

STATUS OF TREE PLANTING CAMPAIGNS IN PAKISTAN (1996 - 2003)

Sardar Muhammad Rafique* and Saliheen Khan*

Introduction

Pakistan is located between 24°-37° N latitudes and 61°-75° E longitudes covering a geographical area of 87.98 million hectares (including AJK). The country, physiographically, is divided broadly into two main regions namely; plains of the Indus River and its tributaries and huge complex of mountains and plateaus lying in north and northwestern boundaries. The plains are, by and large, level country consisting mostly of irrigated agriculture and arid and semi-arid deserts. The mountain complex comprises of broad level valleys, partially irrigated, and high, steep and rugged mountains, hills and plateaus.

More than 60 percent area of Pakistan is arid and receives less than 250 mm rainfall per annum. About 20 percent area is semi-arid where rainfall varies between 250-400 mm per annum. In these zones temperature rises steeply during summer and drops sharply in winter giving rise to great variations in diurnal temperature. Subsequently the arid and semi-arid parts of the country are characterized by low precipitation, extreme temperatures and low humidity. These conditions are inhospitable to good plant growth. There are frequent droughts and the plant growth fluctuates greatly with precipitation.

Pakistan is blessed to possess some of the most productive lands in the world and in addition to feeding its own population is also capable of producing surplus food for other countries. Trees and associated natural vegetation are essential for maintaining the productive capacity of the land. In the mountains, trees protect the soil on slopes from being washed away and deposited in stream beds, water reservoirs and canals. They thus preserve the productive capacity of mountain lands and also increase the useful life of water reservoirs on which depends the prosperity of agriculture in the plains. The vegetation on mountain slopes also reduce the intensity and frequency of floods and increase the quantity and quality of water available for agriculture during the dry season.

The major land uses in the country are agriculture, forests and livestock

* Director General, Pakistan Forest Institute, Peshawar

* Research Officer, Pakistan Forest Institute, Peshawar

grazing. Out of the total area of the country 32.00 million ha or 36.4% are cultivable, 4.72 million ha or 5.4 percent are covered by forests and about 51.26 million ha or 58.2 percent are put to use of livestock grazing. The figure indicates that forested area is far below than the optimum required for economic growth of the country. The country is wood-deficit and had to be imported of wood and wood products to meet the demands of local markets

The Government of Pakistan, to meet the demand for wood, had decided through various Forest Policy Directives to enhance the forest cover. Plantations along road sides, railway tracks, farmlands and uncultivated areas were proposed. To achieve the above objective, the government had also decided to launch plantation campaign twice a year during the spring (February) and monsoon (August) seasons. The provincial/regional forest departments were advised to produce maximum plants in the nursery and supply to the general public or organizations on nominal charges.

The campaigns are regularly being launched by all the forest departments including Northern Areas and A.J.K. However, a declining trend has been observed in supply and or demand of the plants for the campaign. Consequently, the Secretary, Environment, during Spring Planting Campaign 2004, has directed PFI, Peshawar to conduct a study and to investigate the causes, if any, of declining trend of tree planting in the country. This study was designed and conducted by the Institute keeping in view the following objective:

Objective

The main objective of this case study was to find out the present and past state of art of tree planting campaigns in the country and its causes for decline.

Methodology

The study site

The study site consisted of all the four provinces namely; NWFP, Punjab, Sindh, Balochistan and territories including A.J.K and Northern Areas.

The study

A questionnaire was formulated and pre-tested in the office of the Chief conservator of Forests, NWFP. The questionnaire was modified in the light of experience gained during pre-testing. The modified questionnaire (Appendix-1)

was mailed to all the Chief Conservators of Forests in the country for the collection of information. The follow up through visits/letters/phone calls was continued. Data for last eight years (1996-2003) was collected. The NWFP, Punjab, Sindh and Azad Jammu and Kashmir provided the requisite data. The Balochistan province and the Northern Areas, inspite of our best efforts, could not supply the desired data till the completion of this report.

Data Compilation and Analysis

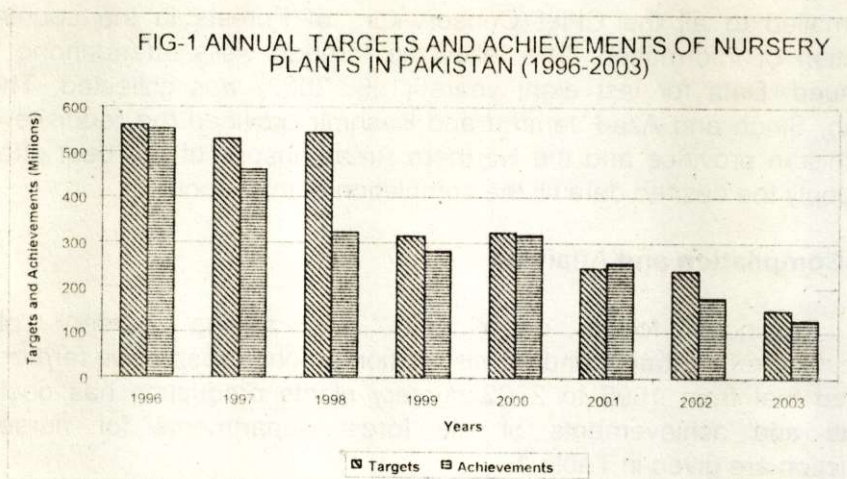
Provincial forest departments are raising nursery plants for afforestation/reforestation and for distribution among prospective farmers. Results showed that from 1996 to 2003 nursery plants production has declined. The targets and achievements of the forest departments for nursery plants production are given in Table 1.

Table 1: Annual targets and achievements of nursery plants in Pakistan
(No. in Million)

| Year | Target (No.) | Achievement (No.) | Percentage of targets |
|---------|--------------|-------------------|-----------------------|
| 1996 | 559.72 | 549.79 | 98.23 |
| 1997 | 529.03 | 460.67 | 87.08 |
| 1998 | 541.85 | 320.66 | 59.18 |
| 1999 | 314.16 | 281.91 | 89.73 |
| 2000 | 322.21 | 317.37 | 98.49 |
| 2001 | 241.75 | 253.44 | 104.83 |
| 2002 | 236.35 | 176.85 | 74.82 |
| 2003 | 149.23 | 129.47 | 86.75 |
| Average | 361.79 | 311.25 | 86.04 |

Source: Office records of the CCF, NWFP, Punjab, Sindh and AJK (2004)

Table 1 indicates that the average achievement for the year 1996 to 2003 was 86.04 percent. However, the target achieved during 2001 was 104 percent and that was because of the target fixed for the year 2001 was very low (241.75 million) as compared to 559.72 million during 1996. The annual targets and achievements of nursery plants from 1996-2000 are also presented graphically in Fig-1.



The annual expenditure of the Forest Departments of NWFP, Punjab, Sindh and AJK for nursery raising is given in Table 2.

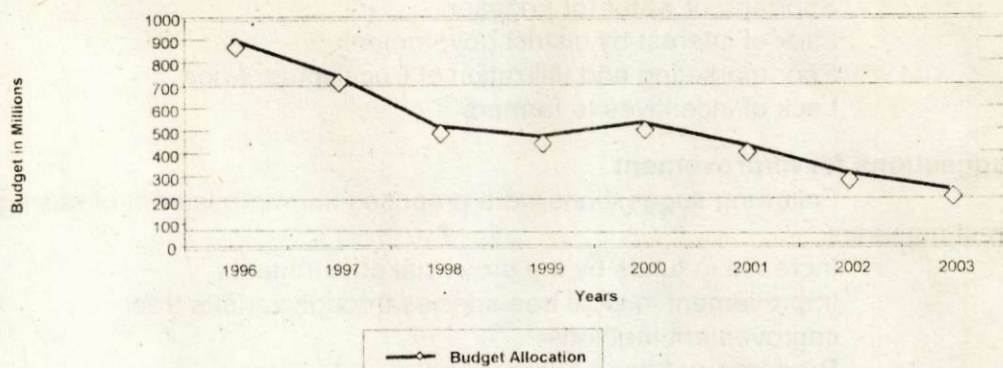
Table 2: Annual expenditure incurred on forest nurseries (1996-2003)

| Year | (Rs. in million) |
|---------|------------------|
| | Expenditure |
| 1996 | 867.6 |
| 1997 | 711.1 |
| 1998 | 482.2 |
| 1999 | 434.0 |
| 2000 | 495.7 |
| 2001 | 396.0 |
| 2002 | 272.8 |
| 2003 | 205.5 |
| Average | 483.1 |

Source: Office records of the CCF, NWFP, Punjab, Sindh and AJK (2004)

The expenditure for last 8 years also showed declining trend. According to the data, expenditure for the year 1996 was 867.6 million Rupees, whereas the expenditure for the year 2003 was 205.5 million Rupees almost 76.3 % less. Average annual expenditure from 1996 to 2003 was 483.1 million Rupees.

FIG-2: ANNUAL EXPENDITURE INCURRED ON FOREST NURSERIES FOR THE LAST EIGHT YEARS (1996-2003)



The major sources for fundings were as follows

- Annual Development Programme
- Federally Administrative Tribal Areas
- Watershed Management Projects
- Forestry Sector Project
- Defence Department allocations
- Reforestation of Highways
- Irrigated Forest Plantation
- Social Forestry Plantations
- Mangroves Forest Plantation
- Cultivation of Neem
- Forestry Development Project (AJK)

The sale price of nursery plants raised in different provinces/ territories

In NWFP, the average sale price for tubed and bare rooted plants was Rs.2.20 and 1.10 per plant, respectively. In Punjab the average sale price for tubed and bare rooted plants was Rs.2 and Rs.0.60 for the year 2003, respectively. In Sindh the average sale price per plant for the year 2003 was Rs.2.50 and Rs.0.50 for potted and bare rooted plants, respectively. In Azad Jammu and Kashmir, the average sale price for potted and bare rooted plant was Rs.1.25 and Rs.1.00 for the year 2003, respectively.

Issues in raising the nursery plants:

Following were the major issues/problems in raising nurseries:

- Lack of fundings
- Lack of availability of good quality seed
- Shortage of water for irrigation
- Lack of interest by district government.
- Poor marketing and utilization of Eucalyptus wood
- Lack of incentives to farmers

Suggestions for Improvement

Following suggestions were proposed for improvement of raising forest nurseries:

- Increase in funds by the provincial governments
- Improvement in local tree species through various tree improvement methods.
- Production of good quality seed
- Adequate water supply for irrigation
- District government should give priority to planting trees.
- Finding out the economical use/utilization of Eucalyptus wood.

Plant Production and Expenditure Index

The time series of plant production and expenditure data for the period 1996 to 2003 (eight years) have been used to determine the secular trend of plant production and expenditure. The data have been converted into series of a single base year. The year 1996 has been used as base year, the data are shown in following Tables 3 and 4. However, with the passage of time the plant production and expenditure percentage index showed declining trend.

Table 3: Nursery Plant Production Index

(Base year 1996)

| Year | Production No. in million | Production Index Percent |
|---------|------------------------------|-----------------------------|
| 1996 | 550 | 100.00 |
| 1997 | 461 | 83.80 |
| 1998 | 321 | 58.36 |
| 1999 | 282 | 51.27 |
| 2000 | 317 | 57.64 |
| 2001 | 253 | 46.00 |
| 2002 | 177 | 32.18 |
| 2003 | 129 | 23.45 |
| Average | 311 | 56.59 |

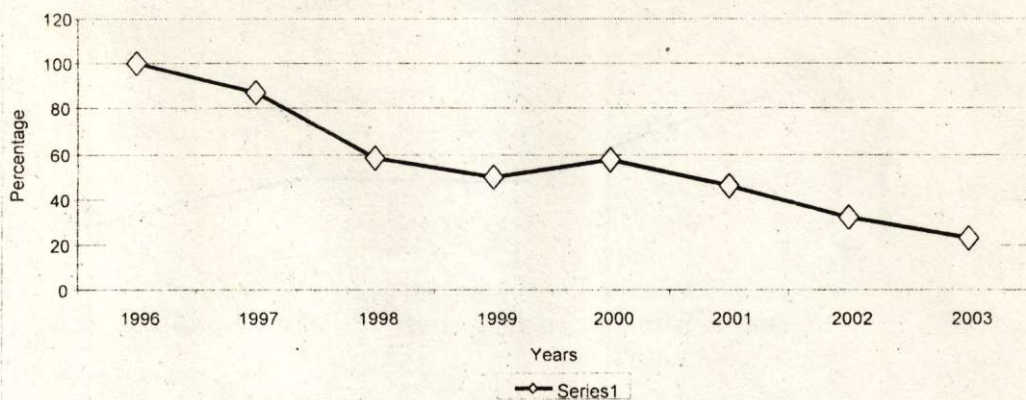
Fig-3: Nursery Plant Production Index
(Base Year 1996)

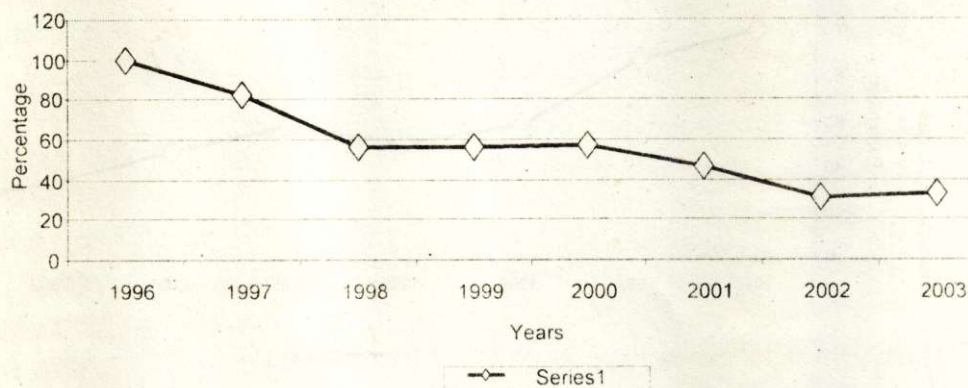
Table 4: Nursery Plant Raising Expenditure Index

(Base year 1996)

| Year | Expenditure Rs. in million | Expenditure Index Percent |
|---------|-------------------------------|------------------------------|
| 1996 | 868 | 100.00 |
| 1997 | 711 | 82.00 |
| 1998 | 482 | 55.53 |
| 1999 | 434 | 50.00 |
| 2000 | 496 | 57.14 |
| 2001 | 396 | 45.67 |
| 2002 | 273 | 23.73 |
| 2003 | 206 | 55.65 |
| Average | 483.1 | 55.72 |

Fig-4: Nursery Plant Raising Expenditure Index

(Base Year 1996)



Production of Nursery Plants and Expenditure of Various Provinces/Territories

NWFP province

Last 8 year data indicated that the average targets and achievements for NWFP were 245.97 and 207.28 million plants, respectively. The highest achievement was 432.75 million plants with total expenditure of Rs.714.04 million. The lowest (63.20 million plants) was for year 2003 at the lowest cost of Rs. 104.3 million.

Table 5: Production of Nursery Plants in NWFP

| (No. in million) | | | |
|------------------|--------|-------------|--------|
| Year | Target | Achievement | %age |
| 1996 | 427.75 | 432.75 | 101.17 |
| 1997 | 383.00 | 337.00 | 87.99 |
| 1998 | 405.95 | 206.52 | 50.87 |
| 1999 | 183.70 | 186.00 | 101.25 |
| 2000 | 234.50 | 217.60 | 92.79 |
| 2001 | 134.75 | 150.25 | 111.50 |
| 2002 | 116.25 | 64.95 | 55.87 |
| 2003 | 82.00 | 63.20 | 77.07 |
| Average | 245.97 | 207.28 | 84.27 |

Fig-5: Production of Nursery Plants in NWFP (1996-2003)

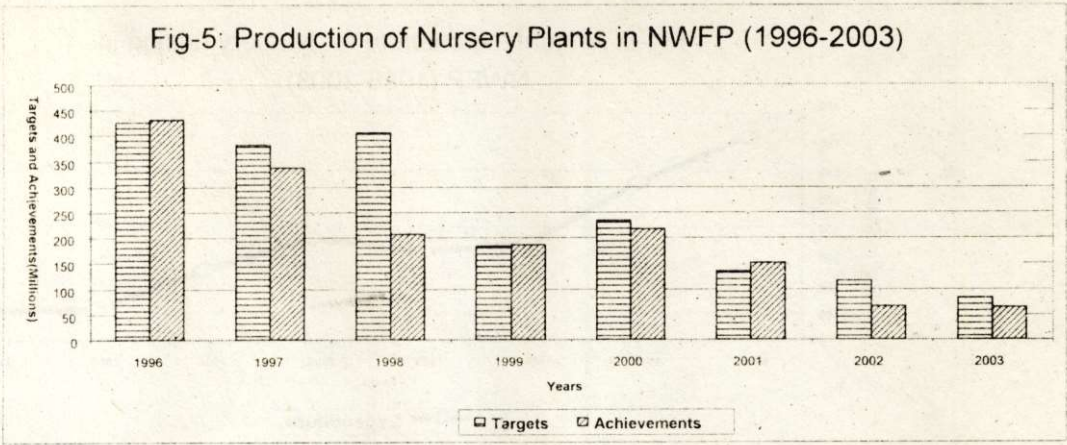


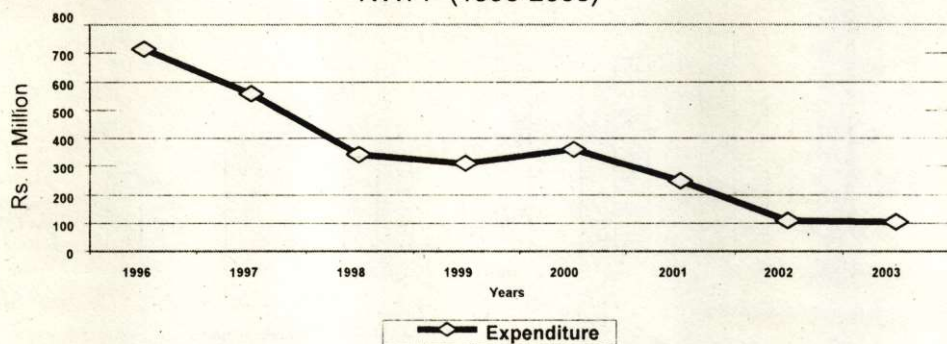
Table 6: Annual expenditure for Nursery raising in NWFP

| (Rs. in million) | |
|------------------|-------------|
| Year | Expenditure |
| 1996 | 714.04 |
| 1997 | 556.04 |
| 1998 | 340.76 |
| 1999 | 306.90 |
| 2000 | 359.04 |
| 2001 | 247.91 |
| 2002 | 107.17 |
| 2003 | 104.28 |
| Average | 342.02 |

Sources of Fundings:- Annual Development Programme

- Federally Administrative Tribal Areas (FATA)
- Watershed management Project
- Forestry Sector Project
- Lack of rainfall
- Lack of funding by Govt. and Donor agencies

Fig-6: Annual expenditure for Nursery raising in NWFP (1996-2003)



Punjab province

The data of last 8 years indicate that the average targets and achievements for Punjab were 89.00 and 77.7 million plants, respectively. The highest achievement was 94 million plants with total expenditure of Rs.122.2 million. The lowest (46 million plants) was for year 2003 at the lowest cost of Rs. 59.8 million.

Table 7: Production of Nursery Plants in Punjab

(No. in million)

| Year | Target | Achievements | %age |
|---------|--------|--------------|--------|
| 1996 | 104 | 84 | 80.77 |
| 1997 | 120 | 94 | 78.33 |
| 1998 | 104 | 86 | 82.69 |
| 1999 | 103 | 73 | 70.87 |
| 2000 | 58 | 79 | 136.21 |
| 2001 | 82 | 79 | 96.34 |
| 2002 | 95 | 81 | 85.26 |
| 2003 | 46 | 46 | 100.00 |
| Average | 89.00 | 77.7 | 87.34 |

Fig-7: Production of Nursery Plants in Punjab (1996-2003)

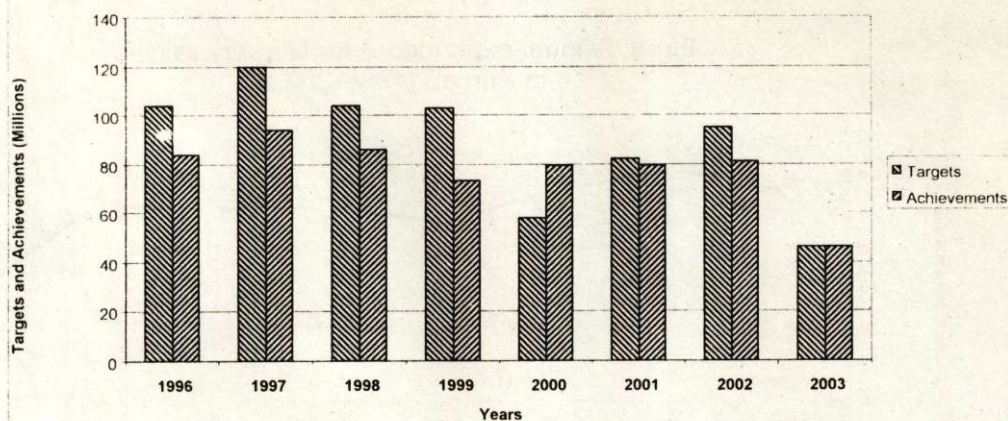


Table 8: Annual Expenditure for Nursery Raising in Punjab

(Rs. in million)

| Year | Expenditure |
|---------|-------------|
| 1996 | 109.2 |
| 1997 | 122.2 |
| 1998 | 111.8 |
| 1999 | 94.9 |
| 2000 | 102.7 |
| 2001 | 102.7 |
| 2002 | 105.3 |
| 2003 | 59.8 |
| Average | 101.1 |

Sources of Funding :

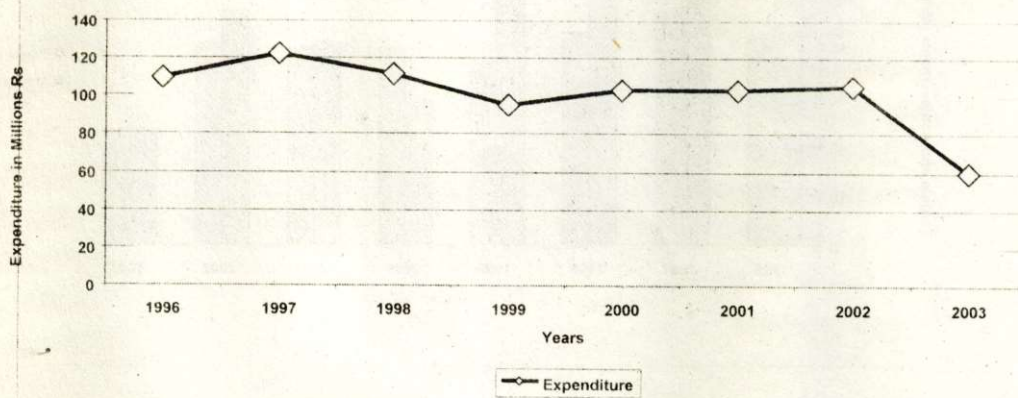
- Annual Development Programme
- Forestry Sector Project
- Defence Department
- Private Nurseries

Issues in raising nursery:

- Non-availability of good quality seed
- Shortage of irrigation water

Late budget releases
No priority for afforestation by the
District Govt.

Fig-8: Annual expenditure for Nursery raising
in Punjab (1996-2003)



Sindh province

Last 8 years data indicated that the average targets and achievements for Sindh were 7.26 and 7.01 million plants, respectively. The highest achievement was 10.41 million plants (1996) with total expenditure of Rs 17.28 million. The lowest (4.22 million plants) was for year 1999 at the cost of Rs. 6.94 million. The highest expenditure (Rs.20.60 million) was incurred in 2002 and lowest (Rs.3.01 million) in 1997.

Table 9: Production of Nursery Plants in Sindh

| (No in million) | | | |
|-----------------|--------|--------------|--------|
| Year | Target | Achievements | %age |
| 1996 | 10.22 | 10.41 | 101.86 |
| 1997 | 5.03 | 5.39 | 107.16 |
| 1998 | 6.85 | 7.09 | 103.50 |
| 1999 | 3.96 | 4.22 | 106.57 |
| 2000 | 6.21 | 4.55 | 73.27 |
| 2001 | 7.00 | 6.25 | 89.29 |
| 2002 | 10.10 | 10.10 | 100.00 |
| 2003 | 8.73 | 8.12 | 93.01 |
| Average | 7.26 | 7.01 | 96.64 |

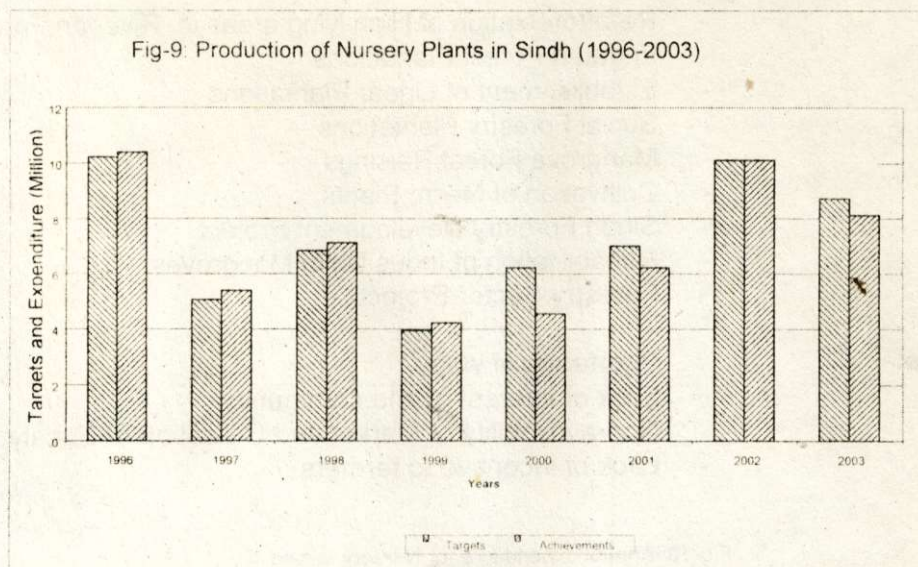


Table 10: Annual expenditure for Nursery raising in Sindh

(Rs. in million)

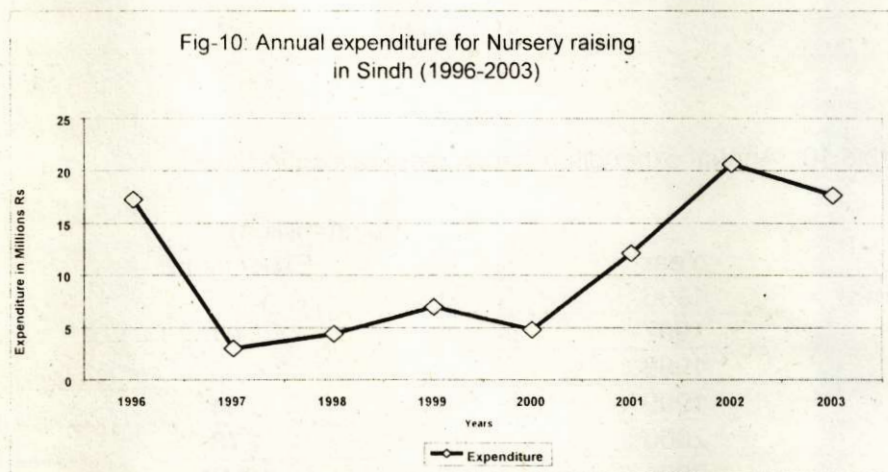
| Year | Expenditure |
|---------|-------------|
| 1996 | 17.28 |
| 1997 | 3.01 |
| 1998 | 4.36 |
| 1999 | 6.94 |
| 2000 | 4.78 |
| 2001 | 12.13 |
| 2002 | 20.60 |
| 2003 | 17.67 |
| Average | 10.84 |

Sources for fundings:

- Re-afforestation of High lying areas in Riverian Forests
- Irrigated Forest Plantations
- Establishment of Linear Plantations
- Social Forestry Plantations
- Mangrove Forest Raisings
- Cultivation of Neem Plants
- Sindh Forestry Development Project
- Rehabilitation of Indus Delta Mangroves
- Forestry Sector Project.

Issues:-

- Shortages of water
- Lack of interest by the community
- Non-availability of Market and Utilization of Eucalyptus
- Lack of incentive to farmers.

**Azad Kashmir province**

The data indicated that the average targets and achievements for AJK was 19.52 and 19.22 million plants, respectively. The highest achievement was 24.29 million plants with total expenditure of Rs.29.83 million during 1997. The lowest (12.15 million plants) was for year 2003 at the lowest cost of Rs. 23.92 million.

Table 11: Production of Nursery Plants in AJK

(No. in million)

| Year | Target | Achievements | %age |
|---------|--------|--------------|--------|
| 1996 | 17.70 | 22.58 | 127.57 |
| 1997 | 21.00 | 24.29 | 115.67 |
| 1998 | 25.00 | 21.07 | 84.28 |
| 1999 | 23.50 | 18.69 | 79.53 |
| 2000 | 23.50 | 16.22 | 69.02 |
| 2001 | 18.00 | 17.94 | 99.67 |
| 2002 | 15.00 | 20.80 | 138.67 |
| 2003 | 12.50 | 12.15 | 97.20 |
| Average | 19.52 | 19.22 | 98.45 |

Fig-11: Production of Nursery Plants in Azad Kashmir (1996-2003)

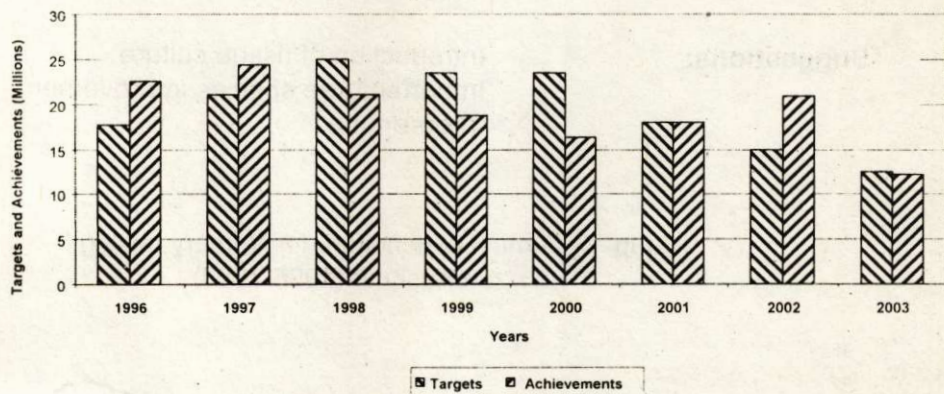
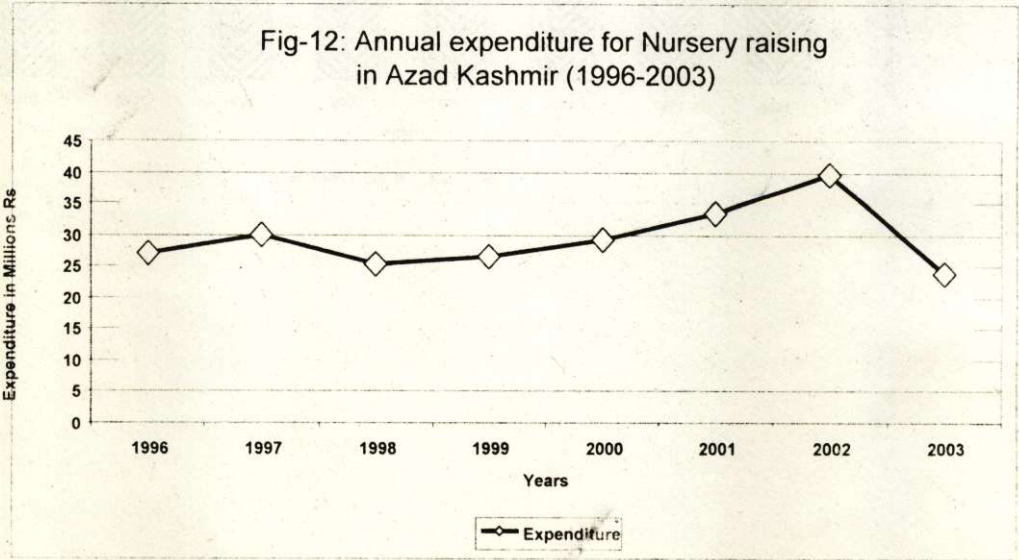


Table 12: Annual expenditure for Nursery raising in AJK

| (Rs. in million) | |
|------------------|-------------|
| Year | Expenditure |
| 1996 | 27.10 |
| 1997 | 29.83 |
| 1998 | 25.29 |
| 1999 | 26.60 |
| 2000 | 29.17 |
| 2001 | 33.28 |
| 2002 | 39.76 |
| 2003 | 23.92 |
| Average | 29.37 |

- Source of Funding - Forestry Development Projects
- Issues: - Non-availability of Suitable tubes
- bio-degradable material
- Medicinal plants cultivation techniques
- Suggestions: - Introduction of tissue culture
- Important tree species improvement programme



Conclusion

The per capita forest area in the country is 0.03 ha which is on decrease due to the human population increase at an average annual rate of 2.1%. Demand for wood and wood products is steadily increasing and our existing national forests and non-forest resources are unable to meet the supply of desired quantities. Total supply of forest products during the year 2002-03 was assessed at 0.47 million m³ from the state forests, 42.55 million m³ from the farmlands and 0.64 million m³ from import. This indicated that an amount of 43.66 million m³ of round wood equivalent to 25.8 million m³ (sawn wood) is supplied to the nation by the existing tree cover with 97.5% share of the farmlands.

Pakistan has very low forest cover of 5% against the internationally recognized level of 25% of the total land area. This is mainly attributed to very low priority to the forestry sector both at provincial and national levels. Consequently the forestry sector suffered a lot by receiving very small budgetary allocations in the ADP & PSDP which is supported by the present study regarding tree planting campaigns during 1996-2003. The results depicted a successive declining trend in the production of nursery seedlings and budget allocations since 1996. It will be appropriate to give due priority to the forestry sector at the national and provincial levels for strategic planning and implementation of the plans.

The preparation and implementation of a national action plan to expedite the uplift of state as well as farmland tree cover through due participation of all the agencies/stakeholders at Federal, Provincial, District, Union council, NGO's, Village levels has to be given the highest national priority. This can be achieved through an umbrella type national programme by undertaking large scale afforestation, rehabilitation and restocking on war footings both on public and private lands by the involvement of peoples from all walks of life in planting and post planting care.

The Pakistan Forest Institute would play its role in the national tree planting campaign through basic and applied research on selection of fast growing tree species suitable for farmlands and uncultivated areas, supply of good quality seeds, raising of nursery plants/seedlings with standard techniques, plant protection measures, market mechanism, wood quality and its uses. Farmer's awareness raising programme would also be launched through print and electronic media by the expertise of the Institute.

Appendix-1

STATUS OF TREE PLANTING CAMPAIGNS IN PAKISTAN (1996-2003)

Name of the Forest Department _____

1. Production of Nursery Plants

| Year | Name of Project | Target | (No. of plants) Achievement |
|------|-----------------|--------|--------------------------------|
| 1996 | | | |
| 1997 | | | |
| 1998 | | | |
| 1999 | | | |
| 2000 | | | |
| 2001 | | | |
| 2002 | | | |
| 2003 | | | |

2. Annual Expenditure for Nursery Raising

(Rs. in Million)

| Year | Name of Project | Expenditure |
|------|-----------------|-------------|
| 1996 | | |
| 1997 | | |
| 1998 | | |
| 1999 | | |
| 2000 | | |
| 2001 | | |
| 2002 | | |
| 2003 | | |

3. Average Sale Price per Plant

| S.No. | Species | Price per plant (Rs.) |
|-------|---------|-----------------------|
| A | | |
| B | | |
| C | | |
| D | | |
| E | | |

4. Problems in Raising Nursery

- a.
- b.
- c.
- d.

5. Solutions/ Suggestions

- a.
- b.
- c.
- d.
- e.