

## **SOCIO-ECONOMIC IMPACTS OF BILLION TREE AFFORESTATION PROJECT IN DISTRICT BUNER, KHYBER PAKHTUNKHWA, PAKISTAN**

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### **ABSTRACT**

The Billion Tree Tsunami Afforestation Project aims to plan, design, launch, and implement "Green Growth Initiative" in the Khyber Pakhtunkhwa Province's Forestry Sector. Thus, the project would work as a catalyst in helping the Khyber Pakhtunkhwa Forest Department plan, create, and implement sustainable development in the forestry sector while also advancing green jobs. This research included the entire District of Buner. The major goal was to understand how the Billion Tree Afforestation Project (BTAP) would affect the local population in order to satisfy the needs of local people in District Buner for fuel wood, timber and employment. According to the study, firewood is the primary fuel source, and the local populations obtained 54% of their firewood from plantations, 24% from farms, and 22% from local purchases. The study revealed that 64% of respondents believe that the increasing usage of firewood in the area as a result of more trees means that people's consumption patterns have changed. When it came to the availability of timber, the data showed that 24% of respondents bought their wood from plantations and 32% bought it from marketplaces, farms, and other places. According to the results, more than 70% of respondents think that the BTAP provides several employment opportunities. The remaining 30% claimed there had not been any job creation. The indigenous populace, however, is drawn to plantations and nursery-raising. The forest department lends its full assistance. The assistance is provided in the form of a cheque payment, and the director of I&HR also provided the necessary trainings. The forest guard provides on-site training for the nursery farmers. Out of 50 individuals who were interviewed, 68% believe that there are no significant types of damages in plantations, whereas 28% believe that damages have happened in plantations. In accordance with the survey, 38% of people do not engage in self-cultivation, 48% of people are tenants who work on other lands under a share cropping system, and 7% of people have their own land but have also purchased land from owners.

### **INTRODUCTION**

Approximately 4 billion hectares, or 31% of the earth's total surface, are covered by forests today (FAO, 2010). Human potential to influence the natural world has grown along with human population and economic activities. The clearance of forests is where this manipulation is most obvious. Globally, the loss of forest area during the next 5,000 years is expected to total 1.8 billion hectares, or an average net loss of 360,000 hectares annually (Williams, 2002). The speed of forest clearing has quickened due to population expansion, the need for food, fibre, and fuel, and during the past ten years, the average yearly net loss of forest

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has reached nearly 5.2 million hectares (FAO, 2010). Given the long-term environmental effects of climate change, which are gradually affecting more and more nations and communities, it is increasingly acknowledged as a common hindrance to development. A stabilization of GHGs is necessary to reduce the consequences of climate change and the ensuing environmental deterioration. There is an urgent need for significant emission reductions, which can only be delivered through coordinated global cooperation (UNFCCC, 2011). Rainforests are being targeted by more recent international initiatives like the REDD programme because of their capacity to absorb and store carbon emissions. However, relatively little is being done to lower world emissions as a whole. Large-scale human intervention is the primary cause of the global forest loss. There are a number of significant problems that have been documented in numerous nations throughout the world and are to blame for the declining health and vitality of forests, including a decline in the social, environmental, and economic functions of forests. In some countries, deforestation actually occurs at a faster rate than forest degradation. The need to comprehend the terrestrial global carbon cycle has been rekindled by rising atmospheric carbon dioxide (CO<sub>2</sub>) concentrations over the past 150 years and the increasingly catastrophic effects of climate change on ecosystems and humanity. With trees collecting up to 82 percent of the world's plant biomass, they constitute a crucial factor in the global carbon cycle (Anonymous, 2010.). The necessity to precisely estimate the quantity of carbon stored in various forest ecosystems is made urgently clear by this worldwide influence of forest ecosystems. Oceans, terrestrial biosphere, and atmosphere all share carbon. Additionally, human activities like fuel combustion and deforestation affect the atmosphere's carbon dioxide (CO<sub>2</sub>) content (IPCC, 2000). When combined with water, CO<sub>2</sub> from the atmosphere is captured by growing trees and other flora, which then generates sugars and carbs. Although this belief has recently come under scrutiny, it has long been assumed that mature forests serve as a carbon stock in which net exchange is almost too negligible (Anonymous, 1984). Forests cover 4 x 10<sup>6</sup> ha (30% of the world's land surface) and produce a lot more biomass per unit of land area than non-woody plants (FAO, 2005).

Projects to mitigate climate change must take into account poverty and the deteriorating of the lives of those who depend on the forest. For these development programmes to be effective, significant livelihoods initiatives must be included in climate mitigation measures. Shortsighted projects only concentrate on carbon trading and GHG emissions. A sustainable project that benefits the poor will be made possible by focusing on meeting local needs, eradicating poverty, and cutting emissions (Bawa *et al.*, 2004). The Intergovernmental Panel on Climate Change (IPCC) states that forest-related mitigation efforts have the potential to significantly reduce emissions from sources and CO<sub>2</sub> removals by sinks at low costs, and they can be considered to build synergies with adaptation and sustainable development (IPCC, 2007).

Given the major effects of forest degradation on world biodiversity and ecosystem services, including carbon sequestration, reducing or reversing it in subtropical regions will also aid in mitigating climate change. However, the methods used to stop deforestation and forest degradation will reveal the rate of change, the extent and kind of impacts on forest biodiversity, and the wider variety of services that forests provide on an international and local level. Deforestation and forest degradation are major issues in Pakistan. Only 5% of the entire land is covered by forests. According to data from FAO (2007), 31,658 acres of natural forests are lost each year on average. However, the standing volume of farmland trees grows by an average of 3.86% year (FAO, 2007). This is extremely troubling given that only 5.2% of the nation's land mass is "labelled" as woodlands. Finding strategies to preserve and expand forest resources is crucial for Pakistan, a country with an estimated 188.02 million people, 115.52 of whom live in rural areas that rely heavily on wood for construction and fuel. Because of their high sensitivity to natural disasters like landslides and flash floods, etc., these forests' high reliance on wood products has additional detrimental effects related to land degradation. REDD<sup>+</sup> and forest management governance are closely related. National forest resources can be increased and maintained with thanks to REDD<sup>+</sup> [ref] (FAO, 2007).

The BTAP is inspired by the government's current vision for green growth, which connects the demands for sustainable forestry development in Khyber Pakhtunkhwa, creating green jobs, empowering women, and preserving Pakistan's natural resources while also addressing the global issue of climate change. The current study will investigate how the local population view the potential effects of the BTAP on local livelihoods and its function in climate change adaptation. Regeneration is rebirth, which is where the expression "born again" comes from. In biology, it is said that an organism, particularly a plant, can regenerate a missing portion. As a result, the component grows back and its distinctive quality returns. It is a method for clearly renewing the forest that relies entirely on the recruitment of younger vegetation obtained from seeds (seedlings). Based on the population size of seedlings and saplings, plant species' popularity for regeneration. Evidently, for the forest to renew, it must produce seedlings, stump sprouts, and root suckers that, after harvest, transform into the next forested area (Khan, A, A and Swati, M.I (2004). Natural woodland regeneration is the unaided germination of indigenous flowers from seeds or propagules, resulting in populations of plants that can survive on their own. The production and distribution of seeds, their germination, and eventually the development of the juveniles until they reach adulthood and start to produce seeds on their own are all parts of a species' regeneration. One of the processes that promote natural regeneration and helps this approach succeed is the use of enclosure to shield degraded areas from outside intervention. When there aren't many trees left in the landscape to serve as seed sources during a later stage of secondary succession, enclosure is used. In order to restore a healthy and

adaptable enclosed woods, purposeful land management is used to enhance and speed up the natural processes of ecological succession (Amjad, M. K. (1992).

## **MATERIAL & METHOD**

### **Study Area**

Buner is located at 34.3943° East and 72.6151° North. Although the exact origin of the name Buner and its true meaning are unknown, local elders believe it to be a Sensikrat term for "forest" (jungle). Because Buner has a strong forestry industry, it appears to be true to some extent. Buner was a subdistrict of the SWAT district prior to its promotion to district rank in 1991. The six tehsils that make up its administrative division are Dagger, Gagra, Gadezai, Chagharzai, Chamla, and Totalai. Buner is reachable from the south via a metaled, winding, and steep road through Totalai, from the west via a windy, steep, and narrow road through Ambella pass, and from the north via a pass through Karakar that is reasonably well-maintained via Bari kot. Its borders are the Swat District to the north, the Malakand Agency to the west, the Mardan District to the south, the Indus River to the east, and the Hazara Division to the west. The region is surrounded by hills on all sides, and a series of mountains separates it from Swat. The district covers a total size of 1,856 square kilometres.

### **Methodology**

The study's methodology includes semi-structured and focus interviews with DFO, SDFO, and field workers as well as surveys of the target population in 10 villages using questionnaires with open- and closed-ended questions. Multiple pertinent offices, including those for agriculture, livestock, and the forest, provided secondary data. DFO Buner, SDFO Buner, and forest workers from the affected area participated in semi-structured and focus interviews to acquire information about the region. A professionally constructed questionnaire was employed to collect primary data for analysis. The questionnaire was created with the study's aims in mind. After pre-testing it in the field, irrelevant questions were removed, and new ones were included after field observations and discussions with key informants. As a result, the questionnaire was changed to improve its validity and reliability as well as to avoid confusions in the latter stages.

### **Sampling Procedure**

Two-stage random sampling was the approach and procedure used for the investigation. At first, ten communities were randomly selected where plantations, nurseries, and enclosures were present. Five respondents were chosen at random from lists of the selected communities in the second step. As a

result, 50 respondents in total were interviewed to provide the necessary data for the study's objective. Sampling was carried out twice using two-stage random sampling techniques. The sample intensity in the initial stage, which involved selecting villages, was left at 12.5%. Ten villages were chosen at random from a total of 80 villages. Five respondents or households were then randomly chosen from each hamlet. Assuming that there are 500 households on average in the village and that the sample intensity is 1%.

### **Data Collection**

A well-designed questionnaire was used to collect the data after 50 respondents were questioned. To boost its validity, the questionnaire was first created and then tested in the field. The questionnaire was adjusted in accordance with the local circumstances following field testing. A sample of the questionnaire is provided (Appendix-I) The interviewees were personally questioned at various locations, such as their Hujras or the farms they worked on. Although the questions were asked during the interview in Pushto, the local language, for the respondents' convenience and to ensure maximum accuracy, the interview schedule was written in English. Since all of the chosen respondents were contacted and interviewed, the response rate was 100%. For each question, all the pertinent data was recorded. Where general information on the research area was felt to be necessary, notes were also included in the field book.

### **Data Compilation and Analysis**

The data collected was reviewed and transferred on a tally sheet for the purpose of compilation and tabulation. Simple statistical techniques of average and percentages were used for interpretation and discussion of data, derivation of conclusions and making of pertinent recommendations and suggestions.

## **RESULTS AND DISCUSSION**

The whole study was conducted in order to assess the social and economic impacts of Billion Trees Afforestation Project interventions which were held in the district Buner in order to fulfill the local requirements of fire wood, timber, fodder and income received by local community in Buner, the following relevant parameters were studied and analyzed.

### **Age**

The interviewed Respondents who are heads of their families are mostly (55 %) above 40 years age. Household head is the person who makes decisions

about all family affairs including property. The age distribution of respondents is shown in the table 1.

Table 1. Age Distribution of Respondents

No	Age	Frequency	Percentage (%)
A	31-40	22	55
B	41-50	17	27
C	51-60	14	18
D	Above 60	5	9

### Household Size

The data reveals that household size of less than 10 family members are 30%, 10 to 20 family members is 54% and above 20 is 64% as shown in table 5.3. Average family size is 17 per house.

Table 2. Household size

Classes	Frequency	Percentage (%)
Below 10	15	30%
10 – 20	27	54%
Above 20	8	16%
Total	50	100%

### Education Level

50 respondents were interviewed and the data was collected from them, out of which 12 (24%) are illiterate while 38 respondents have some education of primary level and above. It reveals that literacy rate is improved (70%) which is higher than the reported rate (54.17%) in census report, 2017. The education level of respondents and there percentage is given in table 3:

Table 3. Education level in Buner

Category	Number of Respondents	Percentage (%)
Primary	2	4
Middle	8	16
Matric	5	10
HSSC	10	20
BA	9	18

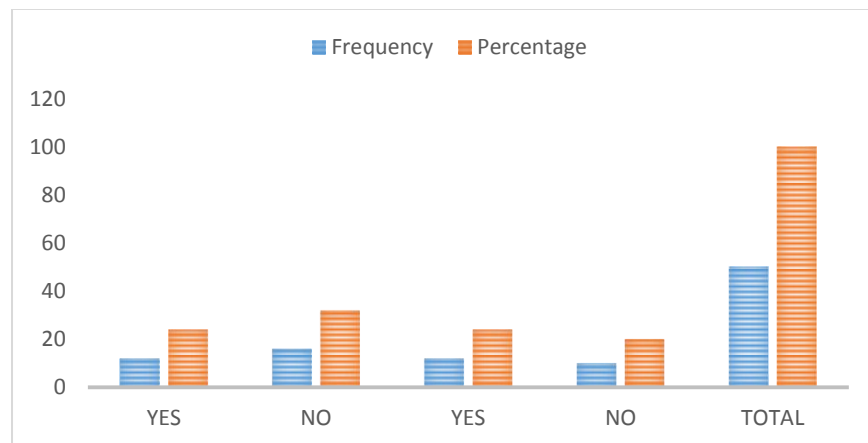
Masters	4	8
Illiterate	12	24
Total	50	100

### Source of Income/Job/ Employment

Out of 50 respondents interviewed from data collection, 60% household main source of income is farming and labour. Twenty six percent (16%) people livelihood source is only farming and 40% are dependent on both farming and labour. Labour alone is source of income of 15% respondents, who has no land and lack of other resources. The well-off and resourceful people have more shares in government jobs.

Table 4. Source of Income/Job/ Employment

Source of Income	Frequency	Percentage (%)
Farming	12	24
Farming and labor	16	32
Labor	12	24
Service	10	20
Total	50	100



### Land Holding Size

As variety of landholding size is there in the area. The land holding size in Buner varies from one acre to more than 100 acres as they have different ownership in various land use classes like agriculture (irrigated and Barrani), forest, waste/marginal lands, rangelands. The land ownership size is categories in each land use class as:

### Irrigated land holding

The data collected from various respondents shows that 26% people have 1 to 3 acre, 22% have 4 to 7 acre, 14% have 8 to 11 acre and 15% have more than 12 acre irrigated land for cropping while 23% have no irrigated land as shown in table 5.

Table 5. Irrigated land Holding

Farm size (Acre)	Frequency	Percentage (%)
0 – 3	13	26
4 – 7	11	22
8 – 11	7	14
12 and above	7	14
No ownership	12	24
Total	50	100

### Barani Land Holding

The Barani land holding data was also collected and the data reveals that 12% households have no barrani land while 56% posses' 1 to 10 acre land. The majority (80%) of land holding falls in the range of 1 to 30 acre The data further shows that 16% have 11 to 20 acre, 10% have 21 to 30 acre, 2% have 31 to 40 acre, 2% have 41 to 50 acre and 6% have 61 to 70 acre land holding as presented below in table 6;

Table 6. Barani land Holding

Size (Acre)	Frequency	Percentage (%)
No ownership	6	12
1-10	28	56
11-20	8	16
21-30	5	10
31-40	1	2
41-50	1	2
51-60	-	-
61-70	3	6
Total	50	100



### Plantation Land Holding

The study was carried out and it was observed that plantations have been raised on wasteland and the locals have their ownership and use rights. The data reveals that 12% respondents have 1 to 20 acre, 14% have 11 to 20 acre and 30 % have more than 21 acre land holding while 44% have no ownership rights of land as shown in table 7.

Table 7. Plantation land Holding

Size (Acre)	Frequency	Percentage (%)
No ownership	22	44
1-10	6	12
11-20	7	14
21 and above	15	30
Total	50	100

Table 8. Showing species planted

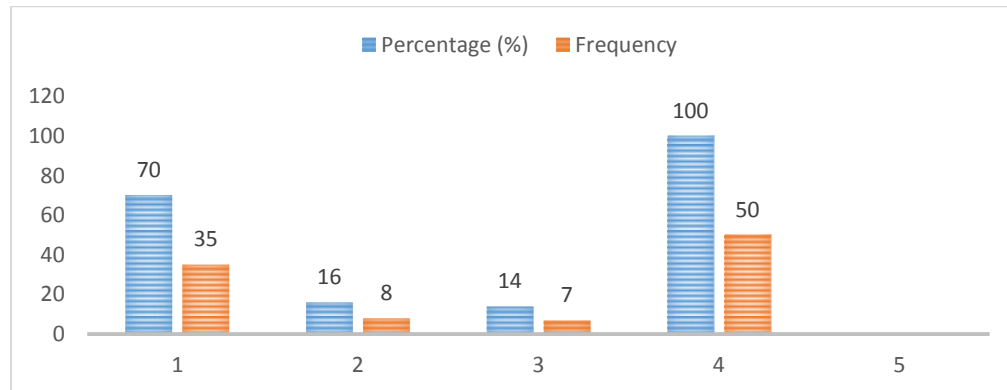
S.No.	Specie	Frequency	Planted (%)
1	Eucalyptus	38	76 %
2	Chir	12	24%
3	Shisham	0	0
4	Pulahi	0	0
5	Bair	0	0
	Total	50	100 %

### Effect of Plantation on Agriculture land

Plantation has affected the crop production and Positive effect of plantation has been observed on agriculture crop production and protection as majority of responds (70%) are of the view that due to planting of trees the income is increased in the shape of additional income from sale of trees, meeting of local requirement of firewood, fodder and upto some extent timber. The other advantages are soil erosion control and less flood hazards. Whereas, 16% says that due to plantation the crop production is decreased. While 14% did not answer the question.

Table 9. Effect of Plantation on Agriculture land

Effect	Frequency	Percentage (%)
Positive	35	70
Negative	8	16
No reply	7	14
Total	50	100

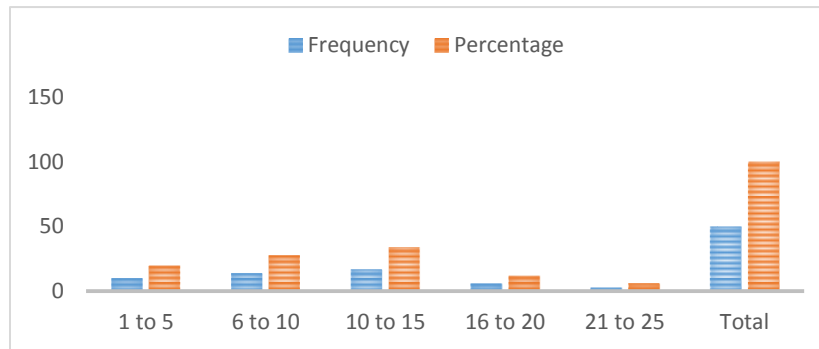


### Livestock Status in the Area

The study reveals that all respondents keep livestock. The data shows that livestock possession varies as 6% of respondents possess the maximum number of livestock i.e., 21 to 25 while 12%, 34%, 28% and 20% respondents have 16 to 20, 11 to 15, 6 to 10, and 1 to 5 livestock heads respectively, as given in table 10;

Table 10. Number of livestock per household

Number of livestock	Frequency	Percentage (%)
1-5	10	20
6-10	14	28
11-15	17	34
16-20	6	12
21-25	3	6
Total	50	100



### Livestock Composition

The livestock composition data was also collected and it reveals that livestock population consists of 27 % cattle, 64 % goat and sheep, 6 % buffalo, 3% horse/donkey and mule.

Table 11. Livestock Composition

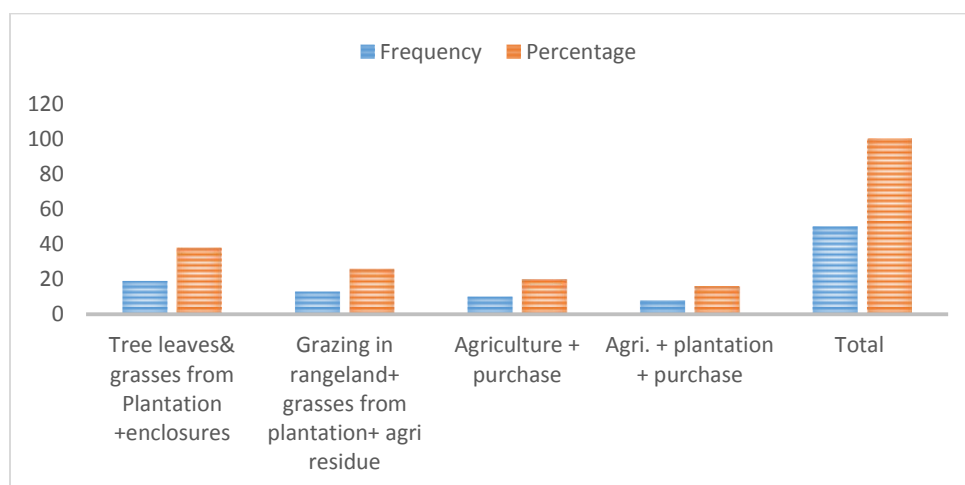
Type of Livestock	Frequency	Percentage (%)
Cattle	68	34
Goat/Sheep	88	44
Buffalo	28	14
Horse/Donkey/Mule others	16	8
Total	200	100

### Main Sources of Fodder

Fodder is considered as the most important requirement in such an area. The locals of the area collect grasses and leaves of trees from plantation and crop residue from farmland which is the main sources of fodder. The data reveals that 38% respondents are utilizing fodder both from plantation and enclosures. The second major source of fodder (26%) is grazing in rangeland, grasses from plantation and agri residue. 20% are collecting from farmlands and market. The remaining 16% are fulfilling their fodder requirement partially from plantation, crop residue and purchasing as shown in table 12 below:

Table 12. Sources of Fodder

Source	Frequency	Percentage (%)
Tree leaves& grasses from Plantation +enclosures	19	38
Grazing in rangeland+ grasses from plantation+ agri residue	13	26
Agriculture + purchase	10	20
Agri. + plantation + purchase	8	16
Total	50	100



### Income from sale of Animals

Livestock also provides a source of income for local people and they earn a handsome amount of money from the sale of these livestock in addition to their by-products.

The survey describes that 14% of the respondents receive up to Rs 10000 from the sale of animals annually, similarly 44% and 12% of the respondents obtained Rs10001-20000 and 20001-30000 per year respectively. The maximum annual income received by 6% respondents is Rs 30001 to 40000 as shown in table given below in table 13.

Table 13. Share of Income from Sale of Animals

Income (Rs)	Frequency	Percentage (%)
1—10000	7	14
10001—20000	22	44
20001—30000	6	12
30001—40000	3	6
Total	38	100

### Effect of Plantation on Livestock

According to the study conducted in the area majority (74%) of population is of the view that after plantation and nurseries of BTAP the fodder production has been increased due to stoppage of free grazing practice, change in grazing pattern like stall feeding, grass cutting from plantation, increase of palatable grasses and availability of fodder trees specie which contributed to livestock health and dairy products. Whereas, 18 % respondents are of the view that no significant effect is observed as when the forest department hand-over the area to owners/communities, the practice of free grazing restarted. Six percent (6%) respondents are of the opinion that the grasses are decreased due to tree planting. Tables 14 & 15 describe the change in grazing pattern and effects of plantation as:

Table 14. Change in Grazing pattern

Change in grazing pattern	Frequency	Percentage (%)
Yes	42	84
No	6	12
No reply	2	4
Total	50	100

Table 15. Effect of Plantation on Livestock

Effects	Frequency	Percentage (%)
Yes	34	68%
No	9	18%
Decrease	4	8%
No reply	2	6%
Total	50	100%

### Source of Fuel wood

According to study carried out in the area, firewood is the main source of fuel and the local communities procure 50% from plantation, 30% from farmland and 20% through local purchase . The total fuelwood consumption in the study area is 207700 kg and average 11.38 kg per household per day is used.

Table 16. Source of Fuel wood

Source of firewood	Frequency	Percentage (%)
Plantation	25	50
Agricultural land	15	30
Market	10	20
Total	50	100%

### Creation of Employment opportunity

The provision of employment is considered as a great achievement. The nurseries and plantations are also providing employment opportunities to the villagers like daily wage labor at the time of planting of plants, watching of plantation and harvesting of plantation and raising of nursery and their care. The data describe that 58% of respondents have employed at the time of various operation in plantation. The remaining 42% are not involved in any work.

Table 17. Employment due to Nursery/ Plantation/Enclosures

Employment	Frequency	Percentage (%)
Yes	35	70
No	15	30
Total	50	100

### Nursery Growers under BTAP-II:

The results shows that 24% of the respondents have grown the nursery while 76% have not grown any nursery as shown in Table 18; and Table 19 shows the Nursery types.

**Daggar Forest Sub Division**

Table 18. Total number of Respondent

Nursery Raised	No Of Respondents	Percentage (%)
Yes	12	24
No	38	76
Total Number	50	100

Table 19. Showing type of nursery

Nursery	Frequency	Percentage (%)
Tube	7	91
Bare Rooted	4	9
Total Number	11	100

Table 20. Unit of nursery raised

Units	Frequency	Percentage (%)
One unit	7	54
Two units	3	36
Three units	1	9
Total Number	11	100

Table 21. Showing assistance provision in nursery raising

Assistance provided by	Frequency	Percentage
Forest department	11	100 %
NGO	0	0 %
Any other source	0	0 %

**DISCUSSIONS**

Until June 2017, private nurseries were raised by local people with the help of forest department. Assistance was in the form of check payment and beside these director I&HR provided proper trainings. In field forest guard conducted trainings program to nurseries grower.

Table 22. Employment opportunities created from nurseries under BTAP

Employment opportunities	Frequency	Percentage (%)
Yes	37.5	75 %
No	7.5	15%
Not sure	5	10 %
Total	50	100 %

A number of employment opportunities have been created through BTAP. It includes, person engaged in various operations, provision of services etc. A 25,000-plant nursery generates 52 man-days of labor. This includes filling of polythene bags with soil, sowing of seeds in p-bags, maintenance of plants and shifting of plants. Private potted nurseries have proved to be a good opportunity for women in rural areas. During the first phase about 13% of the private potted nursery growers were women. In general women showed more interest in raising private nurseries.

Table 23. Profit and Loss Due to BTAP Interventions

Profit/Loss	No Of Respondents	Percentage %
Profit	42	84
Loss	8	16
Total	50	100

## CONCLUSIONS

The survey identifies the causes of plantation damages and remedial measures. The causes of damages are free grazing, un systematic fuel wood collection, un schedule grass cutting, uprooting of whole plant, early cutting of forest plantation, lack of co-operation among locals (owners and tenants) about natural resources utilization, Poor law enforcement and lack of punishment for forest offence cases. The respondents also suggested remedial measures to minimize the plantation damages like allocation of area for livestock grazing, planting of suitable multipurpose plants on proper sites, proper schedule for harvesting of forest produce, formulation of plantation management committees. Mixed plantation must be encouraged and priority should be given to indigenous and multipurpose trees. Formation of VDC or PMCs for implementation of MPs and VPs. Wildlife Department must extend its working sphere to this part of the country. Non Timber Forest Produce (NTFP) sector should play its due role in the development and poverty alleviation of the area. FD should work as a facilitator to establish linkages of communities with Agriculture and livestock for better seed and variety of crop and livestock. Market linkages development of the locals to avoid middle men benefits. Capacity development programme for local communities to improve their skills and working. Capacity development programme for FD staff in social discipline and attitudinal change. Forest development fund (FDF) must be activated for forestry development in the area. Khyber Pukhtunkhwa Forest Ordinance, 2002 must be extended to this area.

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## Appendix-I

SOCIO-ECONOMIC IMPACT OF BILLION TREE AFFORESTATION  
PROJECT IN BUNER

## QUESTIONNAIRE

Sr. No. \_\_\_\_\_

Date: \_\_\_\_\_

Place: \_\_\_\_\_

1. Name and address of the respondent

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2. Age: \_\_\_\_\_

3. Family type: \_\_\_\_\_ Single ☐ Joint ☐

4. House Hold size \_\_\_\_\_

5. Education of household head: \_\_\_\_\_

6. Sources of income (farming, service, labour etc)

a) \_\_\_\_\_

b) \_\_\_\_\_

c) \_\_\_\_\_

7. Do you own a house Yes ☐ No ☐If yes. Kacha ☐ Pacca ☐ Semi Pacca ☐8. Tenure status: Owner ☐ Tenant ☐Owner-cum-tenant ☐

9. Total land area (Acre):

a. Cultivated

i. Irrigated \_\_\_\_\_

ii. Barrani \_\_\_\_\_

b. Uncultivated area

i. Plantataion \_\_\_\_\_

ii. Forest Area \_\_\_\_\_

Rangeland/Barren \_\_\_\_\_

10. Effect of plantation on agriculture crops? Positive ☐ Negative ☐ No Reply ☐

a. If positive how \_\_\_\_\_

b. If negative, how \_\_\_\_\_

11. Do you have livestock? Yes ☐ No ☐

If yes

Number of livestock

Type of Livestock	Number
Cattle	
Sheep/Goat	
Buffalo	
Mule/Donkey & Others	
Total	

12. What are the main sources of fodder

Forest	<input type="checkbox"/>
Plantation	<input type="checkbox"/>
agriculture Residue	<input type="checkbox"/>
Purchasing	<input type="checkbox"/>
Other(specify)	<input type="checkbox"/>

13. Income from milk, butter of livestock Rs. \_\_\_\_\_ per year  
 14. Income from sale of animals during last year Rs. \_\_\_\_\_ per year  
 15. Income from the wool/hair/hides of goats/sheep/cattle during last year.  
 Rs. \_\_\_\_\_  
 16. Effect of plantation on livestock? Yes (positive ☐ or negative ☐ No ☐  
 No Reply ☐  
 If yes, how? \_\_\_\_\_

17. Source of Fuel

Source of fuel	Frequency
Firewood	<input type="checkbox"/>
agri. Residue	<input type="checkbox"/>
Cow dung	<input type="checkbox"/>
LPG	<input type="checkbox"/>
kerosene oil	<input type="checkbox"/>
Others	<input type="checkbox"/>

18. Source of fuel wood:  
 Forest ☐ Plantation ☐ Agri-land ☐  
 Purchase ☐ Others(mention it) ☐

19. How much quantity of firewood you use?

- a) Winter \_\_\_\_\_ kg per month for \_\_\_\_\_ months  
 b) Summer \_\_\_\_\_ kg per month for \_\_\_\_\_ months  
 Total \_\_\_\_\_

20. Was your fuelwood consumption pattern change due to plantation?  
 Yes ☐ No ☐ No Reply ☐  
 If yes how? \_\_\_\_\_

21. Source of timber:

- Forest ☐ Plantation ☐ Purchase ☐ Others ☐

22. Have you got constructional timber from plantation for domestic use?  
 Yes ☐ No. ☐  
 If yes what type of timber \_\_\_\_\_

23. Have you any income from Plantation? Yes ☐ No ☐  
 If yes, how much \_\_\_\_\_

S.No	Year	Value(Rs)	Area (acre
1			
2			
3			
4			

24. Are you getting fuel wood from plantation for selling purposes? Yes ☐ No ☐  
 If yes  
 Income from selling of firewood Rs. \_\_\_\_\_ per month
25. Have you received any income from grass selling during last years?  
 Yes ☐ No. ☐  
 If yes, how much per year Rs \_\_\_\_\_
26. Have you got employment from or due to plantation in the area?  
 Yes ☐ No. ☐  
 If yes \_\_\_\_\_

S.No	Nature of Job	Income per month
1		
2		
3		

27. Was there any increase in the forest cover? Yes ☐ No ☐  
 If yes, how? \_\_\_\_\_
28. Is there any dispute on benefit/income distribution? Yes ☐ No ☐  
 If yes, Describe \_\_\_\_\_
29. How the issues/disputes are settled? \_\_\_\_\_
30. Is there any increase of wildlife in the study area? Yes ☐ No ☐ No Reply ☐  
 If yes how \_\_\_\_\_
31. What are the causes of plantation damages?  
 a) Damages:  
 i. \_\_\_\_\_  
 ii. \_\_\_\_\_  
 iii. \_\_\_\_\_
32. Any suggestion for the improvement of Plantation? \_\_\_\_\_