FARMER'S PERCEPTIONS TOWARDS PRIVATE NURSERIES AND TREE PLANTINGS IN THE UPLIFT OF RURAL COMMUNITIES IN RAWALPINDI CIRCLE, PUNJAB

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ABSTRACT

The study was carried out in Rawalpindi and Attock Divisions of Rawalpindi Circle. The objectives were to identify farmer's perceptions towards private nursery and tree plantings and to determine their role, influencing factors and constraints in the socio economic uplift of the rural communities. A random sampling procedure was adopted to select the five villages per division to collect the relevant data from 50 respondents, according to the pre tested structured questionnaire.

The average household size in the study area was 6 persons with 1-2 earning members per household. 60% were literate including 2% with religious education. The study revealed that 30% of the respondents have agriculture as a sole source of livelihood whereas 70% also have other activities along with agriculture. Majority 94% were landowners with 6% tenants /landless. 54% respondents belonged to middle class (i.e. own pacca house and have less than 10 acres) have sufficient land to plant trees. Forest tree plantations of Eucalyptus species, Poplar and *Acacia modesta*, etc were found on 10-12% of land. Majority 68% respondents use farm trees for mix of uses (timber, fuel wood, fodder) with preferred rotation age, expressed by 80% as 6-10 years. Out of total farm tree produce, 30% consumed for domestic fuel, 12% for roofing windows, poles etc; and 58% sold to get cash for family. 92% used standing sale procedure.

The nursery or trees have proved profitable economic activity for them. The 80 – 84% respondents perceived that the tree planting trend would increase in future. 78% showed their willingness to continue tree growing on their farms. 100% nursery farmers wanted to continue nursery raising business. Forest Department was found effective source of information dissemination as expressed by 86% respondents followed by newspapers, TV and Radio media. Negative perceptions regarding effects of trees planting on agriculture crops is the major hindrance and be removed by conducting on farm relevant scientific research and disseminating the finding to the farmers.

INTRODUCTION

Pakistan is a forest resource deficient country with only 0.3 ha of per capita against world average of 1.0 ha and at the risk of further decline due to population growth of 2.6% per annum. Pakistan has only 4.8% of its total land

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area under forests which is insufficient to meet the wood requirements of the country as well as to provide the sufficient cover for economic development and healthy environment. Out of that total forest area 85% is state owned. It is estimated that farmlands share about 46% timber and 90% firewood requirements of the country. As such farmlands are valuable source of wood production.

The annual demand for fuel wood is 22.15 million cubic meter on the basis of 0.2 m3 per capita. The entire demand for fuel wood is met from indigenous sources, the recorded production from state owned forests being only 0.4 million m3. Even though that planting trees seems to be the responsibility of forest department. The rates of forestations by Provincial Forest Department have been very low only a negligible area is being planted every year. One of the possibilities to bridge the gap between supply and demand of wood is to put more area under state forests. For time being it seems rather difficult because of paramount claim of agriculture on farmlands (Sheikh, 1986; PFI, 1999).

Farmers in Pakistan have been planting trees or growing them since ages. They have long recognized the value of planting trees on farms and marginal lands in various forms such as on field borders, for sheltering crops, or in other combinations in conjunction with agricultural crops. The nurseries or trees planting provide tangible benefits for very little cost and efforts to the rural communities. They provide fuel, fodder, small timber and other wood products including various agricultural implements and articles. In addition trees are the major source of forage for the livestock which is the important component of any rural household community. Thus the importance of nursery and tree planting is quite obvious for economic benefits to the rural communities in Pakistan. The economic uplift of the farmers and improvements in their socio-economic condition can be made through enhancing the land productivity, by integrating various resources. Production of nursery plants and raising tree crops on farmlands are the major farm-based income generating activities which can bring the substantial positive change in the socio-economic conditions of the village masses. Regardless of the fact that private nurseries and farm planting has proved itself an economic activity by generating regular income to the rural poor. But still some farmers have their own perceptions regarding farm tree plantings. Keeping in view the above facts this research was conducted in the Rawalpindi Circle of the province of Punjab. The study focused to identify the farmer's attitude towards tree planting and growing of nurseries in or around their lands; to determine the constraints faced by these farmers and realize improvements in the socio-economic conditions of poor rural communities in the study area.

Description of the study areas

The jurisdiction of Rawalpindi Forest Circle spreads over entire area of Rawalpindi Civil Division (Defunct), comprising four Districts i.e. Rawalpindi,

Attock, Chakwal and Jhelum. Each District is headed by a Divisional Forest Officer, except Rawalpindi District where 4 Divisional Forest Officers are working i.e. Rawalpindi South, Rawalpindi North, Murree and Timber extraction Division. The Conservator of Forests, who is a controlling officer, is stationed at Rawalpindi.

Description of the Rawalpindi district

Rawalpindi is situated in the northern zone. The northern zone is spread over 2 civil divisions i.e. Sargodah and Rawalpindi. District Rawalpindi is bounded on the northwest by NWFP Hazara and in west by district Attock while on eastern side Jehlum River and AJK state and in south by Chakwal and Jehlum districts.

Phulai, Kikar, Kahu (at the verge of extinction and Sanatha are major species of salt range. The former 2 species along with Ber, Bakain and Frash are found in groves or scattered in Pothohar plateau. Phulai, Kikar and Ber are lopped for fodder. The major species in Murree and Kahuta tehsils are *Olea ferruginea* in Murree and *Cerrica spinarum*, *Acacia glomerata*. Other species in the district include *Populus deltoids* (Poplar), and *Eucalyptus camaldulensis* (Safaida), etc.

Description of Attock district

The tract dealt which forms a portion of the famous pothowar region. It is bounded on the North and West by the river Indus and in the east by Abbotabad and Rawalpindi districts while in its South is Chakwal district. The total area of the district is 6856.703 sq. km (2647.395 sq. miles). The forest area is 9.5 percent of the total.

The predominating forest tree species on the northern slopes of the Kalachitta, north of the main ridge, is olive (*Olea cuspidata*) with Phulai (*Acacia modesta*), Sanatha (*Dodonaea viscosa*), Gurgura (*Monotheca buxifolia*), Pataki (*Gymnosporia royleana*) and *Reptonia* as the chief auxiliaries. Along the ravines small groups and isolated specimens of *Grewia oppositifolia*, *Flacourtia ramontachi*, *Pistacia integerrima*, *Albizzia lebbek*, *Rhamnus persica*, *Phoenix sylvestris*, *Ficus* spp, *Dalbergia sissoo*, *Morus alba*, *Salmalia malabarica* etc. are found occasionally. On the southern slopes and flatter ground of Kalachitta, parts of Kawagar and Kherimar forests, Phulai is the predominating species. Van (*Salvadora oleoides*), Karir (*Capparis aphylla*), Mullah (*Zizyphus nummularia*), Lahura (*Tecoma undulata*) and some Sanatha (*Dodonaea viscosa*) are its associates.

METERIALS AND METHODS

A survey was conducted in Rawalpindi and Attock Division of their respective districts. A structured questionnaire comprised of several questions was designed and was pretested in the study area. It was revised in the light of test interview and few questions were modified or deleted.

Sampling design

The two divisions that are Rawalpindi and Attock out of the four under Rawalpindi Circle were randomly selected for the purpose of survey. A list of total number of villages was made for the two divisions and five villages each were randomly selected for both the divisions. The five villages i.e. Garri Afghan, Pind Gondal, Lossar Sharfu, Hassan and Wah were from Rawalpindi Division and villages i.e. Qutbal, Ajjuwalla, Battar, Garri Huso Khan, Darrak from Attock Division were chosen.

Interview procedure

The respondents were randomly selected from the chosen villages with the help of local people and forest department. Questionnaire cum interview method was used for acquiring information from respondents. About five respondents were identified per village in both the divisions.

Data collection and analysis

The pretested questionnaire was used as a research instrument for data collection. The researchers interviewed the respondents personally. Although the instrument was constructed in English, the question were asked in local language i.e. Pothwari. This was done for the convenience of respondents and to attain maximum accuracy in information. The data was collected from ten chosen villages of Rawalpindi and Attock Divisions from 50 respondents. The data collected through questionnaire were coded and arranged for statistical analysis to draw conclusions.

RESULTS AND DISCUSSION

The gathered information was statistically analyzed and the results are discussed in four major head. The first part deal with general characteristics of the study area, second about agriculture/forestry activities, third described information regarding nurseries and trees and fourth part discussed attitude of people about tree and nursery growing.

General characteristics of the study area

Professional status and source of income

The survey results indicated that majority of the people have agriculture as the major source of livelihood. But only 30% have agriculture as a sole source and remaining 70% have other sources of income such as poultry farming, dairy farming, small businesses and forestry in combination with agriculture. Some respondents have adopted other sources of income but not many were found so agriculture farming came out as major source of income as indicated in Table 1.

Table 1: Professional Status and Source of Income

Source of Income	No. of Respondents	Percentage
Agriculture	15	30
Agriculture + Dairy Farm	2	4
Agriculture + Poultry Farm	2	4
Agriculture + Business	13	26
Agriculture + Govt. Servant	8	16
Agriculture + Dairy Farm + Poultry Farm	3	6
Agriculture + Business + Govt. Servant	2	4
Agriculture + Poultry Farm + Business	2	4
Agriculture + Poultry Farm + Govt. Servant	3	6
Total	50	100

Land ownership status

The survey results as indicated in Fig.1 showed that majority i.e. 94% were landowners. Only 6% people were found landless who worked as tenants on other's lands.

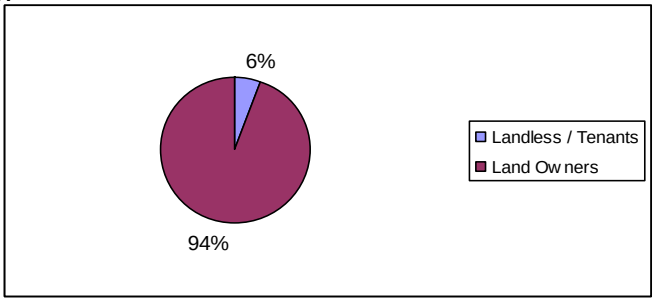

Fig.1. Land Ownership Status

Household Size and Earning Members

The average household size found in the study area was 6 persons / hh. The male population was found more (i.e. 64%) than female population (i.e. 36%).The results contrast with the national figures that females are about 48%. It might be due to the reason that our rural males feel shy to talk about their females in front of outsiders. The information from respondent revealed about 1-2 person/hh were earning the bread for the whole family.

Household Education Level

The education is one of the major factors to influence human's perceptions and develop their attitudes. The education level has been classified into seven groups i.e. illiterate, primary, middle, matric, intermediate, post intermediate and master. The survey results revealed the fact that 40% of the population in the study was illiterate. The highest education level found in 11% of the household were primary, 16% middle, 13% matric and 13% intermediate and 5% members have post intermediate qualification (i.e. BA, B.Sc., MA, M.Sc.). Whereas 2% had Islamic education from Maktib, etc. It was interesting to find that now a days new generation completing their matric education strive to get higher education if not much at least intermediate.

Monthly family income and monthly family income

Most of the respondents were found in low income groups. Out of total respondents 52% had monthly income ranging between either Rs.0 – 10,000 or 10,001–20,000, 18% had Rs.2001-30,000, 12% had Rs.30001–40000, while 6% household had Rs.40,001–50000. Only 12% families had monthly income of more than Rs.50,000 (Table 2). These income ranges may seem quite higher to the salaries class of the country but when on when expenditure figures comes across it becomes clear. The results in Table 2 indicated that the monthly family expenditures were in positive correlation with those of their family income.

Table 2. Monthly family income and expenditure

Expenditure group (Rs)	No. of Respondents (%)	No. of Respondents (%)
0 - 10,000	12 (24)	13 (26)
10,001 – 20,000	14 (28)	15 (30)
20,001 – 30,000	9 (18)	8 (16)
30,001 – 40,000	6 (12)	5 (10)
40,001 – 50,000	3 (6)	3 (6)
50,001 & above	6 (12)	6 (12)
Total	50 (100)	50 (100)

Majority of the population in the study area had low expenditures as 56% have monthly expenditures in two lowest expenditures groups i.e. ranging between Rs.0–20,000.

Social Status

The income status was categorized in three classes; High (if owns pacca house and land is more than 10 acres), Medium (if land is less than 10 acres) and low (if tenants, landless etc. with pacca or semi pacca houses). The results showed that majority of the respondents belonged to middle class i.e. 54%, followed by high class i.e. 40% and only 3% in low class. The reason of very less percentage in lower class is probably due to the reason that about 94% of the people are farmers have some land to work except the 6% who are either landless or tenants or from business community.

Agriculture/forestry activities

Size of agricultural landholding

The survey results indicated that 60% households have below 40 acres of agriculture lands followed by 24% respondents who owns up to 80 acres; where as 16% respondents have above 81 acres of agricultural lands. It might be concluded that the people in the areas have sufficient land to plant trees.

Type of landholding

The study revealed that 22% people have irrigated land, 34% have non irrigated land followed by the 44% people who have both (i.e irrigated and non-irrigated) type of lands. (Fig.2). It is concluded that study area have both type of lands and careful consideration should be given for suggesting suitable tree species harvesting maximum benefits from farm forestry practices.

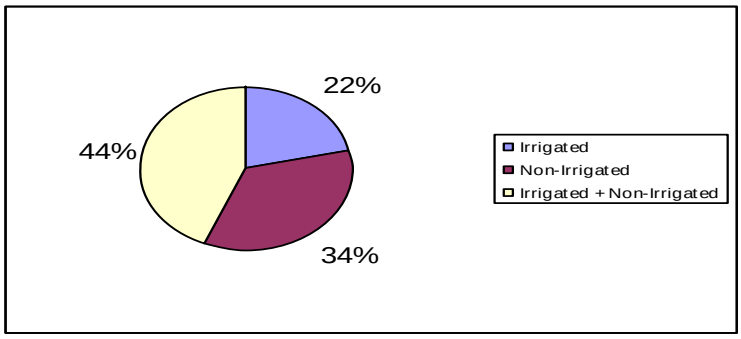

Fig. 2. Type of Landholding

Type of vegetation grown in irrigated areas

The survey results revealed (Table 3) that Wheat and Maize are major agricultural crops of the irrigated tract grown by 90% respondents either singly or with other combinations. 10% respondents have solely forest plantation.

Table 3. Type of vegetation grown in irrigated areas

Vegetation Grown	No. of Respondents	Percentage
Forest Plantation	5	10
Wheat + Maize + Vegetables	12	24
Forest Plantation + Wheat + Maize	7	14
Wheat + Maize + Others	11	22
Forest Plantation + Wheat + Maize + Vegetables	6	12
Forest Plantation + Wheat + Maize + Others	6	12
Forest Plantation + Wheat + Maize + Other + Vegetable	3	6
Total	50	100

It is concluded that 68% respondents (in addition to 10% mentioned before) plant trees or raise plantation along with agriculture. Therefore in irrigated tracts for the economical use of water as well as an additional income tree planting may be enhanced.

Type of vegetation grown in non-irrigated areas

The survey result indicated (Table 4) that in all 88% respondent grow Maize and Wheat along with different combination of other crops, Forest plantation and/or Forest vegetation. There were only 12% who were growing Forest plantation along with Forest vegetation. There was little difference to grow Forest plantation, Forest vegetation and/or other crops with agricultural i.e. Maize and Wheat as indicated from Table 4. Moreover there was no difference among choice of species for agriculture in irrigated or non irrigated areas, however there might be differences in production levels.

Table 4. Type of vegetation grown in non-irrigated areas

Vegetation Grown	No. of Respondents	Percentage
Forest Plantation + Vegetation	6	12
Wheat + Maize + Others	2	4
Forest Vegetation+ Wheat + Maize	5	10
Forest Plantation + Wheat + Maize	6	12

Vegetation Grown	No. of Respondents	Percentage
Wheat + Maize + Other + Forest Vegetation	4	8
Forest Plantation + Maize + Others	8	16
Forest Plantation + Wheat + Maize	5	10
Forest Plantation + Wheat + Maize + Others + Vegetables	14	28
Total	50	100

Sources of irrigation

The study results revealed (Fig.3) that majority (40%) of the respondents have tube wells, 18% have small dams followed by 10% who get canal water; whereas 32% rely on rainfall (who have lands in Barani/Non-irrigated tracts).

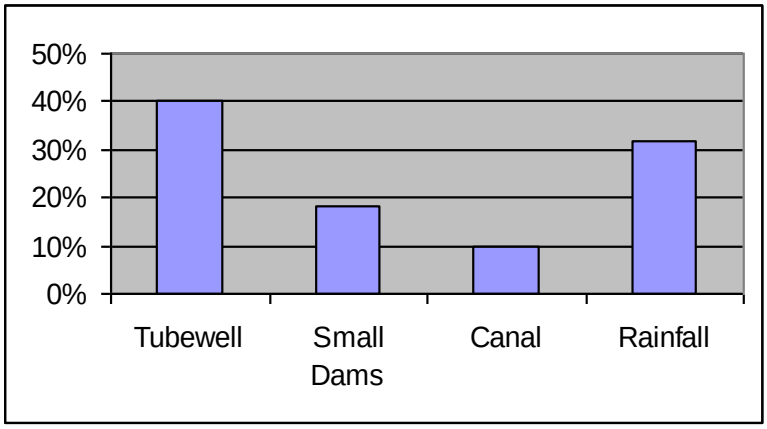

Fig. 3. Source of Irrigation

Land use for grazing and livestock composition

The study data revealed that only 36% respondents their lands for grazing. Although 64% respondens responded in negative when asked question whether they use land for grazing. There is still a great potential for ensuring fodder requirements for their livestock.

The study results revealed the mix of livestock composition. The people keep buffaloes, cows, horses, sheep and goats. The 6% respondents have buffaloes, 8% have cows and 4% have horses and majority (34%) of them keep buffaloes and cows followed by 16% who keep cows and goats. Only 4% reported no livestock.

Tree composition on farm lands and tree uses

The survey results indicated that 80% of the respondents grow timber, firewood and fruit species. Although, they prefer different fruit and fodder species; such as *Acacia modesta*, *Olea ferruginea* etc. It reflected respondents wanted cash returns or valuable woods as majority of them only want to grow trees for timber purposes. The survey questions pertaining to the use of their existent farm trees, 68% reported fuel wood and fodder along with timber uses. It was followed by 32% who used their farm trees only for timber purposes.

Purpose of tree planting

The results Fig.4 indicated that 36% respondents plant trees for commercial purposes, 46% for commercial plus self use and only 18% plant trees for self consumption. It became evident that purpose of tree planting was to earn money in addition to its intangible benefits.

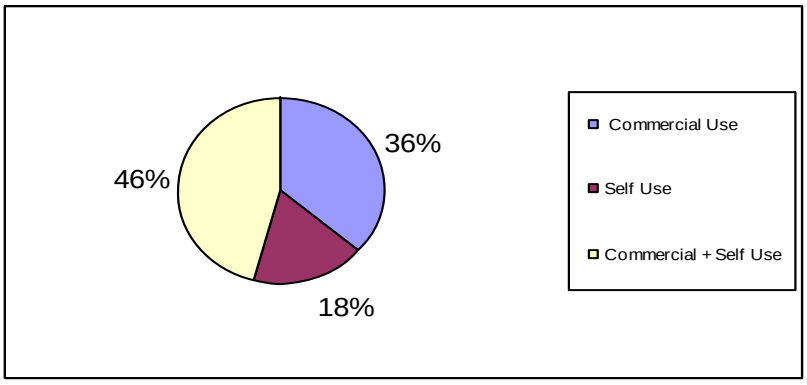

Fig. 4. Purpose of Tree Planting

Preferred rotation

The survey results revealed that a big majority i.e. 80% of respondents sold and preferred to sell their tree crops at the rotation age of 6–10 years. They were in the view that 6–10 year crop fetch more price and it's economical as well; as compare to 0-5 yrs or above 10 yrs.

Cash earned from trees

The survey results indicated that 90% have planted and have started harnessing the fruit of their hard work. 32% respondents have earned Rs.0–100000; the other majority found were 22% who earned a cash more than Rs.600000. It concluded that tree rotation period might be longer than agriculture crops but it pays.

Nursery and trees under Forest Department projects

Planting trees under forest department

Although the tree planting is a centuries old practice but the study revealed that formally 100% of the respondents have started planting under project in the study area.

Pattern of plantings

The study results did not revealed any special patterns of plantings by respondents. It was found that 12% respondents have raised line plantings, 6% have block planting, and 26% have a mix of line and block planting. When as a majority of 56% respondents have raised a mix of line or block or scatter planting on their farms.

Silvicultural operation on forest crop

It was asked of the respondents have done any silvicultural operations (cleaning thinning, final felling, etc) to the forest crop or to their farm trees. The results revealed (Table 5) that only 52% of the respondents have done all the operations where as 48% have only conducted final felling.

Table 5: Silvicultural Operations

Silviculture Operation	No. of Respondents	Percentage
Cleaning	-	-
Thinning	-	-
Final felling	24	48
Cleaning / Final felling/Thinning	26	52
Total	50	100

Various domestic uses of wood

The respondents were also enquired about the domestic use of their own farm grown wood. The 30% used wood for fuel for domestic consumption and 12% for various uses including roofing, doors, and poles etc. Some 58% respondents sell wood after domestic consumption which provided cash to meet their daily requirement (Fig.5).

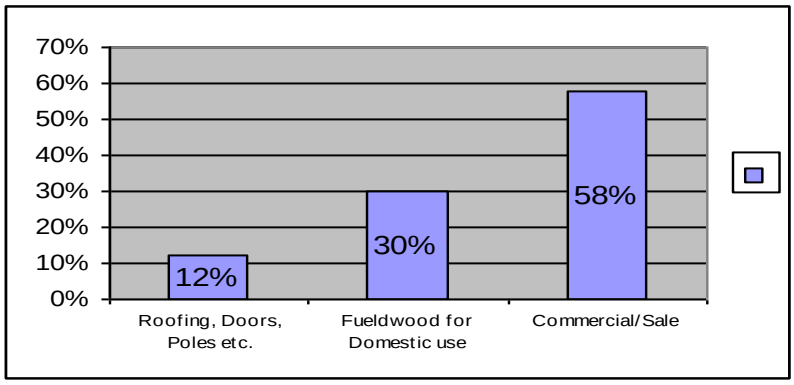

Fig.5. Various Domestic Uses of Wood

Thus growing of trees have helped in the uplift of farmer communities.

Sale and saving from sale of forest trees

The survey data indicated that most of the respondents i.e. 92% use standing sale procedure where as only remaining 8% take the raw material to market for sale them. The survey results indicated that 26% respondents saved upto Rs.10,000, 20% saved upto Rs.20,000, 8% upto Rs.30,000, 6% upto Rs.40,000, 10% upto Rs.50,000 and 30% saved more than Rs.50,000.

Loss to agricultural crops and assistance to grow trees

The survey results indicated that 22% respondents find no hindrance to agriculture crops, where as 50% responded that often some negative impacts have on agriculture crops. Only 28% think that trees impact agriculture crops negatively. Majority of the respondents i.e. 84% expressed the need for assistance/help to grow trees while 16% in the view that they can do on their own.

Sources of information

Majority of the respondents i.e. 86% admitted that Forest Department was their only source of information regarding tree and nursery information. It was followed by newspapers (6%) and TV/Radio (4% each). It concluded that Forest Department the effective in reacting to farmer communities.

Nurseries under government project

The survey results revealed that 80% of nursery raisers started raising nursery after the intervention of project. Whereas, 20% respondents were use to

grow nursery in the past before the commencement of any project area in the study. They indicated the nursery is a profitable business and might help in the uplift of rural communities in the study area.

Number of times nursery raised and number of nursery plants

The survey results indicated that 60% of the respondents raised more than 50000 plants. The nursery raising is a profitable business. This is the economic activity suitable for the landless or small land owners. Even the people have raised the nurseries in their courtyards.

The survey results regarding information that how many times a farmer have been raised nursery were also inquired. It was found that 50% respondents have raised nurseries 1–5 times, 30% have raised 6–10 times and 20% respondents have raised the nurseries 11-15 times. It is evident from the data that farmers found it profitable business to grow plants and continue nursery raising business.

Technical help for nurseries raising and disposal of nursery stock

The respondents were asked whether they received any technical help in raising the nursery the 100% respondents admitted that their capacity building was made by Forest Department. The results of survey revealed that 40% respondents planted their own nursery stock on their own farmlands while 60% distributed to others as well as for self consumption.

Source of seedling

The results indicated the most (80%) of the people obtained plant seedling from the Forest Department. Only a remaining minority either used from self owned nurseries or purchased from private nurseries especially fruit plants. Most of the harvested or present forest plantations are ruminants of the Forest Department (planted under different forestry projects).

Earning from nurseries

The farmers earned a lot of money from the nursery business. The 20% respondents earned upto Rs. 2 lac, 10% respondents earned upto Rs. 4 lac, 30% earned up to 6 lac and 40% respondents earned even up to Rs. 8 lac.

Attitude of farmers

Willingness to grow trees on farmlands

The Question regarding attitude and perceptions of farmers regarding tree farming, trees on farmlands revealed that the majority (78%) were in favour of raising trees on agriculture field. There were some negative responses which could be due to the reason such as farmers have either no land or a small unit of land or they have some fears about impact of trees on agriculture crops.

Continue nursery growing

100% of the respondents ensured that will continue nursery business even if the government stops its help. They found it economical activity and helped to raise their standard of living. In response to other question regarding problems 100% nursery growers admitted that they faced no problem in nursery raising.

Perception regarding future trend

Farmers when enquired about their perception regarding future trend of Farm Forestry/Agroforestry, the majority 80% expressed that it will progress and trend will go up as 84% respondent expressed that they need to plant more trees for future requirements. 14% respondents considered that trend will decrease whereas 6% don't see any change in tree growing in future. The 16% think that they will cope with existing wood to meet their future requirement or due to negative feelings even when they were asked to provide with free seedling. It significantly concluded the need for tree planting.

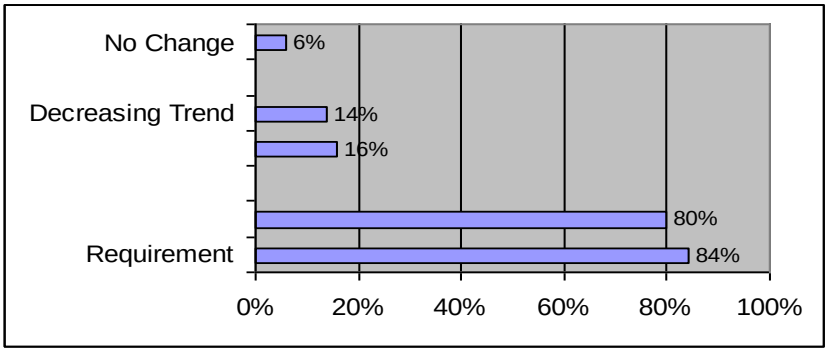

Fig. 6. Perceptions Regarding Future Trends and Requirements

Willingness to purchase seedlings

The survey results indicated that people of the study area are not fully motivated. The statistics showed that only 6% were willing to pay from their

pocket in case they have to purchase the seedlings. The reasons behind might be due to the projects' incentives and/or subsidies they have made it their right to get free seedlings.

Constraints in future tree planting

The farmers were also asked if they suspect any constraints in farm tree plantings for future. Survey results showed that 100% farmers who also planted trees in part, ranked the three major problems/constraints which they suspect will effect the farm tree plantings in future. The constraints reported were;

Cash/return after longer time periods.
Water table went down (Eucalyptus experience)
Decreased agricultural production.

CONCLUSIONS

On the basis of results and discussion based on analysis of the data, following conclusions are drawn:

Majority of the respondents have agriculture as major source of livelihood, 30% of them as a sole source and 70% along with other activities like poultry farming, Dairy farming, Nursery raising, etc.

About half i.e. 52% respondents were found in low income groups i.e. upto Rs. 20,000/month/hh. The monthly family expenditures were in positive correlation with their family income.

Irrigated and non irrigated both types of areas exist in the study area. Maize and Wheat crops with vegetable were grown in the study areas, however production rates vary in Barani and irrigated tracts.

Forest plantation (about 10 – 12%) of Eucalyptus species, Poplar and *Acacia modesta* were found.

Sources of irrigation found were 40% tubewells, 18% small dams, 10% canal water, followed by 32% rainfed.

The study area have great potential for livestock breeding. 96% of the respondents have mix of, cattle, goats, sheep and horses.

Majority of the respondents (68%) use farm trees for mix of uses i.e. timber, fuel wood and fodder.

The preferred rotation age of trees expressed by 80% respondents was 6 – 10 years. It was also emphasized by the results that 36% planted trees for the commercial purposes and 56% planted trees for commercial + self use.

Respondents grew trees in all different planting patterns i.e. line, blocks or scattered. Formally 100% respondents started growing trees after Forest Department Project. About 52% respondents carried out all silvicultural operations in the tree plantations.

Out of the total farm tree produce; respondents consumed 30% for domestic fuel, 12% for roofing, doors, window, poles etc. and remaining 58% has sold to get cash for the family.

Majority 92% of the respondents used standing sale procedure. The 32% respondents earned up to Rs. 1 lac and 22% earned above Rs. 6 lacs. About 70% respondents saved up to Rs. 50,000 and 30% saved even more than Rs. 50,000.

Farmers perceive that tree impact agricultural crop production by reducing it

Forest department was found effective source of tree information as 86% respondents expressed Forest Department as only source of information, followed by 6% newspaper and 4% TV and Radio each. About 6% respondents grew nurseries of more than 5000 plants, 50% respondents raised nursery even 1-5 times and 50% upto 15 times. Moreover 100% nursery growers use their plants, for self consumption where as 40% among them also provided to others free of cost under Forest Department Project. The nursery farmers earned enough cash from private sale or distribution to Forest Department and 100% of them wanted to continue nursery business as it helped to raise their standard of living.

A majority 78% respondents showed their willingness to grow trees on their farmlands in future. 84% respondents expressed the need for assistance to grow trees. 84% respondents showed the requirement for tree growing in future use whereas 16% perceive that they will cope with existing wood to meet their future requirements.

RECOMMENDATIONS

In the light of the results and discussion and conclusion drawn, the following are recommended.

Forest extension activities should be expanded and intensified in the area

so that the farmers are made fully aware of the importance and contribution of trees. For the purpose local males and females to be trained as forestry extension workers.

Farmers should be motivated and convinced to raise fast growing leguminous multipurpose tree species in agroforestry combination to get maximum utilization from the same unit of land.

Linkages between agriculture and forestry research departments/ institutions must be effective.

The Forest Department should purchase from the progressive farmers instead of growing their own nurseries.

Negative perceptions of farmers regarding effects of trees on agriculture crops must be washed by providing relevant scientific research findings. Programs regarding Agroforestry and Farm Forestry should be broad casted in local language, Punjabi and Potwari on Radio and Television. The interviews of tree farmers should be telecasted on mass media with sufficient coverage.

Forest Department should encourage farmers to raise fruit tree species along with forest tree species in their nurseries. Farm forestry and nursery models should be demonstrated in consultation with the farmers of the area, showing a definite margin of profit under this system.

Special incentives in the form of loan and provision of inputs of production at subsidy rates to the tree nursery should be provided by the government but raisers free distribution must be stopped to make them self reliant.

Marketing board should be established immediately to develop contacts between the tree growers and wood based industries.

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