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AGRI. EXTENSION

FORESTATION: THE ULTIMATE REMEDY FOR NATURAL DISASTER, AN EVALUATIVE STUDY

Aqeela Saghir*[*1], Sadia Ijaz[2], Khalid Bashir[3], Ijaz Ashraf[4], Rafay Muzamil[5] and Saba Javed[6]

[1]Associate Professor, [2]M.Sc. (Hons) Student, [4]Professor,[5]Assistant Professor,Institute of Agri. Ext., Edu. and Rd, [3]Associate Professor, Directorate of Graduate Studies, [6]Lecturer, Institute of Agri.& Res. Eco. University of Agriculture Faisalabad, Pakistan

[*]Corresponding author's email: aqeela.sagher@gmail.com

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ABSTRACT

The research study aimed to analyze the participation of the governmental and non-governmental sectors in Billion Tree Project, and to assess the involvement of agricultural extension agents. This study was carried out in the Faisalabad district. The research population comprised the employees of forest department, school education department, agriculture extension office in Faisalabad, and local communities. The research population was comprised of 50 agricultural extension agents, 33 teachers from 3 government schools, 50 employees from the forest department, and 50 local residents. This was survey-type research. Quota sampling was used. The sample was 183 respondents by using www.surveysystem.com with a confidence interval of 5% and 95% confidence level. A well- structured questionnaire was developed for the collection of data. The frequencies, averages, standard deviation, weighted score and chi-square were employed using the Statistical Package for Social Sciences (SPSS). The results show that there was a need for plantations in urban areas to control the temperature. The research indicates the role of government that contributes in different perspectives. The teacher has spread awareness in various ways that people recommend 44% maximum in a medium-range. Research results indicated that increase in the income of local people variable mean is 3.38 and the standard deviation is 0.976, agricultural extension agents highly participated to create green Pakistan. It was crucial in ensuring pay availability for jobless laborers and providing employment for farmers in nursery development, while simultaneously serving as a significant source of income. This approach fosters significant motivation for tree planting, resulting in reduced pollution levels, diminished deforestation, and contributions to the forest afforestation. These initiatives positively impacted our surrounding environment. Therefore, we should refer to plantations that will be able to meet more demand because of technological advancement.

KEYWORDS: forest; project; pollution; environment; motivation; Pakistan

INTRODUCTION

Forests are the reason for the sustainability of the earth. Carbon is removed from the atmosphere, habitat is provided by the forest, and they moderate the water cycle. These are the reasons for soil erosion prevention (Aziz, 2021). Deforestation occurred as a result of rapid industrialization and demand for agricultural land (Zulfiqar *et al*, 2021; Allen and Barnes, 1985). Around 30% of land is covered by forests around the globe, which is 3.8 billion hectares in 2005 and this leads to a slight increase in forests, up to 31%. Nearly 1 billion people depend globally on earth for their livings (FAO, 2010 and UNEP, 2011).

Dyson, a scientist, planned a global emergency plant increasing initiative in 1976 as a short-term solution to growing carbon dioxide ranks in the air. Dyson suggested that fast-growing trees are being used as a "carbon bank," storing carbon until a social transition from fossil fuels to renewable or atomic firewood could be achieved, which was supported by an increasing number of environmental specialists at the time (Ahmad *et al.,* 2017; Barry, 1999).

The UN Framework Convention on Climate Change is set to implement this biological carbon bank after 30 years (UNFCCC). The Kyoto Protocol has incorporated an international line of work in carbon credits created by forest agricultural estates in developing countries under the Clean Development Mechanism since COP 7 in Marrakesh in 2001 (CDM). We use a discourse-analytic approach to critically examine the plan pomposity that has formed about international plant-growing effort (Baynes, 2017).

Current plan address nearby continuing initial plans aimed at sequestering carbon in humid environments,

as well as the political histories used in the CDM's carbon drops debates. We promote address study as a valuable approach because it allows us to examine the power dynamics and competing knowledge claims that underpin prevailing narratives about how to deal with the global issue of anthropogenic climate change (Ahmad, D. and M. Afzal. 2021; González, 2021)..

An extra serious dialogue on the advantages, challenges, and complicated worth trade-offs connected with global drop initiatives, moving outside basic and dichotomous prior framings of woodland agricultural estate programs as either positive-sum or zero-sum, according to the report. Instead, in the future decade, a retrospective discussion on the control, benefits, and morals that underpin the prevailing informal edging of the dropping ground will be required in the plan of maintainable CDM projects. By understanding the power-knowledge that is the dynamics of composition in the expression of international ecological addresses that the first division offerings the essential tenets of our informal framework (Baig *et al*., 2008).

All major problems in global environmental governance is explained clearly. We explore how these covering and opposing addresses are reflected in the discussion on initial forestry initiatives within the Activities Implemented Jointly (AIJ) and CDM frameworks in the second part. Treaty texts, policy papers from NGOs and businesses, and scientific findings from existing pilot plans all assist as entrance facts into the informal world. In the third sector, we unfavorably investigate how these addresses have existed in plans, as well as the processes of collaboration, overlap, and convergence concerning them (Ahmad, 2021; Brahic, 2005).

Rural economics has an agricultural backbone in Pakistan like vegetables, livestock, poultry, fruit farming, and forestation. For the sake of the country's development, the forest plays a vital role and according to standards, there must be 25% forests in Pakistan and only five percent portion covered in Pakistan but there is only 5% part covered by forests in Pakistan. On the other hand, in Germany, there is one-third portion consist of forestland of the land is covered by forest. Moreover, this plays a vital role in their development of wood from forests as a renewable energy reserve. This provides billions of earnings and millions of emoluments annually (Kleinn *et al.,* 2011).

During the last decades, climate change disasters hit Pakistan bitterly and the recurrence of these disasters increased rapidly. This disaster threat was not only the attention of the Pakistan government but also the attention of people and other countries throughout the world. As Pakistan is a developing country, that's why professionals of forest protection were required to invest to mitigate the climate changes in Pakistan, and to help financially to encourage plantation in Pakistan (Shah *et al*., 2013; Ali *et al.,* 2019).

Significance of the study: The purpose of the study was to examine not only the role of the government and non- government organizations in Billion Tree Tsunami Project but also to mitigate pollution levels. The first reason for this study is to determine the role of both governmental and non-governmental sectors at their respective levels to accomplish the initiative of tree cultivation in Faisalabad, particularly in the absence of an adequate system and time to consider the preservation and protection.

The second reason is to mitigate pollution levels. Concerning the environmental issues, the majority of animal species are gone. Some are relocating to habitats that offer adequate food, shelter, and a suitable environment in relation to urban areas. The pollution level and smog are consistently average year-round, approximately 150 on the air quality index. Therefore, there is a need to assess the necessity of the project, participation of the government and non-government sectors, and to determine the involvement of agricultural extension agents.

Objectives

- To identify the demographic attributes of respondents.
- To probe out the role of government and non-government organizations in billion tree tsunami projects.
- To determine the multi-sectoral effect of this project.

Hypothesis:

H_1 Age has a significant association with the tree plantation of respondents

H_2 Education has a direct link with the tree plantation of respondents

H_3 Profession has a significant relationship with the tree plantation of respondents

MATERIALS AND METHODS

The research has been conducted in the Faisalabad district during the year 2022. Faisalabad covered an area of 1.2 square km, contributes 5% to Pakistan's annual GDP due to textile industries and manufacturing sector, therefore known as Pakistan's Manchester (Sharif and Farhan, 2012).

***Target population*:** The term target population refers to a large collection of people who have similar traits.

A resident is a group or set of all potential remarks, limited or unlimited, that is related to some physical characteristics of attentiveness (Muhammad and Kamal, 2006). It is difficult for researchers to obtain data from the entire population due to restricted resources such as time, money, and transportation. This study comprises the data from the school education department, forest department, agriculture extension Faisalabad office, and local communities.

Sampling: Smallest individual unit that contain all features of a population is called a sample. To generalize the results, sample selection is critical. A sample is a small group of people who reflect the entire population in order to obtain results for the whole population (Lance and Hattori, 2016). The study included 50 forest department officials, 50 agricultural extension agents, 33 teachers from 3 government schools, and 50 local people. The sample size for this study was 183, which was chosen using the website www.survysystem.com, with a 95% confidence level and a 5% confidence interval.

The respondents were chosen using a quota sampling method. Although the population consisted of the only four well-defined categories (forest officials, agricultural extensions officers, teachers and local residents) with total 183 individuals, the study used quota sampling to ensure that each stakeholder group was adequately and proportionally represented. If simple random sampling had been used, then there was risk that some categories might receive fewer respondents than others which would limit meaningful comparison across groups.

Research instruments: The researcher prepared only one research instrument that was a questionnaire. They have no extra time to give the researcher. Pre-testing a research instrument is a strategy for determining the instrument's reliability and validity. Pre-testing was done to ensure that respondents were able to grasp the questionnaire and that they responded accurately to the needs.

Validity and reliability: The ability of an instrument to measure what it is intended to measure is known as validity. As research, instruments with both face and content validity are primarily responsible for proper data collection (Brains *et al*., 2011). A panel of subject experts reviewed each item for clarity, relevance and alignment with the study objectives. The content validity index for the scale was 0.86 which is above the acceptable threshold of 0.80, indicating strong content adequacy. Minor wording revisions were made based on experts feedback to enhance clarity and appropriateness for the target population.

The research instrument's reliability is the inverse of its validity. For obtaining high-quality data, the research instrument's reliability and validity are critical. In statistics and psychometrics, reliability refers to a measure's general consistency. It is only reliable when the value falls between 0.00 and 1.00. 0.00 denotes a lot of error, while 1.00 denotes no error (Neil and Carlson, 2009). A polit study was conducted with 30 respondents to assess internal consistency. Cronbach's alpha coefficient for the instrument was 0.82, demonstrating high reliability, as values above 0.70 are considered acceptable in social science research. Sub-scale reliability scores ranged from 0.78 to 0.84, confirming consistent measurement across all dimensions. No major modifications were required following pilot testing.

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Statistical analysis of data: SPSS (Statistical Package for the Social Sciences) was employed to determine frequencies, percentages, means, weighted scores, and standard deviations, which were subsequently utilized to interpret and analyze the results. Chi-square test was employed to get association of the variables.

RESULTS AND DISCUSSION

Table I. Socio-economic attributes of respondents

Characteristic	Category	Frequency (n)	Percentage (%)
Age (years)	25 to 30	35	28.2
	31 to 35	45	36.3
	36 to 40	29	23.4
	Above 40	15	12.1
Education level	Below graduation	19	15.3
	Graduation	50	40.3
	Msc/MA	42	33.9
	M.Phil	12	9.7
	PhD	1	.8
	Below graduation	19	15.3
Departments	School education	37	29.8
	Forest	19	15.3
	Agricultural extension	39	31.5

Table I show that less than half (36.3%) of the respondents were 31-35 years of age. The major part of the age that participates in this research project was the age 31 to 35. While 28.2% of respondents had ages between 25 – 30 years. the 40% of people of the graduation show the maximum level that educated and participate in this project. The near about 34% people shows the postgraduate and 15% of data shows the below graduation people (Mahmood, 2020).

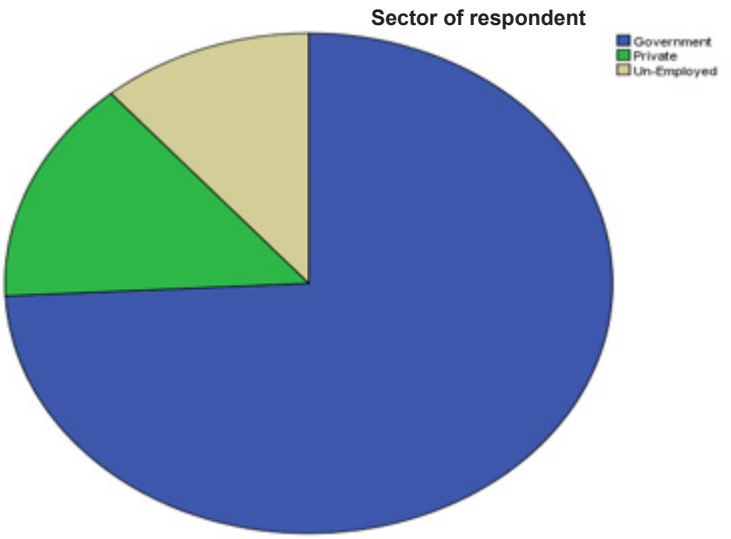

Fig. I. clearly shows that one-third of the total percentage is nearly 75 % of government personnel and the remaining 15 % private and the other rest of 10% shows the only unemployed person participate to become a part of this plan and to become a green Pakistan (Lance and Hattori, 2016)

Table II. Distribution of the respondents according to the role of government in plantation

Role of government in plantation	Mean	S.D	Weighted score
Allocate funding	3.60	.918	447
Planting trees	3.44	1.143	427
Develop nursery	3.26	1.118	404
Seed provision	3.40	1.089	422
Provide land	3.19	1.214	396
Canal side plantation	3.48	1.047	431
Fertilizer provision	3.12	1.130	387
Training regarding tree plantation	3.11	1.149	386
Roadside plantation	3.40	1.110	421
Collaboration with other departments	3.27	1.176	405
Work for the protection of soil	3.19	1.057	396
Protection strategies from plant diseases	3.19	1.072	396
Protective strategies after plantation	3.27	1.092	406

Table II clearly shows role of government in plantation that to develop nursery, to allocate fund, planting trees and seed provision had a greater WS 447, 427 and 422.The mean of fertilizer of provision is 3.12 and the standard deviation of this respondent is 1.130 and 387 is the weighted score. All ecosystem services are vital, but in places like Pakistan, climate and water services are critical. It is water consumption would rise in the coming days due to growing people and socio-economic growth in an already water-stressed country (Bogner *et al.,* 2008).

Table III. Multi-sectoral effects of tree plantation project

Multi-sectoral effect	Mean	S.D	Weighted score
Income enhanced of local people	3.38	0.97	419
Employment opportunities.	3.52	0.99	437
Improve the quality of the environment	3.64	1.06	451
Increase Forestland productivity, produce timber, firewood, and other multipurpose tree species.	3.45	0.90	428
Increase the pasture's productivity and other related services and function.	3.48	1.00	432
Enhance the protective functions of watersheds for regulating their water regimes.	3.44	0.99	427
Soil erosion and siltation of reservoirs, protecting downstream agriculture	3.43	0.98	425
Promote local flora /tree species.	3.43	0.95	425
Provide and conserve the habitat of the flora and fauna	3.61	0.93	448
Convention on Biodiversity.	3.47	0.95	430
Climate Change Convention support	3.59	1.03	445
Sustainable environment	3.65	0.93	452

Table III shows the multi-sector effects of this project. While respondent maximum mean is 3.65 and against this standard deviation is .930 and the weighted score is 452. Regarding improving the quality environment is 3.64 mean and standard deviation

1.069. On the other hand, increase the income of local people mean value is 3.38 and the standard deviation is 0.976 and the weighted score is 419. The billion-tree tsunami afforestation initiative, rendering to a United Nations Food and Agriculture Organization study from 2015, intends to reverse deforestation and rise the province's wooded part by at least 2%. Ages of tree falling have decreased Pakistan's woodlands to less than 2 percent of its all land area, creating it one of the smallest in the region. (Haider and Ali, 2020).

Table IV. Suggestions for future guidelines

Suggestions	Frequency	Percentage
Planting multispecies plantations to meet wood demand	92	74.2
Minimizing the use of natural forests	90	71.0
Improving Consumer understanding for sustainable production practices	96	77.2
Technological improvements to enable plantations to meet more demand	102	82.2
Strict management practices to minimize toxic chemical use, prevent pollution, and avoid adverse effects on water supplies	104	84.5

n=183

Table IV shows suggestions for future guidelines about this project. Majority (84.5%) of the respondents showed that following strict management practices to minimize toxic chemical use, prevent pollution, and avoid adverse effects on water supplies. Then 82.2% of the respondents were of the view that technological improvement is the solution. While consumer understanding and planting multi varieties of plants were also suggested. Rauf *et al.* (2019) stated that BTAP-based family circles make 4% more money and have 35% more assets, according to the study. These data employ that the BTAP has a significant impact on the growth of livelihood assets.

Table V. Chi-square test: association between demographic characteristics and effects of tree plantation project

Demographic variable	χ^2 Value	df	p-value	Significance
Age (years)	5.1	3	0.021	**Significant** ($p < 0.05$)
Education level	8.4	2	0.007	**Significant** ($p < 0.01$)
Profession	7.40	3	0.009	**Significant** ($p < 0.05$)

It is indicated in Table V that tree plantation has positive and significant effect with those of age of the respondents (χ^2 value= 5.1, P=0.021). In case of education it is highly significant with (χ^2 value= 8.4, P=0.007) that clearly show that education is a weapon of knowledge that gives awareness about the benefits of tree plantation. Regarding profession it is also significant (χ^2 value=7.40, P=0.009) with tree plantation as professionally respondents were well equipped with knowledge and skills. Plantations develop relatively quickly under certain conditions, permitting them to absorb more carbon dioxide than natural forests. Newly implanted or regenerated forests can fascinate carbon for 20-50 years or more in an undisturbed environment (Sabir *et al.*, 2020).

CONCLUSION

The billion-tree initiative significantly contributed to providing wages for jobless laborers and creating job opportunities for farmers in nursery development, while also serving as a substantial source of income. These efforts foster motivation for tree planting, significantly reducing pollution levels, mitigating deforestation, and contributing to forest afforestation. These initiatives positively impacted our surrounding environment. Faisalabad has gotten more verdant and aesthetically pleasing than in previous year.

There are some recommendations based on the research:

1. There is need to strength the community by engaging the local households, schools and youth for tree plantation drives to sustain long term ownership and care.
2. Offer more training for nursery development and income-based initiatives for plantation.
3. Partnerships with private sector and NGOs where they can adopt parks and maintain it more sustainably with local community.

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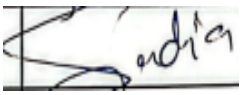
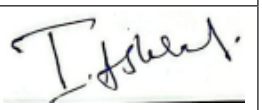
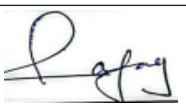
CONTRIBUTION OF AUTHORS

Sr. No.	Authors' name	Contribution	Signature
1.	Aqeela Saghir	Wrote-up the manuscript	
2.	Sadia Ijaz	Collected and analyzed the data	
3.	Khalid Bashir	Analyzed the data statistically	
4.	Ijaz Ashraf	Proof read the manuscript	
5.	Rafay Muzamil	Edited the manuscript	
6.	Saba Javed	Reviewed the manuscript and literature