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WATER MANAGEMENT STATUS IN TERMS OF SUPPLY CAPACITY AND DISTRIBUTION MECHANISM IN UTTARAKHAND

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ABSTRACT

Water, water, everywhere, nor any drop to drink…..'

Almost 97% of this abundant water, mostly comprising seas and oceans, is saline and hence unfit for human consumption. Out of the remaining 3% water, a mere .014% is easily accessible. This may seem like a small amount. However, it is more than sufficient for the world population provided it is used prudently. Alas, this is easier said than done! Prudent use of water can be understood by focusing on 3 How's: a) how much water is available? b) How much the demand is? And c) How the demand can be met? Keeping in mind the above mentioned point this research paper is an effort to study the water demand and supply distribution and eventually to find out the demand-supply gap.

KEYWORDS: *Demand, Supply Distribution, Demand-Supply Gap, Prudent Use of Water.*

Introduction

Dev Bhumi -Uttarakhand is situated in the foothills of the Himalayas. There are two regions Kumaun and Garhwal with 13 districts in typical geographic conditions. Besides the mountainous topography Uttarakhand is blessed with innumerable natural water resources like lake, glaciers, water springs, naulas, rivers, rainfall etc. Great variation occurs in the significant features of the available resources, across several ranges and valleys as a product of the distinct ecological zones. As per the Rawat and Shah Report, 1998, the state has 8 catchments, 26 watersheds, 116 sub watersheds, 1120 micro watersheds. The social and economic lives of the residents of these areas are essentially reliant on these natural resources. Despite the various natural resources of water, this state is also facing the problem of water scarcity. An overall decline in water resources has been recorded in Uttarakhand. Several hydrological studies have confirmed the diminishing water resources, water level and the worsening water crisis in this state[1]. This significant decline in water availability, over the last few decades, has been caused by the mounting infrastructure development and industrialization. Consequently, water resources have been reduced to critical levels. Not only this, the demand-supply gap has also been a concern as this can mitigate various issues among the residents of the state.

Aim of the Study

To determine the status of potable and non-potable water management in terms of supply capacity and distribution mechanism, eventually for suggesting some solutions to overcome the relevant issues.

Objective of the Study

Keeping in mind the above aim, researcher identified the following objectives:

- To identify the demand-supply gap in Uttarakhand.
- To identify the prevailing water distribution issues in the target area.

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Area of Study

The choice of study area was based on the literature available on water scarcity, discussions with experts and on the basic of geographical social and economic conditions of the areas. The field area includes three districts (Nainital, Almora and Bageshwar) in Kumaun and one district (Chamoli) in Garhwal and to be specific for data collection one block from each district and four villages from each block have been included in this study.

S.No.	Zones	District	Block
1	Kumaun Zone	Nainital	Ramnagar
2		Almora	Takula
3		Bageshwar	Bageshwar
4	Garhwal Zone	Chamoli	Dasholi

Sample Size

40% population of the target village was taken and which made the sample size- 800 in total.

Research Methodology

To get data on current water situation a questionnaire was prepared for the households and to get the secondary data various government bodies, websites and experts were approached.

Findings

Although it is evident from the above data that the state official have tried to narrow down the demand of water by establishing proper water distribution network yet there is a marked failure in the Drinking Water Schemes (DRWS) due to various visible and invisible reasons.

Table 1: Status of Drinking Water Schemes in Uttarakhand

District	Number of existing villages	Number of villages identified as water shortage problem villages	Number of drinking water schemes constructed	Number of functioning Systems	Number of non-functioning Systems	Percentage of non-functioning Systems
Nainital	1160	948	889	125	764	85.94
Almora	2294	1756	1721	818	903	52.46
Bageshwar	948	453	382	137	245	64.14
Chamoli	1252	1052	997	536	461	46.24

Source: UJS- Uttarakhand Jal Sansthan

Focusing on the available data for the target area it has been noticed that the coverage of the natural resources is not cent percent thus government has also cooperated and still cooperating to cover whole hamlet. Besides the availability of natural resources in the target area the coverage of habitation is not proper and complete as still 42% of the population is partially covered and thus to cover this partially covered habitation government has come up with various schemes (as per the geographical feasibility and variations of the area).

Table 2: Various Government Schemes

S.No.	Zones	District	Block	Village	No. of Schemes			
					PWS	Hand pump	Others (well, solar pump, tubewell etc.)	Total Schemes
1	Kumaun Zone	Nainital	Ramnagar	Himmatpur	5	0	3	8
				Papdi	3	1	2	6
				Tanda	0	0	3	3
				Choi	6	0	2	8
2		Almora	Takula	Jharkot	2	2	0	4
				Patia	3	2	0	5
				Chanauda	2	2	0	4
				Basoli	4	3	0	7
3		Bageshwar	Bageshwar	Nargoli	2	2	0	4
				Bastoli	2	3	0	5
				Raikholi	3	3	0	6
				Bilari	2	1	0	3
4	Garhwal Zone	Chamoli	Dasholi	Digoli	2	4	0	6
				Agthala	1	2	0	3
				Batula	1	3	0	4
				Jainsaal	1	2	0	3

Source: Compiled data from the information collected from various government departments

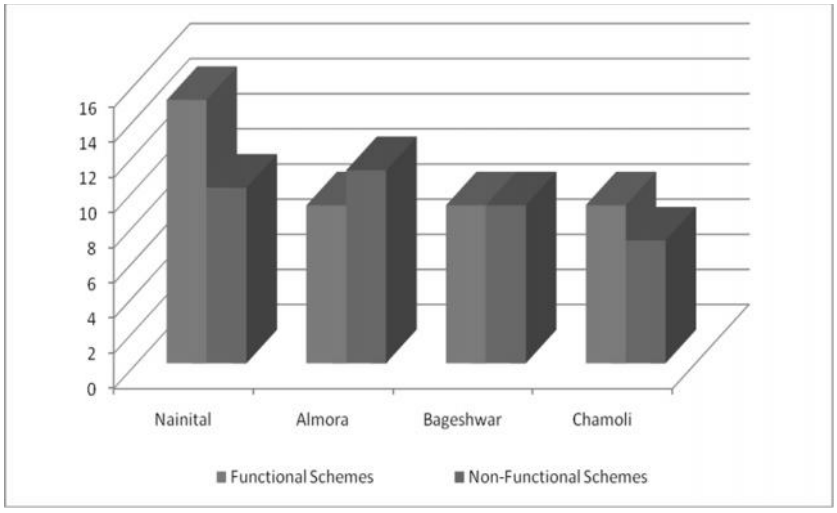
Planning, implementation and regular functioning of the implemented strategies are although correlated yet a periodic check is a must to maintain the efficiency of any project. Thus on the basis of data provided by the government departments following table has been prepared to evaluate the functioning and non-functioning of the implemented schemes/ projects in the target areas.

Table 3: Evaluation of Water Supply Schemes

S.No.	Zones	District	Block	Village	Total Schemes	Functional Schemes	Non-Functional Schemes
1	Kumaun Zone	Nainital	Ramnagar	Himmatpur	8	4	4
				Papdi	6	4	2
				Tanda	3	2	1
				Choi	8	5	3
2		Almora	Takula	Jharkot	4	1	3
				Patia	5	2	3
				Chanauda	4	3	1
				Basoli	7	3	4
3		Bageshwar	Bageshwar	Nargoli	4	1	3
				Bastoli	5	2	3
				Raikholi	6	4	2
				Bilari	3	2	1
4	Garhwal Zone	Chamoli	Dasholi	Digoli	6	4	2
				Agthala	3	1	2
				Batula	4	2	2
				Jainsaal	3	2	1
Total					**73**	**42**	**37**

Source-ibid

Figure 1



Source: Compiled data from Field work

Although government has come up with various schemes to strengthen their water supply mechanism and distribution yet a prominent failure has been identified due to various factors affecting it's proper implementation. Table 3 clearly shows that in spite of the initiation of innumerable schemes their maintenance and continuation has not been noticed, which has eventually landed in demand-supply gap. Data shows a regular increasing demand of water but the question is, that the drinking water supply schemes (DRWS) are sufficient to quench this demand or not? Thus a comparative study has been done for demand and supply of water and this comparison shows a remarkable demand and supply gap which is evident from the column chart constructed on the data collected. Due to the rising population, increasing standard of living, fault in pipelines and water disputes among the neighborhood villages, government bodies like, Jal Nigam and Irrigation Department are facing problems and continuously struggling to mitigate the issues for maintain a proper supply channel.

Table 4: Demand – Supply Gap

Village	Demand/ Hamlets	DRWS	Demand-Supply Gap
Himmatpur	120	58	42
Papdi	20	62	38
Tanda	200	35	65
Choi	45	51	49
Jharkot	25	43	57
Patia	55	32	68
Chanauda	15	54	46
Basoli	35	68	32
Nargoli	20	59	41
Bastoli	15	27	73
Raikholi	45	57	43
Bilari	20	71	29
Digoli	25	51	49
Agthala	45	28	72
Batula	90	42	38
Jainsaal	25	49	51

Source: District wise Complied Demand-Supply gap from secondary data

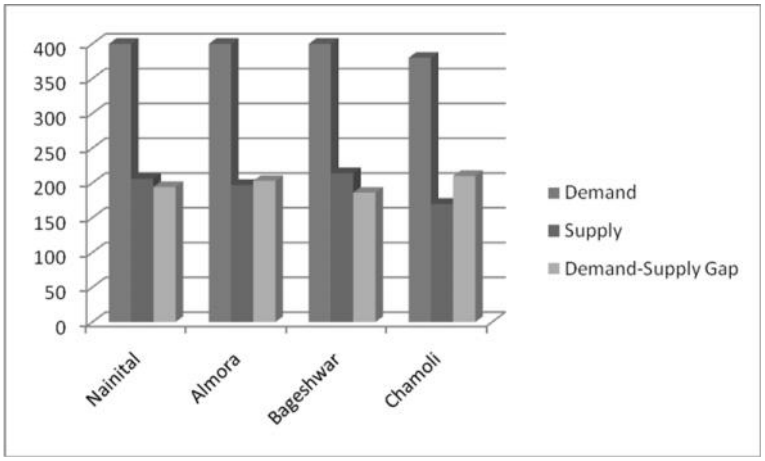


Figure 2: Source: ibid

Recommendations and Suggestions

Over the years the government has put in endless efforts to reduce demand-supply gap but our analysis proves that various factors have become hurdles to maintain a proper supply mechanism. Here are some of the recommendations based on the findings of the research:

- Rainwater is the best source of fresh water and thus rain water harvesting should be extensively adopted.
- For individual domestic supply roof top cisterns are the best solution as it has been extensively common and proved successful in villages.
- Use of ponds to store rainwater for the livestock as well as irrigation.
- Repairing or replacing the pipelines to keep a check on water leakage losses.
- Installation of water meters to control the wastage of water per household.
- Interlinking of rivers, gadheras, rivulets and other resources to maintain potential water level.

Conclusion

The purpose of this study was to determine the status of water management in terms of supply capacity and distribution mechanism and to recommend the best possible solution to improve the management of available water resources eventually to overcome the issues related with water requirement. Although research shows that various initiatives have taken by the government to establish

a bridge between demand and supply yet a gulf has also been noticed due to various reasons like leakages, broken pipelines, alternative uses of the resources, disputed arising between different hamlets. This paper is an effort to serene water related issues by making feasible suggestions. Rainwater harvesting, water meters and maintenance of the existing distribution channels can be really helpful to tackle or even to alleviate the problems.

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