMES OF THE DEPARTMENT

Sl. No.	Division / Subject Matter Area	Scheme/Component	Flow of benefit to women in schemes / programmes
1.	Mechanization and Technology	<p>Promotion and Strengthening of Agricultural Mechanization through Training, Testing and Demonstration</p> <p>Outsourcing of training & Demonstration of Newly Developed Agricultural Equipment including Horticultural Equipment at Farmers' Field</p>	<p>Separate physical targets have been fixed for women and 30% of the funds are allocated for them.</p> <p>During 2012-13, a total of 271 women have been imparted training (till December 2012) at Farm Machinery, Training and Testing Institutes (FMTTIs).</p> <p>List of about 30 identified gender friendly tools/ equipments developed by Research & Development Organization for its use in different farm operations has been sent to all States/ UTs for popularizing them.</p> <p>The State Governments have been directed to earmark for women 10% of the total funds allocated for training large number of farmers in nearby areas.</p>

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Brief on Sub Mission on Agricultural Mechanization

As an integral component of the effort of Dept. of Agricultural Cooperation (DAC), Min. of Agriculture, to restructure and streamline all Agriculture Development Schemes in the XIIth plan, it is envisaged to have one integrated Sub Mission on Agricultural Mechanization (SMAM) which would aim at catalyzing an accelerated but inclusive growth of agricultural mechanization in India.

SMAM puts 'Small and Marginal Farmers' at the core of the interventions with a special emphasis on 'reaching the unreached', that is, bringing farm mechanization to those villages where the technologies deployed are decades old. Besides, the Mission also proposes to cater to 'adverse economies of scale' by promoting 'Custom Hiring Services' through 'rural entrepreneurship' model.

The Mission will aim at catalyzing an accelerated but inclusive growth of agricultural mechanization in India by way of:

1. Increasing the reach of farm mechanization to small and marginal farmers and to the regions where availability of farm power is lower;
2. Offsetting adverse 'economies of scale' and 'higher cost of ownership' of high value farm equipments by promoting 'Custom Hiring Centres' for agricultural machinery;
3. Passing on the benefit of hi-tech, high value and hi-productive agricultural machinery to farmers through creating hubs for such farm equipments;
4. Promoting farm mechanization by creating awareness among stakeholders through demonstration and capacity building activities;
5. And ensuring quality control of newly developed agricultural machinery through performance evaluation and certification at designated testing centers located all over the country.

SMAM will provide a suitable platform for converging all activities related to agricultural mechanization by providing a 'single window' approach for implementation.

The proposed components under Sub Mission on Agricultural Mechanization under National Mission on Agriculture Extension & Technology are as under during 12th Five year plan;

- Promotion & Strengthening of Agricultural Mechanization through Training Testing & Demonstration. Pattern: (100:0%)
- Post Harvest Technology (PHT) & Management. Pattern (100:0%)
- Financial Assistance or procurement subsidy for selected Agricultural Machinery and Equipments .Pattern. (90:10%)
- Establishment of farm machinery banks for Custom Hiring Pattern :(90:10%)
- Establishing Hi-Tech Productive Equipment Centres to Target Low Productive Agricultural Regions. Pattern :(90:10%)
- Enhancing Farm Productivity at village level by introducing appropriate farm mechanization in selected villages. Pattern: (90:10%)
- Input subsidy to small /marginal farmers through cooperative for adopting suitable farm mechanization. Pattern (90:10%)
- Assistance for Mechanized farming Pattern :(90:10%)

**MECHANIZATION & TECHNOLOGY DIVISION),
KRISHI BHAWAN, NEW DELHI**

Annexure: I

I: FINANCIAL STATUS OF FUNDS RELEASED TO STATES/IMPLEMENTING AGENCIES FOR DEMONSTRATION OF NEWLY DEVELOPED AGRICULTURAL EQUIPMENT AT FARMERS' FIELDS & OUTSOURCING OF TRAINING OF FARMERS COMPONENTS UNDER THE CENTRAL SECTOR SCHEME 'PROMOTION & STRENGTHENING OF AGRICULTURAL MECHANISATION THROUGH TRAINING, TESTING & DEMONSTRATION'.

s	Name of the State	Fund Released Year wise (Rs. In Crore)						Unspent Balance as on 31.1.2013
		2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	
1	Andhra Pradesh	0	0.11	0	0	0	0	0.08
2	Arunachal Pradesh	0.32	0.33	0.26	0.49	0	0.54	0
3	Assam	0.22	0.35	0	0	0	0	0.35
4	Bihar	0	0.37	0	0.75	0.16	0	0.16
5	Chhattisgarh	0.95	0.56	0	0.22	0.16	0.20	0
6	Gujarat	1.35	0	0	0	0	0	0
7	Haryana	0.45	0.45	0.20	1.38	0	1.0	0.00
8	HP	0.10	0.22	0.12	0.27	0.70	0.35	0
9	J&K	0	0	0	0	0	2.00	0.00
10	Jharkhand	0	0	0.08	0	1.00	1.00	0.00
11	Karnataka	0	0	0	0	0	0	0.22
12	Kerala	0	0.09	0.09	0	0	0.72	0
13	MP	0.35	0.36	0	0.61	1.00	0.71	0
14	Maharashtra	0	0.06	0	0	1.00	0	0
15	Manipur	0	0.49	0.07	2.10	1.74	0.90	0
16	Mizoram	0.47	0	0	0	0.85	1.57	0
17	Meghalaya	0.03	0.16	0	0	0	1.02	0
18	Nagaland	0.21	0.13	0.13	0.03	0.13	0.53	0
19	Orissa	0.44	0.29	0.48	1.09	1.53	0.88	0
20	Punjab	0	0.96	0	0	0	1.00	0
21	Rajasthan	0	0	0	0	0.19	0	0.02
22	Sikkim	0.02	0	0.21	0	1.14	0	0.78
23	Tamil Nadu	0.77	0.65	0.53	0.68	0.50	0	0.19
24	Tripura	0	0	0	1.16	0	0	0
25	UP	0.17	0.44	0.42	0.19	0	0.22	0.01
26	Uttarakhand	0.29	0.82	0	0	0	0	0.11
27	West Bengal	0	0.30	0	0.13	1.50	0	0
28	ICAR	0	0.14	0	3.70	0	0	3.15
29	SFCI	0.12	0.86	0	0	0	0	0

II: STATUS OF FUNDS RELEASED FOR THE COMPONENTS OF DEMONSTRATION, TRAINING AND DISTRIBUTION OF POST HARVEST TECHNOLOGY EQUIPMENT UNDER THE CENTRAL SECTOR SCHEME - POST HARVEST TECHNOLOGY & MANAGEMENT.

Sr. no	Name of the State	Fund Released Year wise (Rs. In Crore)						Unspent balance as on 31.01.2013
		2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	
1	Andhra Pradesh	0	0	0.24	0	0	0	0.24
2	Arunachal Pradesh	0	0.06	0	0.05	0.21	0	0.21
3	Assam	0	1.10	0	0	0	0	1.10
4	Bihar	0	0.65	0	0	0.17	0	0.17
5	Chhattisgarh	0	0.07	0	0.68	0	0.50	0.52
6	Gujarat	0	0	0	0	0	0	0
7	Haryana	0	0.38	0	0	0	0	0
8	HP	0	0	0	0.16	0	1.09	0
9	J&K	0	0.42	0	0	0	0	0
10	Jharkhand	0	0	0	0	0	1.39	0
11	Karnataka	0	0	0	0.50	1.29	1.50	0
12	Kerala	0	0	0.14	0	0	0	0
13	MP	0	0.64	0	0.44	2.21	1.60	0
14	Maharashtra	0	0	0	0	0	0	0
15	Manipur	0.26	0.33	0.25	1.15	2.52	1.94	1.15
16	Mizoram	0	0.25	0	0	0.63	0	0.63
17	Meghalaya	0	0	0	0	0	0.83	0
18	Nagaland	0	0.30	0	0.88	1.09	0.50	0
19	Orissa	0.34	0	0	0.90	0.54	1.00	0
20	Punjab	0	0	0	0	0	0	0
21	Rajasthan	0	0	0	0.25	0	0	0.25
22	Sikkim	0	0	0	0	0.56	0	0.56
23	Tamil Nadu	0	0	0	0	0	0	0
24	Tripura	0	0	0	0	0	0	0
25	UP	0	0	0	0	0	0	0
26	Uttarakhand	0	0	0	0	0.79	0	0.79
27	West Bengal	0	0	0.70	0	0	0	0
28	ICAR	0.40	0.58	0	4.11	0	0	4.11
29	SFCI	0	0	0	0	0	0	0