

**ASSESSING THE EXISTING TRAINING AND TESTING  
FACILITIES FOR FARM MACHINERY IN  
HIMACHAL PRADESH**

**C.S. Vaidya**

**AGRO-ECONOMIC RESEARCH CENTRE  
HIMACHAL PRADESH UNIVERSITY  
SHIMLA – 171005 (H.P.)  
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## **CHAPTER –I**

### **INTRODUCTION**

With the introduction of new farm technology during the sixties, the farm mechanization was considered to be necessary to cope with the increasing demand of the draught and human labour. The main production areas of the food grains were and are in the plain areas of the country. Hence, technology was developed which is more suitable for plain topography having large holding size and size of individual fields. The same has been applicable for the development in the farm machinery as well. This led to development of various types major farm machinery like tractors of various horsepower, combine harvesters, Irrigation pumps and motors and various other type of machinery. It has been found out that the development in the field of farm machinery made a considerable impact on the production and productivity of food grain and other crops. Keeping in mind the labour shortage in states like Punjab and Haryana etc, which form the granary of the country, the introduction and popularizing of farm machinery was absolutely necessary. The need to supplement the human and draught power with the more efficient farm machinery has led to its adoption in many parts of the country.

The rapid mechanization led to a situation where it was felt that training to the farmers in respect of different aspects of farm machinery was necessary. Simultaneously, need was felt to provide facilities for the testing of farm machinery so that optimum performance of different type of machinery may be ensured. The task of providing training and ensuring the testing facilities was entrusted to the state agricultural universities or other state institutions or departments. This background perhaps provides the basis for the present study so that the existing facilities in this regard may be evaluated so that proper policy back up may be provided.

The story in Himachal Pradesh has been entirely different. The major factors, which have resulted in adoption of farm machinery in many parts of the country, have been

absent or insignificant in the State. Various causes can be listed for very low adoption of farm machinery in the State. One of the major reasons is that due to the emphasis on designing the machinery which is compatible with the topography and environment of plain areas, the hilly region have been left of the priority in this respect. The heavy farm machinery, which has been developed, for the plain areas is simply not suitable for the state of Himachal Pradesh, which is largely a hilly and mountainous State. The land is sloping; the fields are terraced, small in size and fragmented. Under such situation the machinery covered under the scope of study finds very limited adoptability in the State except for very few valley areas.

The financials conditions of the majority of farmers are quite poor because more than 80 percent of the farmers in the state belong to marginal and small category. Due to this factor even if other conditions allow, it is not feasible for the farmers to go in for the heavy farm machinery, which is quite costly, and obviously beyond the means of majority of the farmers. It is very evident that the operators of marginal and small holdings do not require the majority of farm machinery covered under the scope of the study. The situation cannot be improved, except for very limited scale, despite the institutional backing in the form of credit provisions, training provisions, or any other measure. It has been observed that the number of tractors has been rising steadily in the state over a period of time. However, the use of these tractors in the agricultural sector of the state is limited hardly to 10-20 per cent. Their major use has been observed in the transport sector in rural and semi-urban areas.

Due to these reasons, the scenario of farm mechanization in the state is dismal. Due to low number of farm machinery the infrastructure for training and testing has also been very poor. The awareness among the farmers regarding the importance of training and testing facilities is also very low. So much so the department of agriculture could not find candidates to be nominated for the trainings being conducted by various Farm Machinery Training and Testing Institutes located at four different places in India. The CSK Himachal Pradesh Krishi Vishva Vidyalaya, which is

presently entrusted with the job of training concerning farm machinery, could impart training to only 23 candidates over a period of four years. However, it has been observed that the farmers are becoming conscious about the importance of training and testing of farm machinery.

The present study has been conducted for evaluating the existing training and testing facilities in the state. More specifically the study has been based on the following objectives.

1. To evaluate the impact of training and testing programmes being conducted at the existing four farm machinery four farm machinery training and testing institutes (FMT & TIs) and Budni (M.P.), Hissar (Haryana), Garladinne, District Anantpur (A.P.) and Biswanath Chariali district Sonitpur (Assam) as to their adequacy, usefulness, effectiveness and contribution to the development of agriculture besides suggesting on restructuring of the training and testing programmes.
2. To assess the training and testing infrastructure available with the State Governments/Organizations including industry and trade in various states and UTs.
3. To identify the gaps and additional requirement of training and testing for agricultural mechanization in each of the state and UT by 2020 A.D. in the context of fast changing agricultural mechanization scenario in the country.
4. To identify the location of the FMT & TIs in each of the States/Uts for undertaking these programmes. If the requirement is for more than one FMT & TI in any of the state, the same may also be indicated.

## **CHAPTER –II**

### **METHODOLOGY**

The present study intended to cover two aspects of the farm machinery viz training and testing of farm machinery covered under the scope of study including Tractor, Combine Harvester (Tractor), Irrigation pumps/motors, Harvester (self), Power sprayer/Duster, M B. and Disc Plough, Disc Harrow, Cultivator, Seed Drill/Seed Fertilizer Drill, Planter, Leveller, Potato digger, Thresher and Sugarcane Crusher. It was assumed that these two aspects of the farm machinery would be covered by one or more of the following institutions.

1. CSK HP Krishi Vishva Vidyalaya, Palampur.
2. Y.S. Parmar University of Horticulture and Forestry, Nauni, Solan.
3. Directorate of Agriculture, Krishi Bhawan, Shimla.
4. Directorate of Horticulture, Navbhar, Shimla.
5. H.P. Agro-Industrial Corporation, Nigam Bihar, Shimla.
6. Authorized Dealers of Farm Machinery in Himachal Pradesh.
7. The Manufacturers of Farm Machinery in Himachal Pradesh.

The enquiry from the above sources revealed that none of these had any facilities for testing of the farm machinery. As far as the training part is concerned only CSKHP Krishi Vishva Vidyalaya, Palampur had some facilities for the training but the training were being provided for the power tiller only. The authorized dealers of farm machinery particularly tractors have also the provision of trainings, but the main purposes of these trainings are to provide the work force of mechanics for the repair of tractors on their authorized retail outlets. The enquiry from the Directorate of Agriculture revealed that no person has been nominated so far for trainings being organized by different Farm Machinery Training and Testing Institutes (FMT & TI). Initially, the task of providing training was being carried out by Soil Conservation Division of Department of Agriculture located at Bhangrotu in district Mandi. But later

on the CSK HP Krishi Vishva Vidyalaya, Palampur took over the responsibility and the department of Agricultural Engineering of this University started imparting trainings to the farmers by organising demonstrations and Exhibitions cum demonstrations in different important fairs and festivals of Himachal Pradesh. Due to the fact that the topography of the state does not allow the use of heavy farm machinery, the emphasis during such training and demonstrations was on light machinery and improved farm implements and tools, which are not covered under the scope of the study. However, twenty-three persons had been imparted training for power tiller and matching implements from 12.11.1997 to 27.11.2000. These persons were contacted but only nine of them responded. Thus, the analysis has been based on the nine respondents. In addition five extension workers were also contacted who had obtained training not necessarily from CSKHPVV but from any other sources. Due low number of trainees and the extension workers, all of these were contacted pooled together. No differentiation was made in respect of present and past trainees.

As directed in the synopsis of the study, a list of approved manufactures of farm machinery and tools/implements was obtained from department of agriculture. Thirty-seven such manufactures were identified and contacted in order to get information regarding any training and testing facilities they might have. Only seventeen of these cooperated in imparting information. It was very discouraging to find out that none of these have any such facilities. It was also noted that except for minor tools and machinery, they were not manufacturing anything. The maize shellers and threshers being supplied by them to the department or being sold to the farmers was infect imported from the neighbouring state of Punjab.

A few manufactures of foot and knapsack sprayers were located in the state and they were also contacted on this aspect. These manufactures were producing these sprayers as per ISI specifications under which it is mandatory for the manufacturing unit to establish a laboratory as per the guidelines for testing the equipment being

manufactured by these units. But these units restrict the use of testing facilities only to their own production. This facility is not available to any one else.

To find out the level of various farm machinery in Himachal Pradesh data was collected from Directorate of Agriculture, Himachal Pradesh for the period 1990-1991 to 1997-98. The year was data prior to 1990-91 was not available as the concerned persons in the Directorate revealed that due to the fire accident in the directorate all the records were gutted and hence no such data exists with them. This data also pertained to the machinery and implements distributed through department of agriculture every year. These figures were added successively to census data published by Directorate of Land Records, H.P. in the State Report on Livestock Census. The latest report available was 15<sup>th</sup> report published in 1992 and this data was used as earlier data of 1987 could not be used due to unavailability of data from department of agriculture. The data pertained to tractors, disc harrow, seed cum fertilizer drill, threshers, maize shellers, electric pump set/motors and diesel engines. In order to forecast the use of machinery by the year 2010-11 and 2020-21 the compound growth rate were calculated with the following formula and used for the projection.

$$\text{CGR} = (b-1) \cdot 100$$

where

$$\text{Log } b = \frac{\sum x \log y - \sum x \cdot \sum \log y / N}{\sum x^2 - (\sum x)^2 / N}$$

And  $X$  = Time variable in years

$Y$  = No. of machinery units under consideration

## **CHAPTER –III**

### **PERFORMANCE OF THE TRAINING AND TESTING INFRASTRUCTURE IN THE STATE**

The present chapter has been further divided into two parts:

1. Farm Machinery Training; and
2. Farm Machinery Testing.

#### **Farm Machinery Training**

The trainings on different aspects of farm machinery were being provided by CSK HP Krishi Vishwa Vidyalaya, Palampur under the department of agricultural engineering. The emphasis normally remained on the use of improved farm implements and machinery, which are more compatible with the topography, and terrain of the state. However, the department recently has started training on power tiller with matching implements. For this purpose twenty-three persons were trained since 12.11.97 to 27.11.2000, Table 3.1 provides the details. In addition to trainings on power tiller along with its matching equipment the other trainings were concerned with minor farm implements and tools. This indicates that the scenario of farm training in the state is very dismal. But in a sense nothing better could be done in absence of farm tools, implements and machinery especially designed for the hill terrain. The majority of the farm machinery covered under the scope of study has applicability in the plains. In Himachal Pradesh, which is a hilly state, this machinery cannot be used in majority of the areas except for few valleys. This combined with the fact that more than 80 per cent of the farmers in the state belong to small and marginal category having a total land holding of less than two hectares limits the scope of farm mechanization in the state to a very large extent. Another contributing factor is the lack of irrigation. In the state only about 17 percent of the gross cropped area is irrigated. This also leads to the traditional agriculture in majority of the holdings with the result that the farmers get very low incomes. Due to this fact the farmers are not able to go in for the farm mechanization.

**TABLE 3.1 THE DEMONSTRATIONS OF POWER TILLER WITH MATCHING IMPLEMENTS HAVE BEEN CARRIED OUT IN THE FOLLOWING VILLAGES SINCE, 1997.**

Sr.No.	Name of the farmer trained and address	Date of demonstration
1	Sh.Prakash chand, Vill, Bandhau, Jaisinghpur	12.11.1997
2	Sh.Hari ram, Vill.Sakoh, Jaisinghpur	13.11.1997
3	Sh.Sukh Dev.Vill.Sakri, Baijnath	18.11.1997
4	Sh.Dina Nath, Vill.Pihar, Baijnath	19.11.1997
5	Sh.Mohinder Singh, Hatwas, Kangra	28.1.1998
6	Sh.Prem Singh, Hatwas, Kangra	29.1.1998
7	Smt.Kamla Devi, Bandhau, Kangra	21.5.1998
8	Sh.Prem Singh, Bandhau, Kangra	21.5.1998
9	Sh.Banwari Lal, Diffarpur, Kangra	6.10.1998
10	Sh.Pritam Singh, Sungal, Palampur	22.5.1999
11	Sh.Kanhiya Lal, Molichak, Kangra	22.5.1999
12	Sh.Wazir Singh, Ahju, Mandi	29.5.1999
13	Sh.Prakash Chand, Saliana, Palampur	14.6.1999
14	Sh. Hoshiar Singh, Vill. Matiyal Khurd, Jaisinghpur	2.6.2000
15	Sh.Subhash Chand, Vill. Dagahan, Dheera	3.6.2000
16	Sh. Jai Chand, Vill. Lahu (Bhullender)	6.6.2000
17	Sh.Devi Singh, Vill. Lahat	7.6.2000
18	Sh.Paras Ram, Vill. Duhak Khurd, Kangra	12.10.2000
19	Sh.Baldev Singh, Vill. Sari, Jaisinghpur	13.10.2000
20	Sh.Swarup Chand, Vill. Jhikly Bheth, Palampur	10.11.2 k to 17.11.2k
21	Sh. Amar Singh, Vill. Machui, Baijnath	14.11.2000
22	Sh.Piar Chand, Vill. Tinbar, Panchrukhi	25.11.2000
23	Sh.Jaishi Ram Chaudhary, Vill.Saliana, Palampur	27.11.2000

The power tiller along with matching implements was also displayed at various melas and festivals of the state like Holi mela at Palampur, Kissan Diwas at Kangra, Kissan Goshti at Palampur, Pilot Project village Sunher at Kangra, twenty years celebration at CSK HP KV, Kullu Dushera and Kissan Diwas at Palampur and Bhulana etc (Table 3.2).

**TABLE 3.2. EXHIBITION-CUM-DEMONSTRATIONS OF POWER TILLER AND MATCHING IMPLEMENTS AT VARIOUS MELAS AND FESTIVALS.**

Sr.No.	Exhibition cum demonstration of power tiller and matching implements at various melas and festivals	Date
1.	<b>Holi Mela at Palampur</b>	20-25.3.1997
2.	<b>Agricultural Festivals CSK HPKV</b>	5-6.4.1997
3.	<b>Kissan Mela and Agricultural Officer Workshop at Palampur</b>	21.24.4.1997
4.	<b>Kissan Diwas at R.R.S. MALANK Kangra</b>	26.8.1997
5.	<b>Agricultural Officer Workshop at Palampur</b>	19-20.9.1997
6.	<b>Holi Mela at Palampur</b>	12.13.3.1998
7.	<b>Agri. Festivals at Palampur</b>	20-21.3.1998
8.	<b>Agricultural Officer Workshop at Palampur</b>	17-18.4.1998
9.	<b>Kissan Gosti at Palampur</b>	26.6.1998
10.	<b>Agricultural Officer Workshop at Palampur</b>	13-14.10.1998
11.	<b>Pilot Project Village Sunker Kangra</b>	15.11.1998
12.	<b>Twenty Year Celebration of CSK HPKV</b>	18-19.12.1998
13.	<b>Agricultural Officer Workshop at Palampur</b>	24-25.4.1998
14.	<b>Kullu Dusheera</b>	1999-2000
15.	<b>Kissan Mela at K.V.K. Bara (Hamirpur)</b>	31.3.2001
16.	<b>Kissan Diwas at alampur</b>	25.3.2001
17.	<b>Kissan Diwas at Bhulana (Kangra)</b>	27.3.2001

The department also adopted villages for dissemination of power tiller and matching implements.

1. In the year 1998-1999, village Dhog in district Mandi was selected for dissemination of power tiller and machining implements for kharif and rabi crops. In this village, power tiller and implements were kept for 15 days in each crop seasons.
2. Power tiller was kept in village Panper district Kangra for kharif and rabi crops in the year 1999-2000.
3. In this year 2000-2001, one power tiller was kept in village Jhikly Beth (Kangra) for approx seven days for rabi crops.
4. In the year 2001-2002 power tiller and matching implements was kept in village Kunsal district Kangra for kharif crops.

### **Experiences of Trainees**

The persons listed above in Table 3.1 were contacted and out of these twenty-three persons the responses only nine were received. The details regarding the experiences have been presented in the following text.

### **Sources of Information**

There were five sources of information to the farmers (Table 3.3) viz. University sources, relatives and friends etc. The analysis revealed that relative and friends were the major source of information and 67 percent persons received information from these. This was followed by university sources (56%). No persons got information from TV/Radio/New Paper and any other sources.

**TABLE: 3.3 SOURCE OF INFORMATION FOR TRAINEE FARMERS.**  
**(Multiple Response)**

Source	Percent of Trainees
<b>1.Agril.Officers</b>	11
<b>2.Earlier Trainees</b>	11
<b>3.Relatives &amp; Friends</b>	67
<b>4. University Source</b>	56
<b>5. TV/Radio/Newspaper</b>	0
<b>6. Others</b>	0
<b>Total</b>	100

### **Benefits Derived**

The power tiller being costly machinery and having limited application in the light of terraced fields, sloping land etc., it is very difficult for the farmers especially small and marginal to purchase this equipment for their fields. As such the trainee farmers could not derive any benefits from it, however, they expect that if it were possible for them to purchase this piece of machinery or it is available to them on hire, it will definitely lead to rise in their income. About 78 percent of the trainees were of this view. About 11 per cent thought that since they were trained to use this machinery they are now in a position to train other farmers as well. The similar number thought that they can now train other farmers.

**TABLE: 3.4 TYPES OF EXPECTED/DERIVED BENEFITS BY FARMERS FROM TRAINING**

Particulars	Percent of Trainees
<b>1. Improvement in Income</b>	78
<b>2. Better Use of Machinery</b>	11
<b>3. Better Use of Pumps/Motors</b>	0
<b>4. Trained/will train the others</b>	11
<b>5. Any Other</b>	11

A trainee may have multiple benefits also.

### **Extension Officials**

About 80 per cent of the extension workers revealed that the trainings they had received had increased their own knowledge. A total of 60 per cent felt that the training will improve the teaching of the farmers and only one worker felt that he can train his colleagues.

**TABLE: 3.5 TYPES OF BENEFITS DERIVED BY EXTENSION OFFICIALS FROM THE TRAININGS**

Particulars	Percent of Trainees
<b>1. Increase in own knowledge</b>	80
<b>2. Teaching the farmers</b>	60
<b>3. Training the fellow workers</b>	20
<b>4. Any other</b>	0

## **Infrastructure**

The responses of the farmers regarding the infrastructure has been presented in Table 3.6 wherein it may be seen that since they had received training in the fields they could not say anything about the building since it was not required. Majority of the trainees (89 %) were satisfied with the machinery require for the training. About 78 percent of the trainees felt that they received due attention from the trainers and the same number thought that the training staff provided was adequate for the purpose. The staff behaviour was reported to be excellent by hundred percent of the trainees.

**TABLE: 3.6 RESPONSE OF TRAINEES REGARDING TRAINING INFRASTRUCTURE**

<b>Particulars</b>	<b>Percent of Trainees</b>
<b>1. Present Building</b>	0
<b>2. Required Machinery</b>	89
<b>3. Attention to trainees</b>	78
<b>4. Adequate training staff</b>	78
<b>5. Staff behaviour</b>	100

## **Miscellaneous Information**

About 89 percent of farmers felt that they had learnt something new and 22 percent thought that they will encourage other farmers to get some sort of training. It was only 11 percent farmers who thought that training will help in improving the agricultural situation in the region. However, no farmer was willing to buy the machinery for his farm as they thought that such machinery was beyond their means.

**TABLE: 3.7 OTHER MISCELLANEOUS INFORMATION FROM THE TRAINEES**

<b>Particulars</b>	<b>Percent of Trainees</b>
<b>1. Learnt something new</b>	89
<b>2. Any villager trained earlier</b>	0
<b>3. Encourage/will encourage others to get training</b>	22
<b>4. Purchase/will purchase some machine as encouraged by training</b>	0
<b>5. Training helped/will help improving the Agril. Situation of the region</b>	11

### **Manufacturers of Machinery**

The various manufacturers of farm machinery and implements located with in Himachal Pradesh were contacted regarding any training facilities they might have on their establishments. Thirty-seven such approved manufacturers approved by department of agriculture, Himachal Pradesh of whom 17 responded were contacted for recording their responses but not even one of them had such facilities of providing trainings. It was revealed that they provide operating instructions to the buyer and promise to repair any equipment sold by them in case it needs some repair after the prolonged use or it develops some defect prematurely.

### **Training by Private sources**

There are various authorized outlets of tractors in Himachal Pradesh. The retail outlets of tractors like Mahindra, Sonalika, HMT, Escorts, and Messy Ferguson etc. were contacted regarding any training programmes they might be running for the benefit of the farmers of the state. It was found out that none of these had any training programmes covering the tractors or the ancillary machinery being sold by them as

authorized agents for the manufacturers of these machinery. It was revealed by the authorized agents that about 80-90 per cent of the tractors being sold by them are used for transportation of construction material and other goods. The use of tractors for agricultural purposes was limited only to about 10-20 per cent. As such they felt that it is undesirable to design and conduct any training courses for the farmers. They however have repairing facilities at their establishments.

It was also revealed that they have training courses in respect of tractors, but these courses are designed to produce workforce of mechanics to be employed on their establishments after the training are over. These trainings are generally conducted at the manufacturing units or the designated places by the manufacturer of the tractors. The persons who desired to receive such trainings have to be nominated by the authorized sale agent. After a person is nominated he receives to and fro fare for visiting the training place. The boarding and lodging is provided free of cost by the manufacturers of the tractors and in addition they also receive a stipend to cover out of the pocket expenses. After the training is complete they are presented with a tool kit. Despite all this there is no compulsion for the trainees to serve the retail outlets from where they were nominated. But the experience of the owners of the outlets was that majority of the trainees return back to them for seeking employment. This they attributed to the dismal employment scenario in the state and lack of opportunities for running their own business of repairing the tractors or other farm machinery.

### **Testing of Farm Machinery**

The farm machinery currently being used in the state, in whatever meager numbers, is hardly manufactured within the state but is largely imported from neighbouring state of Punjab. During the course of study it has been indicated that the low number of farm machinery has been responsible for poor training facilities and this factor is also responsible for dismal facilities for testing of farm machinery. In fact there are absolutely no such facilities in any of the institutions located within the state or belonging to the state Govt.

## **CHAPTER –IV**

### **STATUS OF FARM MACHINERY**

The present chapter deals with the status of farm machinery over a period of time and growth their in. The present trend in the growth of number of various machineries has been used to forecast the number of respective machineries during the years 2010 & 2020. As recommended the data for the forecasting should have been for the period 1970-71 to 1997-98 or the latest available. But in Himachal Pradesh the year-wise data pertaining to the number of farm machineries was not available. The Directorate of Land Records publishes the figures every five-year based on the census. Hence, the figures available for 1992 were used and the year-wise figures were generated by adding successively the number of farm machinery distributed/purchase through department of agriculture Himachal Pradesh. Obviously, this does not take in to account the farm machinery purchased directly by the farmers. Hence, the figure may be little under estimation of the actual number of machinery. But there was no other alternative but to generate data this way.

It appears that the farm mechanization in Himachal Pradesh has not achieved the desired level any many cases there is almost a complete stagnation. The details of the trends have been presented in Table 4.1 and the following text presents the details.

#### **Tractors**

During 1992 there were 2565 tractors in the state. This figure remained stagnant till 1997 and during the terminal year increase to 2576. This stagnation has been due to the fact that during intervening years no tractor was purchase through department of agriculture. However, this does not mean that during this period no tractor was

purchased in the state. But this information is not available from any sources. Keeping in view this trend, it is envisaged that the number of tractors in the state during the year 2010 will be 2588, which will increase to 2599 during the year 2020. It may also be mentioned here that the utilization of tractors in the state for the agricultural purposes is limited only to 10-20 percent and rest of the time they are used for the transportation of usually the construction material. The agricultural experts feel that if the tractors are not used for the transportation purposes they will no more be viable.

### **Disc Harrows**

The number of disc harrows, as in the case of tractors, remained stagnant during the reference period and their number increased from 2384 during 1992 to 2386 during 1998. If this trend continues the number of disc harrows will also remain constant at 2386 during the years 2010 & 2020.

### **Seed-cum-Fertilizer Drills**

There were only 340 seed cum-fertilizer drills in the state during the year 1992 which marginally increased to 360 during the year 1998. This indicates that their number would increased to 415 during the year 2010 and 468 during the year 2020.

### **Threshers**

The number of thresher in the state has seen a continuous increase from 12700 during 1992 to 14290 during 1998. Relying on this trend the figures extrapolated for the year 2010 is 18273 threshers and 22428 threshers during the year 2020. The wheat threshers dominate this category in the state.

### **Maize Shellers**

Maize is one of the most important crop of Himachal Pradesh and forms the staple diet of majority of the people. Due to this importance the number of maize shellers have increased at quite fast pace and their number increased from 3561 in 1992 to 5108 during 1998. Based on this trend the number of may shellers in the state would increase to 11060 during 2010 and would further almost double to 21057 during the year 2020.

### **Electrical Pump Sets/Motors**

The increase in the number of electrical pump sets/motors has also been quite fast in the state and these increased from 1222 during 1992 to 1658 during the year 1998. This trend indicates that their number would increased to 3102 during the year 2010 and would further increase to 5229 during the year 2020.

### **Diesel Engines**

The increase in the number of diesel engines was the fastest among all the machinery under consideration. Their number increased from 1299 during 1992 to 2468 during the year 1998. This trend indicates that during the year 2010, there will be 9421 diesel engines of different horsepowers in the state. This number will increase to 28768 during the year 2020.

**Table 4.1: Level of Farm Machinery, Over Time in H.P.****(Numbers)**

Particulars	1992	1993	1994	1995	1996	1997	1998	2010	2020
Tractors	2565	2565	2565	2565	2565	2565	2576	2588	2599
Disc harrow	2384	2384	2386	2386	2386	2386	2386	2386	2386
Seed cum fertilizer drill	340	340	340	340	340	360	360	18273	2468
Threshers	12700	12891	13061	13310	13653	14050	14290	11060	22428
Maize shellers	3561	3707	4329	4638	4865	5017	5108	3102	21057
Electric pump set/motors	1222	1276	1376	1475	1513	1601	1658	9421	5229
Diesel Engines	1299	1418	1551	1667	2001	2275	2468		28768

As mentioned earlier this data was generated by adding year-wise distribution of farm machinery by department of agriculture to the base year figures of 1992 published by Directorate of Land Record in The State Report on Fifteenth Livestock Census, 1992. In addition to the machinery listed above there are other items also which have been left out because the year wise figures for these could not be generated. These include power sprayers and dusters of which 1791 were there during 1992. During this year there were also 2080-mould board ploughs, 95 planters, 754 levelers and 3681 potato diggers. There were no tractor operated or self-propelled combine harvesters in the state.

The above discussion leads to fact that the position of farm mechanization in the state is very dismal. This has led to the scenario where the position of training facilities in this regard are almost non-existent and the testing facilities for farm machinery is totally absent.

## **CHAPTER – V**

### **FUTURE REQUIREMENTS AND POLICY SUGGESTIONS**

The implications arising out of the study in the farm of future requirements and policy suggestions can be summarized as follows:-

1. The level of farm mechanization in the state is very low. This has been the result of the fact that the emphasis so far has been on the development of machinery, which is more suitable for the plain areas. The machinery covered under the scope of study can be categorized under this type. The tractors, combine harvesters, power tillers etc. can not be used in majority of the areas of the state due to uneven topography, terrace fields and the remoteness of villages.
2. Therefore, the need is to develop the farm machinery, which is compatible with the topography of the state and suitable in terms of initial cost of acquisition, maintenance costs etc.
3. There is also a need to develop such type of machinery , which can be used for the production of off-season vegetables and fruit cultivation as these are the emerging livelihood strategies in the agro climatically suitable areas.
4. To boost the farm mechanization in the state a strong institutional and policy backup is a pre requisite.
5. In the areas, which generally are valley areas where the farm mechanization has slowly gaining foothold, the training facilities for the farmers are grossly inadequate.
6. It is important that instead of giving emphasis on training and testing of farm machinery the attention should be paid on the development of machinery like hand tractors, improvement in traditional farm tools and equipments, which can prove to be more important for the marginal and small farmers of the state, instead of generating facilities for training and testing of heavy farm machinery.

The above findings were discussed with the scientists from department of agriculture and horticulture to incorporate their views so that some policy implications may emerge from the study. They were also unanimous in their view that the state requires improvement in the hand operated and bullock operated tools and equipments, which is more important for the large majority of farmers. They felt that suitable provisions should be made and clear policy guidelines be framed for popularizing such simple tools as manually operated seed-cum-fertilizer drills, chaff cutters, sprayers, dusters and animal operated implements like steel ploughs, disc harrows, seed-cum-fertilizer drills, levelers animal operated threshers etc. It was argued that if a farmer does not have money for buying insecticides and pesticides, there is little point in introduction of power sprayers and dusters. Therefore, the focus should shift from farm mechanization in terms of heavy machinery and facilities for training and testing to the development and introduction of small, efficient manually and animal driven implements, which can improve the productivities on marginal and small farms. Keeping in view the current financial position of the state and the funds available with the farmers, neither it is possible for the state government to subsidized the farm machinery and equipments nor the farmers can afford to make such heavy investment on their farms which is beyond their means and in most of cases is not at all required when the holding size is even less then one hectare. Thus, under the typical conditions of Himachal Pradesh the introduction of such simple thing as serrated sickles or improved pruning shears may prove to be more important than most of the heavy farm machinery.

## **CHAPTER - VI**

### **SUMMARY AND CONCLUSIONS**

#### **INTRODUCTION**

The farm mechanization was considered necessary after the green revolution during sixties when increasing demand of draught and human labour was felt. As the main food grains production centres were in the plain areas of the country where the holding sizes were large, the emphasis was naturally given to the development of large farm machinery. The farm mechanization in terms of heavy machinery could not benefit the hilly states like Himachal Pradesh. Many factors were responsible for such a scenario. Small holding sizes, scattered and fragmented holdings, low capital formation, uneven topography, and terraced fields etc. Thus, in some parts of country where considerable farm mechanization took place a need for training the farmers for the use and upkeep of the machinery and its testing for optimum performance was felt. This formed the basis for the present study, which has been conducted with the following specific objectives.

1. To evaluate the impact of training and testing programmes being conducted at the existing four farm machinery training and testing institutes (FMT & TIs) and Budni (M.P.), Hissar (Haryana), Garladinne, District Anantpur (A.P.) and Biswanath Chariali district Sonitpur (Assam) as to their adequacy, usefulness, effectiveness and contribution to the development of agriculture besides suggesting on restructuring of the training and testing programmes.
  
2. To assess the training and testing infrastructure available with the State Governments/Organizations including industry and trade in various states and UTs.

3. To identify the gaps and additional requirement of training and testing for agricultural mechanization in each of the state and UT by 2020 A.D. in the context of fast changing agricultural mechanization scenario in the country.
  
4. To identify the location of the FMT & TIs in each of the States/Uts for undertaking these programmes. If the requirement is for more than one FMT & TI in any of the state, the same may also be indicated.

## **METHODOLOGY**

The study has been divided in to two parts, training and testing of farm machinery in Himachal Pradesh. The machinery covered under the scope of study is Tractor, Combine Harvester (Tractor), Irrigation pumps/motors, Harvester (self), Power sprayer/Duster, M B. and Disc Plough, Disc Harrow, Cultivator, Seed Drill/Seed Fertilizer Drill, Planter, Leveller, Potato digger, Thresher and Sugarcane Crusher. In this regard the following institutions were contacted.

1. CSK HP Krishi Vishva Vidyalaya, Palampur.
2. 2.Y.S. Parmar University of Horticulture and Forestry, Nauni, Solan.
3. Directorate of Agriculture, Krishi Bhawan, Shimla.
4. Directorate of Horticulture, Navbhar, Shimla.
5. H.P. Agro-Industrial Corporation, Nigam Bihar, Shimla.
6. Authorized Dealers of Farm Machinery in Himachal Pradesh.
7. The Manufacturers of Farm Machinery in Himachal Pradesh.

It was found that the training facilities were being provided only by CSK HP Krishi Vishva Vidyalaya, Palampur, which had provided training 23 persons during the period 12.11.1997 to 27.11.2000 in respect of power tiller and matching equipments. The other trainings pertained to the use of minor farm machinery and implements, which are not covered under the scope of the study. All these persons who had received

training were contacted but the responses of only nine were received. In addition five extension workers were also contacted for the study. No manufacturers of farm machinery and implements in the state was providing any training or testing facilities for the machinery sold by him.

The data regarding level of farm machinery in the state was obtained from directorate of land records and department of agriculture. The data was analysed and compound growth rates were calculated for projecting the figures for the years 2010 and 2020.

### **Farm Machinery Training**

The investigations revealed that no farmer has been nominated so far by department of agriculture for any training conducted by farm machinery training and testing institutes located at four places in India. The only source of training for the farmers in respect of farm machinery was CSK HP Krishi Vishwa Vidyalaya which had trained 23 persons in respect of power tiller and matching implements during the period 12.11.1997 to 27.11.2000. As the responses of only nine persons were received the analysis has been based only on these. It was revealed that relatives and friends and the university sources were the main source of information for the persons regarding the training to be held by the university. Majority of the people felt that if it were possible for them to acquire such machinery, they would definitely experience an improvement in their income levels. The extension workers also felt that it has increased their own knowledge, which will be reflected in teaching of the farmers. Some of them were also prepared to train their fellow workers and colleagues. The responses of trainees regarding the training infrastructure and the behaviour and dealing of the trainers towards them was really encouraging. The overwhelming majority felt that the machinery required for the purpose was adequate, the training staff was also sufficient which paid good attention towards the training and their behaviour was excellent.

The authorized sale outlets for tractors were nominating the persons (not necessarily farmers) for the training concerning the repair of tractors and other ancillary machinery. The purpose of these trainings was to produce the work force mechanics for their establishments.

### **Testing of Farm Machinery**

The testing facilities for farm machinery in the state were totally absent.

### **Status of Farm Machinery**

The data regarding all the machines covered under the scope of study was not available hence the analysis in this regard was restricted to the available data. The analysis reveals that the status of farm mechanization in the state is very dismal and if the present trend continues the situation is not likely to improve during the forecasting period.

### **Suggestions and Policy Implications**

It has been found out that the position of farm mechanization in the state is dismal and based on the present trend is not likely to improve in near future. The need in a hilly state like Himachal Pradesh is to go in for the improved hand and animal operated tools which are likely to go in a long way for improving the productivities and hence the living standards of farmers as compared with heavy farm machinery. Thus, a clear-cut policy backup by institutional support is needed in this regard.