AN INVESTIGATION TO FIND OUT THE REASONS FOR ADOPTION OF AGROFORESTRY BY FARMERS IN DISTRICT FAISALABAD

W. Nouman, G. S. Khan, H. Farooq and N. Jamal*

Department of Forestry, Range Management and Wildlife
*Department of Agricultural Extension, University of Agriculture Faisalabad.

ABSTRACT

Forests play an important role in Pakistan's economy. These are the important sources for provision of timber, fuel wood, fodder and shelter for livestock. The significance of wood produced on farmlands has increased sharply during the last two decades. The cultivated fields are the best places to grow trees along with crops. The objective of this study was to investigate the reasons and the factors, which are responsible for the adoption of agroforestry by farmers in district Faisalabad. A sample of 125 respondents from five randomly selected rural union councils of tehsil Faisalabad were interviewed through a structured interview schedule in person and the data were analyzed by using computer software to draw conclusions. It was concluded that the farmers were adopting agroforestry practices mainly to meet their fodder and fuel wood requirements. They highly preferred *Delibergia sissoo* and *Acacia nilotica* for better economic returns.

Key words: Agroforestry; Tree benefits, Sheltering crops.

INTRODUCTION

Agriculture is the mainstay of Pakistan's economy, which is contributing 22% of its total Gross Domestic Product (GOP, 2005) and providing employment to 65.9% inhabitants mostly living in rural areas (GOP, 2003). The area under cropping system in Pakistan is 22.15 million hectares out of which 76% is cultivated area under irrigation (GOP, 2003). Twenty eight present of rural population is living below poverty line, earning Rs. 878.64 per adult equivalent per month (GOP, 2005). Therefore, there is a need to justify their necessities of life by scientific use of natural resources such as agriculture, livestock, poultry and forestry up to their potential for those deprived persons living below poverty line.

Besides agriculture and livestock, the trees are also the best solution to combat this lack of natural resources and income generation. According to FAO (2000), the area under forest in Pakistan is just 3.1%, which has remained 2.5% in the year 2005.

Pakistan being a forest deficient country is facing timber and fire wood shortage of about 29 million cubic meters (GOP, 2005). There is a need to increase the area under tree cover not only to meet the material needs of the growing population but also to enhance the environmental and ecological services being provided by the forests. The only available option to fulfill the energy requirements is to increase wood production on private farm lands by promoting agroforestry. Our cultivated land is 22.15 million hectares and 10% of this can easily be brought under trees. The Government of Pakistan is trying to make up the deficiency and has brought 2% of a agricultural land under tree cover (Qureshi, 1998). According to FSMP (Forestry Sector Master Plan) the annual growth of forests and trees was 14.4 million m^3 of which 7.7 million m^3 (53%) was put on by the farmland trees (Qureshi, 1998).

Zubair and Garforth (2005) reported that the farmers' willingness to grow trees on their farmlands is a function of their attitudes mainly towards the advantages and disadvantages of growing trees. The farmers perceive tree planting as a source of income, providing wood for fuel and furniture, controlling erosion and pollution, and providing shade for humans and animals. Hence, now the farmers have long recognized the value of planting trees on their fields for sheltering crops, generating wood for self-consumption and commercial sale. This study was conducted to find out the reasons and factors responsible for the adoption of tree planting on farmlands and tree species preferences given by farmers in district Faisalabad.

MATERIALS AND METHODS

The study was conducted in district Faisalabad, which consists of five tehsils. Tehsil Faisalabad was selected through purposive sampling technique. Out of total 58 rural union councils, five were selected through simple random sampling technique. From each selected union council, one village was selected randomly, and from each selected village, 25 farm families were selected at random. From each selected farm family, one farmer who was actively engaged in farming activities was taken, thereby, making a sample of 125 respondents. The information regading the reasons of tree planting on farmlands by farmers, tree benefits obtained from trees and the preferences given to different tree species by

farmers was obtained with the help of an interview schedule in person, which was analyzed by using computer software SSPS to draw conclusions and to recommend suggestions for the improvement in the adoption of agroforestry.

RESULTS AND DISCUSSION

Reasons for planting trees on farm lands: The results of the present investigation revealed that 73.6% of the respondents gave reasons to grow trees on their farmlands to produce fodder for their livestock and 65.6% of them reasoned fuel wood to grow trees to fulfill their combustion needs, while 58.4% and 57.6% respondents gave reasons to meet shelter or shade requirements for their crops and livestock and timber were also the reasons to plant trees. A marginal number of the respondents (30.4%) were aware of rehabilitation of degraded lands through tree plantation. The trees on farmlands are also grown to diversify farm income by adding an additional enterprise. Beside these monitory benefits, trees are also the main sources of supply of wood and wood products for on-farm use, fuel wood for combustion requirements and to increase livestock productivity by providing forage, shade and shelter and protect crops from damaging winds (Cooperative Research Center, 1999).

The farmers mostly like to plant trees to get fodder, fuel wood and timber. They grow trees to meet their fuel requirements. They consider the fuel wood not only cheaper as compared with natural gas but also easily accessible. The trees are also utilized for shade and shelter for their livestock. The farmers think that the housing and shedding with proper direction, ventilation and lightening are very important for keeping the animals healthy and more productive. Thus they mostly utilize the tree trunks and branches for the livestock production practices. The farmers get fodder for their livestock from trees specially *Acacia nilotica*, which have more proteins (18.6%) and about 61.2% nitrogen-free extract (Duke, 1983). These trees are leguminous having nodules in its roots, which ameliorate the soil by fixing atmospheric nitrogen. Hence such trees rehabilitate the degraded lands by adding nitrogen. They also control the waterlogging and salinity problems by up taking the excess amount of water along with salts. The water is transpired in the atmosphere, which eliminates the water logging and the salts and nutrients are utilized by trees for their self-nutrition and growth. A study conducted by Cooperative Research Center in 1999 to investigate the reasons for planting trees by farmers on their farmlands in North queens land, Australia also supported our results. These results are also in line with the findings of Saxena (1990) who concluded that the main reasons for planting trees on farmlands were small construction timber, fodder, fuel wood and additional income through sale. Other reasons indicated for tree planting included the need to protect fields from the risk of encroachment by neighbours.

Tree Benefits: Results of the present study showed that the respondents were aware of benefits obtained from trees. It was observed that 68.8% respondents obtain fodder from trees for their livestock while 53.6% respondents were getting fuel wood for their combustion purposes. Only 9.6% respondents were gaining timber for sheltering and shading purposes mainly for their livestock.

HESS (Household Energy Strategy Study) demand survey reported similar results as shown in our data that the main benefits, due to which the landowners consider to plant trees were timber, fuel wood and fodder production. Similarly, Kausar (1989) also reported a considerable scope of raising multiple utility plantations of various species for food, fodder, fuel wood and timber on farmlands. He concluded that such plantations could be raised along the boundaries of agricultural fields and canal sides. This study also commensurate with Jamil (2003) who reported that the (17.8%) of farmers in Attock district were obtaining timber and 81.1% fuel wood for their own requirements.

Tree Species Preferences by Farmers: Increasing efforts are being made all over the world to plant new species and improved varieties of trees that have a good growth rate as well as multiple uses. In Pakistan too a number of experiments have been made and fast-growing, short rotation trees have been cultivated. Hence, the farmers were asked about the species, which they mostly like to grow on their farmlands. In irrigated plains, *Dalbergia sissoo* is the most favourite. Its timber is sold with a high price. It is also reported as folk remedy for skin ointments. *Acacia nilotica* is the next grown for getting rough timber, fuel wood, shelter, shade and fodder for livestock. Its gum is still used in many medicines, inks, matches and paints (Duke and Wain, 1981). Fruit trees are not usually encouraged by farmers to grow on farmlands due to its management problems. Hence, the farmers gave their opinions about different tree species regarding their liking and disliking.

Table 1. Tree species preferences given by farmers to promote agroforestry on their farmlands.

Tree Species	Frequency	Percentage
Dalbergia sissoo	87	69.6
Acacia nilotica	68	54.4
Populous deltoids	47	37.6
Eucalyptus camaldulensis	36	28.8
Fruit trees	27	21.6
Melia azaderach	26	20.8

The data shown in Table 1 reveal that the farmers mostly liked *Dalbergia sissoo* and *Acacia*

nilotica. The highly preferred *Dalbergia sissoo* (69.6%) because this tree is best and suitable for planting in irrigated lands. Its timber is sold at high price, which is used in furniture and other products. The farmers also preferred *Acacia nilotica* (54.4%) due to its utilization as fodder and fuel wood. The *Eucalyptus camaldulensis* was low in priority (only 28.8%) because now the farmers have lost their interest in planting *Eucalyptus* due to their consideration about degradation of cultivated land and limited market uptake of the tree. Saxena (1990) narrated that a majority of respondents preferred *Dalbergia sissoo, Acacia nilotica* and *Populous deltoids* to get better economic and other benefits.

The other reasons to like *Dalbergia sissoo* is that the farmers feel comfortable in planting and growing these trees. In many cases, the plants grow themselves in certain crops. The wise farmers shift these plants on the field boundary or at any other proper place. Its growth is quite encouraging and it provides reasonable economic benefits to farmers after every 10 to 15 years depending upon the number of trees available. The farmers feel no fear in marketing their products. The buyers come to the farm gate and after negotiation, the farmers receive a reasonable price. The buyers harvest trees by themselves and farmers are not involved in such practices. The same is for *Acacia nilotica*. It has been observed that certain new species in the absence of proper marketing create problems for the farmer. *Eucalptus camaldulensis* is seriously condemned by many government and non-governjment agencies for its luxurious water uptake but it is still grown only because it is easy to grow. It can grow in rich to poor soil. It can grow with more as well as less water. Jamil (2003) also concluded that the farmers highly preferred *Dalbergia sissoo* and *Acacia nilotica.*

Conclusions: This research study concludes that the farmers were planting trees on their farmlands mainly to obtain fodder for their livestock and fuel wood to meet their combustion needs. The farmers highly prefer *Dalbergia sissoo* and *Acacia nilotica*,which give better economic returns and have best quality of timber, fuel wood and fodder. It is suggested that the government institutions and NGOs should provide technical guidance and assistance to farmers for promoting the agroforestry to fulfill the energy requirements. The farmers should also be educated about the marketing tactics of wood and wood based products to get better monitory benefits.

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