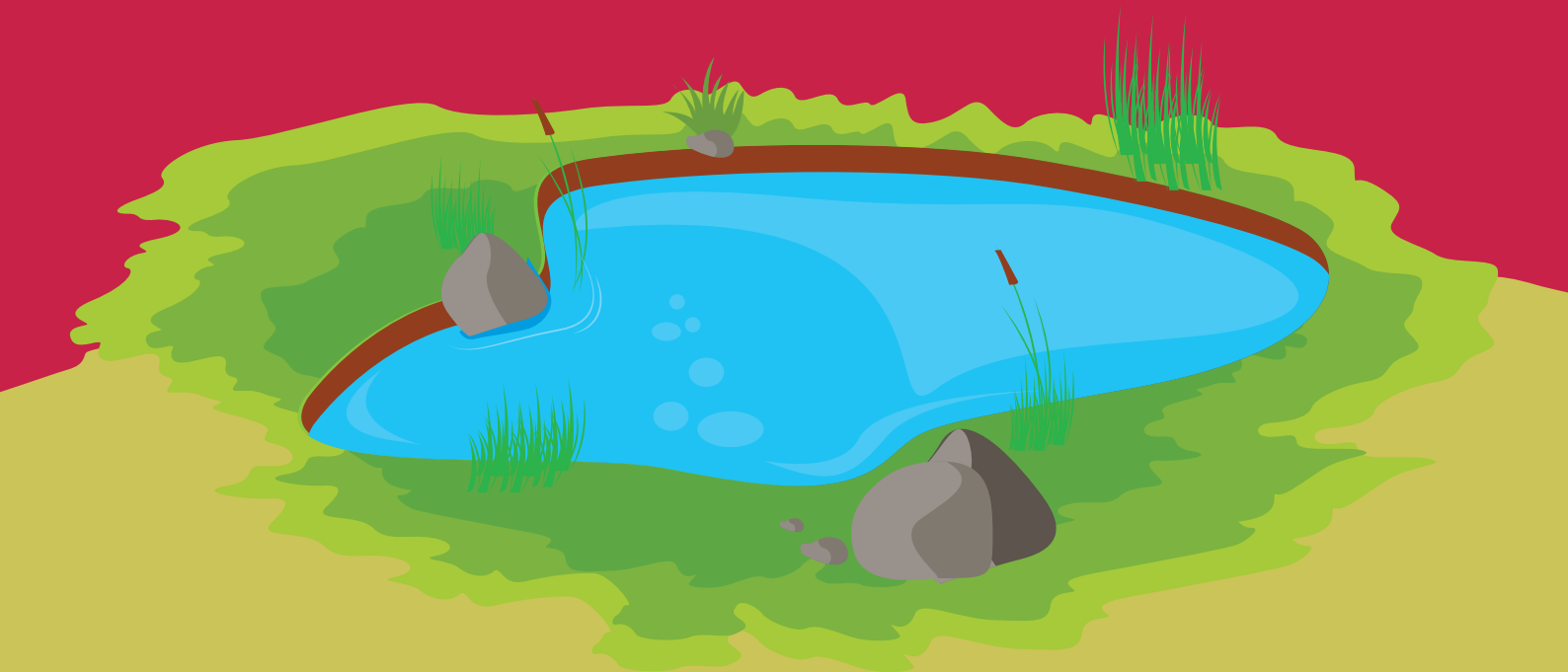
The Infravision Foundation

Research • Knowledge • Capacity Building

WATER BODIES CENSUS 2019/2023

Validation, Insights and Opportunities

A study by **The Infravision Foundation**



© The Infravision Foundation

The material in this white paper is copyrighted. Content from this publication may be used for non-commercial purposes, provided it is attributed to the source.

Report Prepared by:

Mr Rajiv Ranjan Mishra
IAS (Retd), Distinguished Fellow
The Infravision Foundation

For More Information Contact

E 2261, Palam Vihar, Gurugram 122017 Haryana,
Delhi NCR, India

Tel: +91 9717702286

Email: info@theinfravisionfoundation.org

Website: www.theinfravisionfoundation.org

Table of Contents

List of Tables

List of Figures

WBC Key Terms

Indicator	Description
Natural or Man-made Units	Refers to water bodies that can occur naturally (e.g., lakes, ponds) or those that are constructed by humans (e.g., reservoirs, tanks).
Bounded on All Sides	Implies that the water body is enclosed or surrounded by some form of boundary, such as masonry work or natural features like hills or embankments.
Masonry Work	Refers to the use of bricks, stones, or other construction materials to create boundaries or structures around the water body.
Storing Water	Indicates the purpose of the water body, which is primarily for storing water. This water can be used for various purposes such as irrigation, industrial use, pisciculture (fish farming), domestic or drinking water supply, recreation, religious ceremonies, or groundwater recharge.
Various Types	Water bodies may vary in terms of their characteristics and purposes, and they can be known by different names such as tank, reservoirs, ponds, bundhies, etc.
Ice-melt, Streams, Springs, Rain, Drainage	Describes various sources from which water may be accumulated into the water body, including ice melting, streams, springs, rainfall, or drainage from residential or other areas.
Diversion from Stream, Nala, or River	Refers to the process of redirecting water from a natural watercourse (stream, nala, or river) into the water body for storage or other purposes.

Introduction

Water essential for human civilisation needs to be sustainably developed, conserved, and wisely managed. This has got a sense of urgency as the world faces the impacts of climate change.

Freshwater is any naturally occurring liquid or frozen water containing a low concentration of dissolved salts and other total dissolved solids. Freshwater is the water resource that is of the most immediate use to humans. Freshwater habitats are classified as either lentic systems, which are the still waters including ponds, lakes, swamps etc; lotic which are running water systems like rivers & streams or groundwater which flows in rocks & aquifers. There may be zones underground in some large rivers which may contain more water than in the open channel. Freshwater is renewable but a finite resource and is replenished through the natural water cycle which is now undergoing significant changes due to the impact of climate change.

However, freshwater is not always potable water i.e., water safe to drink by humans. Fresh water can easily get polluted by human activities or due to some naturally occurring process and needs some treatment as prescribed by standards set by regulators like the Central Pollution Control Board etc. to make it fit for human consumption or to qualify as drinking water. Fresh water makes up less than 3% of the world's water resources and only about 1% of that is readily available. Hence, it becomes absolutely important to manage it sustainably.

Freshwater storage is at the heart of adapting to climate change, most obviously by saving water for drier times and reducing the impact of floods. In the years ahead, the most stable, durable societies will, in many cases, be anchored in more resilient approaches to water storage. Water storage provides three major services: improving the availability of water; reducing the impacts of floods; and regulating water flows to support energy, transportation, and other sectors. While the global population doubled over the last 50 years, water stored in nature dropped by some 27,000 billion cubic meters as glaciers melted, snowpack diminished, and wetlands and floodplains were destroyed.

This is even more urgent in India which has 18% of the global population but shares only 4% of its freshwater. India is also endowed with diverse sources of water and dotted with natural and manmade water bodies. The Government of India (GOI) has also attached high priority to water management with several policies and programs including flagship missions.

Fresh water storage can be natural, built or a combination of both. Strategically water is stored in dams, reservoirs, tanks, retention ponds, farm fields, or paddies. **Traditionally, the attention has been on larger storage structures like dams and reservoirs, but the changing times and growing needs have brought attention to local sources of water, wetlands and waterbodies.**

1. Water is a precious national resource that is essential for human civilization, living organisms, and natural habitat.
2. Fresh water, on the other hand, refers to water that has a low concentration of dissolved salts and other total dissolved solids.

GOI has also attached priority to developing information systems and creating databases. The first-ever Census of Water Bodies (WBC) in India conducted by the Ministry of Jal Shakti in 2018-19 in convergence with the 6th Minor Irrigation (MI) Census is a very significant step in creating a national database for improving water management in the country.

This census provides a comprehensive inventory of water bodies. It is likely to provide a much-needed valuable database and can help in understanding their potential in addressing water security and sustainability challenges. It would also be useful in facilitating the Government agencies to monitor the state of these waterbodies and to take the required action for their protection and improvement.

In April 2023, the Ministry of Jal Shakti released the WBC report. It enumerated more than 2.4 million water bodies across the country, covering several important aspects such as ownership, size, condition and usage.

Highlights of the census

The WBC collected information on all important aspects of the water bodies including their type, condition, ownership, status of encroachments, use, storage capacity, status of filling up of storage etc. It covered all the water bodies located in rural as well as urban areas that are in use or not in use. The census also took into account different types of usage of water bodies like irrigation, industry, pisciculture, domestic/ drinking, recreation, religious purposes, groundwater recharge etc.

For the WBC, a water body is defined as: "All natural or man-made units bounded on all sides with some or no masonry work used for storing water for irrigation or other purposes (e.g. industrial, pisciculture, domestic/drinking, recreation, religious, groundwater recharge etc.) will be treated as water bodies in this Census. These are usually of various types known by different names like tanks, reservoirs, ponds bundhies etc. A structure where water from ice melt, streams, springs, rain or drainage of water from residential or other areas is accumulated or water is stored by diversion from a stream, Nala or river will also be treated as a water body." Some of the key terms related to water bodies used in the WBC are explained in Table 1.

Table 1: Key Indicators covered in WBC

Indicator	Description
Natural or Man-made Units	Refers to water bodies that can occur naturally (e.g., lakes, ponds) or those that are constructed by humans (e.g., reservoirs, tanks).
Bounded on All Sides	Implies that the water body is enclosed or surrounded by some form of boundary, such as masonry work or natural features like hills or embankments.
Masonry Work	Refers to the use of bricks, stones, or other construction materials to create boundaries or structures around the water body.

3. Encroachment of water bodies refers to the illegal entry into the defined boundary of the water body for various human activities like construction, agriculture, etc.
4. Reference – WBC, 2023, Para 1.3, Census Report, Vol 1

Storing Water	Indicates the purpose of the water body, which is primarily for storing water. This water can be used for various purposes such as irrigation, industrial use, pisciculture (fish farming), domestic or drinking water supply, recreation, religious ceremonies, or groundwater recharge.
Various Types	Water bodies may vary in terms of their characteristics and purposes, and they can be known by different names such as tanks, reservoirs, ponds, bundhies, etc.
Ice-melt, Streams, Springs, Rain, Drainage	Describes various sources from which water may be accumulated into the water body, including ice melting, streams, springs, rainfall, or drainage from residential or other areas.
Diversion from Stream, Nala, or River	Refers to the process of redirecting water from a natural watercourse (stream, nala, or river) into the water body for storage or other purposes.

Some key findings of the WBC are:

- Out of a total of 24, 24,540 water bodies enumerated in the country, 97.1 per cent (23, 55,055) are in rural areas and only 2.9 per cent (69,485) are in urban areas.
- The top 5 States in terms of the number of water bodies are West Bengal, Uttar Pradesh, Andhra Pradesh, Odisha and Assam. These constitute around 63 per cent of the total number of water bodies in the country.
- The top five States in terms of number of water bodies in urban areas are West Bengal, Tamil Nadu, Kerala, Uttar Pradesh and Tripura, whereas in rural areas, top five States are West Bengal, Uttar Pradesh, Andhra Pradesh, Odisha and Assam. West Bengal remains the state with the highest number of water bodies in rural as well as urban areas.
- 59.5 per cent of water bodies are ponds, followed by tanks (15.7 per cent), reservoirs (12.1 per cent), water conservation schemes/percolation tanks/check dams (9.3 per cent), lakes (0.9 per cent) & others (2.5 per cent).
- An interesting feature observed is regarding a very significant number of privately owned water bodies. 55.2 per cent of water bodies are owned by private entities whereas 44.8 per cent of water bodies are in the domain of public ownership.
- Out of all public-owned water bodies, the maximum water bodies are owned by Panchayats, followed by the State Irrigation/Water Resources Department.
- Out of all privately owned water bodies, most bodies are in the hands of Individual owners/ farmers followed by groups of individuals and other private bodies.
- The top 5 States which lead in the privately owned water bodies are West Bengal, Assam, Andhra Pradesh, Odisha and Jharkhand.
- Out of all '**in use**' water bodies, major water bodies are reported to be used in pisciculture followed by Irrigation.

5. Major refers to the largest number and not necessarily more than 50%.

- Top 5 States wherein major use of water bodies is in pisciculture are West Bengal, Assam, Odisha, Uttar Pradesh and Andhra Pradesh;
- The top 5 States wherein the major use of water bodies is in irrigation are Jharkhand, Andhra Pradesh, Telangana, West Bengal and Gujarat.
- 78 per cent of water bodies are man-made water bodies whereas 22 per cent are natural water bodies. 1.6 per cent (38,496) water bodies out of all the enumerated water bodies are reported to have been encroached out of which 95.4 per cent are in rural areas and the remaining 4.6 per cent in urban areas.
- The information on the water spread area was reported in respect of 23, 37,638 water bodies. Out of these water bodies, 72.4 per cent have a water spread area of less than 0.5 hectare, 13.4 per cent have a water spread area between 0.5-1 hectare, 11.1 per cent have a water spread area between 1-5 hectares and the remaining 3.1 per cent of water bodies have water spread area more than 5 hectares.

Need for conducting a field study on the WBC

This is a historical and laudable attempt to conduct the first Water Body Census for the country. The census envisages that this database would be useful in different fields such as serving as an authentic dataset for estimating recharge of groundwater, implementation of Atal Bhujal Yojna, preparation of realistic water security plans, assessment of Gram Panchayat wise water budget, spatial analysis of the distribution of abstraction structure coordinates and assessment of groundwater draft. The data may help in understanding farm-level irrigation water management and water trading, if any.

As mentioned in the census, certain aspects have been attempted for the first time. These include a census of water bodies in urban areas and an attempt to capture the state of encroachment of water bodies in rural as well as urban areas. There is a need to study position on the ground for ground truthing and come up with findings which may help make the census more comprehensive.

The census reports information on the existing use of water bodies, listing six categories. However, it does not include data on water quality status. This can cause difficulties in the prioritisation of restoration efforts. If a source is in use, but is contaminated, and this information is not captured, then it can deprive these water bodies of seeking funds and making efforts for improving them. There may be some added value for helping restoration if we recognise biodiversity and ecosystem services as one of the “in use” functions.

Water bodies also play an important role as biodiversity habitats and provide several ecosystem services. These two are also usages of the water bodies that the stakeholders need to be sensitised about. Their restoration would also improve such uses. Hence, it is felt that we can have value addition if the Water Body Census also suitably captures these attributes by recognising biodiversity and ecosystem services as one of the “in use” functions.

There have been several definitions and prevalent nomenclature regarding water bodies. Similarly, there is a whole set of provisions and rules with respect to wetlands. The nomenclature issues would also need to be studied to avoid any confusion.

Protection, conservation and development of water bodies is the ultimate goal of any such exercise and hence there is a need to carefully analyse the state of repair and upkeep of these waterbodies across different states.

In light of the above, it was felt that a field study on the WBC can further help in improving our understanding of different parameters of the census and their larger implications as well as the ability to utilise its full potential. **This would also help in strengthening the process of conducting census in future.**

Water Scarce States and Selection of Area of Study-State, Districts/Sub-districts

Some of the states are arid, water scarce and have a comparatively lesser number of water bodies. The census categorises waterbodies as per count in slots of less than 2500, 2500-10000, 10000-25000, 25000-50,000, 50,000-100,000, 100,000-200,000 and more than 200,000. It was considered appropriate to look at states in the slot of 10,000 to 25000 water bodies as these may present enough diversity for the study of different attributes. Meghalaya (13332), Rajasthan (16939), Punjab (16012) and Haryana (14898) fall in this slot as given in Table 1.

Table 2: States with the number of Water Bodies ranging from 10,000 to 25,000 in WBC

Sl No	State	No of water Bodies (Rural)	No of Water Bodies (Urban)	Total Number of Water Bodies
1.	Meghalaya	12,798	534	13,332
2.	Rajasthan	16,750	189	16,939
3.	Punjab	15,831	181	16,012
4.	Haryana	14,898	0	14,898

Meghalaya is a hilly state but with a high level of rainfall. So, the remaining three states fall under this category of water-scarce states, forming a group. As a pilot study, it was decided to select one state.

Rajasthan was chosen as the preferred state to understand the situation on the ground through a pilot study. The State of Rajasthan is one of the driest states of the country and the total surface water resources in the state are only about 1% of the total surface water resources of the country.

Rajasthan is characterized by low to very low rainfall and excessively high aridity due to high temperatures affecting large parts of the state. The arid region of Western Rajasthan has vast amounts of arable land. Western Rajasthan has several traditional water-harvesting systems

including Khadins. There is a very rapid and marked decrease in rainfall in the west of the Aravalli range. The average annual rainfall in this part ranges from less than 100 mm to 300 mm in Sri Ganganagar, Bikaner and Barmer districts, 300-400 mm in Nagaur, Jodhpur, Churu and Jalor districts and more than 400 mm in Sikar, Jhunjhunu and Pali districts. On the eastern side of the Aravalli, the rainfall ranges from 550 mm in Ajmer to 1020 mm in Jhalawar.

The state has a rich tradition of water conservation practices driven out of necessity and has several iconic water heritage structures such as step wells, tanks, lakes etc. Royal patronage as well as community participation have contributed to developing them.

Some important features of the water body census data of **Rajasthan** are:

- Out of 16,939 water bodies, there are 16,750 in rural areas and 189 in urban areas. The majority of the waterbodies are Ponds (47.5%) and Tanks (33.3%). 4799 (28.33%) waterbodies are natural and 12140 (71.67%) are manmade.
- By location, 10.3% (1,745) of water bodies are located in tribal areas, 6.1% (1037) in Drought Prone Area Program (DPAP) areas and the remaining 83.6% (14,157) are located in Desert Development Plan (DDP), and other areas.
- Substantial privately owned water bodies- 53.3% of the water bodies in Rajasthan are Privately Owned.
- 79.2% (13416) of water bodies are in use whereas 20.8% (3523) are not in use due to various reasons.
- Filling of the waterbodies: 37% of the water bodies are filled less than 50%. 8664 (62.41%) waterbodies are usually filled up, and 1077 (7.76%) are filled up every year. 3361 (24.21%) waterbodies are rarely filled up and 881 (5.63%) are never filled up.
- Out of 16,750 waterbodies in rural areas in Rajasthan, 5482 water bodies have more than 10,000 cubic mts storage capacity and 7240 water bodies have storage capacity between 1000 to 10,000 cubic mts.

Western Rajasthan is more water-scarce. Jodhpur is an important district from the arid region of the state and also has the potential for having the right size, importance and multiple characteristics – factors found useful for a field study. With an area of 22,850 square km, it covers 11.6% of the total arid zone of the state and 6.68% of the total state area. It is the second-highest populated district in the state after Jaipur. It has been the historic centre of the Marwar region. It has 11 Tehsils, development blocks and 1794 villages with 351 Gram Panchayats. Jodhpur is a historical city and district headquarters and a municipal corporation. There are three Municipal councils in Bilara, Phalodi and Piparcity in Jodhpur district.

There are water heritage structures of national importance in the district. Kayalana & Takhat Sagar lakes and Toorji ki Bawari at Jodhpur have been included in the list of National water heritage structures by the Ministry of Jal Shakti. Jojri River, a tributary of Luni River passes through Jodhpur city and is in dire need of rejuvenation.

In view of these, Jodhpur was given priority in selection as a district for pilot study. Out of its 11 tehsils, *Luni Tehsil* was identified for field study in view of the availability of data due to the presence of waterbodies and also the presence of Luni River in this tehsil.

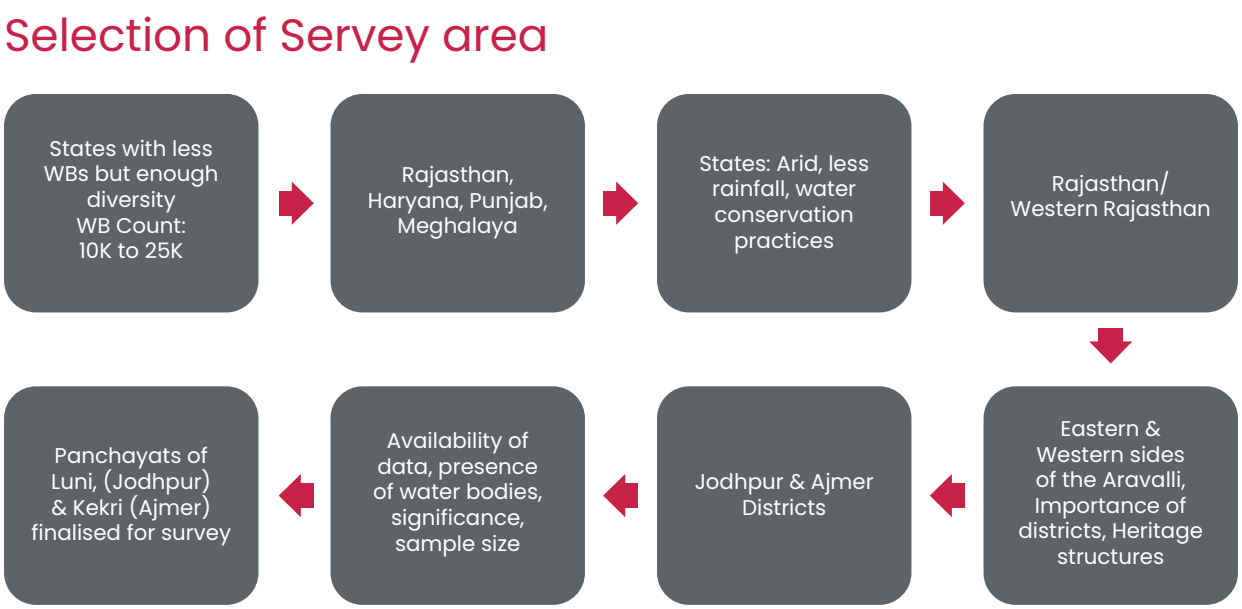
The headquarters town, Luni is situated on the bank of the Luni River and is 35 km from Jodhpur.

After preliminary analysis and while discussing the detailed sampling study it was realised that we do not have data from all blocks of the district in the WBC. With an objective to bring as much diversity as possible, it was considered desirable to expand the scope of field study to another district and pick up one sub-district/Tehsil from each of the two districts.

Looking at the distribution of annual rainfall patterns across the state, after selecting Jodhpur from the western side, it was considered to select a district in Rajasthan from the eastern side of Aravalli's. This also should have comparatively lesser rainfall in this range. On the eastern side of the Aravalli, the rainfall ranges from 550 mm in Ajmer to 1020 mm in Jhalawar and hence Ajmer draws priority attention. There are important lakes in Ajmer district such as Ana Sagar, Foy Sagar, Pushkar, and Budha Pushkar. Ana Sagar Lake is one of the identified Water Heritage Sites of India and Pushkar is a well-known heritage of India.

Given these, Ajmer was taken up as the second district for study. Southeast from Ajmer, Kekri Tehsil was considered for this study given the enumeration of a large number of water bodies in WBC to facilitate analysis of different aspects. Of late, the state has reorganised districts and formed many new districts. Kekri is a new district with five sub-divisions having headquarters at Kekri, about 90 km from Ajmer town. The following figure captures the process followed for the selection of the survey area.

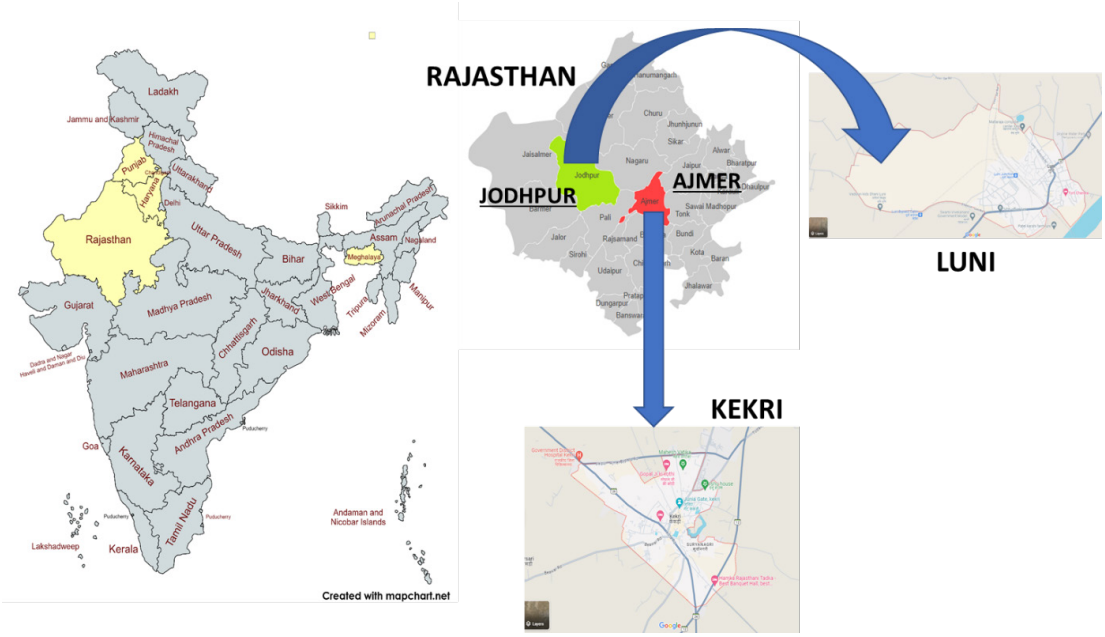
Figure 1 – Selection of Survey Area



The district-rural and urban areas both present opportunities to observe important missions of Govt of India apart from schemes of the state government.

In view of the above, The Infravision Foundation (TIF), in collaboration with People Research on India's Consumer Economy (PRICE), carried out a field study (the Study) in Ajmer and Jodhpur districts in Rajasthan to improve understanding of the WBC data and generate insights to strengthen its subsequent editions, among others. Sub-districts like Luni in Jodhpur and Kekri in Ajmer/Kekri district were selected for their significance and the possibility of a better sample size for enhancing the quality of the study. The figure below shows the geographical location of the survey area.

Figure 2 – Location of Survey Area



Scope of Study

The scope of the study was as mentioned below:

1. Census data would be validated in the selected area.
2. Analysis of ownership patterns of the water bodies with special attention on the analysis of privately owned water bodies. Some of the aspects in respect of them could be exploring the questions such as
   - What is the ownership pattern (public vs Pvt, multiple owners, individual vs organizational ownership) in water bodies? How has it changed over the years?
   - What's the legal position on privately owned water bodies?
   - Are privately owned bodies better maintained?
3. Capture the traditional wisdom and practices in water bodies' conservation.
4. Linkage of water bodies with Government schemes and flagship missions (a) Mapping of these water bodies with identified sources under Jal Jeevan Mission and analysis thereon (b) Utilisation and convergence of government schemes such as RRR, MGNREGA etc. for repair, renovation and development of water bodies. (c) The potential of these water bodies for fisheries and the possibility of linkage with PM Matsya Sampada Yojna
5. Study of water quality aspects of the water bodies.
6. Analysis of different parameters of water body census in urban areas including the pattern in the peri-urban areas, special threats to water bodies in urban areas by pollution, encroachment etc. It can also be studied as to how much these water bodies contribute as sources of drinking water needs for cities. Similarly, we can enquire about the allocation and utilisation of funds for the protection, and conservation of urban water bodies under AMRUT 2.0, SBM (U) 2.0 etc.
7. Study of selected best practices from different states/ districts and exploring possible improvements in future such as the possibility of a PPP model in rejuvenating water bodies.

8. Phase II of the study could use the experience gained through this study and could endeavour to cover more areas geographically as well as thematically. It could be a combination of primary fieldwork as well as a reference to secondary research. Stakeholder consultation would be given due importance.

Sampling Strategy & Methodology

This pilot study was also aimed at creating a research model which can be replicated on a larger scale in the future.

A preliminary review of WBC data highlighted that a large number of villages either did not have water bodies or were not covered in the WBC. This necessitated the use of data from the last available population census (Census of India 2011) to allow meaningful comparisons with the WBC at the local level. Accordingly, all villages in the Luni and Kekri sub-districts in the 2011 census constituted the sampling frame.

These villages were subsequently clustered based on their panchayat and their important characteristics like type, ownership, usage, size and location of water bodies were identified (both at village and panchayat level) from the WBC.

For these villages, characteristics like population (total, SC and ST), cultivators and agricultural labourers, and more importantly, a village-level indicator of the existence of water bodies were identified from the Census 2011. Cognizance was taken of the fact that the definition of water bodies may not be fully aligned with that in the WBC.

Panchayats were subsequently chosen to ensure adequate coverage and distribution of water bodies in terms of key research areas (ownership and usage) as well as other characteristics on which data were collated.

It was decided to select 50% control villages i.e., those without water bodies according to WBC. An important aspect of this methodology was the ability to identify whether villages had a water body according to Census 2011. This allowed us to achieve an appropriate mix of control villages —both with and without water bodies according to Census 2011.

The final sample size included fieldwork covering 45 villages in 2 sub-districts, of which 15 control villages did not have any water bodies according to the WBC. These 45 villages constitute 17% of the total number of villages in the two sub-districts. The primary data was collected during October-November 2023.

Significance of the Sample Size

In a water deficit state (Rajasthan) with poor coverage of WBC, sub-districts with better than average coverage were selected to provide a significant sample size. 45 villages out of 270 villages (17%) in the two sub-districts have been covered by the survey.

---

6. Census 2011 provides a village-level indicator on existence of water bodies (Yes/No). An important aspect of this methodology was our ability to identify whether villages had a water body according to Census 2011. This allowed us to achieve appropriate mix of control villages — both with and without water bodies according to Census 2011
7. Please refer to Annexe 2
8. Better than 'average' means, the selected most of the sample villages have more than average number of Water bodies (5) as observed in WBC.

A snapshot of the comparative position emerging with respect to waterbodies between the Water Body Census (WBC), 2019 and Census 2011 at different geographic levels including selected states, districts and sub-districts is presented in Table 2.

Table 3: Comparative position of waterbodies in Census 2011 and WBC 2019:

	No of Waterbodies as per Census 2011			No of Waterbodies as per Water Body Census (WBC) 2019			Percentage (%)
Geographical Unit	Villages (Rural)	Towns (Urban)	Total	Villages (Rural)	Towns (Urban)	Total	Coverage
India	5,97,607	7,933	6,05,540	3,67,194	3,007	3,70,201	61.1%
Rajasthan	43,264	297	43,561	5,698	47	5,745	13.2%
Selected Districts	2,935	18	2,953	769	4	773	26.2%
Ajmer	1,099	11	1,110	611	4	615	55.4%
Jodhpur	*1,836*	*7*	*1,843*	*158*	*0*	*158*	*8.6%*
Selected Sub-Districts	272	1	273	184	0	184	67.4%
Kekri	102	1	103	89	0	89	86.4%
Luni	170	0	170	95	0	95	55.9%

Sample Characteristics

The selected sample includes 15 panchayats (out of about 90 panchayats in these two tehsils). Please refer to Table 3 below.

- Nine of these panchayats are in Kekri tehsil and six in Luni tehsil (as per Census 2011).
    - Overall, these panchayats have 53 villages, out of which 45 were selected for fieldwork after ignoring a few very small villages based on secondary analysis
- **30 of these villages have water bodies according to WBC. These villages have a total number of 254 water bodies as per WBC.**
- **15 villages do not have water bodies (50% control villages) according to WBC.**
    - 10 of these 15 villages have water bodies according to Census 2011;
    - 5 villages do not have water bodies according to both WBC and Census 2011.

Table 4: Status of waterbodies in Sample villages

Village Category	Ajmer/Kekri	Jodhpur/Luni	Total
Waterbodies in WBC	**14**	**16**	**30**
- Not included in Census 2011	11	-	11
- Also Included in Census 2011	3	16	19
No Waterbodies in WBC	**7**	**8**	**15**
- Also Not in Census 2011	5	-	5
- But in Census 2011	2	8	10
Grand Total	**21**	**24**	**45**

Across the 30 villages, the total number of water bodies in the sample is 254 as per the WBC, out of which 247 water bodies are currently in use.

These water bodies are well distributed in terms of key parameters, especially ownership and usage.

Table 4 gives details of panchayat-wise details of villages' along with the breakup of those with waterbodies and without water bodies as per census 2011 and as per WBC for each of the sub-districts selected for study.

Table 5: Details of villages and status of Water bodies in sample villages (WBC)

		Census 2011		Water Body Census		
Sub-district and Panchayat	No of Villages	**Villages with WB**	**Villages w/o WB**	**Villages with WB**	**Villages w/o WB**	**No of WB**
Kekri	**21**	**5**	**16**	**14**	**7**	**203**
Amali	2	1	1	0	2	-
Dhoondhari	1	1	0	0	1	-
Girwarpura	2	1	1	1	1	2
Jooniya	1	0	1	1	0	37
Kushayata	7	1	6	7	0	48
Lasadiya	3	0	3	2	1	13
Naiki	2	0	2	2	0	89
Sadari	2	0	2	0	2	-
Sawar	1	1	0	1	0	14
Luni	**24**	**24**	**0**	**16**	**8**	**51**
Kalijal	5	5	0	1	4	1
Khejarlikalan	4	4	0	4	0	11
Modi Joshiyan	4	4	0	4	0	10
Mograkalan	4	4	0	4	0	11
Satlana	5	5	0	1	4	5
Shikarpura	2	2	0	2	0	13
Grand Total	**45**	**29**	**16**	**30**	**15**	**254**

Survey Findings

A. Number of water bodies

The survey documented 517 waterbodies compared to 254 (~2X) in the WBC. In each of the 45 villages surveyed, the number of waterbodies found was more than or equal to the number of waterbodies identified as per the WBC. In 3 villages, the number of water bodies found in the survey was equal to the number of water bodies enumerated in the WBC. As given in Annex 2, in the following 3 villages in the Luni sub-district the number of water bodies was found to be the same in the Survey as well as WBC.

- Luni - Modi Joshiyan – Peshawas
- Luni - Shikarpura - Sewala Nagar
- Luni - Khejarlikalan - Sanga Sani

Each of the 15 control villages in the survey had at least 1 water body. Number of water bodies in these villages collectively stood at 75 — an average of 5 per village. It is important to note that only about 11 of these water bodies were built post-WBC2019 (See Annex 1).

Table 5 gives the comparative position of water bodies studied during the field survey and as per WBC in the villages selected for the study.

Table 6: Comparative position of waterbodies in field survey and WBC

Sample Category	No of Villages	No of Water Bodies		
		Survey	WBC	Diff
Village Not in WBC	15	75	0	75
Village in WBC	30	442	254	188
Total	45	517	254	263

The survey found a consistently higher number of water bodies (517) across both sub-districts and panchayats as compared to the number of water bodies enumerated as per WBC (254).

Some villages in Kekri tehsil had considerably higher numbers of water bodies. Annex 5 provides detailed village-wise data.

B. Type, Location, Ownership

494 out of 517 water bodies (95.6%) in the survey were reported to be in use compared to a similar 247 out of 254 (97.2%) water bodies in WBC.

The diversity of water bodies in terms of major characteristics is captured well by the survey.

In the case of private water bodies, the usage is restricted to a handful of households in an overwhelming majority of cases.

Table 7: Status of waterbodies - Type, Location and Ownership as per survey study and WBC

	Survey	%	WBC	%
Type				
Ponds	492	95%	177	70%
Others	25	5%	77	30%
Total	517	100%	254	100%
Location				
DPAP	271	52%	75	30%
Others	246	48%	179	70%
Total	517	100%	254	100%
Ownership				
PVT - Individual	291	56%	164	65%
PVT - Others	3	1%	6	2%
GOV - Panchayat	210	41%	74	29%
GOV - Others	13	3%	10	4%
Total	517	100%	254	100%

Table 8: Status of waterbodies - Ownership & HHs benefited as per survey and WBC

Ownership / HH Benefited	1:1-10	2:10-50	3:50-100	4:>100	Total
PVT - Individual	274	5	10	2	291
PVT - Others	2	0	0	1	3
GOV - Panchayat	20	8	250	157	210
GOV - Others	1	2	4	6	13
Total	**297**	**15**	**39**	**166**	**517**

C. New Queries included in the Survey (Not in WBC 2019)

New queries were included in the survey to capture some important characteristics. These questions can add value to future editions of WBC.

Survey results indicate that change of ownership in the case of water bodies was reported in very few cases.

Most of the water bodies were reported to be in good condition and had water quality fit for the use they were meant for. The survey wanted to probe the existence of industries and their impact on the waterbodies by asking if there were industries in the vicinity of the waterbodies and if there is any system of maintaining records for their impact on waterbodies. In the area where the field study was conducted, we did not find such cases. This particular aspect is not shown in Table 7, which provides details on responses to new queries.

Table 9: Response to New Queries

Change in Ownership (Private, total 294)	Survey	%
Yes	10	2%
No	284	55%
Not Applicable (Publicly owned)	223	43%
Total	517	100%
Current Condition		
Very Good	93	18%
Good	225	44%
Neutral	139	27%
Poor	45	9%
Very Poor	15	3%
Total	517	100%
Quality of Water (Use Specific)		
Very Good	132	26%
Good	232	45%
Neutral	89	17%
Poor	43	8%
Very Poor	21	4%
Total	517	100%

D. Use of Water Bodies

The WBC identifies the following as waterbodies in use- Agriculture, industry, pisciculture, domestic/ drinking, recreational, religious groundwater recharge, and others. There may be circumstances leading to the water bodies not being able to satisfy the intended purposes. There could be several reasons for the water body to be notified. It may be on account of the water body drying up due to disconnection with the source, prolonged deficit rainfall etc. There may be construction activities due to which the waterbody has failed to be in use. Siltation can also lead to waterbody losing in use status and there may be cases where the water body has been destroyed beyond repair. Salinity and industrial effluents could also lead to a 'not in use' status. There could also be a combination or some other site-specific reasons. The water body census found that a major proportion of water bodies (87% at an overall national level) are in use.

Most water bodies surveyed were reported to be in use, with irrigation and domestic / drinking reported to be the most common usage.

The survey findings are consistent with WBC as seen in Table 10.

Table 10: Details on Water Usage - I

Whether In Use?	Survey	%	WBC	%
Yes	494	96%	247	97%
No	23	4%	7	3%
Total	517	100%	254	100%
Used For (Top 3 uses)				
Irrigation	329	64%	164	65%
Industry	0	0%	2	1%
Pisciculture	8	2%	2	1%
Domestic/Drinking	109	21%	24	9%
Recreation	1	0%	9	4%
Religious	1	0%	20	8%
Ground Recharge	5	1%	56	22%

For cases where water bodies are used for irrigation, most of these are used to irrigate areas less than 5 hectares. The survey findings are consistent with WBC.

For water bodies used for domestic or drinking purposes, 50% of such water bodies were used by a Jal Jeevan Mission (JJM) scheme. In contrast, PM Matsya Sampada Yojana (PMMSY) was not a prominent scheme in the area surveyed for water bodies used for pisciculture.

For water bodies not in use, in most cases, it was due to the drying-up of the water bodies.

Table 11: Details of Water Usage - II

Area Irrigated	Survey	%	WBC	%
1:<=1ha	30	6%	15	6%
2:1-5ha	233	45%	121	48%
3:5-50ha	58	11%	22	9%
4:>50ha	8	2%	6	2%
Not Applicable	188	36%	90	35%
Total	517	100%	254	100%
JJM (waterbodies used for Domestic/ Drinking- total 109)	Survey	%	WBC	%
Yes	51	10%	-	-
No	58	11%	-	-
Not Applicable	408	79%	-	-
Total	517	100%	-	-
PMMSY (Use for Pisciculture)	Survey	%	WBC	%
Yes	0	0%	-	-
No	8	2%	-	-
Not Applicable	509	98%	-	-
Total	517	100%	-	-
Reason for Not in Use (total 23)	Survey	%	WBC	%
Dried-up	21	4%	4	2%
Others	2	0%	3	1%
Not Applicable	494	96%	247	97%
Total	517	100%	254	100%

E. Nature of Water Bodies

The survey reported all water bodies to be manmade in contrast to 20% of natural water bodies in the WBC. The distribution of type of manmade water bodies is consistent with WBC with the maximum number being earthen type as shown in Table 10.

Table 12: Nature of water bodies

Nature	Survey	%	WBC	%
Man-made	517	100%	209	82%
Natural	0	0%	45	18%
Total	517	100%	254	100%
Type (If Manmade)				

Nature	Survey	%	WBC	%
Earthen	486	94%	201	79%
Concrete	15	3%	2	1%
Masonry	16	3%	6	2%
Not Applicable	0	0%	45	18%
Total	517	100%	254	100%

F. Year and Cost of Construction

Most water bodies were constructed between 2010 and 2019. In percentage terms, sizeable construction has happened since 2020. (Table 11). Note that WBC was conducted in 2019 and does not have recent data that the field survey has been able to capture.

The cost of construction is consistent with WBC.

Table 13: Age and Cost of Construction

Year of Construction	Survey	%	WBC	%
Up till 1989	73	14%	23	9%
1990-1999	26	5%	2	1%
2000-2009	43	8%	24	9%
2010-2019	285	55%	160	63%
After 2020	55	11%	0	0%
Not Available	35	7%	45	18%
Total	517	100%	254	100%

Table 14: Cost of Construction (INR)

Year of Construction	Survey	%	WBC	%
1:<=20K	8	2%	7	3%
2:20K-50K	11	2%	7	3%
3:50K-1L	158	31%	154	61%
4:1L-10L	160	31%	40	16%
5:10L+	4	1%	1	0%
Not Available	176	34%	45	18%
Total	517	100%	254	100%

G. Renovation and Government Funding

Significant renovation is reported after 2020. This needs to be viewed in light of the fact that WBC was conducted in 2019 and does not have recent data as compared to the field survey. Much of the renovation activity has happened with priority accorded to water with Jal Shakti Abhiyan and government funding, driven by MGNREGA, during or after COVID-19. Details are given in table 12 and table 13.

Table 15: Details on Waterbody Renovation

Year of Renovation	Survey	%	WBC	%
Up to 1989	0	0%	0	0%
1990-1999	0	0%	0	0%
2000-2009	2	0%	1	0%
2010-2019	45	9%	28	11%
2020 and beyond	163	32%	0	0%
Not Available/Applicable	307	59%	225	89%
Total	517	100%	254	100%

Table 16: Funding

	Survey	%
Govt Fund for Renovation		
Yes	191	37%
No	55	11%
Not Available/Applicable	271	52%
Total	517	100%
Govt Scheme for Renovation		
MGNREGA	153	30%
Others	25	5%
Not Available/Applicable	339	66%
Total	517	100%

H. Health of Water Bodies: Filled-up Storage

The survey results indicate a significantly better filled-up level in 2022-23 (reference year of survey), compared to WBC in 2017-18 (reference year of WBC 2019).

Table 17: Storage level and filled-up status

Filled-up Level (Ref Yr: 2017-18)	Survey	%	WBC	%
Full	116	22%	48	19%
Upto ¾	268	52%	27	11%
Upto ½	86	17%	107	42%
Upto ¼	36	7%	27	11%
Nil/Negligible	11	2%	3	1%
Not Available	0	0%	42	17%
Total	517	100%	254	100%
Filled-up Status (5 Yrs.)				
Filled up every year	209	40%	17	7%
Usually filled up	242	47%	191	75%
Rarely filled up	57	11%	4	2%
Never filled up	9	2%	0	0%
Not Available	0	0%	42	17%
Total	517	100%	254	100%

I. Beneficiaries of Water Bodies

The benefits of most water bodies are limited to one location/village. Similarly, the number of households (Survey) or people (WBC) who benefited from the water bodies is small in about two-thirds of cases.

Table 18: Beneficiaries of Water Bodies

Locations Benefited	Survey	%	WBC	%
1Village	449	87%	238	94%
2-5 Villages	18	3%	2	1%
More than 5Villages	0	0%	2	1%
Not Available	50	10%	12	5%
Total	517	100%	254	100%

Table 19: HH/People Benefited

Locations Benefited	Survey	%	WBC	%
1-10	297	57%	171	67%
10-50	15	3%	4	2%
50-100	39	8%	19	7%
More than 100	166	32%	53	21%
Not Available	0	0%	7	3%
Total	517	100%	254	100%

J. Water User Associations

Water User Associations (WUA), which apply to non-private water bodies are not prevalent in the areas surveyed. Hence it was not possible to analyse their impact on water bodies and compare them with those where Water User associations do not exist.

Table 20: Status of Water User Association

Water User Association	Survey	%	WBC	%
1: Yes	0	0%	0	0%
2: No	226	44%	86	34%
3: Don't Know	0	0%	4	2%
Not Applicable	291	56%	164	65%
Total	517	100%	254	100%
Waterbodies Covered by WUA				
Yes	0	0%	0	0%
No	0	0%	0	0%
Not Applicable	517	100%	254	100%
Total	517	100%	254	100%
No of WUA	Survey	%	WBC	%
1-10	0	0%	0	0%
10-50	0	0%	0	0%
50-100	0	0%	0	0%
More than 100	0	0%	0	0%
Not Applicable	517	100%	254	100%
Total	517	100%	254	100%

K. Inclusion of Water Bodies in District/State Irrigation Plans

The survey reports a significantly high inclusion of water bodies in district or state irrigation plans. This may be a more recent development as the same trend was not observed in WBC. This is a positive development reflecting the increased priority towards water management at different levels in recent years and the impact of Jal Shakti Abhiyan.

Table 21: Inclusion of Water Bodies in District/State Irrigation Plans (DIP/SIP)

Included in DIP/SIP	Survey	%	WBC	%
Yes	178	34%	3	1%
No	339	66%	251	99%
Total	517	100%	254	100%

L. Encroachment of Water Bodies

Encroachment is not a major issue in the areas surveyed.

Table 22: Status of Encroachment of Waterbodies

Encroachment?	Survey	%	WBC	%
Yes	16	3%	0	0%
No	501	97%	254	100%
Total	517	100%	254	100%
Encroachment Assessed?	Survey	%	WBC	%
Yes	16	3%	0	0%
No	501	97%	0	0%
Total	517	100%	254	100%
Encroached Area (%)	Survey	%	WBC	%
1-33	12	2%	0	0%
34-66	4	1%	0	0%
67-100	0	0%	0	0%
Not Applicable	501	97%	254	100%
Total	517	100%	254	100%

Conclusions

- A well-thought-out sampling strategy and efficient execution of fieldwork have contributed to good-quality data.
- The study brings out gaps in the coverage of water bodies in the case of the two sub-districts in Rajasthan. Given the way the sample was identified, it would be reasonable to expect a similar situation in other districts of Rajasthan, particularly those with similar climatic conditions and water use.
- Analysis of survey data indicates there is a considerable congruence of the study findings with WBC and at the same time, highlights important changes in the landscape over the last few years from the water body census to the present field survey. These changes are reflected in terms of improvement in the inclusion of water bodies in the district/state irrigation plans, priority in government programs for their restoration etc.
- The research also evaluates additional areas that can add value to future editions of WBC.
- A study with wider coverage, including urban areas, will be required to generalize these findings and evaluate the situation in other states and regions of the country.

These findings have been further discussed below.

Gaps in Coverage

The Study documented 517 waterbodies compared to 254 i.e., over twice the number of waterbodies in the WBC. This represents an additional 5+ waterbodies in the Study compared to the WBC on average. The number of waterbodies was consistently higher across both sub-districts and panchayats covered by the study. In each of the 45 villages surveyed, the number of waterbodies found was more than or equal to the WBC. Further, each of the 15 control villages — those without any waterbodies as per the WBC — had at least one water body. The number of water bodies in these 15 villages collectively stood at 75, which works out to an average of 5 waterbodies per village that could not be captured in the WBC.

To account for the difference in reference year between the WBC and the TIF Study, the survey also collected information on the year of construction of water bodies. Only about 11 of the 75 water bodies in the 15 control villages were built after the WBC was carried out. This indicates gaps in coverage of waterbodies in the WBC in so far as the surveyed areas in Rajasthan are concerned.

Common Research Areas

An important aspect of the Study was the use of similar concepts and definitions to ensure compatibility with WBC. It was reassuring to see that the findings of the Study on these parameters are very closely associated with those of the 30 common villages in the WBC — be it type, ownership, usage, beneficiaries, prevalence of water user associations and encroachments.

It is important to note that the present study has taken place almost 5 years after the data collection year of WBC. One interesting theme which emerges in this context is the push from the government with the launch of programs for water conservation and priority in government funding for protection and renovations of water bodies in the last few years, mostly under Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA). The proportion of waterbodies included in state or district irrigation plans has also increased significantly. Possibly due to this, the survey results indicate significantly better health of waterbodies in terms of filled-up levels, compared to the WBC. This is a positive development.

Towards a More Complete Picture

The study also tried to evaluate certain parameters/characteristics not covered under the WBC. This included change in ownership in the case of private waterbodies, current condition and quality of water, impact of nearby industries, maintenance of records of these waterbodies by local authorities as well as their utilisation under flagship government schemes such as JJM and PMMSY.

It found that most water bodies in the area of study were reported to be in good condition and had water quality fit for the use they were meant for. Again, this could be due to better maintenance and renovation activity during the last few years. It was interesting to note that 50% of the waterbodies used for drinking purposes were utilised under the JJM or other drinking water schemes. In contrast, pisciculture, and therefore PMMSY, was not prominent in the areas surveyed.

Recommendations

Based on the findings of the survey and the critical nature of the water bodies in improving water security, we believe the following recommendations, if and when implemented, will significantly improve the usefulness of the census data for formulating policies to augment water supply and move ahead towards ensuring water security.

1. Strengthen the Water Bodies Census

(a) There is a need to review the data collection mechanism. The WBC document in Chapter II gives an account of the mechanism of conduct of water body census which was conducted along with the census of 6th Minor Irrigation structures. It underlines that the attempt was made to ensure that no water body is left out and gives details of the methodology, coordination mechanism and different institutions involved.

As we understand, WBC was, however, quite dependent on the information given by state agencies. Given the study conducted, it appears that there is a need to make the process more robust, especially to ensure that all water bodies get covered. There may be a need to conduct detailed orientation and training of the personnel conducting the census.

(b) There is also a need to sensitise the states and review the data collection mechanism. It will be good to involve urban departments in the water body census in urban areas. It should be reviewed if any required dept. /agency was not part of the WBC process. States may be requested to make this census more comprehensive with improved coordination among departments.

2. State of Waterbody Health & their Management

The survey results indicate better health of waterbodies in terms of filled-up levels, compared to the WBC. The proportion of waterbodies included in state or district irrigation plans has also increased significantly. Jal Shakti Abhiyan since 2019 and increased priority to water conservation work in MGNREGA seems to have supported maintaining the water bodies.

This needs to be continued. Special efforts should be made to use the census data for the utilisation of funds under MGNREGA, RRR etc.

3. Utilization of Water Bodies for Govt programs

50% of the waterbodies used for drinking purposes were utilised under JJM or other drinking water schemes. In contrast, pisciculture, and therefore PMMSY, was not prominent in the areas surveyed.

It may be prudent to position the presence of water bodies in local areas drawing upon the data from the water body census in programs like Jal Jeevan Mission and formalise this approach by officially requesting the mission authorities. Source sustainability is also a priority area under JJM. This may facilitate the availability of funds and better maintenance of the water bodies and in turn, improve water security for the villages.

4. Water User Association

There are no water user associations in the surveyed villages. There is a need to look at areas where we have active WUA and compare the state of management of water bodies. It is recommended that the number of WUAs be increased for better management of the water bodies as it is expected that effective water user associations can help improve the management of water resources.

5. Ownership

(a) Ownership of water bodies is an interesting aspect to study. The survey showed around 50% of private ownership of water bodies. This is also in line with the overall proportion of privately owned waterbodies at the state or national level with no major change observed from WBC data. Most of the public-owned WBs are with panchayats and privately owned water bodies with individuals. No major change in ownership was observed compared to the WBC data.

There is a need to develop a strategy to take the benefits accruing from the water bodies –both public and private to a larger number of people and if possible for larger societal interest. This approach becomes especially important in the case of privately owned waterbodies. It may be inherently difficult to expand their use but with proper understanding, this may be possible to attempt in certain cases. There is a need to conduct a detailed case study of a few privately owned water bodies. The findings of such a study would help develop strategies for maximizing their benefits.

6. Urban Waterbodies

The water bodies in urban and peri-urban areas are subjected to the intense pressure of urbanization and hence their protection and conservation are priorities. While cities are considered the engines of growth and development, much of this growth happens through relocation and appropriation of land and water from the adjoining areas. There is inherent competition between the needs of peri-urban, and rural areas and with needs of expanding cities. The peri-urban areas present an intermixing of rural and urban. The waterbodies in these areas have serious threats of encroachments for construction needs, disrupting interconnectedness of the ecological and natural water transfer systems existing for ages, and pollution of water bodies due to discharge of effluents-domestic or otherwise into the neighbouring waterbodies. There is a need for water-sensitive urban design and planning taking care of city as well as peri-urban areas and even in regional planning. Several documents and guidelines exist and are also being developed. A comprehensive water body census with these insights can be of great help.

Effective coverage of these aspects needs to be done in the WBC. Even though the present study did not go in-depth for urban areas, it is felt that the data for urban waterbodies in WBC needs

strengthening in future editions and states may be asked to involve urban sector agencies in this. There are several initiatives taking place in this domain as well such as urban river management plans, river city alliances etc. AMRUT 2.0 has also included provisions for funding activities for the protection of urban water bodies.

There is a need to look at making WBC more robust for urban ones and use it effectively for their conservation. Much more needs to be work with urban agencies /departments/local bodies for a realistic and improved coverage of urban water bodies. (Explore involving MoHUA in this process)

7. Monitoring

WBC can play an important role in setting baseline and monitoring changes. This should be further supplemented with modern techniques and specialized Apps developed for mapping and monitoring water bodies.

It may be considered useful to make use of remote sensing data and space technologies to monitor and also compare the water body census results with them. The study has tried to look at WBC data along with the Census. This could be further supplemented with remote sensing data.

8. Demarcation of Boundaries and accounting for Water bodies

It has been observed that some water bodies have boundaries whereas some do not. It is important to leverage the water body census to initiate special efforts for the demarcation of boundaries of water bodies and incorporation into revenue records. The Wetland Conservation Rules, 2017 provides specific provisions and there are several guidelines for different states. There would also be interesting findings to observe how much extent and hence the capacity the water bodies have lost over the years.

9. Local Water Security Action Plan

It may be possible to use the WBC and take action at the local level- villages, Panchayats etc. for planning for source sustainability and developing water management practices to help in understanding the overall water position and work for such water security plans. Meghalaya has initiated developing village water security plans. Wetlands and water bodies play an important role along with other sources of freshwater.

10. Other Points:

The research also evaluates additional areas that can add value to future editions of WBC.

- Include wider coverage in diverse areas (with other traditionally important water usage such as fisheries- Eastern India)
- Use findings to further fine-tune the questionnaire and better data collection
- It may be explored to observe the method of drawing water from the waterbodies (manual, mechanised etc.). This could be an interesting aspect to be included in the next version of the census.

- Use WBC to improve their utilisation in other govt. schemes
- Use WBC to capture water quality aspects to add value
- Explore sharing data and collaborating with reputed NGOs active in water conservation and also corporates under their CSR program
- There is a need to cross-learning from different states.
- There is a need to carefully plan water storage with a systems approach for natural, built and hybrid storage systems. There are several advanced tools and techniques for doing so and arriving at integrated storage solutions.
- We need to respect local sources of water and develop plans based on local needs, improve capacities develop authentic sources of data and continuously improve them.
- We need to take nature as part of the solution as most of the freshwater is in natural storage like flood plains, aquifers, wetlands etc. They need to be monitored. The built and natural waterbodies could further strengthen recharge if their health is closely monitored and improved.

There is a need to carefully plan water storage with a systems approach for natural, built and hybrid storage systems. There are several advanced tools and techniques for doing so and arriving at integrated storage solutions. We need to respect local sources of water and develop plans based on local needs, improve capacities, develop authentic sources of data and continuously improve them. We need to take nature as part of the solution as most of the freshwater is in natural storage like flood plains, aquifers, wetlands etc. They need to be monitored. The built and natural waterbodies could further strengthen recharge if their health is closely monitored and improved.

The first WBC is a laudable attempt in the right direction which can get more robust and comprehensive with a collaborative approach at all levels. This can go a long way in sustaining water secure future for generations and it needs to be addressed as a shared challenge and goal.

Annex 1:

Year of Construction of 75 Water Bodies Found in the 15 Non-WBC (Control) Villages

Year of Construction	No of WB	%
1:LT1989	14	19%
2:1990-1999	3	4%
3:2000-2009	7	9%
4:2010-2019	27	36%
5:2020+	11	15%
Don't Know	13	17%
Total	75	100%

Annex 2:

15 Non-WBC Villages & 30 WBC Villages

Non-WBC Villages				
Sub-District + Panchayat + Village	**Type**	**SVY**	**WBC**	**Diff**
Kekri - Amali - Amali	Non-WBC	2	0	2
Kekri - Amali - Mehroo Khurd	Non-WBC	4	0	4
Kekri - Dhoondhari - Dhoondhari	Non-WBC	12	0	12
Kekri - Girwarpura - Padaliya (Sawar)	Non-WBC	2	0	2
Kekri - Lasadiya - Lasadiya	Non-WBC	5	0	5
Kekri - Sadari - Naya Gaon	Non-WBC	4	0	4
Kekri - Sadari - Sadari	Non-WBC	10	0	10
Luni - Kalijal - Loonawas Jatan	Non-WBC	3	0	3
Luni - Kalijal - Melawas	Non-WBC	2	0	2
Luni - Kalijal - Panne Singh Nagar	Non-WBC	1	0	1
Luni - Kalijal - Shiv Gaon	Non-WBC	2	0	2
Luni - Satlana - Goliya Magra	Non-WBC	6	0	6
Luni - Satlana - Madhopura	Non-WBC	9	0	9
Luni - Satlana - Mori	Non-WBC	5	0	5
Luni - Satlana - Satlana	Non-WBC	8	0	8

WBC Villages				
Sub-District + Panchayat + Village	**Type**	**SVY**	**WBC**	**Diff**
Kekri - Girwarpura - Girwarpura	WBC	3	2	1
Kekri - Jooniya - Jooniya	WBC	57	37	20
Kekri - Kushayata - Baneriya	WBC	7	1	6
Kekri - Kushayata - Bisundani	WBC	9	2	7
Kekri - Kushayata - Kushayata	WBC	69	16	53
Kekri - Kushayata - Motalao	WBC	64	25	39
Kekri - Kushayata - Surajpura	WBC	2	1	1
Kekri - Kushayata - Udaisagar	WBC	4	2	2
Kekri - Kushayata - Ummedpura	WBC	4	1	3
Kekri - Lasadiya - Ekalseenga	WBC	3	1	2
Kekri - Lasadiya - Kesarpura	WBC	16	12	4
Kekri - Naiki - Jal Ka Khera	WBC	6	4	2
Kekri - Naiki - Naiki	WBC	104	85	19
Kekri - Sawar - Sawar	WBC	18	14	4
Luni - Kalijal - Kalijal	WBC	6	1	5
Luni - Khejarlikalan - Bhagta Sani	WBC	3	2	1
Luni - Khejarlikalan - Khejarai Khurd	WBC	4	3	1
Luni - Khejarlikalan - Khejari Kalan	WBC	9	5	4
Luni - Khejarlikalan - Sanga Sani	WBC	1	1	0
Luni - Modi Joshiyan - Baniyawas	WBC	5	3	2
Luni - Modi Joshiyan - Mori Joshiyan	WBC	4	1	3
Luni - Modi Joshiyan - Mori Sothran	WBC	4	3	1
Luni - Modi Joshiyan - Peshawas	WBC	3	3	0
Luni - Mograkalan - Mogra Kalan	WBC	8	6	2
Luni - Mograkalan - Mogra Khurd	WBC	5	3	2
Luni - Mograkalan - Shekhanada	WBC	2	1	1
Luni - Mograkalan - Shri Rajeshwar Nagar	WBC	2	1	1
Luni - Satlana - Karniyali	WBC	6	5	1
Luni - Shikarpura - Sewala Nagar	WBC	3	3	0
Luni - Shikarpura - Shikarpura	WBC	11	10	1

Annex 3:

Village wise Water Bodies

Sample Category	No of Villages	No of Water Bodies		
		Survey	WBC	Diff
Kekri - Amali	2	6	0	6
Kekri - Dhoondhari	1	12	0	12
Kekri - Girwarpura	2	5	2	3
Kekri - Jooniya	1	57	37	20
Kekri - Kushayata	7	159	48	111
Kekri - Lasadiya	3	24	13	11
Kekri - Naiki	2	110	89	21
Kekri - Sadari	2	14	0	14
Kekri - Sawar	1	18	14	4
Luni - Kalijal	5	14	1	13
Luni - Khejarlikalan	4	17	11	6
Luni - Modi Joshiyan	4	16	10	6
Luni - Mograkalan	4	17	11	6
Luni - Satlana	5	34	5	29
Luni - Shikarpura	2	14	13	1
Total	45	517	254	263

Annex 4:

Sample photographs of Water Bodies

Constructed After 2020

In WBC Village

In non-WBC Village

Privately owned

Publicly owned