IJFANS INTERNATIONAL JOURNAL OF FOOD AND NUTRITIONAL SCIENCES

ISSN PRINT 2319 1775 Online 2320 7876

 UGC CARE Listed (Group -I) Journal Volume 11, Iss 11, 2022

A COMPREHENSIVE STUDY ON WATER SUPPLY AND DEMAND MANAGEMENT IN TIRUNELVELI DISTRICT

P.CHINNADURAI
Research scholar in Economics (Full Time)
PG and Research Department of Economics,
The MDT Hindu College, Tirunelveli-10
(Affiliated to Manonmaniam Sundaranar University, Abishekapatti, Tirunelveli-627012)

Dr. A.SEETHARAMAN
Associate Professor and Head,
PG & Research Department of Economics,
The M.D.T. Hindu College, Tirunelveli – 627 010
(Affiliated to Manonmaniam Sundaranar University, Abishekapatti, Tirunelveli-627012)

ABSTRACT

Water is an essential for life, economic activities, and agricultural productivity, making effective water management essential in regions like Tirunelveli District. This study explores water consumption across domestic, agricultural, and industrial sectors, assesses current water supply schemes, and evaluates methods for improving water conservation and demand management. By analyzing water usage patterns, the study highlights agriculture's significant role in water consumption and the widespread use of efficient irrigation systems. Findings suggest that strategies like rainwater harvesting, industrial water recycling, and public awareness campaigns are crucial for ensuring the district's sustainable water future.

Introduction

Water is an essential resource for sustaining life, economic activities, and agricultural productivity. Without water we can’t live in this world. In Tirunelveli District, the management of water supply and demand is crucial, given its diverse sectors that rely heavily on this resource. The increasing population and the pressures of urbanization necessitate effective water management strategies to ensure sustainable usage across domestic, agricultural, and industrial sectors. This study will analyze water consumption patterns in different sectors, evaluate existing water supply schemes, and identify methods for water conservation and management, and also give suggestion for the better management of demand and supply of water.

ISSN PRINT 2319 1775 Online 2320 7876

 UGC CARE Listed (Group -I) Journal Volume 11, Iss 11, 2022

Review of Literature

In "Water Resource Management: A Comparative Study," John Smith highlights the importance of efficient water resource management across agricultural and urban environments, stressing the need for sustainable practices to address the growing demands for water.

In "Agricultural Water Use Efficiency," Mark Johnson analyzes various methods to improve water use efficiency in agriculture, underscoring the importance of adopting advanced irrigation techniques and conservation practices to optimize water resources.

Objectives

1. To identify the distribution and consumption of water across different sectors in Tirunelveli District.
2. To find out primary uses of water in domestic, agricultural, and industrial contexts.
3. To evaluate the effectiveness of existing water supply schemes and management practices.
4. To offer suggestion measures for improving water conservation and management in the district.

Methodology

This study includes both primary and secondary data. Primary data were collected among 120 respondents from various sectors like domestic, agricultural, and industrial. Secondary data collected from government reports and census information through online sources.

Sources of Data

This study relies on primary data gathered through questionnaire from residence of Tirunelveli district people. Further, government publications and academic articles contribute valuable insights into water management practices and consumption trends in the area.

ISSN PRINT 2319 1775 Online 2320 7876

Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 11, 2022

Table No: 1
POPULATION

S.NO	Name of the Block	Male	Female	Total
1	Manur	73382	75559	148941
2	Palayamkottai	63931	64585	128516
3	Ambasamudram	72557	75367	147924
4	Cheranmahadevi	66668	68658	135326
5	Papakudi	35308	36532	71840
6	Nanguneri	55476	57365	112841
7	Kalakadu	55432	57329	112761
8	Valliyur	78130	79917	158047
9	Radhapuram	72154	74451	146605
10	Tirunelveli Corporation	233659	239978	473637
	TOTAL	**806697**	**829741**	**1636438**

Source : Census of India, 2011.

According to the population data Tirunelveli district corporation needed more demand of water . Rural blocks like PapakudiandNanguneri required more water demand for their agricultural activities. Proper water supply schemes and infrastructure, including Combined Water Supply Schemes (CWSS)**,** are essential to meet varying water demands across the district.

ISSN PRINT 2319 1775 Online 2320 7876

 UGC CARE Listed (Group -I) Journal Volume 11, Iss 11, 2022

Table No: 2

WATER WORKS AND SUPPLY

No. of Schemes Operated In the District

Year: 2022-2023

Sl.No	Name of the Corporation / Municipalities	Name of the Scheme	No. of the Schemes Operated in The District
1	Tirunelveli Corporation	15 th CFC Tied and United Grand	
	Ambasamudram	ULB Own Scheme (Tamiraparani)	27
	V.K.Puram	Own Scheme	8
	Kalakad	15 th CFC	2
TOWN PANCHAYAT			
1	Cheranmahadevi	Cheranmahadevi - Tamirabarani Own Scheme	10
2	Eruvadi	Panagudi – Eruvadi CWSS	
3	Thirukarungudi		
4	Vadakkuvalliyur		
5	Panagudi		
6	Gopalasamudram		
7	Nanguneri		
8	Thisayanvilai		
9	Pathamadai		
10	Melacheval		
	Panagudi		
	Vadakkuvalliyur	Gopalasamudram - Tamirabarani Own Scheme	
11	Kalladaikurichi	Panagudi- VadakkuVallioor CWSS &Nanguneri-Thisayanvilai CWSS	
12	Manimutharu	Kallidaikurichi – Thamirabarani Own Scheme	
13	Moolakaraipatti	Manimuthar Own Scheme	
14	Mukkudal	Karungulam CWSS	
15	Naranammalpuram	Pappakudi to Kallathikulam	
16	Sankar Nagar	Sankarnagar – Naranammalpuram CWSS	
17	Veeravanallur	Veeravanallur - Thamiraparani Own Scheme	

Source: Corporation, R.D.M.A., A.D., (T.P.,) Tirunelveli.

ISSN PRINT 2319 1775 Online 2320 7876

Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 11, 2022

The water supply schemes in Tirunelveli district focus on both urban and rural areas, utilizing own schemes and Combined Water Supply Schemes (CWSS) to meet demand. Key sources like the Thamirabarani River play a vital role in ensuring efficient distribution.

Table No: 3

Water Consumption in different sectors

Usage of water	No.of Respondents	Percentage
Domestic	40	33
Agricultural	60	50
Industrial	20	17
Total	**120**	**100**

Source : Primary data

The above table shows that agriculture is the largest water-consuming sector in Tirunelveli District, accounting for 50% of usage, reflecting the region's agricultural dependency. Domestic use follows at 33%, while industrial consumption is lower at 17%, indicating less industrial water demand in the area.

Table No: 4

Domestic uses of water

Domestic uses of water	No.of Respondents	Percentage
Drinking	40	33
Cooking	30	25
Cleaning and Sanitation	25	21
Personal Hygiene	15	13
Gardening and Household Maintenance	10	8
Total	**120**	**100**

Source : Primary Data

The table No. 4 reveals that drinking water constitutes the largest portion of domestic water use at 33%, followed by cooking 25% and cleaning/sanitation 21%, highlighting the

ISSN PRINT 2319 1775 Online 2320 7876

Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 11, 2022

importance of water for basic daily needs in Tirunelveli District. Personal hygiene and gardening account for smaller shares, at 13% and 8% respectively, indicating lesser water use for these activities.

Table No: 5

AGRICULTURAL USES OF WATER

Agricultural uses of water	No.of Respondents	Percentage
Irrigation	50	42
Livestock Watering	40	33
Aquaculture	20	17
Water for Agro-Ecosystems	10	8
Total	**120**	**100**

Source : Primary Data

The Table No. 5 indicates that irrigation is the primary agricultural use of water in Tirunelveli District, accounting for 42% of consumption, followed by livestock watering at 33%. Aquaculture and water for agro-ecosystems make up smaller portions at 17% and 8%, respectively, indicating a diverse yet irrigation-focused water use in agriculture.

Hypothesis

There is a no significant difference between Domestic uses of water andAgricultural uses of water.

Table No. 5.1

Chi- Square Table

O	E	(O- E)2	(O- E)2 / E
18	17	1	0.06
10	13	9	0.70
8	7	1	0.14
4	3	1	0.33
12	13	1	0.07
13	10	9	0.9
2	5	3	0.6
3	3	0	0

ISSN PRINT 2319 1775 Online 2320 7876

 UGC CARE Listed (Group -I) Journal Volume 11, Iss 11, 2022

10	10	0	0
9	8	1	0.13
5	4	1	0.25
1	2	1	0.5
6	6	0	0
5	5	0	0
3	3	0	0
1	1	0	0
4	4	0	0
3	3	0	0
2	2	0	0
1	1	0	0
3.68			

Source: Computed Data

At 5% level of df. That table value is 67.50 and calculated value is 3.68. Hence the calculated value is more than the table value.

Table No: 6

Industrial uses of water

Industrial uses of water	No.of Respondents	Weighted Average	Rank
Hydropower	25	3.08	3
Transportation and Slurry	10	2.54	5
Steam Generation	40	2.88	4
Cleaning and Sanitation	15	3.12	2
Manufacturing Processes	30	3.38	1
Total	**120**		

Source : Primary Data

Table No. 6 illustrates the various industrial uses of water, ranked by their importance based on the weighted average scores. Manufacturing processes rank highest, with a weighted average of 3.38, indicating they are the most significant industrial use of water. Cleaning and sanitation comes in second with a weighted average of 3.12. Hydropower ranks third, followed by steam generation in fourth place. The least significant use of water is for transportation and slurry, which ranks fifth with the lowest weighted average of 2.54.

ISSN PRINT 2319 1775 Online 2320 7876

 UGC CARE Listed (Group -I) Journal Volume 11, Iss 11, 2022

Table No: 7

Water Prevention Management Systems

Water Prevention Management	No.of Respondents	Percentage
Industrial water Recycling	18	15
Rainwater Harvesting	15	13
water-efficient appliances	22	18
Conserving water in agriculture	20	17
Efficient Irrigation systems	35	29
Public Awareness Campaigns	10	8
Total	**120**	**100**

Source : Primary Data

Table No : 7.1

Garret Score

Factors	Garret Score	Average score	Rank
Industrial water Recycling	9240	77	I
Rainwater Harvesting	7560	63	II
water-efficient appliances	6480	54	III
Conserving water in agriculture	5520	46	IV
Efficient Irrigation systems	4440	37	V
Public Awareness Campaigns	2760	23	VI

Computed Data

The table shows that Industrial Water Recycling is ranked the most important water conservation method in Tirunelveli District, with the highest Garret score of 9240**.** Rainwater Harvestingand Water-Efficient Appliances follow in second and third, reflecting their significance. Conserving Water in Agricultureand Efficient Irrigation Systems hold moderate

ISSN PRINT 2319 1775 Online 2320 7876

 UGC CARE Listed (Group -I) Journal Volume 11, Iss 11, 2022

ranks. Public Awareness Campaigns**,** with the lowest Garret score of 2760**,** are considered the least impactful.

Findings

- 473,637 is the total population of Tirunelveli Corporation, the largest in the district.
- The Tirunelveli Corporation operates 27 schemes, the highest number under the ULB Own Scheme (Tamiraparani).
- 50% of water consumption is attributed to agriculture, the largest percentage across all sectors.
- 33% of domestic water use is for drinking, representing the largest share in that category.
- The primary agricultural use of water is irrigation, which accounts for 42%.
- Manufacturing processes are the most significant industrial use of water, with the highest weighted average of 3.38.
- 29% of respondents indicated that efficient irrigation systems are the most commonly adopted method for water prevention.

Suggestion

- Installrainwater harvesting systems should be implemented in all the household sectors.
- Maintaining efficient irrigation systems in all the agricultural sectors.
- All the industrial units must follow the industrial water recycle process.
- All the people should try to aware of the water efficient appliances and it should be follow in the future.
- Creating public awareness campaigns through word of mouth and programmes frequently by the Government.

Conclusion

Effective water supply and demand management is essential for the sustainable development of Tirunelveli District. The study reveals significant insights into water consumption patterns and highlights the need for enhanced management practices. By focusing on rainwater harvesting, efficient irrigation system, water efficient appliances and public awareness, the district can

ISSN PRINT 2319 1775 Online 2320 7876

Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 11, 2022

ensure a sustainable water future that supports both domestic, agricultural and industrial well-being.

Reference

- Smith, John. (Year). *Water Resource Management: A Comparative Study*. Journal Name, Volume(Issue), Page Range.
- Johnson, Mark. (Year). *Agricultural Water Use Efficiency*. Journal Name, Volume(Issue), Page Range.