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HYDRO-SOCIAL DYNAMICS OF THE GHIZER RIVER: EXPLORING COMMUNITY RESILIENCE AND ECONOMIC LIVELIHOODS IN GILGIT-BALTISTAN

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Abstract
The focus of this article to exploring the role of Ghizer River on the socio-economic status of the nearby community. The attempt is to assess the benefits such as services, opportunities, natural resources and many others of Ghizer River. Through the household survey and data collection the result is drawn. The data point out that the Ghizer River is the blessing for the local community. Many villages are situated on the bank of the Ghizer river and some are completely depended on river water for many purposes such as irrigation as well as drinking. More advantages like more income, tourism food security and entrepreneurship can be flourish through the proper planning and keen interest of NGO and govt. The study encourages that efficient irrigation system and vast barren lands indirectly provides benefits for local communities. Moreover, it is very important motivate the local to increase the productivity. Training of local people to is also necessary to produce horticulture and dairy products. The study suggests the way to achieve these aims, a severe need to fulfill the demand of hydropower electricity of local community to save them from uninterrupted electricity for agriculture. The research attempted to highlight the importance of fish farming as well as poultry farmers.
Key Words: *Socio-economic Status, Goods & Services, Livelihood and Fuelwood.*

1. Introduction

The association between water and human beings has been found from the hunting and gathering societies. This relationship is existing in the contemporary era (Sahlins, 2017). The water is a sign of life. The people of foraging societies were lived near river or any source of water because of different facilities like raw material, food and communication (Salman, 2004). River and water have different purposes as well benefits. River is habitat for fishes, shellfishes, wildfowl and birds (Lansing, 1998).Water is very precious. Without water no one can survive on the earth. Scarcity of water is the very biggest issue of the contemporary era. Large scale population growth, deforestation and industrialization are major causes for the scarcity of water (UNESCO, 2003).

Water and river played a crucial role in the development of civilizations (Adas, 1993).The agriculture sector plays a crucial role in improving the Gross Domestic Products of Pakistan. It contributes 20% in the total Gross Productive Products of Pakistan. River provide 55% jobs to the labor (F.A, 2008) . Gilgit is a province of Pakistan and rich with water resources. These water resources are in the form of glaciers, lakes and rivers. The main river the of the Gilgit-Baltistan is located in the district Ghizer named Ghizer river. This is situated at northern part of the Gilgit-Baltistan. The Ghizer river pass through the many villages and discharge Indus river. The Ghizer river also attach with the Khyber Pakhtunkhwa via Shandur Pass. Ghizer River of the Gilgit-Baltistan is the gateway for two main areas one is Central Asia and the other is Tajikistan through Boroghul pass. (Skefeld, 1999). The Ghizer river consist of

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thee main rivers of Phander River, Yasin and Ishkoman River because the Ghizer River arise from Shandur Lake. The Ghizer River is the hub of economic opportunities such as agriculture sector, hydropower fish farming and hotels. Because lack of the money local people look forward to the government and NGOs to install business for their livelihood. Mostly NGOs and government agencies make them capable to start their own business through loans and support. There is need to invest more in energy and agriculture sector because Gilgit-Baltistan has a capacity to produce more energy, surplus in agriculture, fishing and tourism. A big issue is the environment impact in the Galgit-Baltistan because wood is use as a source of heat energy in result deforestation is going on in the area (Kreutzman, 2013). The research was conducted on the socio-economic effect of the Ghizer River on local community of District Ghizer Gilgit-Baltistan. We all know the importance of water for life and ecosystem that the water is very important for human life. The tragedy is we do not protect such precious resources and even we do not now how we can protect them. There is need to make a river garbage free and should not through garbage and animal bodies in it. Moreover, plantation of trees is also very important to protect erosion.

2. Objectives

i) To examining the goods and services supplied by Ghizer River to local community.
ii) To give suggestions to the government and NGOs for work on preservation of river and to make people aware about importance of river.

3. Literature Review

The river is a source, which takes water from one place to another. River also carries different kind of nutrients through the earth. The river provide habitat to grow different kind of plants. Rivers also are the source of travel source for much purpose such as business as well as recreation (Coley, 2005). Zhang, 2015 founded that in the primitive time people were lived near the rivers and used major waterways for agriculture growth and angling. (Neely, 2005) Compared the relationship between hunting and gathering society and primitive society with fresh, sweat water, and distribute into the two themes. Firstly, the rivers help to achieve economic goals like income. Secondly, figurative rituals such as deposition and burial sites. The availability of pure fresh and drinkable water is the basic rights of the human being and the responsibility of the state United Nation Resolution 2010. Water provides a good ecosystem for animals and human to survive (Kapoor, 2008). Water has keen relationship with the human food. Hunter and gathers were settled to near rivers because on the bank of rivers there were many plants as well fishes. After the invention of pillow, the world has been shifted to the agriculture mode of production (Crossman, 2011). The water is the nucleus of maintainable development, socio-economic development, health and for human survival itself. It is also important for decreasing dieses and improving the health of humans (Bhaduri, 2003). Water is a indispensable and finite source which is basic human need. It can be reuse if we well managed it. Water could be pose Infront of sustainable development but can be managed through good use. Water plays a crucial role in strengthening adaptability of social, economic and ecological system in the brightness of rapid social change (Water & Council, 2000).The history of water management has been traced from the history of human being. In the contemporary era human animals are facing the challenge of water scarcity (Richter, 2003). Grey, 2003 distributed the benefits of river into three categories like economic, strategic and social. The benefit of energy, tourism, transportation are included in the economic benefits. Secondly, there is the strategic benefit include the last category is social benefits, in the social benefit there are health, livelihood of crops, livestock, recreation, cultural spiritual, education and science.

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4. Research Methodology

A collection of rules, principles and procedures, which include the methods of how to investigate scientifically, is called methodology. It means assessment by using proper tools and techniques for data collection. Methodology enables to sociologists to do empirical research. Methodology makes possible advancement of the sociological knowledge (Berg, 2004). Whole methods which researcher use in research is called research methods. Research methods include theoretical procedures, experimental studies, numerical schemes, statistical approaches. Research methods also help us in data collection and to finding the solution of a problem. Quantitative research methods are used to conduct the present research and get the desired data from the respondents. The elements of the population from which the sample is selected from the population is called universe of the study. Ghizer River starts its journey from Shondoor District Chitral and then enters in District Ghizer. At the end, it passes through District Gilgit and falls in Indus river near Juglote, sub division of Gilgit. The study was conducted in Tehsil Punail, District Ghizer focusing on those community's dependent socioeconomically on Ghizer River. The process of data collection was held through convenient sampling. The selected sample represent the whole population. Total 190 household head were interviewed in 15 villages of Tehsil Punail, Districts Ghizer, Gilgit Baltistan. Those house were choosen which falls within the 50meters from Ghizer River to examine the socioeconomic effects of this river. Data collection process is use for gathering and measuring information on variables of interest in an established systematic way, which enables to answer stated research questions, test hypothesis and evaluate outcomes. Quantitative research, methods used this process for data collection from respondents through structured interview schedule. A set of questions asked from respondents. In this research, the data was analyzed with the help of statistical package for social science. Pre-testing is the useful tool before finalizing the shape, so that a researcher could reach to the accountability of question. It is the only way for use in modifying the interview schedule and discovery of new aspects of problem under the study. The methodology through which we use to utilize specific term is called conceptualization. Clarifying a concept is very useful process in the social research. Conceptualization is the clarification of the specific abstract idea that led to the result based on empirical observation as well as representation of concept in the real world. The data was systematically structured as well statistically investigated. Devices of various types were used for the examination of result. To attain the individual qualities for respondent percentage is figured out in a straightforward way.

The formula of percentage is;

$$\frac{\mathbf{P}}{\mathbf{N}} \times \mathbf{100}$$

P= Percentage
F= Frequency
N= Total number of populations

Data has been analyzed for conclusion through suitable techniques. Data analysis process is used to reach conclusions. SPSS was used for the data analysis process. Frequency tables were drawn.

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Figure:1 Administrative map of District Ghizer

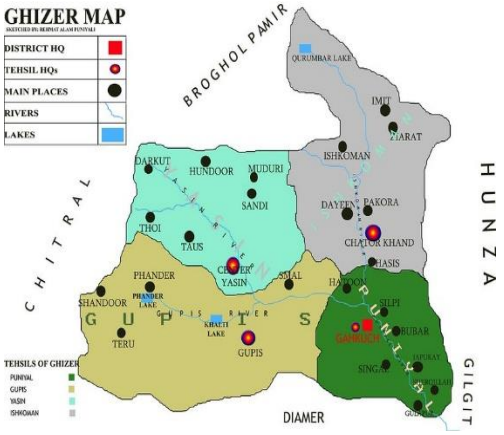

Figure 2 maps is showing the whole Province Gilgilt Baltistan

5. Results and Discussions

This chapter consists on tables and explanations of mathematical findings of tables. The most necessary step in rational or scientific research explanation as well as examination of the data. Because data interpretation leads to re-categorization and explanation of tabulated variables and drawing meaningful inferences. Mathematical analysis of data makes it unable us to check the relationship between variables and find out the results. In this article, SPSS software was used to interpret the data.

Table 1: Distribution of Respondents Regarding their Education

Education Categories	***f***	**Percentage**
Illiterate	09	10.00
Primary	03	03.30
Secondary	08	08.80
Matriculation	13	14.40
Intermediate	15	16.70
Graduation	19	21.10
Master	23	25.60
Total	**90**	**100.00**

Education plays a very important role in the development of socio-economic status of a society. It empowers individuals to enhance their potential and contribute to the production of society. Table 1 demonstrates the education of respondents. The data shows that 25% respondents were master degree holders. Similarly graduated respondents 21%. The data illustrate 16 % respondents are intermediate. Three are primary passed and uneducated are 10 percent. In Gilgit there are Federal government as well as NGOs based schools. This was the greater opportunity to get education. Gradually they learn about the importance of women's education and get enrolled to their women.

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Table 2: Frequency Distribution of Respondents Regarding Their Household Income per month from all sources		
Income of respondents	***f***	**Percentage**
10000-30000	34	37.7
31000-60000	33	36.6
61000-90000	05	05.50
91000-120000	08	08.80
121000-above	10	11.10
Total	**90**	**100.00**

Table 2 highlights the income of respondents as a house per month from all sources. Almost 60% respondents are belonging to the 10 to 30 thousand incomes. 10% are belonging to above one lac income. Overall, the income level of people falls in moderate not too much low nor high. Only 5% respondent's income were between 61000-90000.

The table 3 explain the information about the family size including male children and female children. The table demonstrates 87% of the respondents gave information that their family consist 0-3 male children.11% of the respondents that their family comprises on 4-7 male children. 1% of the respondents respond that their family consist of 8-11 male children. The table highlights the information about respondent that 85% of the respondents answered their family constitute 0-3 female children. Accordingly, 13% of the respondents said their family members have 4-7 female members. 1% of the respondent their family consist of 8-11 children female members.

Table 3: Frequency Distribution of Respondent Regarding their Family Size		
Male Adult	***f***	**Percentage**
1-3	54	60
4-6	25	27.7
7-9	11	12.2
Total	**90**	**100**
Female Adult	***f***	**Percentage**
1-3	54	60
4-6	30	33.3
7-9	6	6.6
Total	**90**	**100**
Male Children	***f***	**Percentage**
1-3	79	87.7
4-6	10	11.1
7-9	1	1.1
Total	**90**	**100**
Female Children	***f***	**Percentage**
0-3	77	85.5
4-7	12	13.3
8-11	1	1.1
Total	**90**	**100**

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Table 4: Frequency Distribution of the Respondents Regarding Cultivated Land		
Cultivated land (Kanal)	***f***	**Percentage**
0-5	58	64.4
6-10	26	28.8
11-15	6	6.6
Total	**90**	**100**
Barren land	***f***	**Percentage**
0-5	54	60
6-10	19	21.1
11-15	12	13.3
16-20	4	4.4
21 Above	1	1.1
Total	**90**	**100**

Table 4 disclose that the respondents have too much low cultivated land because of mountain area. There is canal watering system. Lack of modern technologies. The organizations are inadequate to set up canal for watering on the mountain. In result, the most land is dependent of barren water. The table also highlights the data of cultivated land status. It illustrates that 64% of the respondents are the owner of 0-5 cultivated land. Furthermore, 6% respondent are the owner of 11-15 cultivated land. Furthermore, the table 4.8 explains the data about the ownership of the barren land. According to the provided data 60% of respondents said that they are the owner of 0-5 barren land. While 21% respondent told, they are 6-10 of barren landowner. Just 1% is the owner of above 21 of barren land. There is immense barren land in the study area because of the unavailability of irrigation system. There was only way to cultivate barren land and produce crops as well as vegetables to set up canal system through the uses of modern techniques. This leads to the local people to convert barren land into cultivated land and generates income as well employment opportunities. This could be possible through the collaboration of government and NGOs with the local community.

Table 5: Frequency distribution of respondents regarding fuel-wood consumed in summer (kgs)		
Fuel wood (Summer)	***f***	**Percentage**
100-1000	51	56.5
1100-2000	38	42.2
2100-3000	1	1.1
Total	**90**	**100**

Table 5 highlights that how fuel or wood local community use in summer. The main purpose of using wood is for cooking and other purpose like heating. This table shows that how much local community is dependent on the Ghizer River and forests that are nearby. The data illustrate that 56.5% of respondent's use of woods in summer between 100 to 1000 kg. Almost 42% of respondents use wood in between of 1100-2000 kg. 1.1% of the respondents use woods in summer in between of 2100-300. The data also explore the importance of protestation of river and forest. These to resources are very helpful for maintaining the living standard of people and makes the environment balance.

Table 6 highlights the about the use of medical plants near the Ghizer River. It shows 81% of the respondents used medical plants. While abide 19% of the respondents not used medical plants. The aim of medical plants was to use self-medication, 41% of the respondents were used it. Only 4% of the

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respondents used herbal for livestock. Majority get medical plants from forest. The table also shows the data of the used of wild vegetables, 86% percent of the respondents used forest fruits and vegetable. Although 14% of the respondents have not used of any wild fruits and vegetables. Moreover, this table show up that 83% of the respondents used honey at home. In contrast 13% of the respondents did not use of honey at homes. Consequently, the data highlights the environmental change in last ten years. Most 92% of the respondents feel that the environment has been changed. Merely 10% of the respondent believe that there is no environmental change. Besides, the table 7 characterize the data about the work of NGOs on conservation of rivers. Only 33% of the respondents stated that few NGOs are working on the conservation of Ghizer River. 78% of the respondents reported that the government is working for the conservation of the Ghizer River. Moreover, the table stated about the seminar on the awareness of environment protection for community. 96% of the respondents said that there is no conduction of such seminars by the NGOs.

The Table 7 shows that lots of building material found on riverside, which can be used in the construction of building. In the Gilgit Baltistan, the traditional practices like separating gold from sand along the river is s alive until now. Selecting gold from sand was the source of income of some families; they have not modern techniques to earn. Almost 86%of the respondent use sand from the Bank of the river. Construction material such as sand stones are easily available on the bank of Ghizer River. 27% of the participants take stones from the bank of river, only 7% of the respondents earn by collecting gold. 4% respondents only get gems from bank of river.

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Table 6 Frequency Distribution of Respondent Regarding River Goods and Services

Use of medical plant	***f***	**Percentage**
Yes	73	81.1
No	17	18.9
Total	**90**	**100**
Purpose of use medical plants	***f***	**Percentage**
No used	17	18.9
Own medication	37	41.1
Livestock medication	4	4.4
Both	32	35.5
Total	**90**	**100**
Source of medical plant	***f***	**Percentage**
Forest	63	70
Purchase	17	18.8
Both	10	11.1
Total	**90**	**100**
Used wild fruit/vegetable	***f***	**Percentage**
Yes	77	85.6
No	13	14.4
Total	**90**	**100**
Use honey	***f***	**Percentage**
Yes	75	83.3
No	15	16.6
Total	**90**	**100**
Feel environmental change	***f***	**Percentage**
Yes	83	92.2
No	7	7.8
Total	**90**	**100**
NGO work on conservation river	***f***	**Percentage**
Yes	30	33.3
No	60	66.7
Total	**90**	**100**
Govt role in preservation of river	***f***	**Percentage**
Yes	12	13.3
No	78	86.7
Total	**90**	**100**
Seminar on environmental by NGO	***f***	**Percentage**
Yes	4	4.4
NO	86	95.6
Total	**90**	**100**

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Table 7 Frequency distribution of the respondent regarding material found on riverside		
Sand	***f***	**Percentage**
Yes	78	86.7
No	12	13.33
Total	**90**	**100**
Concrete	***f***	**Percentage**
Yes	71	78.9
No	19	21.1
Total	**90**	**100**
Stone	***f***	**Percentage**
Yes	25	27.8
No	65	72.2
Total	**90**	**100**
Gold	***f***	**Percentage**
Yes	7	7.8
No	86	95.9
Total	**90**	**100**
Gems	***f***	**Percentage**
Yes	4	4.4
No	86	95.6
Total	**90**	**100**

Table 8 Frequency Distribution of Respondents Regarding River Benefits		
Activity/Service	**Yes (%)**	**No (%)**
Fishing	88.90	11.10
Floating Wood	15.60	84.40
Hunting	84.40	15.60
Aqua Flora	13.30	86.70
Aqua Fauna	14.40	86.70
Transportation	31.10	68.90
Tourism	38.90	61.10
Swimming	68.90	31.10
River-based Jobs	03.30	96.70
Electricity Generation	90.00	10.00

Table 9 Frequency distribution of the respondent regarding Fishing practices

Fishing	***f***	**Percentage**
Yes	75	83.3
No	15	16.7
Total	**90**	**100**
Fishing for house hold purpose	75	83.3
Fishing for economical purpose	6	6.7
Both	9	10
Total	**90**	**100**

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Table 8 elaborate that people get many benefits from the river. Local people like too much hunting. They hunt birds and ducks from river side. 84% of the respondent hunt from river side. Hovering woods are the benefit of the river. Almost 15% of the respondent collect wood from the river side. Electricity is very important of today's era. 81% of the people are getting electricity from water because this source is less costly as well as friendly. Traveling is the strength of Gilgit Baltistan. There are lovely places in the Gilgit Baltistan that intract local as well as international travlers that result tourism is source of income. 38% of the respondents used river for tourism purpose. 62% of the respondent enjoy swimming in river and 31% of the respondent use river as medium of transportation.

Table 9 shows that the Fishing was a major source of livelihood in past but now a days most people do fishing as a source of income. Majority 75% of the respondent catch fish for household purpose. Only 6% of the respondents do fishing to earn because trout fish are economical for doing business.

6. Conclusion

This study suggests that Ghizer River play important role in the livelihood of the local community. It could not be wrong that the Ghizer River is the blessing for local people. The local people depend on the Ghizer River for employment opportunity, tourism, food security, hydropower, agriculture, livestock, drinking purpose, hygiene, transport, medical plants, adventure, construction material, catch wood, forest, fishing and hunting. The present research revealed that the Ghizer River have great socio-economic effects on local community who lived on the bank of Ghizer River. The study finds out that the government and other stakeholders should pay their role to increase business and tourism as well income opportunities. The Gilgit Baltistan is more attractive and beautiful place, but unfortunately, the federal and provincial govt did not pay attention in promoting tourism in the study area. There are lack of staying facilities such as proper roads, transportation, hostels and guesthouses. The areas have a lot potential of hydropower projects sites. Investment in this field can easily produce cheap electricity.

7. Recommendations and Suggestions

Water is the very required commodity for the survival of the human being. If look at the location of the villages of the district Ghizer are situated at the bank of the Ghizer river. These villages are totally relay on the Ghizer River for irrigation as well drinking purposes. The water of river is being contaminated because of population growth as well as beginning of the population growth. This contamination is very harmful for the aquatic species of the Ghizer River and it effect the livelihood of those people who rely on fishing and tourism.

Various opinion people have to conserve the Ghizer River. Some people argued that it is the responsibility of the district administration to take steps for the conservation of the Ghizer River and give punishment to those people who make water contaminated by troughing different harmful acids and chemical. There should be proper sanitation system for public and needs to install dustbin. Second opinion is it is the responsibility of the people ti play role in the conservation of Ghizer River by some steps like plantation tress on the bank of the river. Govt and NGOs must have taken steps to aware the local people to take steps.

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