

Collegedunia NCERT Notes

NCERT Revision Notes

Chapter 5: Water Audit for Water Management

These notes explain Class 8 Kaushal Bodh Chapter 5 as a project-based revision guide. The chapter teaches students to measure water use, collect local data, analyse wastage and suggest practical conservation steps.

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1 Water Audit Chapter Map

Water Audit for Water Management is a Human Services project. It trains students to serve the community by studying a real problem: how water is used, wasted, stored and saved.

1.1 Meaning of water audit

A water audit is a systematic check of water use and water wastage. It uses data from homes, schools, offices and local water sources.

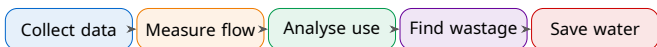
- **Use:** water consumed for drinking, cooking, bathing, washing and gardening.
- **Wastage:** water lost through leaks, overflow, careless use and poor reuse.
- **Audit:** collect data, organise it, calculate totals and suggest action.

- **Outcome:** a clear report that helps people save water.

Core Idea

A water audit is not only a survey. It is a complete cycle: measure, record, calculate, compare and improve.

Water Audit Learning Path



1.2 Learning outcomes from the project

By the end of the project, students should be able to measure water availability, calculate water use, compare data and identify practical ways to reduce wastage.

Outcome	What students do	Evidence in project file
Measurement	find capacity and flow rate	bucket, bottle and tap readings
Data collection	survey families and officials	forms and interview notes
Analysis	use totals, averages and comparison	spreadsheet or notebook tables
Action	reduce wastage and reuse water	repair log and saving estimate
Prediction	estimate future demand	housing society and hostel scenarios

Revision Tip

Write the five audit verbs in order: collect, measure, calculate, compare and act.

1.3 Why the chapter matters

India has only a small share of the world's freshwater but a large share of the world's population. Some places face floods, while others face droughts.

- A running tap can waste about 45 litres in five

minutes.

- Leaks and overflowing tanks waste water without being noticed.
- Data helps people decide where repairs and conservation are needed first.
- Programmes like Jal Jeevan Mission and Jal Shakti Abhiyan support water access and conservation.

Community Link

A water audit helps a school or locality speak with facts. It can show where water is wasted and which repair will save the most.

2 Data Basics for Water Audit

A water audit depends on reliable data. The chapter explains data through weather prediction, farming choices, household use and government planning.

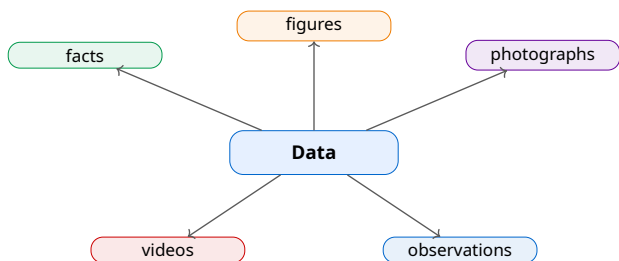
2.1 Meaning of data

Data is information collected for a specific purpose. It can be facts, figures, photographs, videos or observations.

- **Facts:** names of sources, number of tanks or

type of water supply.

- **Figures:** litres used, minutes of flow, rainfall and population.
- **Photographs:** leaking tap, tank overflow or greywater system.
- **Observation:** wet patch under a pipe or time of water supply.



2.2 Primary and secondary data

The chapter separates first-hand data from data obtained from reliable sources. Both are needed for a complete water audit.

Type	Meaning	Water audit example
Primary data	collected directly by students	family survey, tap flow, bucket count
Secondary data	obtained from reliable sources	population, rainfall, supply norms
Qualitative data	describes a situation	shortage faced, repair difficulty
Quantitative data	gives numbers	litres per day, people per house

Common Mistake

Do not mix guesses with measurements. If a number is estimated, write how the estimate was made.

2.3 Data quality rules

Good data should be correct, authentic, reliable and consistent. A water audit can fail if students record unclear or changing units.

- **Correct:** count only the thing you decided to count.
- **Authentic:** collect data yourself or use a trusted source.

- **Reliable:** two observers should get nearly the same result.
- **Consistent:** use litres throughout the final table.

Memory Key

Use CARC for data quality: Correct, Authentic, Reliable, Consistent.

3 Measurement Methods and Units

The first activity teaches how to measure water in common units. Students use bottles, buckets, taps and time to convert daily use into litres.

3.1 Units used for water

Water is measured in millilitres for small amounts, litres for household use and cubic metres for large storage or supply.

Unit	Best use	Conversion note
Millilitre	glass, medicine cup, small samples	1000 mL = 1 L
Litre	bucket, bottle, daily household use	main unit for final audit
Cubic metre	tanks, municipal supply, rainwater	$1 \text{ m}^3 = 1000 \text{ L}$
Square kilometre	district or town area	$1 \text{ km}^2 = 1,000,000 \text{ m}^2$

Important Conversion

$$1 \text{ m}^3 = 1000 \text{ L} \quad 1 \text{ km}^2 = 1,000,000 \text{ m}^2$$

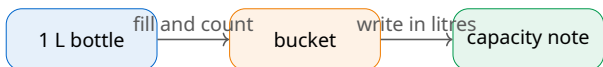
3.2 Capacity of utensils and tanks

Students can measure daily use with common utensils. A known 1 litre bottle can be used to mark a bucket or mug.

- Find the capacity printed on a bucket, can or bottle.
- If no marking is present, fill it with a known 1 litre bottle.
- Count how many buckets, mugs or bottles are

used for an activity.

- Convert every entry to litres before analysis.



Example: if a bucket takes 15 bottles, the bucket capacity is 15 L.

Field Tip

*Carry the same measuring bottle for all homes.
This keeps the survey method consistent.*

3.3 Flow rate method

Flow rate means the amount of water flowing in one minute. The chapter uses it for taps, showers and pipes.

Flow Rate Formula

Water used = Flow rate in L per minute $\times$ Time tap is ON

- Put a bucket under the tap.
- Keep the tap open for exactly one minute.
- Measure the water collected in litres.
- Multiply by the number of minutes used for washing or bathing.



Common Mistake

*Do not write only “tap used for 10 minutes”.
First find the tap flow rate, then multiply.*

4 Local Supply and Water Sources

The chapter asks students to understand where water comes from. This needs both official information and a simple map.

4.1 Storage and supply capacity

Large tanks store water for a school, building or locality. Students can estimate tank capacity from dimensions or ask the local water supply office.

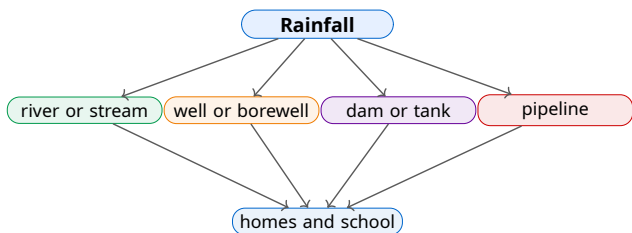
- Ask how much water is supplied daily.
- Record how many people use the water.
- Note whether supply changes by season.
- Compare the supply with household demand.

Per Person Supply

$$\text{Water per person per day} = \frac{\text{Total daily supply in L}}{\text{Number of people}}$$

4.2 Natural and manmade sources

Water reaches people through natural sources and manmade systems. Knowing the path of water helps students understand scarcity.



Water Source Map

A neighbourhood map can show wells, tanks, water delivery points and leaking areas. It turns scattered observations into a clear field record.

4.3 Interview with an official

The book suggests visiting the Gram Panchayat, Municipal Corporation, water supply department or ward office. Students should prepare questions before the visit.

Question area	What to ask
Source	What is the main source of water for our locality?
Quantity	How much water does each household or person receive?
Challenge	What makes regular supply difficult?
Rainwater	How is rainwater stored for later use?
Season	Does supply change in summer or monsoon?
Suggestion	What can individuals do to manage water better?

Interview Tip

Carry written questions. Write the official's designation and the date of the visit in your project file.

5 Household Survey and Spreadsheet Work

Activity 3 teaches students how to estimate average household consumption. It also introduces spreadsheet formulae for totals and averages.

5.1 Choosing sample families

It may not be possible to visit every home. The book suggests a minimum of ten families per student group.

- Decide the number of families before fieldwork starts.
- Keep the same form for each family.
- Record the number of people in each family.
- Convert bucket, mug, tank and bottle counts into litres.

Sampling

A sample is a smaller group used to understand a larger locality. A good sample follows the same method for every family.

5.2 Survey form columns

The sample form asks about storage, washing clothes, washing utensils, drinking, cooking, bathing, shortage, machines, garden use, alternate source and billing.

Survey item	Data to record	How to convert
Family size	number of members	use for per person average
Storage	tanks, pots, vessels	capacity in litres
Clothes	machine cycles or buckets	cycle litres or bucket count
Utensils	tap flow and time	flow rate times minutes
Bathing	buckets or shower time	bucket litres or flow rate
RO filter	treated and rejected water	add rejected water separately
Garden	pipe time or buckets	flow rate or bucket count

Common Mistake

Do not leave non-number answers inside the calculation table. Put comments in a separate observation column.

5.3 Spreadsheet formulae

Spreadsheets help students add, divide and compare data. A calculator can also be used if a computer is not available.

Common Formulae

Total consumption = sum of all activity-wise consumption

$$\text{Average per person} = \frac{\text{Total family consumption}}{\text{Number of family members}}$$



Spreadsheet Tip

Use one row for one family. Use one column for one activity. This keeps totals easy to check.

5.4 Integrity of data

Data integrity means the data stays accurate, reliable and consistent. It is important because every conclusion depends on the field entries.

- Write the unit with each reading in the rough notebook.
- Convert all readings to litres in the final table.
- If a family gives an estimate, write “estimated” in remarks.
- Recheck unusually high or low values before final analysis.

Memory Key

Use LRCR for survey work: List, Record, Convert, Recheck.

6 Rainwater Availability and Secondary Data

Activity 4 teaches students how to use secondary data from reliable sources. It connects rainfall, area, population and per person availability.

6.1 Reliable sources

The chapter asks students to use government websites, reports, officials, books or newspapers. The source and year must be mentioned.

- Population data may come from census or government records.
- Rainfall data may come from weather or district reports.
- Water standards may come from Ministry of Jal Shakti or Jal Jeevan Mission.
- Every secondary data point needs source, year and reference.

Why Year Matters

Population, rainfall and water availability change over time. A report should mention the year so readers know how current the data is.

6.2 Rainwater calculation

Rainwater availability can be estimated from area and rainfall. The book gives a district example using rainfall in metres.

Rainwater Availability

Rainwater volume in $m^3 = \text{Area in } m^2 \times \text{Rainfall in } m$

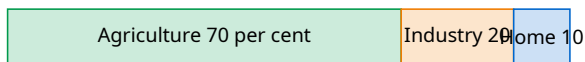
Rainwater in litres = Rainwater volume in $m^3 \times 1000$

Data item	Why needed	Example source
Area	tells the land receiving rainfall	district website
Rainfall	gives depth of rain received	meteorological report
Population	tells number of dependent people	census or local office
Usage norm	gives comparison value	Ministry or mission release

6.3 Domestic, agriculture and industry use

The book uses a broad split: seventy per cent of rainwater for agriculture, twenty per cent for industry and ten per cent for domestic consumption.

Broad Rainwater Use Split



Common Mistake

Do not treat district rainfall as water available only to one town. River basin sharing can make the real picture more complex.

6.4 Comparing prescribed consumption

Activity 5 compares primary data with secondary data and prescribed use. The book mentions Jal Jeevan Mission norms of 55 L per day for rural areas and 135 L per day for urban areas.

Your primary data	Secondary calculation	Prescribed norm
Average per person per day	per person water availability	55 L rural or 135 L urban
High-use families	rainwater or supplied water	note area type
Shortage remarks	official supply challenge	compare and explain

7 Finding Wastage and Saving Water

Activity 6 asks students to identify wastage points such as leaking taps, wet patches and overflowing tanks. It also teaches simple repairs.

7.1 Wastage points

Water wastage should be recorded like other data. Location, problem type, duration and volume should be written.

- **Leaking tap:** slow drip or continuous trickle.
- **Overflowing tank:** water spills after filling.
- **Pipe leak:** wet patch below or near the pipe.
- **Full throttle tap:** more flow than needed for the task.



Wastage Tip

For a leak, write litres per minute and hours per day. This makes daily wastage visible.

7.2 Fixing a leaking tap

The chapter shows a step sequence for a tap repair. Students should work only with adult supervision and after the water mains are turned off.

1. Remove the tap cover and handle carefully.
2. Unscrew the tap bonnet and remove the headgear.
3. Check the body washer, o-ring and jumper valve.
4. Replace worn parts and apply tap lubricant.
5. Refit the bonnet and spindle without over-tightening.
6. Turn water on and check whether the leak has stopped.

Safety Mistake

Do not start tap repair while the water mains are on. Turn the supply off before opening the tap.

7.3 Flow caps and aerators

A tap need not run at full throttle for every task. Flow caps and aerators reduce water flow while keeping the tap useful.

Method	What it does	Where useful
Partial opening	reduces flow manually	quick washing and rinsing
Flow cap	limits maximum flow	school washbasins
Aerator	mixes air with water stream	handwash and utensil rinse
Awareness sign	reminds users to close tap	common areas

Small Repair, Big Saving

A cheap washer can stop a daily leak. The audit should list such low-cost fixes before expensive solutions.

7.4 Water availability can be increased

The chapter lists several ways to increase effective availability: planting trees, reducing pollution, reducing wastage, recycling water and conserving rainwater.

- Planting trees improves local ecological balance.
 - Reducing pollution protects water bodies.
 - Reducing wastage saves already supplied water.
 - Recycling water uses the same water for another safe purpose.
 - Rainwater harvesting stores rain for later use.
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8 Groundwater Recharge and Greywater Reuse

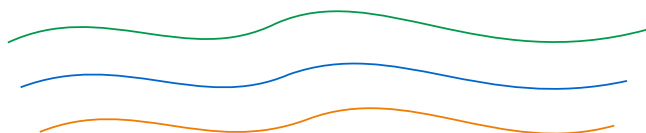
The chapter moves from measurement to action. It explains how communities can recharge groundwater and reuse greywater safely.

8.1 Groundwater recharge principles

Groundwater is important because underground storage has less evaporation loss. The chapter gives three basic conservation principles.

Principle	Method	Purpose
Hold water in field	contour bunds	slow runoff and reduce erosion
Reduce speed of runoff	check dam	store flowing water temporarily
Let water percolate	percolation tank or recharge well	send rainwater into ground

Contour Bund Idea



Bunds follow equal-height contour lines so rainwater slows down and stays longer on the field.

Memory Key

For recharge, remember HSP: Hold water, Slow runoff, Percolate into ground.

8.2 Greywater meaning

Wastewater from sinks, baths, washing machines and kitchens is called greywater. It can be reused after removing impurities.

- Use leftover vegetable washing water for plants

when it is not oily or soapy.

- Use hand-pump runoff for a kitchen garden.
- Search for safe greywater toilet-flush ideas under teacher guidance.
- Never reuse unsafe water for drinking or cooking.

Greywater

Greywater is used water from domestic activities, but it is not toilet waste. It may need settling, filtering or plant-based treatment before reuse.

8.3 Reed bed system

A reed bed system follows a natural filtration process. Suspended particles settle first, then water passes through plant roots and filter material.

Reed Bed Flow



Natural Cleaning

In a reed bed, plants and filter material help remove pollutants. The system copies natural cleaning in rivers and wetlands.

9 Future Water Requirement and Project Report

Activity 8 asks students to estimate future water demand in different scenarios. This is where audit data becomes planning data.

9.1 Scenario calculation

The book gives two examples: a new housing society with 100 homes and a college hostel with 1000 students.

Future Demand

Extra demand = Number of extra people $\times$ Average use

Overall demand = Present demand + Extra demand

- For 100 homes, estimate four people per family if no other data is given.
- For 1000 hostel students, use average consumption per person.
- Compare the extra demand with existing locality supply.
- State if conservation steps can reduce the expected pressure.

present users

new users

average use

future demand

9.2 Project timeline

The chapter asks students to calculate the time spent on each activity. This helps them understand project planning.

Stage	Activity	Time record
Preparation	form, questions, tools	date and hours
Fieldwork	survey and interview	homes or offices visited
Calculation	spreadsheet and averages	formulae used
Action	repair, reuse or awareness	water saved estimate
Report	findings and suggestions	final presentation date

Report Tip

A strong project file shows raw data, converted data, calculations, graphs, findings and action taken.

9.3 What students learn from others

Students learn by meeting officials, families, plumbers, teachers and community members.

The project becomes stronger when every source is noted.

- Write one surprising fact about water use.
- Write three habits that can save water in daily life.
- Note what the official or plumber explained.
- Mention which suggestion can be applied at home or school.

Memory Key

For the final report, use FACS: Findings, Action, Calculation, Source.

10 Safety, Internet Use and Viva Preparation

The chapter includes safety instructions because students may visit homes, inspect water points, use tools and search online.

10.1 Safety rules

Safety comes before data collection. Students must take permission and use tools only under adult guidance.

Area	Safety rule
Tools	use plumbing tools carefully and follow instructions
Outdoor visit	take permission before entering homes or property
Water source	avoid slippery areas and unsafe water edges
Heat	stay hydrated and avoid extreme heat
Internet	use reliable sources and do not share personal data

Privacy Rule

Do not upload survey forms with personal details. Protect the privacy of families and officials.

10.2 Viva questions and answers

A viva checks whether students understand their project. Prepare short answers with numbers from your own data.

Question	Answer point
What is a water audit?	systematic study of use and wastage
What is primary data?	data collected first-hand by survey or measurement
Why convert to litres?	comparison becomes clear and consistent
How did you measure tap use?	flow rate times time tap was ON
What is greywater?	domestic wastewater that can be reused safely after treatment
How can future demand be estimated?	new users times average use per person

10.3 Quick reference summary

The whole chapter can be revised through a few formulae, tables and action points.

- **Water used:** flow rate multiplied by time.
- **Average per person:** family total divided by family members.
- **Rainwater volume:** area multiplied by rainfall.
- **Extra demand:** new users multiplied by average use.
- **Main actions:** fix leaks, reduce flow, reuse greywater and recharge groundwater.

One-Shot Revision

A good water audit report must answer four questions: how much water is available, how much is used, where it is wasted and what can be done.

Revise More Class 8 Kaushal Bodh Chapters