STUDY OF PUBLIC PERCEPTION OF WATERSHED MANAGEMENT ACTIVITIES BY KPK FOREST DEPARTMENT AT KANSHIAN VALLEY

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ABSTRACT: The purpose of this paper is to study the perception of the local community towards watershed management activities and to investigate how watershed management initiatives have impacted rural areas. the fieldwork for data collection was conducted in the Kanshian village with assistance from the office of the Kunhar Watershed Division, the study involved two levels of investigation through a carefully designed questionnaire eliciting information from the respondents, and unstructured interviews of the functionaries of the watershed division and other resource personnel were conducted. Results indicated that residents had a strong grasp on the issues stemming from the watershed's decline and the effects of efforts to address them, the survey showed that the locals were apparently only consulted on a small number of the numerous major decisions that were taken without their input. Adoption rates were low across the board, and they were far lower for most individual pursuits. The growth of human, natural, monetary, social, and physical resources crucial to people's livelihoods had some gaps. To ensure the sustainability of watershed management methods and to address any technical shortcomings identified in conservation structures, researchers must provide ongoing technical support, training, and follow-ups in the study area. This is crucial in order to address any underlying technical problems that may be found in conservation infrastructure. In the future, studies should focus on watershed management, ecological services, climate change, and climate variability. Taking into consideration the significance of water reservoirs for agriculture, the generation of electricity, as well as for commercial and residential use, and this research aims to gain a better understanding of public awareness and attitude towards different watershed management activities so that stakeholders and policymakers can better plan for and implement them.

KEYWORDS: Public perception, watershed, climate variability, local community, public awareness, policy makers

INTRODUCTION: Water being a major natural flow is an indispensable part of life, for the existence of life on this earth, whether of a human being or a plant all due to this gift of nature. Among the nine planets, the earth is uniquely endowed with large quantities of water mostly in its liquid state *(United Nations, 1987)*

The use and overuse of watershed for centuries have threatened the ecological stability of the region. Subsequently, ecological degradation has become a serious problem in the country's northern mountains *(Lacombe et al., 2019)*

Rastilantie et al. (2010) assessed the natural resource of Hazara in their study particularly the irrigation and power potential of the Siran Basin and the possibilities of their development.*Fida hussain (2011)* explained the importance of our water reservoirs for irrigation, energy production.*Cosgrove and Loucks (2015)* described how to deal with the changing nature of the future climate, as well as the rapidly expanding population, which is hastening social and economic development, as well as urbanization and globalization.

Barclay and Klotz (2019) described the role of community participation in the development of green stormwater infrastructure (GSI).*Mekuriaw and Amsalu (2022)* determined how effective community-based watershed management is in land rehabilitation. *Agidew and Singh (2018)* investigated factors affecting farmer's participation in Northeastern highlands of Ethiopia watershed management programs, data was gathered from 215 farm households, from four villages using random sampling and structured questionnaires, group discussions, and interviews.

*Floress et al. (2015)*provided a background information on the social aspects of watershed management to elected officials and policymakers, watershed managers, and others who are interested in improving water resources. *Fenta et al. (2016)* demonstrated the ability of watershed management efforts to bring about remarkable restoration of degraded semi-arid lands, which could serve as a foundation for long-term planning of future developments in areas experiencing severe land degradation due to water erosion.

Uniyal *et al.* (2020)assess the Baitarani watershed in India in order to evaluate and suggest feasible combinations of best management practices (BMPs). *Wolka, Moges, Yimer et. al (2013)* assessed farmers' opinions on the effect of soil and water conservation (SWC) structures, particularly level soil bunds and stone bunds, in improving agricultural crop production.

Duldiano, Anacleto, C (2018) studied the socio-economic approach to the watershed development and the conservation in Pakistan. *Mengistu and Assefa (2020)* explained the relationship between the community's perspective, involvement, and livelihoods as essential element for the longevity of environmental management initiatives like the watershed intervention program.

STUDY AREA DESCRIPTION: Kanshian village (Latitude: 34.53283° or 34° 31' 58" north Longitude: 73.40241° or 73° 24' 9" east Elevation: 1,627 meters (5,338 feet) is located in Mansehra District, Khyber-Pakhtunkhwa province of Pakistan. It is a village of Union Council Garlat of tehsil Balakot to the southeast of Balakot city which lies in the Reserved Forests in the Kaghan valley (total area of 1, 864, 44 hectares). On either side of the river

Kunhar, at varying distances from Balakot on the north by Chilas and Gilgit agencies, and on the west by Allai Kohistan and Siran Forest Division.

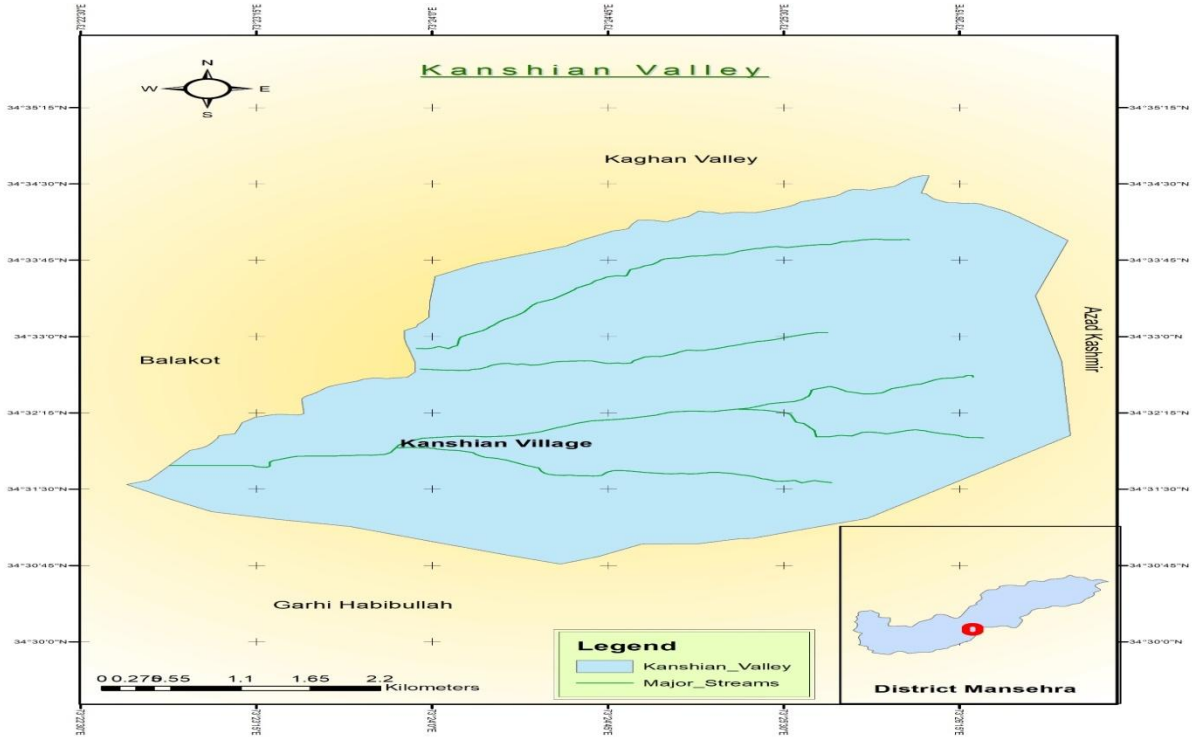


Figure 1: MAP

MATERIAL & METHOD: The fieldwork for data collection was conducted in the Kanshian village with assistance from the office of the Kunhar Watershed Division, the study involved two levels of investigation:

a) *The secondary data was obtained from the official records of experience regarding such activities as planting, and protection of the planted trees, watershed management practices carried out, etc.*
b) *To understand the reactions and attitudes of the local community of the selected village where the study was to be carried out.*

1. Consultative Meeting with the Divisional Forest Officer of Kunhar Watershed Division KP Forest Department:

At the office the of DFO Kunhar watershed division, in the presence of officials from the Forest Department, a discussion was held primarily to identify themes or concerns to be investigated further during household surveys and key informant interviews.

2 Focus Group Discussions (FGDs): The FGD participants were mostly community members, VDC members, and forest department representatives. Community members and forest department staff were consulted for data collection.

3 Pre-Test: A preparatory survey was carried out to know any changes that were found to be necessary as a result of this pre-test were recorded and carried out

4 Data Collection: Keeping in view the considerations a questionnaire was prepared to have three broad divisions, general information (Demographic profile), which included personal information such as name, locality, age, education, profession, household size, In Kanshian village, a total of 70 male respondents provided information for questionnaires.

RESULTS AND DISCUSSION:

1 Family Types of the respondents living in the watershed area:

The number of respondents who belonged to the single-family type was 25(35.71%) and the number of respondents who belonged to the joint-family type was 45(64.29%).

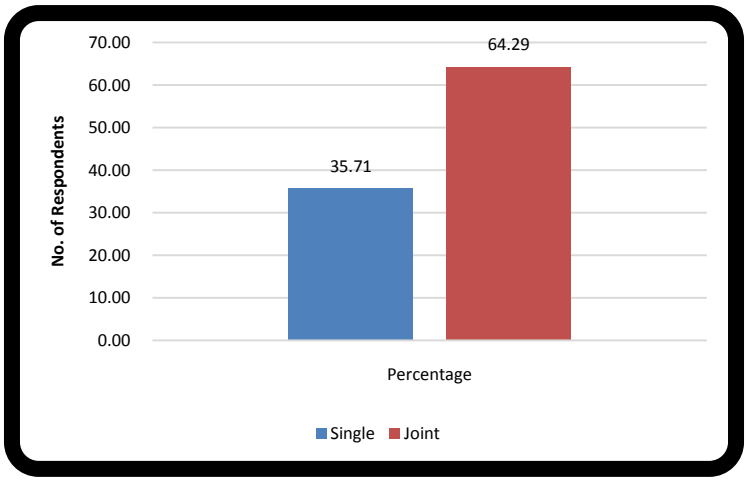


Figure 2 : Family type

2 Marital Status of respondents of the watershed area:

Data revealed that there were a total of 18 respondents who were unmarried (26.09%), 48 respondents who were married (69.57%), 1 respondent who was divorced (1.45%), and 2 widowed 2.90% of the total respondents.

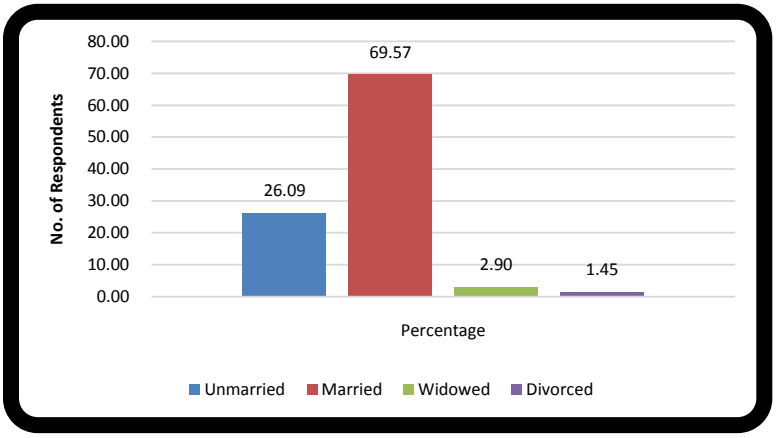


Figure 3: Marital status

3 Size of Household of the respondents residing in the watershed area:

Three household size consists on 19 respondents, accounting for 27.14%, were placed in the first group, 45 respondents, accounting for 64.29%, were placed in the second group, 06 respondents, accounting for 8.57%, were placed in the third group.

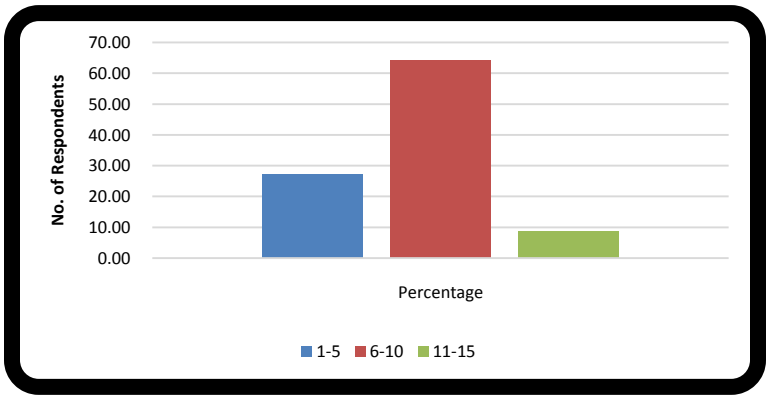


Figure 4. Size of Household

4 Average Monthly Income of groups living in the watershed area:

In order to find the accessibility the average monthly income was divided into 5 groups, 8(11.43%) belonged to class one, 32(45.71%) belonged to the second class, 20(28.57 %) belonged to the third, 6(8.57%) belonged to the fourth class, and 4(5.71%) belonged to the fifth income class as shown below.

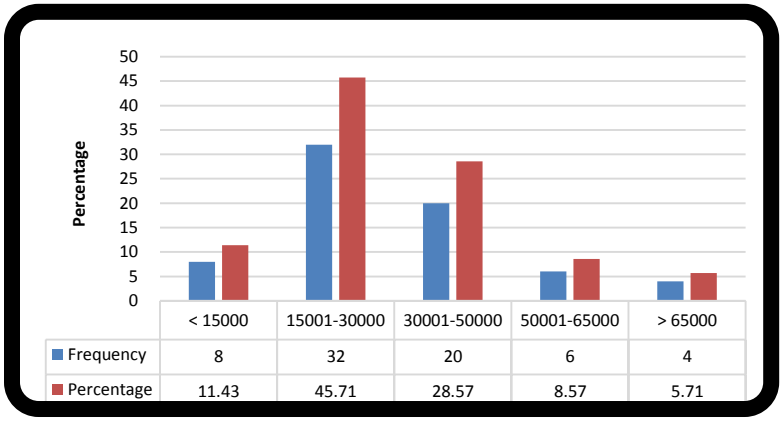


Figure 5. Average Monthly Income

5 Activities under Balakot Watershed Range

The data was collected from the Forest Department Kunhar Watershed Division office regarding different projects carried out in the area and what practices were used which are given below:

S. No	Activity	Area (Ha)	Year/Season	Survival
1	UNDP Project	60	2000-2012	70-80 %
2	Kanshian Block Plantation	23	Spring 2019	70-75 %
3	Kanshian Moist Temperate	40	Monsoon 2021	90%
4	Kanshian Moist Temperate	20	Spring 2022	90%
5	Closure	40	Monsoon 2021	90%

Table 1: Activities under Balakot Watershed Range *(Source: Kaghan Division Working Plan)*

6 Perception towards Watershed Management (Ws Mgt) Techniques

The total 70 respondents , 8 respondent prefer retaining walls, 12 respondents were in the favor of check dams, 14 preferred reforestation, 10 respondents wanted control works, 22 respondents showed preference towards soil bio engineering techniques and only 4 respondents preferred grass cover techniques for the purpose of watershed management in the area, the proportion of the respondents along with their preference of different watershed management activities are expressed in the chart below;

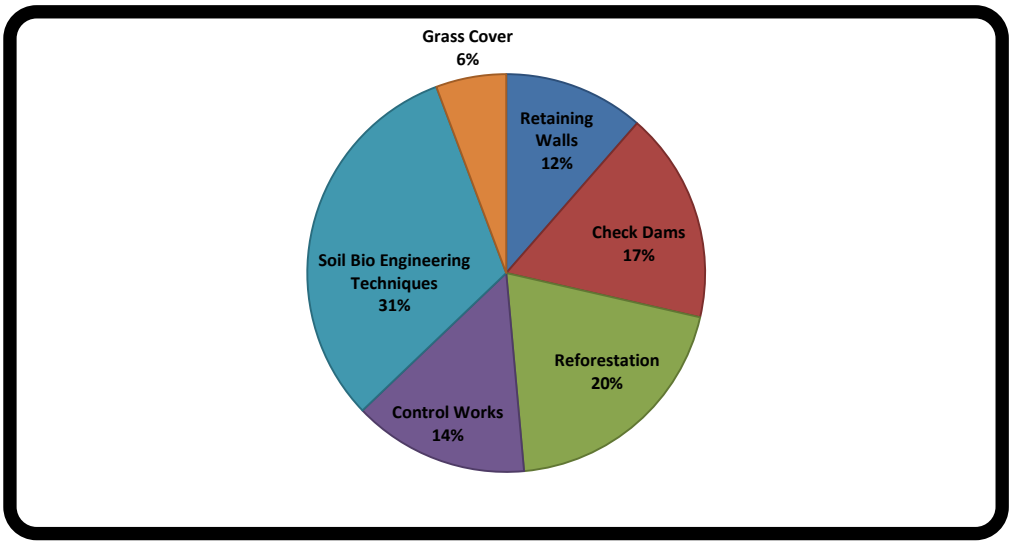


Figure 6. Perception towards WS Mgt Techniques

7 Effects of Watershed Management Activities

Our results showed that out of total 70 respondents, for Retaining walls; 23 respondents prefer it for slope stabilization, 9 for crop production, 7 for increase in forest area, 31 respondents for runoff control. Check dams; 10 respondents prefer it for slope stabilization, 2 for crop production, 5 for increase in forest area, 53 respondents for runoff control. Reforestation activities; 17 respondents prefer it for slope stabilization, 8 for crop production, 34 for increase in forest area, 11 for runoff control. Control works; 11 respondents prefer it for slope stabilization, 11 for crop production, 5 for increase in forest area, and 43 for runoff control.Soil Bio Engineering Techniques; 55 respondents prefer it for slope stabilization, 15 for runoff control and none of the respondents prefer it to enhance forest cover and agriculture productivity. Reasons for the preference of different watershed management activities by the respondents is shown in the chart below:

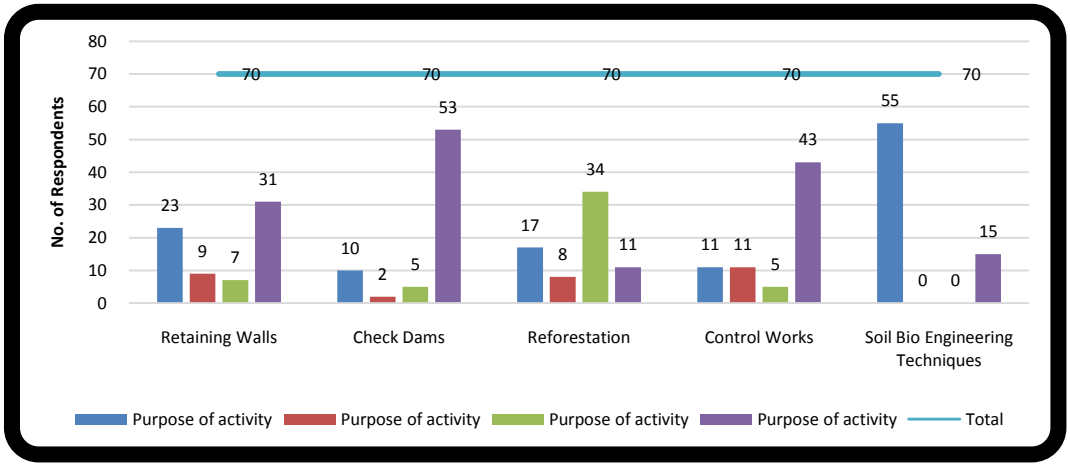
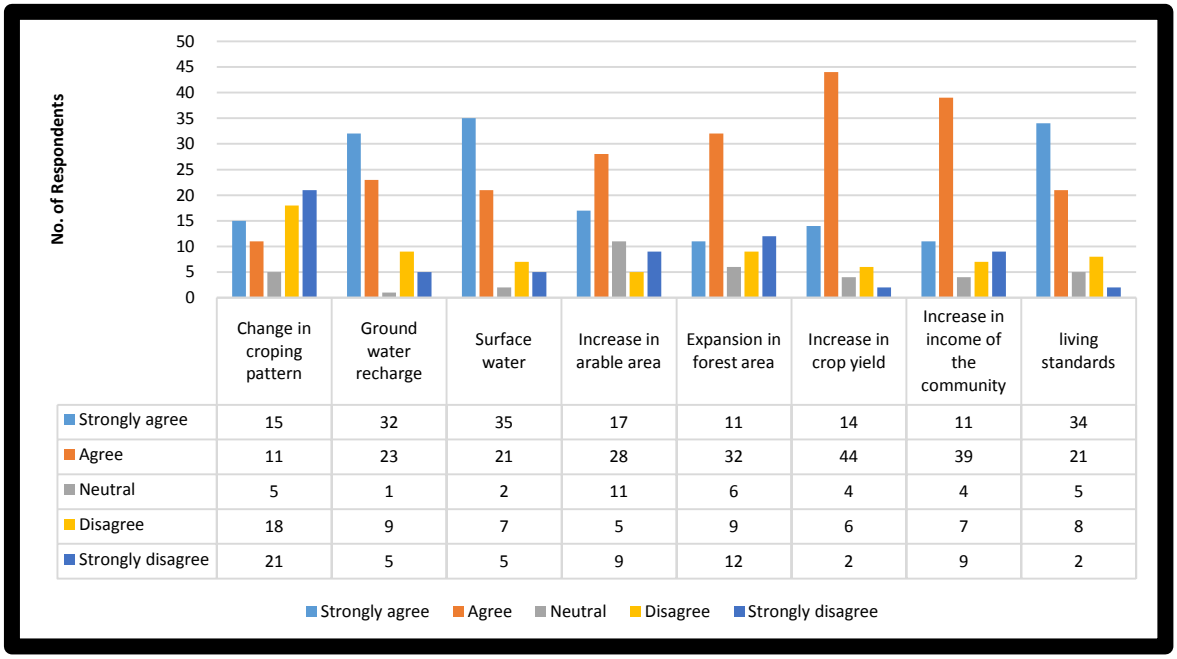


Figure 7. Effects of Watershed Management Activities

8 Benefits of Watershed Activities

The benefits of watershed were asked through questionnaire starting from strongly agree, agree, neutral, disagree, to strongly disagree. For change in cropping pattern out of 70 respondents 15 strongly agreed, 11respondents answered to agree, 5 to neutral, 18 answered in disagree and 21 respondents strongly disagreed to the statement. For ground water recharge 32responndents strongly agreed, 23 agreed, 1 neutral, 9respondents disagreed while only 5 respondents were in the opinion of strongly disagree to the statement. For surface water improvement 35 respondents recorded their opinion to be strongly agree with the statement, 21 to agree, 2 to neutral, 7 to disagree and 5 respondents strongly disagreed to the statement, similarly, for the statements regarding increase in arable area, expansion in forest area, increase in crop yield, increase in the income of the community, improvement in living standards, the opinion of the 70 respondents was recorded which is shown in the chart below:

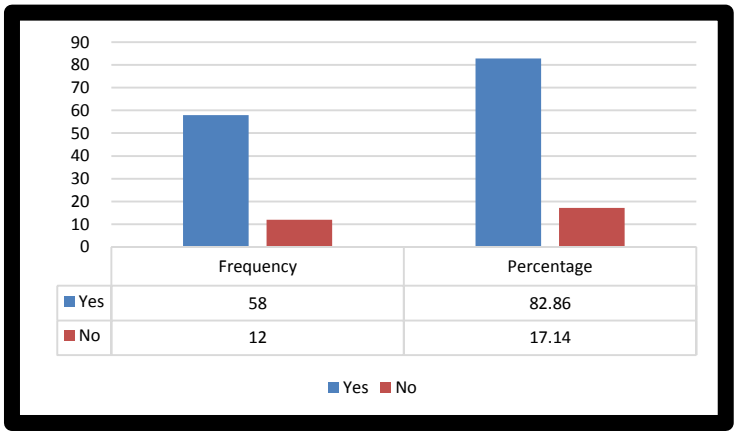


	Change in croping pattern	Ground water recharge	Surface water	Increase in arable area	Expansion in forest area	Increase in crop yield	Increase in income of the community	living standards
Strongly agree	15	32	35	17	11	14	11	34
Agree	11	23	21	28	32	44	39	21
Neutral	5	1	2	11	6	4	4	5
Disagree	18	9	7	5	9	6	7	8
Strongly disagree	21	5	5	9	12	2	9	2

Figure 8: Benefits of Watershed Activities

9 Role of Forest Department towards Community Development

In order to know the role of forest department a simple method of yes/no based questions were asked the results of the data recorded from total 70 respondents is given below in the following charts:



	Frequency	Percentage
Yes	58	82.86
No	12	17.14

Figure 9. Role of Forest Department towards Community Development

10 Involvement of Community in Species Selection

For data regarding involvement of community in species selection results show that out of total 70 respondents 39(55.71%) answered in "yes" while 31(44.29%) respondents answered in a "no"

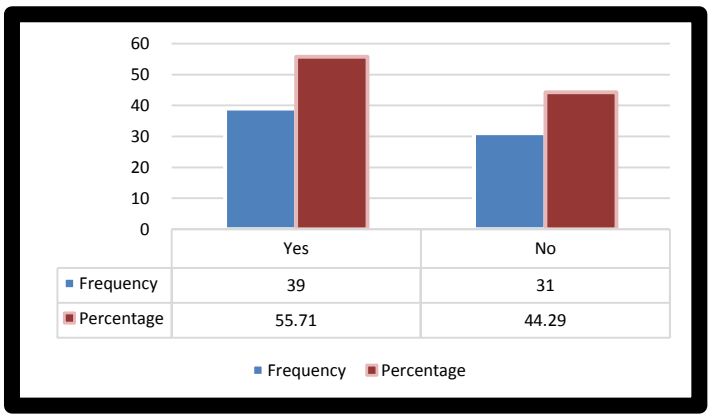


Figure 10. Involvement of Community in Species Selection

11. Community preference of different species for plantation

According to the data collected it showed that out of total 70 respondents, 11(15.94%) prefer Eucalyptus, 9(13.04%) prefer Iple, 9(13.04%) prefer Ailanthus, 2(2.90%) prefer Deodar, 12(17.39%)Robinia , 7(10.14%) Chir, 8(11.59%) Mulberry, 3(4.35%) prefer Kail and 7(10.14%) preferred Poplar which are shown in the chart below:

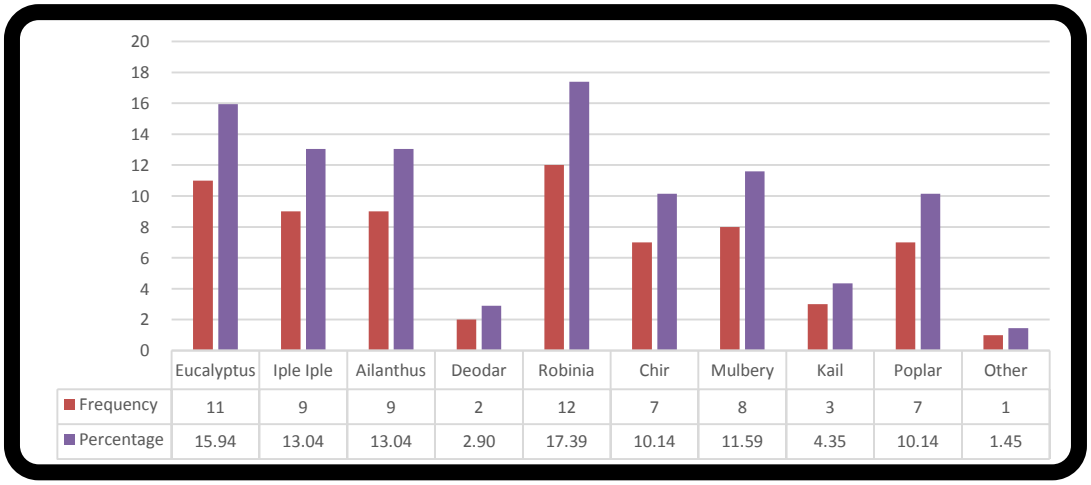


Figure 11. Species preferred By Community for Plantation

12: Reason for preference of different species for plantation

It was recorded that out 70 respondents the reason of preference of different species was that 11 respondents (15.71) preferred it because of Aesthetic value, 9 respondents (12.86%) preferred it for Fodder production, 10 respondents (14.29%) preferred for the reason that they are fast growing, 19 respondents (27.14%) preferred it because of coppicing properties, 21

respondents (30%) preferred the different species for the reason of their economic value as shown in the chart below;

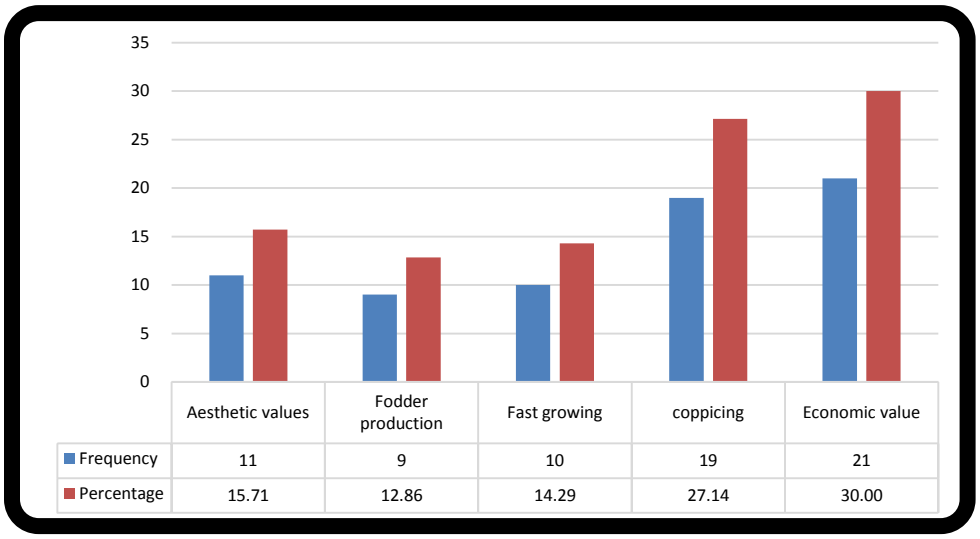


Figure 12 . Reason for preference of different species for plantation

DISCUSSION: The role of the Forest Department towards community development in order to get the perception of the community towards the watershed management activities. For this reason, respondents were interviewed regarding the establishment of village development committees (VDCs) and community involvement in the process of species selection. This was done so that we could get the community's perspective on the watershed management activities. A lack of extension services, a lack of money, and an interest in short-term agricultural output are the primary impediments to the long-term viability of watershed management.

The key obstacles that limit the longevity of watershed management are a lack of extension services, a lack of money, and an interest in short-term agricultural output. The progress accomplished in each of the following areas of livelihood assets—human, natural, monetary, social, and physical—had some holes in it. Ongoing technical support, training, and follow-ups are required in the research region in order to guarantee the long-term viability of watershed management practices and to correct any technical inadequacies discovered in conservation structures. In addition, this is necessary in order to ensure that any discovered technical deficiencies in conservation structures are addressed. Future studies need to concentrate on the interplay between watershed management and ecosystem services, as well as climate change and variability*(Mengistu and Assefa (2021).*

CONCLUSION: Our study revealed that the standard of living, learning, understanding, employment opportunities, and medical care are all intertwined with and dependent on one

another, and all rely on a solid infrastructure to function. The key obstacles that limit the longevity of watershed management are a lack of extension services, a lack of money, and an interest in short-term agricultural output. The progress accomplished in each of the following areas of livelihood assets—human, natural, monetary, social, and physical—had some holes in it. Ongoing technical support, training, and follow-ups are required in the research region in order to guarantee the long-term viability of watershed management practices and to correct any technical inadequacies discovered in conservation structures. In addition, this is necessary in order to ensure that any discovered technical deficiencies in conservation structures are addressed. Future studies need to concentrate on the interplay between watershed management and ecosystem services, as well as climate change and variability.

RECOMMENDATION: Local perception of watershed management approaches is a key social factor that plays a great role for sustainable watershed management strategies to be implemented;

- Adoption of modern integrated watershed management approaches for natural resource conservation involves the local population. This will not only assist to continue the restoration of damaged watershed areas, but it will also help the people become more aware of the worth of the gifts that nature so generously provides.
- Decision-makers and managers must examine the geography and socioeconomic context-specific circumstances to identify watershed dreadful conditions and monitor restoration initiatives in a given environment.
- In order to pursue the active participation of local communities at all levels of planning and implementation of watershed projects, detailed sociological studies are required in all critical watershed areas of Pakistan.
- Watershed management must be improved upon from a technical standpoint, particularly with regard to integrating hydrogeology and biophysical factors.
- Research must be presented clearly so that policymakers and managers can integrate knowledge into practical applications. This will lay a solid foundation for better future participatory watershed management of those vulnerable watershed zones, ultimately contributing to the country's economy in a variety of ways on a long-term basis.
- More participative and integrated approaches to watershed management must be supported in order to scale up and sustain watershed management techniques.
- Local administrators and planners must acknowledge variety in families' socioeconomic and topographic particular qualities, as well as the abovementioned limits, in order to effectively engage the community in diverse watershed management operations.

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