Rainflower

RAINFLOWER YOUTH RESEARCH

Research Team *Handbook*

How the platform works, how to claim and run a research team, the ethics every researcher keeps, and every open research paper in full.



NOVEMBER 2, 2026 EDITION

When it rains, the flower blooms.

About this handbook

This is the handbook for Rainflower research teams: the students who take on a research paper together, and the coordinators who support them. Read Parts I to III once from start to finish. Keep Part IV, the research papers, to hand while you choose a paper and while you work on it.

This edition was made on November 2, 2026 and contains 4 open research papers. It is rebuilt whenever a proposal changes, so the latest edition is always at **rainflower.world/guides/handbook/pdf**. The same material, with search and an Ask Thunder button, is online at **rainflower.world/guides/student** and **rainflower.world/guides/coordinator**.

Questions about a paper go in the Questions section on that paper's page. Anything else: ask your coordinator.

Scan for the latest edition

https://rainflower.world/guides/handbook/pdf

“When it rains, the flower blooms.”

Contents

The people behind Rainflower 4

About the founder: Ethan Kabir 4

Meet your coordinators 5

I The Rainflower platform 6

1 Welcome to Rainflower 7

2 Getting started 9

3 Raindrops and badges 11

4 The research stages 13

5 Community and help 15

II Research teams 17

6 Forming your team and claiming a paper 18

7 Approval and your group page 20

8 The 13 weeks 23

9 Asking questions and changing plans 25

III Research ethics 26

10 Why research ethics matters 27

11 Consent 28

12 Privacy and data 29

13 Safety in the field 30

14 Honest data and honest AI 31

15 Ethics checklist 33

IV The research papers 34

16 The papers at a glance 35

17 *Is Our Water Safe? Drinking Water Quality, Treatment and Trust in a Bangladeshi Community* 36

18 *The Water Economy of Bangladesh: What People Pay for Water in Our Cities, Towns and Villages* 49

19 *Water at School: Comparing Drinking and Handwashing Access in Two Secondary Schools* 61

20 *Who Walks for Water? Time, Distance and Gender at Shared Water Points in One Neighbourhood* 74



THE PEOPLE BEHIND RAINFLOWER

Ethan Kabir

FOUNDER OF RAINFLOWER · ROCKLIN HIGH SCHOOL, CALIFORNIA

> *"No problem is too big or too small for anyone — and especially not for kids in K–12."*

Where it began

Ethan Kabir started studying rainfall and water with his family when he was in elementary school. Those early questions about where rain falls, where it goes and who it reaches grew into the program you are now part of.

The first Rainflower

He spent most of 11th grade building the first Rainflower: a flower-shaped rain collector, installed in Rocklin, California. The whole program is named after it. Its hardware, software and design are being open-sourced, so Rainflower teams anywhere can build one, deploy it, monitor it and make it better.

The platform

Ethan built this platform and its documents alongside AI agents. That is why AI plays such a large part in how Rainflower works, from Thunder answering your questions to the agent that writes research proposals, and why this handbook asks you to use AI honestly. He is now in 12th grade at Rocklin High School.

Why Rainflower

He believes a student in school can do research that matters, and Rainflower exists to prove it: real questions, real data from your own neighborhood, and real credit for the students who do the work.

When it rains, the flower blooms.

Ethan Kabir

THE PEOPLE BEHIND RAINFLOWER

Meet your coordinators

Coordinators bring students into Rainflower and support them and their teams through every stage of research.



Mostafijur Rahman

DHAKA, BANGLADESH

Mostafijur graduated in Computer Science and Engineering from American International University-Bangladesh (AIUB) and works as an AI developer. His interests span machine learning, computer vision, natural language processing and data science. He enjoys building practical, data-driven solutions to real-world problems, and brings that same habit of careful, evidence-first thinking to the students he guides.



Rabiul Hasan

NOAKHALI, BANGLADESH

Rabiul is an elementary school teacher who earned his B.A. and M.A. in History at the University of Chittagong. He is interested in how education, AI and entrepreneurship can drive national development. A believer in lifelong learning and evidence-based thinking, he values constructive collaboration and helping young people contribute to Bangladesh's sustainable progress.



Najmul Huda

CHATTOGRAM, BANGLADESH

Najmul is a Master's student in Public Administration at the University of Chittagong, studying how AI is shaping education, public institutions and decision-making. He founded Boithak, a youth initiative that brings students together through reading circles and discussions to encourage critical thinking, civic engagement and informed public debate.

Every coordinator's profile is on **rainflower.world/team**.

PART I

The Rainflower platform

Who we are, how the site works, raindrops and badges, and the stages of Rainflower research.

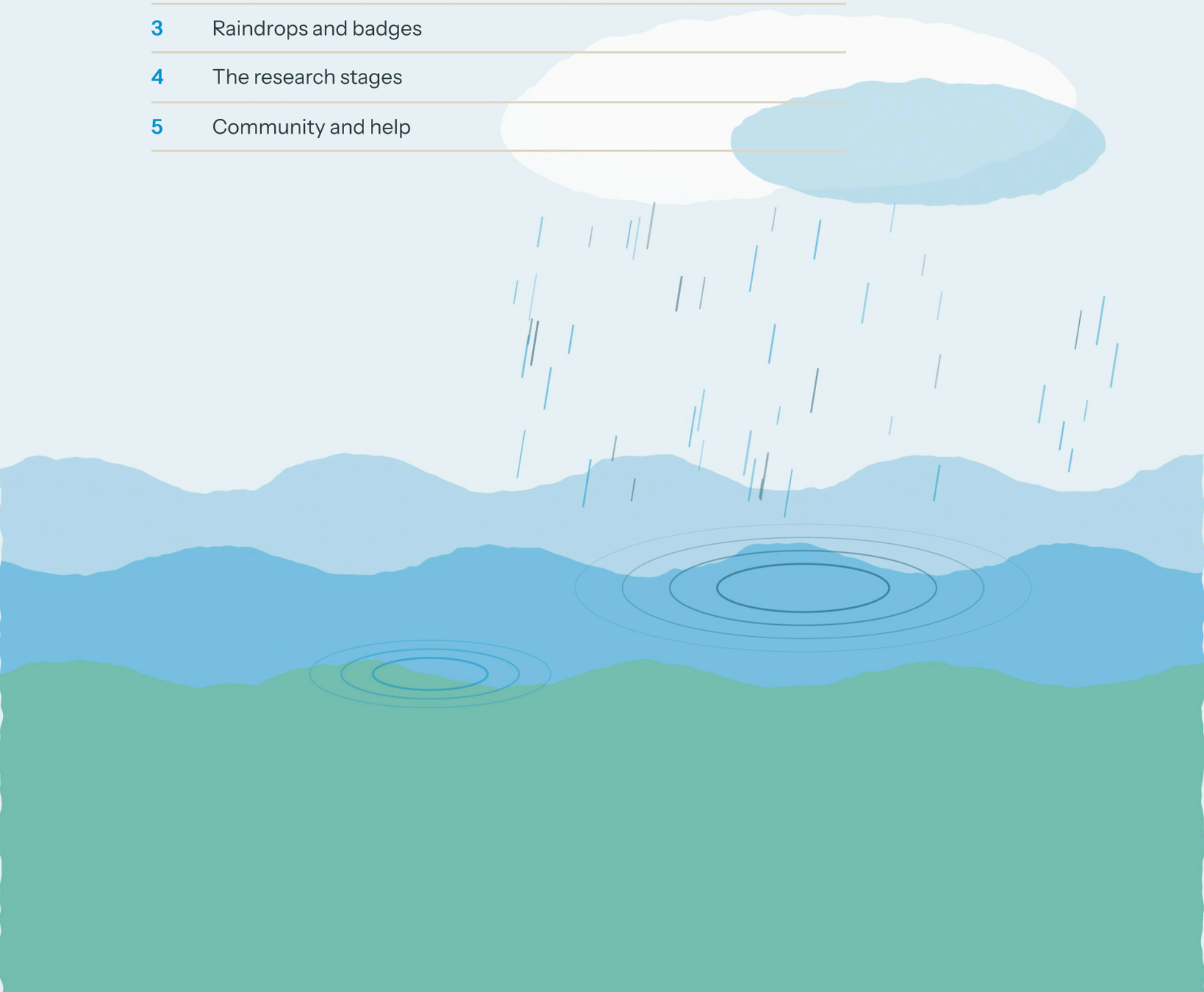
1 Welcome to Rainflower

2 Getting started

3 Raindrops and badges

4 The research stages

5 Community and help



CHAPTER 1

Welcome to Rainflower

Who we are, why water, and the people who will help you.

Rainflower is a youth research program about water. School students in grades 9 to 12, most of them in Bangladesh, collect real data about rain and water in their own neighborhoods and turn it into research that matters.

Most research about Bangladesh is written by adults, often from far away. You live here. You can walk to the tube well, the water seller, the pond and the kitchen tap, and you can ask your neighbors questions no outside researcher can. That is what makes your work valuable.

> *When it rains, the flower blooms.*

What this handbook is for

This handbook is for **research teams**: the one to five students who take on a Rainflower research paper together, and the coordinators who support them. It has four parts:

1. **The Rainflower platform**: how the site works, raindrops, badges and the research stages.
2. **Research teams**: how to claim a paper, get approved, and run your group's work for 13 weeks.
3. **Research ethics**: how to treat people, data and AI honestly and safely. Read this part before any field work.
4. **The research papers**: every open research proposal, in full.

The people around you

WHO	WHAT THEY DO
You, the researcher	Choose a paper, collect the evidence, analyze it and write the paper.
Your teammates	Share the work and the credit. Everyone on a team is a co-author.
Your coordinator	Approves your account, supports you locally, and runs a checklist review before field work and before you submit.
Your AI research assistant	Reads your plan, survey, data and drafts at every stage and gives feedback. It helps you do the work; it never does it for you.

WHO	WHAT THEY DO
Your advisor	Reviews your question, sampling plan and first data, then rates your finished paper.
Thunder	The Rainflower AI. Ask it questions about the program or the science at /ask, or on any proposal page.
Rainflower	Approves research groups, reviews and grades papers, and chooses which papers go to a journal.

The research stages

Rainflower research grows in stages, each building on the one before: **Learn** (surveys), **Experiment** (measurements such as daily rainfall), **Analyze** (your own observations), **Pilot** (the Rainflower device) and **Publish** (real research papers). This handbook is mostly about the last one.

What success looks like

A successful research paper ends with three things: a finished paper in English, a full evidence package that shows the work is yours, and acceptance by Rainflower. A small, careful study that answers a small question honestly is exactly what good science looks like. A paper that finds "we expected X but found Y" is still a success.

CHAPTER 2

Getting started

Your account, signing in, consent and your profile.

Your account goes live once you confirm your email and your coordinator approves you. Nobody uses a password: you sign in with a link sent to your email.

Signing up

1. Go to **/signup** (or use your coordinator's own link, `/c/<code>`, or a friend's invite link, `/s/<code>`).
2. Fill in **About you** (full name, email, WhatsApp number with country code) and **Your school** (school name, grade or university year).
3. Pick **Your coordinator**. The list only shows coordinators in your country who are accepting new students.
4. Complete the security check, check the Terms box and press **Create account**.
5. Open the email from Rainflower and click the confirmation link. Your coordinator then reviews you, and you get an email saying *Your Rainflower account has been approved!*

When signups are closed in your country

If no coordinator in your country is taking students, the form becomes a **waitlist**. Leave your email and WhatsApp and press **Join the waitlist**; you will be emailed when a coordinator opens signups.

Signing in

1. Go to **/login**, enter your email and press **Send login link**.
2. Open the email and click the link. It works once and expires after **15 minutes**.

If you see *Your account is pending approval*, your coordinator has not approved you yet.

> *Never forward your login link to anyone. It signs in whoever clicks it.*

First-time checks

- **Birth year:** the first time you sign in you are asked for your birth year.

- **Parental consent (under 18):** you get a link (`/paperwork/<code>`) to send to a parent or guardian. You can press **Continue for now** up to **3 times**; after that your account stays locked until your guardian signs, or your coordinator records a signed paper form.

Your profile

Edit it at **/dashboard/profile**; others see it at `/profile/<username>` .

- **Photo:** press **Change Photo**.
- **Bio:** must be in English and at least **500 characters**. Press **Check with AI**; it checks language, tone and grammar and may offer a polished version (**Approve & Save** or **Keep editing mine**). Bios that break the rules are hidden.
- **Other fields:** name, username, WhatsApp, school, grade and social links. Press **Save Profile** when done.

CHAPTER 3

Raindrops and badges

How you earn raindrops, and the badge ladder.

Raindrops ( ) are Rainflower's reward points. You earn them for real contributions and can spend them in the shop.

Earning raindrops

ACTIVITY	WHAT YOU EARN
Quizzes	Your best score pays; a retake pays only the improvement. Practice rounds pay nothing.
Experiments	Each accepted report pays the experiment's reward. Rainfall pays once per day or week.
Analyze projects	Pays on submission, on thumbs-up from others, for comments, and when accepted.
Memes	10 for each like on your meme (your own likes don't count).
Ask Thunder	Asking at /ask costs 10; an answered question pays back 10, up to 100 a day.
Arcade games	Up to 150 a day in rewarded mode.
Inviting friends	A bonus when your friend is approved, and another once they stay active.
Support feedback	A reward when your report leads to a change listed on the Change Log.
Research papers	Rewards for submitting, grades and advisor ratings, set per paper.

Wallet, leaderboard and shop

- **/wallet** shows your balance and every transaction. To send raindrops to a friend, enter their username and an amount, then press **Send**.
- **/raindrops** is the leaderboard.
- **/shop** lets you spend raindrops, including **Cash out** above a minimum amount.

Badges

Badges follow your raindrop balance and only ever go up: spending raindrops never takes a badge away.

BADGE	RAINDROPS
Novice	0 to 10,000
Observer	10,000 to 20,000
Surveyor	20,000 to 30,000
Field Researcher	30,000 to 40,000
Analyst	40,000 to 50,000
Senior Researcher	50,000 to 100,000
Lead Researcher	100,000 and above

Your dashboard shows how far you are from the next one.

CHAPTER 4

The research stages

Surveys, experiments, Analyze projects, the pilot and quizzes.

All research starts at **/research**, which lays out the stages of the program as cards. Each stage builds on the one before.

STAGE	WHAT YOU DO	WHERE
Learn	Answer public surveys about water and rain, then see the live results.	/research/learn, /surveys
Experiment	Collect measurements, such as daily rainfall from your own collector.	/experiments
Publish	Write a real research paper, alone or in a team.	/research/proposals/open
Analyze	Submit your own observations and creative work on a topic.	/research/analyze
Pilot	Follow the Rainflower device being built and tested.	/research/pilot
Assessments	Take timed quizzes on the program and the science.	/quizzes

Learn: surveys

Open a survey and press **Take the survey**. Each survey has a public report (**View report**) with charts and a map of all responses.

Experiment: rainfall and other measurements

1. Open an experiment at **/experiments** and press **Join this experiment**.
2. Choose how many slots you want and press **Request to join**. Your coordinator approves the request.
3. Submit reports with **Submit a report**.

The daily rainfall form

Fill in when you checked, what you saw (measured rain, no rain, trace, overflow or missed), the amount in mm, any problems, whether you reset the collector, and an optional photo. Press **Save daily observation**.

You can send one rainfall report per day. Sending it again updates it but does not pay twice.

Publish: research papers

Writing a paper has its own page: see Research groups and papers.

Analyze: your own research

Open a project at **/research/analyze**, read its rules checklist and submit your work. You must confirm the work is your own and not AI-generated. Other members can give thumbs-up and comment; an advisor or admin accepts or rejects it.

Assessments: quizzes

Quizzes at **/quizzes** are timed: an answer after the timer ends scores 0. Your history is at **/quizzes/history** and rankings at **/quizzes/leaderboard**.

CHAPTER 5

Community and help

The places to share, ask and learn, and where to get help.

Beyond research, Rainflower has places to meet other researchers, share what you learn and have some fun. Most of them also earn raindrops.

FEATURE	WHAT IT IS	WHERE
Team	A map of where researchers live, with every member and paper team. Filter by role, sort, or search.	/team
Blog	Write posts about your research, life and reviews. An AI check runs first, then a coordinator or admin reviews the post before it is published.	/blog, /blog/new
Memes	Post rain and science memes (an image or a YouTube, TikTok or Facebook link).	/rain-and-science-memes
Arcade	Games that teach water science; rewarded mode pays up to 150 raindrops a day.	/arcade
Ask Thunder	Ask the Rainflower AI anything about the program or the science. Others can reward good questions.	/ask
Documents	Rainflower's shared documents, with likes and comments.	/dms
X Space	The weekly live audio session on X, with agenda, speaker queue and check-in.	/x
Events	Upcoming events you can join, with comments.	/events
Videos	The Rainflower YouTube channel and playlists.	/video
Invite a friend	Your personal invite link; you earn raindrops when friends join and stay active.	/dashboard/profile
Kickoff reward	A one-time raindrop claim for students who attended the kickoff.	/reward

Posting rules

- Blog posts and memes must suit a school audience. Anything flagged is held back or hidden.
- Two flags from other members hide a meme until a coordinator or admin reviews it.
- Your own likes on your memes don't earn raindrops.

Getting help

Ask your coordinator first. Then:

- **The online guides:** /guides/student and /guides/coordinator have everything in Part I of this handbook, with search and an **Ask Thunder** button that answers questions about them.
- **Questions about one paper:** use the **Questions** section on that paper's page (see Chapter "Asking questions and changing plans").
- **Support (/support):** for problems with the site itself. If your report leads to a change, you may earn raindrops.
- **Change Log (/changelog):** what has changed on the site recently.

PART II

Research teams

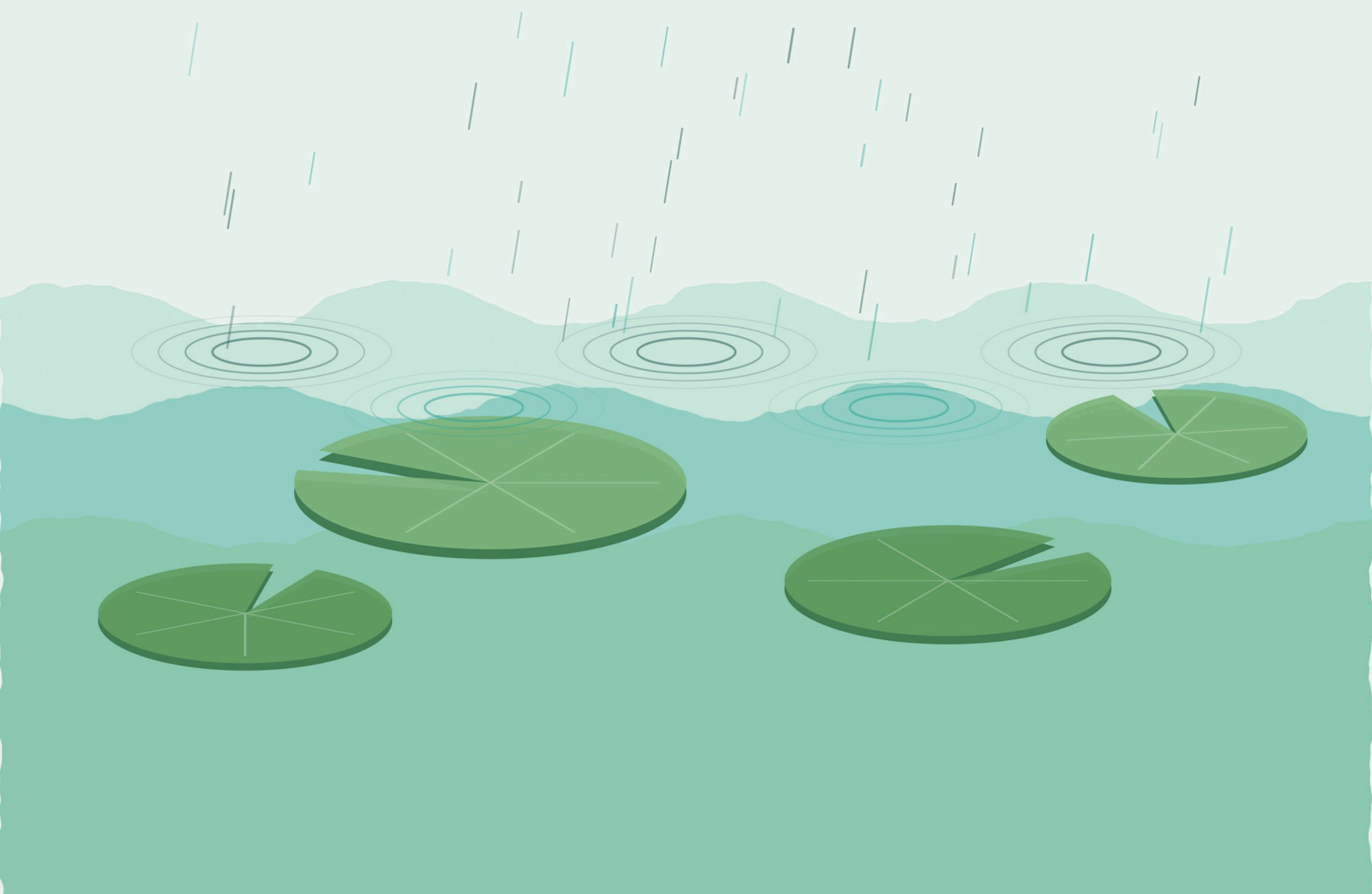
Forming a team, claiming a paper, approval, your group space, the 13 weeks and what to do when plans change.

6 Forming your team and claiming a paper

7 Approval and your group page

8 The 13 weeks

9 Asking questions and changing plans



CHAPTER 6

Forming your team and claiming a paper

Choose a paper, agree on a team, and claim it together.

A **research group** is the one to five students working on the same research paper. Several groups can work on the same paper at the same time, each in their own space. You do not compete with them: each group produces its own paper from its own neighborhood.

Before you claim

1. Be a Rainflower student researcher with a confirmed account and a coordinator.
2. Read the proposal all the way through. Every paper is in Part IV of this handbook, and online at /research/proposals/open with a PDF of its own.
3. Check the team size on the proposal. Some papers can be done alone; others need a group of 2 to 5.
4. Talk to your teammates first. Agree who is in the group and who will lead it before anyone presses the button.
5. Tell your parents or guardians what you plan to do. Field work needs their agreement.

Choosing the right paper

- **Region:** each proposal says which regions it suits best (Dhaka, Chittagong, Noakhali, Sylhet).
- **Time:** each proposal gives the hours of work per student. Plan for about 3 months with a few focused hours each week.
- **Interest:** you will spend 13 weeks on this question. Pick one you genuinely want answered.
- **Reward and budget:** every proposal shows its raindrop reward and its cash budget for expenses before you accept it.

Claiming

Open the paper you want online, scroll to **Want to write this?** and choose how you will work.

ON YOUR OWN	AS A GROUP
Leave **Teammates** empty.	In **Teammates**, start typing a friend's name or username and pick them from the list. Press × on a chip to remove someone.
Type a group name if you like.	Add a group name, or pick one of your earlier groups to fill the members in.
Press **Claim this paper**.	Press **Claim this paper**.

The student who presses the button becomes the **group lead**. Teammates don't need to do anything: they are part of the group as soon as the claim is made.

> *You can't add more people than the paper allows, and only student researchers can join. A student can be in only one group for each paper, but can be in groups on different papers.*

If you leave the name empty, your group gets a water-themed one like *Lotus Petals* or *Monsoon Herons*. The lead can change it at any time.

Sharing the work

A team works best when everyone owns something. A common split for a team of four or five:

ROLE	OWNS
Lead	The plan, the timeline, and talking to the coordinator.
Survey lead	The AKTI Survey form, the pilot and the survey exports.
Interview lead	The interview guide, recordings and consent log.
Photo and field lead	Geo-tagged photos, the photo log and the field diary.
Analysis lead	The spreadsheet, tables and charts.

Everyone writes. Everyone is a co-author. Meet at least once a week, even for fifteen minutes, and write down what each person will do before the next meeting.

CHAPTER 7

Approval and your group page

What happens after you claim, and how your group's home works.

Waiting for approval

As soon as you claim, you land on your new group page, marked **Waiting for approval**. Your claim now appears for Rainflower admins, who approve or decline every claim (sometimes with a short note), and for your coordinator and each teammate's coordinator.

While you wait, the group lead can rename the group, write a description, add a cover photo, and add or remove members. Use the time to plan: read the proposal again and agree who does what. Approval usually takes a few days.

Once approved, the page says **Approved**, your group's file space opens, and your group appears on the paper's page. If a claim isn't approved, the note from Rainflower explains why, and an admin can reopen it later.

Your group page

Your page at `/research/group/<your-group-name>` is your group's home: the cover photo, group name, the paper, your description, the researchers (the lead is marked) and your coordinator. Find it from **My Group** in the profile menu, at /research/my-groups, or on your dashboard.

Signed-in Rainflower members can see an approved group's name, description and members. **Your files are never public.**

Who can do what

ACTION	GROUP LEAD	TEAMMATES	COORDINATOR	ADMIN
See the files and every version	Yes	Yes	Yes	Yes
Upload and remove files	Yes	Yes	No	Yes
Rename, description, cover photo	Yes	No	Yes	Yes
Add members	Yes	No	Yes	Yes
Remove members	Before approval	No	Yes	Yes

ACTION	GROUP LEAD	TEAMMATES	COORDINATOR	ADMIN
Withdraw the group	Yes	No	No	Yes
Approve or decline the claim	No	No	No	Yes

Renaming changes your page's address too, but the old address keeps working.

Aktiful Survey

Once approved, **Log in to Aktiful Survey** on your group page opens the survey tool already signed in. Everyone in your group shares every survey any member creates there, so build your survey together.

Files and versions

Everything your group collects lives in **Group files** on your page.

1. Drag files onto the upload box, or press **choose files**. Up to 20 at a time, each up to 100 MB.
2. Pick a folder (optional), like `survey` or `photos/week-3`.
3. Say what changed in a few words: "First 15 survey responses".
4. Press **Upload**.

Documents, data (CSV, Excel), photos, audio and video interviews, slides and ZIP files are all accepted.

Nothing is ever lost. Upload a file with the same name in the same folder and it becomes the new version; the old one is still there. Press **Versions** next to any file to see who changed it, when and why. **Remove** takes a file out of the current list, but it stays in the history.

A tidy space

FOLDER	WHAT GOES IN IT
`plan/`	Research question, roles, survey draft, interview guide
`consent/`	Consent scripts (Bangla and English), consent log
`survey/`	AKTI Survey exports (CSV), pilot notes
`interviews/`	Recordings named by date and role, e.g. 2026-11-02_mechanic.m4a
`photos/`	Geo-tagged photos and photo-log.csv
`diary/`	Field diary, one entry per visit
`analysis/`	Spreadsheet, tables, charts

FOLDER	WHAT GOES IN IT
`drafts/`	paper-v1.docx, paper-v2.docx …
`final/`	Final paper, evidence manifest, AI-use and ethics statements

Good habits: upload after every field visit, not at the end; keep a file's name the same when you update it; name new files by date and what they are; and always write what changed.

CHAPTER 8

The 13 weeks

Seven stages from plan to paper, and the evidence each one produces.

A project moves through seven stages. The weeks are a guide, not a rule: finishing well matters more than finishing fast. Your AI research assistant checks in at every stage.

STAGE	WEEKS	WHAT HAPPENS	SAVE TO
1. Choose and plan	1–2	Decide your exact question, who you will ask and where. Draft the survey and interview questions.	`plan/`
2. Permission and pilot	2–3	Guardians' agreement, consent scripts, coordinator's first checklist, pilot the survey with 3–5 people.	`consent/`, `survey/`
3. First sample	3–4	First 10–20 responses, 1–2 interviews, first photos. An advisor reviews your question, sampling plan and early results.	all folders
4. Full data collection	5–8	Run the survey, record interviews, take geo-tagged photos, keep the field diary.	all folders
5. Analyze	9–10	Count, compare and chart. Decide what your data can and cannot support.	`analysis/`
6. Write	11–12	Introduction, methods, results, discussion, limitations, references. AI-use and ethics statements.	`drafts/`
7. Final review	13	Coordinator's final checklist. Upload the paper and evidence package.	`final/`

Three kinds of evidence

Every project must produce all three:

- **Online survey:** a questionnaire on AKTI Survey, answered by real people. It gives you numbers you can count and compare.
- **Video interviews:** short recorded conversations with people who know your topic. They give you the stories and reasons behind the numbers. Record in parts of 3 to 8 minutes.
- **Geo-tagged photos:** the places, sources and problems you study, with location turned on. They show what you saw and where.

Your proposal says how much of each your project needs. Who you ask matters as much as how many: a survey of your neighbors tells you about your neighbors, not about all of Bangladesh. Say in your paper exactly who you reached and what your results can and cannot claim.

After you submit

1. **Rainflower acceptance.** Your paper and evidence pass review and get a grade; your advisor rates it. This is the finish line, and where raindrops are paid.
2. **Journal submission.** From accepted papers, Rainflower selects some and submits them to a US youth science journal on your behalf.
3. **Journal acceptance.** The journal decides, usually after months. Rainflower works with you on any changes.

Most papers stop at step 1, and that is a complete, successful project.

Keeping the budget

Every proposal has a cash budget for the real costs of field work: travel, mobile data, printing consent forms and small items. Track what you spend in your field diary.

CHAPTER 9

Asking questions and changing plans

Getting answers about your paper, and what to do when the team changes.

Asking questions about a paper

Every paper's page has a **Questions** section for questions about that paper: its method, survey, interviews, budget, team, timeline, ethics, writing or submission. Press **Ask a question** near the top of the paper.

- **Thunder answers straight away** when the proposal itself covers your question.
- **Otherwise it waits for a person.** Your coordinator and Rainflower are emailed, and you are emailed when someone answers.
- Until it is answered, you can edit or withdraw your question. Questions are tagged by topic, so read what others asked first.

When plans change

- **Someone wants to join:** the group lead opens **Add members**, any time the paper's team size allows.
- **Someone wants to leave:** before approval the lead can remove them. After approval, ask your coordinator or Rainflower.
- **You can't continue:** the lead can press **Withdraw the group**. Your files are kept, and an admin can bring the group back if you return.

For coordinators

Coordinators find every group that includes one of their students under **Dashboard → Research Groups** (/dashboard/coordinator/research-groups), with claims waiting for approval marked. You can rename a group, edit its description and cover, add or remove members, and open its files and history to follow the work. You cannot upload files, and approving claims is done by Rainflower admins.

Your two reviews in the 13 weeks are the **plan** (weeks 1–2, before field work) and the **final draft** (week 13). Your checklist asks three things: is the group collecting data with a proper method, staying safe, and being honest?

When Thunder can't answer a student's question on a paper, you get an email. Answer from the link in the email or on the proposal page.

PART III

Research ethics

Consent, privacy, safety and honesty: the promises every Rainflower researcher keeps. Read this part before any field work.

10 Why research ethics matters

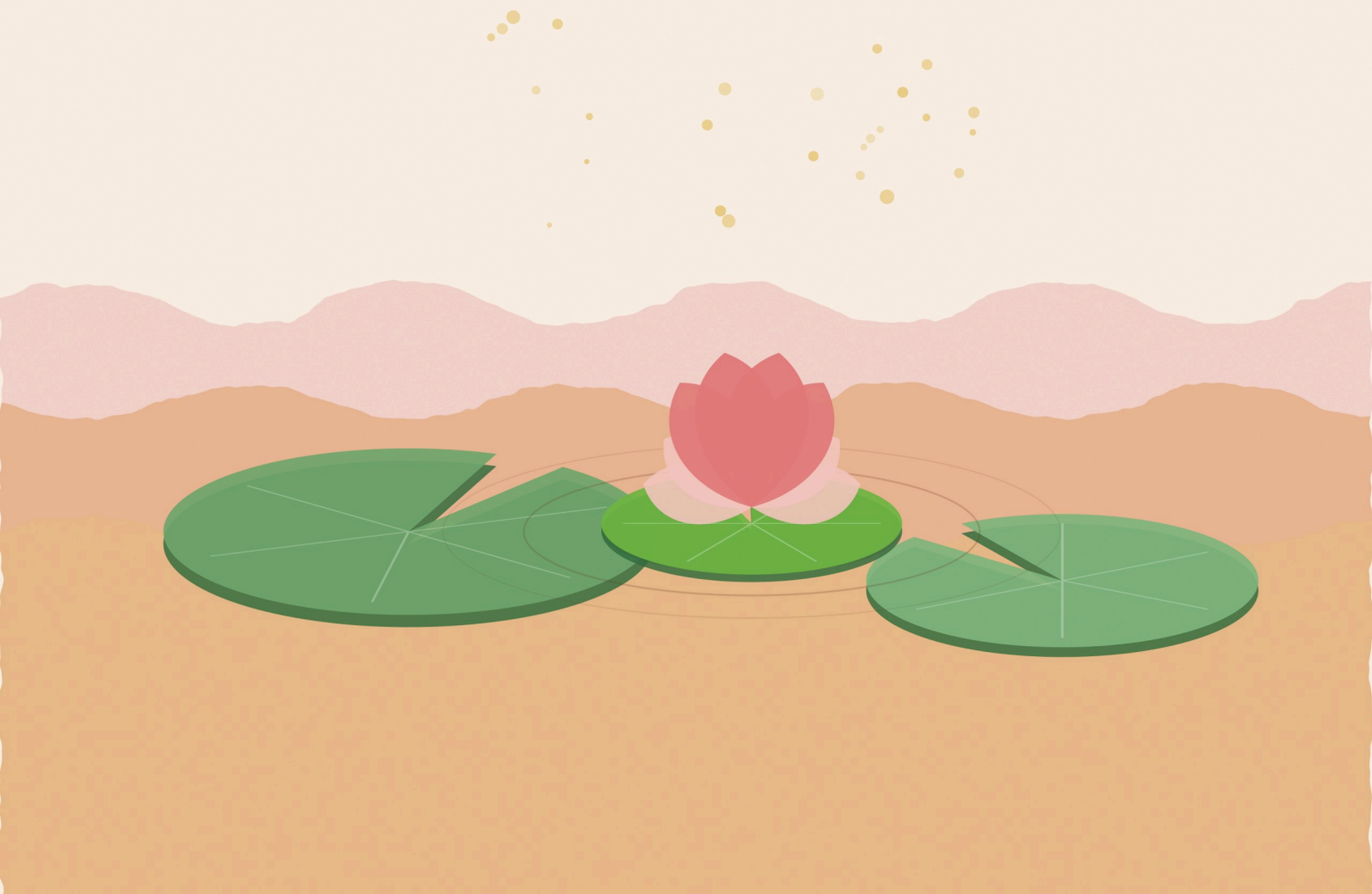
11 Consent

12 Privacy and data

13 Safety in the field

14 Honest data and honest AI

15 Ethics checklist



CHAPTER 10

Why research ethics matters

The promises every researcher makes to the people they study.

You will be working with real people and real places: a mother carrying water home, a tube-well mechanic, a shopkeeper, a neighbor's child. They give you their time, their words and sometimes their pictures. Research ethics is the set of promises scientists make so that nobody is harmed or tricked by taking part.

These rules are not extra paperwork. A paper that breaks them will not be accepted, however good its data, and Rainflower's review checks them before any paper is graded or sent to a journal.

Four principles

PRINCIPLE	WHAT IT MEANS FOR YOU
Respect	People decide for themselves. Explain your project, ask clearly, and accept "no" without argument.
Do no harm	Nobody should be worse off for talking to you: not embarrassed, not exposed, not put at risk. That includes you.
Fairness	Treat everyone you ask the same way. Report what people said, not what you wished they had said.
Honesty	Your data, your quotes, your photos and your use of AI are exactly what you say they are.

The ethics statement

Every Rainflower paper includes a short **ethics statement** confirming that you followed the rules in this part, and an **AI-use statement** saying exactly what you used AI for. Your coordinator's checklist and Rainflower's review both check them.

> *If you are ever unsure whether something is ethical, stop and ask your coordinator before you do it. Asking is always right.*

CHAPTER 11

Consent

Ask first, ask three separate questions, and protect children.

Ask first

Before anyone answers your survey, speaks on video or appears in a photo, explain what your project is and get their clear agreement. Anyone can say no, and anyone can stop at any time, even halfway through an interview.

Three separate permissions

Taking part, being recorded, and having anything shared publicly are **three different permissions**. Ask for each one separately, every time, and respect a yes to one and a no to another.

1. **Taking part:** "Would you be willing to answer some questions about how your family gets water?"
2. **Being recorded:** "May I record this conversation on video (or audio only)?"
3. **Sharing publicly:** "May we use your words or picture in our paper, without your name?"

Each proposal has a consent script in Bangla and English. Use it word for word. On AKTI Survey, the first screen should state the purpose and ask for consent before any questions begin.

The consent log

Keep a simple table in `consent/` : a code for each person (H01, H02…), the date, and their answer to each of the three questions. Never write their name next to their answers in your data.

Children need a parent

If you want to survey, interview or photograph anyone under 18, **including a child who fetches water**, a parent or guardian must agree first, in person, before you record that child.

Your own consent

If you are under 18, your parent or guardian must also agree to your taking part in Rainflower. That is the consent link you received when you first signed in.

CHAPTER 12

Privacy and data

Codes instead of names, private evidence, and what may go public.

Protect people's identity

- No full names, phone numbers or home addresses in your paper.
- Describe people by role: "a shopkeeper in Sylhet", "an adult woman who fetches water for her household". Use a name only if the person asks to be named.
- In data files, use codes such as **H01** for households and **I03** for interviews, never names.
- Never upload or publish photos of **children's faces**, or anything that shows exactly where a family lives.

Two kinds of material

THE PRIVATE EVIDENCE PACKAGE	THE PUBLIC PAPER
Raw survey exports, full interview recordings, original photos with location data, the household list, your field diary.	Summaries and grouped numbers, anonymized quotes, selected photos with exact locations removed.
Seen only by your team, coordinator, advisor and Rainflower reviewers.	Seen by anyone, possibly by a journal.

Keep the private material **only in your group's file space** on Rainflower, not in public chats, social media or shared drives. It is kept only as long as the review and any journal process need it, and is deleted on request.

When something slips

If you accidentally record a name, a phone number or a face that shouldn't be there, delete or blur it as soon as you notice, upload the corrected file, and tell your coordinator.

CHAPTER 13

Safety in the field

Your own safety comes first, every time you go out.

No piece of data is worth getting hurt for.

Before you go

- Tell your family where you are going and when you expect to return, **every time**.
- Go in pairs where possible.
- Charge your phone and carry a little money for transport.

While you are out

- Work in **daylight** and in **public places**.
- Never enter private property, a household's rooms or yard, a factory or a water facility without permission.
- Do not go near fast water, open wells, unstable banks or standing floodwater, even for a good photo.
- If a route has slopes, stairs or busy road crossings, walk it once without heavy bags before bringing equipment.
- If anyone becomes angry, uncomfortable or unsafe, thank them, stop, and leave.

Seasons

Every Rainflower project must be doable in any month of the year, so you never need to go out in a storm or a flood. Record the date of every visit, and say in your paper how the season may have affected what you saw.

CHAPTER 14

Honest data and honest AI

The data wins, and AI is a helper, never the author.

Honest data

- Report what people said, not what you wished they had said. If your data disagrees with your idea, **the data wins**.
- Record missed days, refusals and things that went wrong. They belong in your limitations section.
- Never invent, copy or "fill in" a response, a quote, a measurement or a photo.
- Say exactly who you reached and how you chose them. Don't claim your neighborhood speaks for all of Bangladesh.
- Read every source you cite. Give credit to every idea, table or picture that isn't yours.

Using AI honestly

AI tools are allowed as a helper, never as the author. AI can help you present your work, but it cannot do your work. That includes your Rainflower AI research assistant.

ALLOWED	NOT ALLOWED
Fixing grammar and spelling, and making your English clearer	Inventing survey answers, interview quotes or photos
Helping you organize sections, headings and layout	Writing your results or conclusions for you
Formatting tables, figures and references	Creating references to sources you have not read
Explaining a concept or a method you want to understand	Writing any part of the paper that claims to be your own observation or data

Every paper includes a short **AI-use statement** that says exactly what you used AI for. Being open about it is normal in science and costs you nothing. **Hiding it, or faking data, ends the project.**

Showing the work is yours

Your evidence does two jobs: it supports every claim, and it shows the work is yours. Your field diary, your stage-by-stage uploads, your check-ins with your AI assistant and advisor, and a short final conversation about your findings complete the picture. A paper without an evidence package will not be accepted.

CHAPTER 15

Ethics checklist

Check off every line before field work, and again before you submit.

Before field work

- [ ] My parent or guardian knows about the project and has agreed.
- [ ] We have the proposal's consent script in Bangla and English.
- [ ] Our consent log is ready, with codes instead of names.
- [ ] The first screen of our survey explains the purpose and asks for consent.
- [ ] We know we must get a parent's agreement before talking to anyone under 18.
- [ ] We have a safety plan: daylight, public places, pairs, family told every time.
- [ ] Our coordinator has run the first checklist review.

Before you submit

- [ ] Every person in our data agreed to take part, and we asked the three permissions separately.
- [ ] No names, phone numbers, addresses or children's faces appear in the paper.
- [ ] All private material is in our group's file space and nowhere public.
- [ ] Every number, quote and photo in the paper is real and ours.
- [ ] We read every source we cite.
- [ ] Our AI-use statement says exactly what we used AI for.
- [ ] Our ethics statement is written and true.
- [ ] Our coordinator has run the final checklist.

PART IV

The research papers

Every open research proposal, in full: the question, the method, the evidence, the timeline, the budget and the reward.

16 The papers at a glance

17 Is Our Water Safe? Drinking Water Quality, Treatment and Trust in a Bangladeshi Community

18 The Water Economy of Bangladesh: What People Pay for Water in Our Cities, Towns and Villages

19 Water at School: Comparing Drinking and Handwashing Access in Two Secondary Schools

20 Who Walks for Water? Time, Distance and Gender at Shared Water Points in One Neighbourhood



CHAPTER 16

The papers at a glance

Every open research paper on one page.

4 research papers are open right now. Each one is a complete proposal you can claim alone or as a team. Every proposal has the same twenty-or-so sections, so once you have read one you can find your way around all of them.

RESEARCH PAPER	TEAM	HOURS EACH	REWARD PER STUDENT	BUDGET
Is Our Water Safe? Drinking Water Quality, Treatment and Trust in a Bangladeshi Community In the study area, how do households' drinking water practices (source choice, storage and treatment) compare with their beliefs about whether their water is safe, and what observable indicators support or challenge those beliefs?	2–5 students	about 60	2,500 raindrops ($5)	BDT 7,000
The Water Economy of Bangladesh: What People Pay for Water in Our Cities, Towns and Villages What is the real price per litre of water from each source used by households in the study area, and how accurately do households know what they pay?	2–5 students	about 80	2,500 raindrops ($5)	BDT 7,000
Water at School: Comparing Drinking and Handwashing Access in Two Secondary Schools In two named secondary schools, how many enrolled students share each working drinking water point and handwashing station, and how long do students report waiting at these points during the morning break?	2–5 students	about 48	1,000 raindrops ($2)	BDT 3,200
Who Walks for Water? Time, Distance and Gender at Shared Water Points in One Neighbourhood In [the student's chosen lane, para or short street], how much time do households spend each day fetching water from shared tube wells or taps, and who in the household usually does this work?	2–5 students	about 42	1,000 raindrops ($2)	BDT 6,500

Proposals open and close during the year. The latest list is always at rainflower.world/research/proposals/open, and the latest edition of this handbook at rainflower.world/guides/handbook/pdf.



RESEARCH PAPER 1 OF 4

Is Our Water Safe? Drinking Water Quality, Treatment and Trust in a Bangladeshi Community

From Source to Glass: What Households in Bangladesh Do to Make Water Safe, and What They Believe

RESEARCH QUESTION

In the study area, how do households' drinking water practices (source choice, storage and treatment) compare with their beliefs about whether their water is safe, and what observable indicators support or challenge those beliefs?

2–5 students TEAM	**about 60** HOURS EACH	**13** WEEKS
2,500 raindrops ($5) REWARD PER STUDENT	**BDT 7,000** EXPENSE BUDGET	**Dhaka, Chittagong, Noakhali, Sylhet** REGIONS

Read online and claim it at rainflower.world/research/proposals/is-our-water-safe

IN THIS PROPOSAL

01 Summary
02 Why this matters
03 Background
04 Research question and hypothesis

05 Who should do this
06 Evidence plan
07 Survey design
08 Sampling and limits
09 Interview guide
10 Photo and observation plan
11 Optional measurements
12 Timeline
13 Analysis plan
14 Ethics and safety
15 Expected outcomes and limitations
16 Paper outline
17 Budget
18 Before-you-start checklist
19 Glossary
20 Submission guide

01 Summary

Most families in Bangladesh believe their drinking water is safe, or hope it is. Very few have ever seen a test result. This project does not try to test water in a laboratory. Instead it studies the three things a student team can measure well in the field: where drinking water comes from, what households do to it between the source and the glass, and what people believe about its safety and why.

Your team will survey 50 or more households about their drinking water source, storage, treatment and beliefs. You will observe and photograph the path water takes in a sample of homes, from pump or tap to the cup, and record simple observable indicators such as clarity, smell, container type and cover. You will interview people who know the local water: a tube-well mechanic, a filter seller, a health worker, a jar supplier, and families. An optional part uses low-cost field indicators (TDS meter, turbidity tube, arsenic test strips where arsenic is a known concern) to add numbers, with a firm rule that none of these can show water is safe to drink.

The result is a paper that maps how drinking water quality is produced and protected, or lost, inside a real community, and how far trust and practice match each other. The awareness outcome is a one-page "Source to Glass" checklist for households. The study works in any month of the year.

02 Why this matters

Bangladesh has done more than almost any country to bring drinking water close to people: tens of millions of tube wells, growing piped supply in cities, and a large private market for filtered and bottled water. But quality is a different problem from access. Groundwater in many districts contains arsenic or iron; shallow wells near latrines or drains can carry bacteria; piped water can be clean at the plant and dirty by the time it reaches a rooftop tank; and clean water can be spoiled by a dirty jug or an uncovered pot inside the home.

Households know some of this and act on it: they boil, filter, use alum, buy jars, or choose one tube well over another for taste. These actions cost money and time, and nobody knows whether they are the right ones for that family's water. At the same time, people's trust in a source often comes from habit, taste or the seller's word, not from any test. A study that records both practice and belief in one community shows where small changes, such as covering a container or changing a filter cartridge, could matter most. That is useful to your neighbours, and it is exactly the kind of local evidence that larger studies cannot collect.

03 Background

Arsenic in groundwater was identified as a national problem in Bangladesh in the 1990s, and large surveys found elevated arsenic in tube wells across many districts, with the national standard for arsenic in drinking water set at 50 micrograms per litre [verify: Bangladesh drinking water standard for arsenic and the WHO guideline value, cite an official or WHO source]. Tube wells were painted red or green in many areas after testing, though paint fades and new wells are often untested [verify: current status of well-marking programmes in your district].

Microbial contamination is the other main concern. Studies have found that water that is clean at the source can be contaminated by the time it is drunk, because of dirty containers, hands and storage practices; this is often called "recontamination at the point of use" [verify: find one peer-reviewed study on point-of-use contamination in Bangladesh, Google Scholar]. Household treatment options promoted in Bangladesh include boiling, ceramic and membrane filters, chlorine tablets and solar disinfection [verify: a WHO, UNICEF or DPHE source listing recommended household treatment methods].

Cities like Dhaka and Chittagong supply piped water through WASA systems, with quality monitored at treatment plants; quality at the tap and in building tanks depends on pipes and tank maintenance [verify: a news report or WASA statement on tap water quality or tank cleaning]. Sylhet and Noakhali have different source mixes, including deep tube wells, shallow wells and, near the coast, salinity problems [verify: a DPHE or academic source on groundwater salinity in coastal Noakhali].

Your paper needs only three or four verified sources, cited correctly. A single reliable source for each of arsenic, point-of-use contamination and household treatment is enough.

04 Research question and hypothesis

Primary research question: In [your study area], how do households' drinking water practices (source choice, storage and treatment) compare with their beliefs about whether their water is safe, and what observable indicators support or challenge those beliefs?

Secondary questions:

1. What share of households treat their drinking water, by which method, and how consistently?
2. Where along the path from source to glass do observable risks appear (uncovered storage, shared dipping cups, old filter cartridges, untested wells)?

Hypothesis: Most households (more than 60%) believe their drinking water is safe, but fewer than half use a consistent treatment method, and at least one observable risk will be found in most homes observed. Trust in the source will be based mainly on taste, habit and the seller's word, not on any test.

Your data may show the opposite, for example a community that treats carefully and distrusts its source. Report what you find.

05 Who should do this

Team size: 2 to 5. The home observation part needs two people at each visit for safety and for accurate recording, so this project needs a team of at least two.

Suited regions: All four, with different emphasis:

- **Dhaka and Chittagong:** piped supply, rooftop tanks, jar and filter markets.
- **Sylhet:** mixed tube-well and piped supply, iron and taste issues [verify].
- **Noakhali:** tube wells, salinity in some unions, arsenic in some areas [verify local DPHE data]; the optional arsenic strip test fits best here if a known arsenic area is nearby.

Suggested roles:

- **Survey lead:** builds and runs the AKTI Survey, recruits households, exports data.
- **Observation lead:** runs the source-to-glass observation in 15 to 20 homes with a partner, fills the observation sheet, takes photos.
- **Interview lead:** arranges and records 6 to 8 interviews, keeps the consent log.
- **Indicator lead (optional):** runs TDS, turbidity and, where relevant, arsenic strip readings and records them with the sample's source and time.
- **Writer and analyst:** builds the tables and charts, drafts the paper. Can be shared.

06 Evidence plan

Every claim in your paper rests on evidence you collected. The three required evidence types are joined by a structured observation sheet, which is the heart of this study.

EVIDENCE	WHAT IT WILL SHOW	TARGET AMOUNT
AKTI Survey of households	Source, storage, treatment habits, beliefs about safety and where that belief comes from	50 or more completed responses
Source-to-glass observation	What actually happens in the home: containers, covers, cups, filter condition, well condition	15 to 20 homes observed with a checklist
Video interviews	Why people choose, treat or trust their water; what experts and sellers see	6 to 8 interviews of 5 to 10 minutes
Geo-tagged photos	Sources, storage, filters, well markings, and proof you were there	25 or more photos with location on
Optional indicator readings	Simple numbers for TDS, turbidity, and arsenic presence where relevant	20 or more readings, each tied to a source and time

Why each fits the question: the survey measures belief and reported practice; observation measures real practice and visible risk; interviews explain the reasons; photos show readers the path from source to glass; indicators add numbers but never a verdict on safety.

07 Survey design

Build this survey on AKTI Survey in Bangla with an English copy for the paper. Keep it under 8 minutes. Pilot it with 3 to 5 people and fix anything that confuses them.

Target respondent: one adult (18 or older) per household who usually handles drinking water, often the person who cooks. Do not survey children.

Recruitment: every second household on 3 to 5 streets, lanes or paras in your study area, in daylight. Record refusals and absences. If you include relatives or friends, mark them.

Sample size target: 50 completed responses.

Draft questions (ready to paste):

1. Which area do you live in? (short answer: ward, mahalla, para or village)
2. How many people live in your household, and how many are children under 5? (two numbers)
3. What is your main source of **drinking** water? (single choice: piped supply / own tube well or pump / shared or public tube well / 20-litre jar / bottled water / pond, river or rainwater / other)
4. Is this the same source you use for cooking? (yes / no, cooking source: …)
5. If you use a tube well, is it marked with paint (red, green) or a tag? (single choice: red / green / other mark / no mark / don't know / not applicable)
6. Has your drinking water source ever been tested, as far as you know? (single choice: yes, I saw a result / yes, I heard it was tested / no / don't know)
7. Do you treat your drinking water before drinking? (single choice: always / sometimes / never)
8. If you treat it, how? (multiple choice: boiling / filter jug or candle filter / electric or membrane filter / chlorine tablets or liquid / alum / letting it settle / other)
9. If you use a filter, when did you last clean it or change the cartridge? (single choice: within a month / 1–6 months / more than 6 months / never / don't know)
10. If you boil, for how long after it starts bubbling? (single choice: less than 1 minute / 1–5 minutes / more than 5 minutes / don't know)
11. How do you store drinking water at home? (multiple choice: covered pot or kolshi / uncovered pot / plastic bottle / filter container / jar as delivered / refrigerator bottle / other)
12. How do you take water from the container? (single choice: tap on the container / pouring / dipping a cup or glass / dipping a hand / other)
13. How often is the storage container washed? (single choice: daily / weekly / monthly / rarely / don't know)
14. Do you think your drinking water is safe to drink? (single choice: yes, definitely / probably / not sure / probably not / no)
15. What makes you think so? (multiple choice: taste or smell / it looks clear / it has always been fine / a test result / the seller or supplier says so / a health worker said so / neighbours use it / I treat it / other)
16. In the last 12 months, has anyone in your household had diarrhoea or stomach illness that you connected with water? (single choice: yes / no / not sure) *(sensitive: optional to answer)*

17. Has your household ever changed drinking water source because of quality, taste or smell? (yes / no; if yes, from what to what)
18. How much does your household spend per month on treating or buying drinking water (filter, fuel, jars, bottles)? (number in BDT, or 0)
19. Would you like your water tested if it were free? (yes / no / don't know)
20. What is the one thing you most want to know about your drinking water? (short answer)

Questions 14 and 15 against questions 7 to 13 are the heart of the study: what people believe, and what they actually do.

08 Sampling and limits

Your survey and observations describe the households you reached, not your city, your district or Bangladesh. Say so in the paper.

- **Who to recruit:** adults who handle water, in a defined area, chosen by a rule (every second household). Aim for a mix of housing types; storage and treatment differ between a flat with a filter and a rented room with one kolshi.
- **Observation homes:** choose 15 to 20 homes from among survey respondents who agree to a short visit. These are volunteers, so they may be more careful than average. Say this in the limitations.
- **What the sample can claim:** the share of your respondents who treat water, the common storage practices, the visible risks found in observed homes, and the gap between belief and practice in your sample.
- **What it cannot claim:** that any water is safe or unsafe; disease rates; district-level patterns; or comparisons with areas you did not visit.
- **Non-response:** record refusals and absences for both the survey and the observation visits.

09 Interview guide

Record 6 to 8 interviews of 5 to 10 minutes. Interview people in these roles:

- a tube-well mechanic or the person who installs or repairs pumps locally
- a filter seller or a shop that sells filters and cartridges
- a jar supplier or refill plant worker
- a community health worker, pharmacy worker or clinic staff member
- a household that treats water carefully
- a household that does not treat water
- a building caretaker who manages a rooftop tank (cities)
- if possible, a DPHE, WASA or pourashava water staff member

Sample questions (choose 6 to 8 per interview):

1. Where does the drinking water here come from, and what happens to it before people drink it?
2. What do you see go wrong most often between the source and the glass?
3. Has the water here ever been tested? Who tested it, and what happened after?
4. What do people ask you about water quality? What do you tell them?
5. Which treatment methods do people use, and which do you think work?
6. How do people decide whether a well, a tap or a jar is safe?
7. What changes have you seen in the water in the last few years: taste, colour, iron, salt, pressure?
8. What would you tell a new family moving here about the water?
9. What do you think people misunderstand about water safety?
10. If one thing could be fixed about drinking water here, what should it be?

Consent script (read aloud before recording):

Bangla: আমি রেইনফ্লাওয়ার প্ল্যাটফর্মের একজন ছাত্র গবেষক। আমরা আমাদের এলাকার খাবার পানির মান, পানি শোধন ও মানুষের বিশ্বাস নিয়ে একটি গবেষণা করছি। এই সাক্ষাৎকারটি প্রায় দশ মিনিটের। আপনার নাম বা ঠিকানা আমরা প্রকাশ করব না। আপনি তিনটি বিষয়ে আলাদাভাবে সম্মতি দিতে পারেন: এক, সাক্ষাৎকারে অংশ নেওয়া; দুই, ভিডিও রেকর্ড করা; তিন, রেকর্ডের কোনো অংশ প্রকাশ্যে ব্যবহার করা। আপনি যেকোনো সময় থামতে পারেন। আপনি কি রাজি?

English: I am a student researcher with the Rainflower platform. We are doing a study about drinking water quality, treatment and people's beliefs in our area. This interview takes about ten minutes. We will not publish your name or address. You can agree to three things separately: one, taking part; two, being recorded on video; three, having any part of the recording shared publicly. You can stop at any time. Do you agree?

Log the three answers with date, time and place in your field diary. Use the same script, shortened, before each home observation visit.

Recording tips: phone sideways, light behind you, microphone close, 10 seconds of surroundings first, date and place said aloud at the start.

10 Photo and observation plan

Turn on location (geo-tagging) in the camera before the first visit. Take 25 or more photos. Log each one: date, time, place, what it shows.

Photo ideas:

1. The main drinking water source: tube well, tap, jar stack or bottle shelf.
2. A tube well's paint mark or tag, or the absence of one.
3. The surroundings of a well or tap: distance to a drain, latrine or rubbish, taken from a few metres away.
4. A household storage container, showing whether it is covered.
5. The cup, jug or tap used to take water from the container.
6. A filter in use, and its cartridge or candle if the family will show it.
7. A boiling pot or the stove used for boiling water.
8. A rooftop tank and its lid, with the building caretaker's permission.

9. A jar refill point or delivery van.
10. Water in a clear glass against a white background, to show clarity (no claims about safety).
11. A filter shop shelf with cartridges and their prices.
12. Your team running an observation visit or reading an indicator, with permission.

Privacy rules: never photograph a child's face. Adults' faces only with permission for public sharing. Inside homes only with permission, and never show anything that identifies the family. Exact home locations stay in the private evidence package; the paper uses the area name only.

Source-to-glass observation sheet (one per home, 10 minutes): record source type and distance from home; well marking; visible surroundings risk (drain, latrine, animals within about 10 metres: yes/no); storage container type; covered (yes/no); how water is taken out (tap, pour, dip); container looks clean (yes/no, your judgement, say what you saw); treatment method in use; filter condition (cartridge date if known, visible dirt); water clarity in a glass (clear / slightly cloudy / cloudy); smell (none / earthy / chemical / rotten / other); any other observation. Aim for 15 to 20 homes.

11 Optional measurements

These are optional. They can make your paper stronger, but the study works without them. Each reading must be tied to a source, a time and a container, and your paper must state that **none of these show whether water is safe to drink**.

- **TDS meter** (BDT 800 to 1,500): a number for dissolved solids. High readings can go with salinity or iron; low readings say nothing about bacteria or arsenic. Useful to compare a jar, a tap and a well in the same home.
- **Turbidity tube** (BDT 500 to 1,500, or a home-made version with a clear 1-litre bottle and a printed black cross): how cloudy the water is. Cloudy water is harder to treat; clear water is not proof of safety.
- **Arsenic field test strips** (BDT 1,500 to 3,000 for a kit; only in areas where arsenic is a known concern): follow the kit instructions exactly, with gloves, in open air, and let an adult supervise. A strip can show presence above a rough level; it is not a laboratory result. Never tell a family their well is safe or unsafe from a strip; say what the strip showed and recommend a DPHE test. If a reading is high, record it and inform your coordinator so Rainflower can pass it to the right authority.
- **Time and distance:** time the round trip to the drinking water source and count the trips per day; this is a cost of quality that surveys miss.

12 Timeline

Plan for 13 weeks. Your AI research assistant checks each stage. Two stages have a human gate.

STAGE	WEEKS	WHAT YOU DO	WHAT YOU SUBMIT	GATE
1. Choose and plan	1–2	Define the study area. Build the AKTI survey. Write the observation sheet and interview guide. Decide on optional indicators. Find local source and test information.	Research question, survey link, observation sheet, interview guide, photo plan, roles	AI coach
2. Permission, checklist and pilot	2–3	Parental agreement. Consent script ready. Pilot survey with 3–5 people and one practice observation visit.	Pilot notes and changes, consent script, parental confirmation	Coordinator checklist
3. First sample and advisor review	3–4	10–20 responses, 3 observation visits, 1–2 interviews, 5+ photos, first optional readings.	AKTI export, observation sheets, interview files, photos, field diary	Advisor review
4. Full data collection	5–8	Reach 50 responses, 15–20 observations, 6–8 interviews, 25 photos.	Full exports, all sheets and files, photo log, field diary	AI coach
5. Analysis	9–10	Belief-versus-practice tables, risk counts, charts, interview themes, indicator summary.	Tables, charts, draft findings	AI coach
6. Write	11–12	Full paper with AI-use and ethics statements. "Source to Glass" household checklist.	Draft paper, statements, checklist sheet	AI coach
7. Final review and submit	13	Before-you-submit list. Evidence package manifest. Short conversation explaining findings.	Final paper, manifest, author list	Coordinator checklist, then Rainflower review

13 Analysis plan

Decide this before data collection, and note any change in the paper.

1. **Sources.** From Q3 to Q6, count households by drinking source, by whether the source is marked, and by whether it was ever tested. Bar chart.
2. **Treatment.** From Q7 to Q10, report the share who treat always, sometimes, never; the methods used; and, for filter users, how recently the cartridge was changed; for boilers, how long they boil. Define "consistent treatment" as "always" plus a method, and report that share.
3. **Storage and handling.** From Q11 to Q13 and the observation sheet, count covered versus uncovered storage, dipping versus tap or pour, and washing frequency.
4. **Belief.** From Q14, report the share who say "definitely" or "probably" safe. From Q15, count the reasons, and report the share whose belief rests on a test result versus taste, habit or a seller's word.

5. **Belief versus practice.** Cross Q14 with your "consistent treatment" measure and with the observed risks. Report the share of households who believe their water is safe **and** use no consistent treatment **and** have at least one observed risk. This is your hypothesis test.
6. **Observed risks.** From the observation sheet, count each risk type across homes and report the median number of risks per home and the most common one.
7. **Indicators (optional).** Report TDS and turbidity as ranges and medians by source type. Report arsenic strips as presence counts by well, with the kit's rough level, and state clearly that these are field indicators, not safety results.
8. **Interviews.** Write 3 to 5 themes with one or two anonymised quotes each.
9. **Health question (Q16).** Report the count only, with the note that it is self-reported and not a measure of water safety. Do not link it to any single source.
10. **Limitations check.** Sample size, refusals, volunteer bias in observed homes, and sample-only claims.

Use a spreadsheet for all counts and keep it in the evidence package.

14 Ethics and safety

- **Three separate permissions** for every person: taking part, being recorded, and public sharing. For home observations, ask separately for photographs inside the home.
- **Parental agreement** for every team member before field work.
- **Adults only** as respondents and interviewees.
- **Sensitive question:** Q16 about illness is optional; say so before asking; never ask about a named child's illness.
- **No verdicts.** Never tell a household their water is safe or unsafe. If an optional reading looks worrying, say what the strip or meter showed, recommend a DPHE or WASA test, and report it to your coordinator the same day.
- **Privacy:** no names, phone numbers or addresses in the paper. Home locations and faces stay in the private evidence package, kept only as long as review and any journal process need, and deleted on request.
- **Physical and chemical safety:** work in daylight, in pairs; do not climb to rooftop tanks; do not lean over open wells; use gloves with arsenic kits and dispose of strips as the kit instructs; an adult supervises any chemical test.
- **Respect:** a family's water practices are not a test they can fail. Thank them, and leave the "Source to Glass" checklist with them at the end of the project if they want it.

15 Expected outcomes and limitations

Expected outcomes:

- A map of drinking water sources, marking and testing status for the households in your sample.
- Measured shares for treatment, consistent treatment, storage and handling practices.

- A belief-versus-practice table showing how many households trust untreated, untested water, and what that trust rests on.
- A count of observable risks along the source-to-glass path in 15 to 20 homes, with photos.
- 3 to 5 interview themes explaining local practice.
- An optional indicator summary, clearly labelled as field indicators.
- A one-page "Source to Glass" household checklist as the awareness outcome.

Limitations written in advance:

- Results describe one area and one sample.
- Observed homes are volunteers and may be more careful than others.
- Practices are partly self-reported and may be improved for the interviewer.
- No laboratory testing; no statement about safety is possible from this study.
- Illness reports are self-reported and cannot be linked to water.
- Conditions may change over the 13 weeks; every observation and reading carries a date.

16 Paper outline

Write 5,000 to 10,000 words in English, plus tables, charts and the appendix.

1. Title, authors, school or region, date
2. Abstract (150 to 200 words)
3. Introduction and background (3 to 4 verified sources)
4. Research question and hypothesis
5. Methods: study area, sampling, survey, observation sheet, interviews, photos, optional indicators, ethics
6. Results: sources; treatment; storage and handling; belief and its basis; belief versus practice; observed risks; indicators; interview themes
7. Discussion: what the gaps mean, surprises, comparison with the hypothesis, what a household could change
8. Limitations
9. Conclusion and the "Source to Glass" checklist
10. AI-use statement
11. Ethics statement
12. References
13. Appendix: survey questions, observation sheet, interview guide, photo log, indicator log

17 Budget

Cash budget: **BDT 7,000** for the team. Drop the optional items if the team does not use them.

ITEM	ESTIMATE (BDT)	NOTES
Local transport for field and observation visits	2,000	10 to 12 visits; observation visits need two people
Mobile data	1,000	For AKTI Survey and uploads, shared across the team
Printing consent scripts, observation sheets and the checklist	1,000	80 to 100 pages
Clear glass, white card, gloves, small sample bottles	1,000	For clarity photos and readings
Optional TDS meter	1,000	If the team chooses indicators
Optional arsenic strips or turbidity tube	1,000	Only where relevant
Total	**7,000**	

Estimated hours: about 60 hours per student across 13 weeks (planning 8, field work 27, analysis 12, writing 11, review 2). **Reward:** 2,500 raindrops for each student on the team.

18 Before-you-start checklist

- [ ] Our study area is one named ward, mahalla, union or para, and we wrote down why we chose it.
- [ ] Every team member has a parent's or guardian's agreement.
- [ ] Our AKTI Survey is built in Bangla with the 20 questions, tested on 3 to 5 people, and fixed.
- [ ] Our observation sheet is printed or set up as a form, and we did one practice visit.
- [ ] We have the consent script in Bangla and English and know the three separate permissions, plus the extra permission for photos inside homes.
- [ ] Location (geo-tagging) is on in every phone camera we will use.
- [ ] We have a field diary with date, time, place, what happened.
- [ ] We know who does what: survey lead, observation lead, interview lead, indicator lead (optional), writer.
- [ ] We have read the Ethics and safety section, especially "No verdicts."
- [ ] If we use indicators, we have the kit instructions, gloves, and an adult who will supervise any chemical test.
- [ ] We know who to tell the same day if a reading looks worrying: our coordinator.
- [ ] We have found what is publicly known about water sources and testing in our area and written down the source.
- [ ] We know our first-sample target for the advisor review: 10 to 20 responses, 3 observations, 1 to 2 interviews, 5 photos.

19 Glossary

- **Point of use:** the place where water is actually drunk; quality can change between the source and here.
- **Recontamination:** clean water becoming dirty again through containers, hands or cups.
- **Arsenic:** a natural element in some groundwater; harmful over long exposure; invisible and tasteless.
- **Microbial contamination:** bacteria or other germs in water, often from human or animal waste; invisible.
- **TDS:** total dissolved solids, a number from a cheap meter; not a measure of safety.
- **Turbidity:** how cloudy water is; cloudy water is harder to treat.
- **Field indicator:** a quick measurement that hints at a condition; not a laboratory test.
- **DPHE:** Department of Public Health Engineering, the agency responsible for rural water supply and testing in Bangladesh [verify current name and role].
- **WASA:** Water Supply and Sewerage Authority, the city water utility in Dhaka, Chittagong and some other cities.
- **Consistent treatment:** treating drinking water every time with a method that is actually maintained.
- **Volunteer bias:** when the people who agree to be observed differ from those who do not.
- **Self-reported:** information a person gives about themselves, which may not match what they do.

20 Submission guide

Submit through your claim page on Rainflower, one stage at a time. Each stage opens when the previous one has passed. Your AI research assistant reviews every submission within a day and tells you what is met, what needs work, and what to do next. Stage 2 waits for your coordinator's checklist; stage 3 waits for your advisor's review; stage 7 goes to the coordinator's final checklist and then to Rainflower review and grading.

At stage 7 your evidence package manifest must list: the AKTI Survey export (CSV), every observation sheet, every interview file with its date, place and the three consent answers, every photo with its log line, the indicator log if used, the field diary, the analysis spreadsheet, and the final paper. Keep the originals; upload the manifest and the files Rainflower asks for.



RESEARCH PAPER 2 OF 4

The Water Economy of Bangladesh: What People Pay for Water in Our Cities, Towns and Villages

The Price of a Litre: How Water Is Bought, Sold and Valued in Bangladesh

RESEARCH QUESTION

What is the real price per litre of water from each source used by households in the study area, and how accurately do households know what they pay?

2–5 students TEAM	**about 80** HOURS EACH	**13** WEEKS
2,500 raindrops ($5) REWARD PER STUDENT	**BDT 7,000** EXPENSE BUDGET	**Dhaka, Chittagong, Noakhali, Sylhet** REGIONS

Read online and claim it at rainflower.world/research/proposals/the-water-economy-of-bangladesh

IN THIS PROPOSAL

01 Summary
02 Why this matters
03 Background
04 Research question and hypothesis
05 Who should do this
06 Evidence plan

07 Survey design
08 Sampling and limits
09 Interview guide
10 Photo and observation plan
11 Optional measurements
12 Timeline
13 Analysis plan
14 Ethics and safety
15 Expected outcomes and limitations
16 Paper outline
17 Budget
18 Before-you-start checklist
19 Glossary
20 Submission guide

01 Summary

This project asks a simple question that almost nobody can answer from memory: *what does one litre of water actually cost a household in Bangladesh, and does the household know?* Your team will measure the real price of water in one or two communities. You will record the price of piped water, tube-well water, jar water, bottled water and water from sellers, and then survey households about how much they spend, which sources they use and what they believe about the price. Short video interviews with water sellers, shop owners and households will explain the reasons behind the numbers.

The result is a paper that shows the "water economy" of a real place: where water comes from, who sells it, what it costs per litre at each step, and how aware people are of what they pay. The study works in any month of the year because prices, sources and habits exist all year round. The paper will also produce a one-page "Know Your Water Price" sheet that you can share in your community as an awareness outcome.

02 Why this matters

In Bangladesh, water is often called free, but almost every household pays for it in some way. City households pay a monthly water bill, buy 20-litre jars, or pay a neighbour with a deep tube well. Town households may pay a pourashava (municipal) fee, buy bottled water for guests, or spend money on a filter. Village households may pay to install or repair a tube well, buy jars when the well water is salty or has arsenic, or walk far to a safe source, which costs time instead of money.

These costs are rarely compared. A family may pay BDT 50 for a 20-litre jar from a shop and at the same time pay a water bill for piped water they do not drink. The poorest families often pay the highest price per litre, because they buy small amounts from sellers. When people do not know what they pay per litre, they cannot make good choices or ask for better service. Your study will make this invisible economy visible for one community, with real numbers.

03 Background

Public water supply in large cities is run by water authorities such as Dhaka WASA and Chittagong WASA, which charge a metered tariff per 1,000 litres for residential and commercial connections [verify: current residential tariff per 1,000 litres, official WASA website]. Many homes also draw groundwater through private pumps. In smaller towns like Noakhali, the pourashava may run a piped system for part of the town,

and most households use tube wells [verify: local pourashava water service area]. In Sylhet, the city corporation supplies some areas, and many households depend on tube wells and private supply [verify].

Alongside public supply there is a large private market: 20-litre refill jars delivered by van or rickshaw, bottled water in 500 ml to 5-litre sizes, "water ATMs" or vending points in some city areas, and informal sellers who carry water in drums [verify: typical jar and bottle prices in your area at the time of study]. Household filters, boiling fuel and tube-well repair are also part of the cost of water, even though they are not a price per litre.

Studies by development organisations and newspapers have reported that poor urban households in Bangladesh may pay many times the official tariff per litre when they buy from informal sellers [verify: find one report or news article from a reliable source and cite it properly]. Research on willingness to pay for safe water in rural Bangladesh has also been published in academic journals [verify: search Google Scholar for "willingness to pay" "drinking water" Bangladesh and cite one peer-reviewed study]. Your paper does not need many sources. Two or three verified sources, cited correctly, are enough for a strong background section.

04 Research question and hypothesis

Primary research question: What is the real price per litre of water from each source used by households in [your study area], and how accurately do households know what they pay?

Secondary questions:

1. How does the price per litre differ between piped water, tube-well water, jar water, bottled water and water bought from sellers?
2. Which sources do households use for drinking versus cooking and washing, and why?

Hypothesis: Households in the study area pay a higher price per litre for water they drink (jars, bottles, sellers) than for water they use for other purposes (piped, tube well), and most households cannot state their monthly water spending within 25% of what the price data shows.

Your data may prove this hypothesis wrong. That is fine. A paper that reports "we expected X but found Y" is still a strong paper if the data is good.

05 Who should do this

Team size: 2 to 5 students. This project has three parts (price observation, household survey, interviews) that work best when split across team members, so it needs a team of at least two.

Suited regions: All four. The project is strongest when a team studies one clear area, such as one ward of Dhaka or Chittagong, one neighbourhood of Sylhet, or one union or town ward in Noakhali. Teams in different regions can later compare results.

Suggested roles:

- **Price recorder:** visits shops, jar sellers and water points, records prices and takes photos.

- **Survey lead:** builds and runs the AKTI Survey, recruits respondents, exports data.
- **Interview lead:** arranges and records 6 to 8 video interviews, keeps consent records.
- **Writer and analyst (can be shared):** builds the price-per-litre table, charts and the paper draft.

06 Evidence plan

Every claim in your paper must rest on evidence you collected. This project uses the three required evidence types plus one small addition, price observation.

EVIDENCE	WHAT IT WILL SHOW	TARGET AMOUNT
AKTI Survey of households	Which sources people use, how much they spend, what they believe they pay	50 or more completed responses from different households
Video interviews	Why prices are what they are; how sellers and families decide	6 to 8 interviews of 5 to 10 minutes
Geo-tagged photos	Proof of sources, sellers, price boards, bills and your presence in the field	20 or more photos with location on
Price observation sheet	The actual price of each water product at each place	15 or more price records across at least 5 points of sale

Why each fits the question: the survey measures what households believe and spend; price observation measures what water really costs; interviews explain the gap between the two; photos show readers the real places and prove the work was done in the field.

07 Survey design

Build this survey on AKTI Survey in Bangla, with an English copy for your paper. Keep it under 8 minutes. Pilot it with 3 to 5 people before the real run and fix anything that confuses them.

Target respondent: one adult (18 or older) per household who knows the household's spending. Do not survey children. Ask the respondent, not a neighbour, about their own household.

Recruitment: every second household on 3 to 5 streets or lanes in your study area, visited in daylight. Record the street name and the number of refusals. Do not survey only your friends and relatives; if you must include some, mark them in the data.

Sample size target: 50 completed responses.

Draft questions (ready to paste):

1. Which area do you live in? (short answer: ward, mahalla or village name)
2. How many people live in your household? (number)
3. What type of home is it? (single choice: own house / rented flat / rented room / other)

4. Which of these water sources does your household use? (multiple choice: piped supply with meter / piped supply without meter / own tube well or pump / shared or public tube well / 20-litre jar delivery / bottled water from shop / water seller with drum or van / pond, river or other surface water / other)
5. Which ONE source do you mainly use for **drinking**? (single choice, same list)
6. Which ONE source do you mainly use for **cooking**? (single choice, same list)
7. Which ONE source do you mainly use for **washing and bathing**? (single choice, same list)
8. Do you treat your drinking water at home? (single choice: boil / filter / chlorine tablets or alum / nothing / other)
9. If you have a water bill or fee, how much do you pay per month? (number in BDT, or "no bill")
10. How many 20-litre jars does your household buy per week? (number, 0 if none)
11. What do you pay for one 20-litre jar? (number in BDT)
12. How many bottles of water (any size) does your household buy per week? (number)
13. What did you pay the last time you bought water from a seller or neighbour? (number in BDT, and amount of water)
14. About how much does your household spend on water in total per month, including bills, jars, bottles, fuel for boiling and filter costs? (number in BDT)
15. How confident are you in that number? (single choice: very confident / somewhat / just a guess)
16. Do you think the price you pay for drinking water is fair? (single choice: too high / about right / cheap / don't know)
17. Do you know the official price per 1,000 litres of piped water in your area? (single choice: yes, I know it / I have an idea / no)
18. If yes, what do you think it is? (number in BDT)
19. Have you ever changed your water source because of price? (single choice: yes / no)
20. What would make you pay more for water? (multiple choice: guaranteed safe to drink / delivered to home / always available / better taste / nothing / other)

Question 14 against questions 9 to 13 is the heart of the study: it lets you compare what people think they spend with what their own answers add up to.

08 Sampling and limits

Your survey tells you about the households you reached, not about your whole city and not about Bangladesh. Say this clearly in your paper.

- **Who to recruit:** adults in a defined area, chosen by a rule (every second household) rather than by convenience. Try for a mix of housing types, because water spending differs a lot between a rented room and an own house.
- **How to choose streets:** pick streets with different conditions if you can, for example one near a main road with shops and one inside a residential block. Write down why you chose them.
- **What the sample can claim:** differences between sources, and the gap between believed and calculated spending, for the households in your sample.

- **What it cannot claim:** city-wide averages, differences between rich and poor areas you did not visit, or trends over time.
- **Non-response:** record how many households refused or were absent. Readers need this number.

09 Interview guide

Record 6 to 8 interviews of 5 to 10 minutes each, with the camera on the person (if they agree) or on the place (if they prefer not to show their face). Interview people in these roles:

- a 20-litre jar seller or delivery worker
- a shop owner who sells bottled water
- a water seller with a drum or van, if your area has one
- a household that buys most of its drinking water
- a household that uses only a tube well or piped water
- a caretaker or operator of a public tube well, water point or building pump
- if possible, a staff member of the water authority or pourashava water office

Sample questions (choose 6 to 8 per interview):

1. Where does the water you sell or use come from, and how does it reach here?
2. What do you charge, or pay, for water, and how is that price decided?
3. Has the price changed in the last year? Why?
4. Who are your customers, or who do you buy from?
5. What costs are inside the price: transport, fuel, electricity, bottles, labour?
6. Do people ask whether the water is safe? What do you tell them?
7. What happens when supply is short or the pump breaks?
8. Do you think people know what they pay for water per litre? Why or why not?
9. If you could change one thing about water supply here, what would it be?
10. Is there anything about water and money here that outsiders do not understand?

Consent script (read aloud before recording):

Bangla: আমি রেইনফ্লাওয়ার প্ল্যাটফর্মের একজন ছাত্র গবেষক। আমরা আমাদের এলাকায় পানির দাম ও খরচ নিয়ে একটি গবেষণা করছি। এই সাক্ষাৎকারটি প্রায় দশ মিনিটের। আপনার নাম বা ঠিকানা আমরা প্রকাশ করব না। আপনি তিনটি বিষয়ে আলাদাভাবে সম্মতি দিতে পারেন: এক, সাক্ষাৎকারে অংশ নেওয়া; দুই, ভিডিও রেকর্ড করা; তিন, রেকর্ডের কোনো অংশ প্রকাশ্যে ব্যবহার করা। আপনি যেকোনো সময় থামতে পারেন। আপনি কি রাজি?

English: I am a student researcher with the Rainflower platform. We are doing a study about the price and cost of water in our area. This interview takes about ten minutes. We will not publish your name or address. You can agree to three things separately: one, taking part; two, being recorded on video; three, having any part of the recording shared publicly. You can stop at any time. Do you agree?

Write the three answers (yes/no for each) in your field diary with the date, time and place.

Recording tips: hold the phone sideways, stand with the light behind you, keep the microphone close, and record 10 seconds of the surroundings first so the location is clear. Say the date and place at the start of each recording.

10 Photo and observation plan

Turn on location (geo-tagging) in your camera settings before the first field visit. Take 20 or more photos. For each photo, write one line in your field diary: date, time, place, what it shows.

Photo ideas:

1. A price board or price list at a shop selling bottled or jar water.
2. A 20-litre jar with its brand or refill label, and the price if shown.
3. A water bill or meter from a household that agrees to show it (hide the name and account number).
4. A jar delivery van, rickshaw or cart on its route.
5. A public tube well with people collecting water, taken from a distance so faces are not clear.
6. A water ATM or vending point, if your area has one.
7. A household filter or boiling pot, with permission.
8. A water seller's drum or container and the measuring cup or jug used.
9. A building's rooftop tank and pump, with permission from the building manager.
10. A shop shelf with different bottle sizes and their prices.
11. The street where you ran the survey, to show the housing type.
12. Your team at work: holding the survey phone, measuring, or writing the field diary.

Privacy rules: never photograph a child's face. Photograph adults' faces only with permission for public sharing. Do not photograph the inside of a home without permission. Exact home locations stay in your private evidence package; the paper uses the area name only.

Observation sheet: at every point of sale, record: date, place, product (jar 20 L, bottle 500 ml, bottle 1 L, bottle 5 L, seller drum, piped tariff), price in BDT, volume in litres, and price per litre (price ÷ litres). Aim for 15 or more records from at least 5 different places.

11 Optional measurements

These are optional. They can make your paper stronger, but the study works without them.

- **Time cost:** at a public tube well or water point, time how long it takes a person to fill one container, and count how many people queue in 30 minutes. Time is a real cost of water.
- **TDS reading:** a low-cost TDS meter (BDT 800 to 1,500) gives a number for dissolved solids in jar water, tube-well water and piped water. It does **not** tell you whether water is safe to drink, and your paper must say so. It can show whether a higher price goes with a different reading.
- **Volume check:** measure a "20-litre" jar with a marked bucket or bottles to check its real volume. Report what you find; do not name the company.

12 Timeline

Plan for 13 weeks. Your AI research assistant checks each stage with you. Two stages have a human gate.

STAGE	WEEKS	WHAT YOU DO	WHAT YOU SUBMIT	GATE
1. Choose and plan	1–2	Define the study area and streets. Build the AKTI survey. Write interview questions. Assign roles.	Research question, survey link, interview guide, photo plan, team roles	AI coach
2. Permission, checklist and pilot	2–3	Parental agreement. Consent script ready in Bangla and English. Pilot survey with 3–5 people.	Pilot notes and survey changes, consent script, parental confirmation	Coordinator checklist
3. First sample and advisor review	3–4	10–20 survey responses, 5 price records, 1–2 interviews, 5 photos.	AKTI export, price sheet, interview files, photos, field diary pages	Advisor review
4. Full data collection	5–8	Reach 50 responses, 15 price records, 6–8 interviews, 20 photos.	Full exports, all files, photo log, field diary	AI coach
5. Analysis	9–10	Price-per-litre table, spending comparison, charts, first findings.	Tables, charts, draft findings	AI coach
6. Write	11–12	Full paper draft with AI-use and ethics statements. "Know Your Water Price" sheet.	Draft paper, statements, awareness sheet	AI coach
7. Final review and submit	13	Before-you-submit checklist. Evidence package manifest. Short conversation explaining findings.	Final paper, manifest, author list	Coordinator checklist, then Rainflower review

13 Analysis plan

Decide this before you collect data, and do not change it afterwards without saying so in the paper.

1. **Price per litre table.** From the observation sheet, compute price ÷ litres for every record. Report the lowest, highest and middle (median) price per litre for each product type. Compare with the official piped tariff per litre (tariff per 1,000 litres ÷ 1,000) [verify tariff].
2. **Source use.** From survey questions 4 to 7, count how many households use each source for drinking, cooking and washing. Show as a bar chart.
3. **Calculated monthly spend.** For each household, add up: monthly bill (Q9) + jars per week × jar price × 4.3 (Q10 × Q11) + bottles per week × typical bottle price × 4.3 (Q12 × your observed price) + seller purchases if regular (Q13). Call this the *calculated spend*.

4. **Believed spend.** Q14 is the *believed spend*. For each household compute the gap: (believed − calculated) ÷ calculated. Report how many households are within 25% (your hypothesis test), how many guess too low, and how many guess too high. Cross this with Q15 (confidence).
5. **Awareness.** Report Q16 to Q18: how many say the price is fair, how many know the official tariff, and how close their guess is.
6. **Price sensitivity.** Report Q19 and Q20 as counts.
7. **Interviews.** Write 3 to 5 themes that appear in the interviews (for example "transport is the biggest cost inside the jar price"). Support each theme with one or two short, anonymised quotes.
8. **Limitations check.** State the sample size, the refusal count, and that results describe your sample only.

Use a spreadsheet for all counting. Keep the spreadsheet in your evidence package.

14 Ethics and safety

- **Three separate permissions** for every person: taking part, being recorded, and public sharing. A yes to one is not a yes to the others.
- **Parental agreement** for every team member before field work starts. Keep a signed or messaged confirmation.
- **Adults only** as survey respondents and interviewees. If a person under 18 wants to help you, they may, but they cannot be a respondent without a parent's agreement.
- **Privacy:** no names, phone numbers, addresses or account numbers in the paper or the awareness sheet. Bills and meters are photographed with identifying details covered.
- **Data storage:** raw survey exports, videos and original photos stay in the private evidence package, visible only to your team, your coordinator, your advisor and Rainflower reviewers. They are kept only as long as review and any journal process need them, and are deleted on request.
- **Physical safety:** work in daylight, in pairs, in public places. Tell your family where you are going. Do not enter rooftops, pump rooms, factories or water authority sites without permission. Stay away from open wells, riverbanks and fast water.
- **Honesty with sellers:** tell sellers you are a student researcher. Do not pretend to be a customer to get a price, and do not name any business in the paper when reporting a problem.

15 Expected outcomes and limitations

Expected outcomes:

- A price-per-litre table for 5 or more water products in your area, compared with the official tariff.
- A clear picture of which sources households use for drinking versus other uses, and the money and time each costs.
- A measured gap between what households believe they spend and what their own answers add up to.
- 3 to 5 themes from interviews explaining how the local water market works.
- A one-page "Know Your Water Price" awareness sheet for your community.

Limitations written in advance:

- Results describe one area and one sample, not a city or the country.
- Spending answers are self-reported and may be wrong; this is in fact part of what the study measures.
- Prices may change during the 13 weeks; record the date of every price.
- Interviewees who refuse recording are still valuable; take notes and say the interview was not recorded.
- Optional TDS readings say nothing about safety.

16 Paper outline

Write 5,000 to 15,000 words in English, plus tables, charts and the appendix. Use this structure:

1. Title, authors, school or region, date
2. Abstract (150 to 200 words)
3. Introduction and background (with 2 to 3 verified sources)
4. Research question and hypothesis
5. Methods: study area, sampling, survey, interviews, price observation, photos, ethics
6. Results: price per litre; source use; believed versus calculated spend; awareness; interview themes
7. Discussion: what the results mean, surprises, comparison with the hypothesis
8. Limitations
9. Conclusion and the awareness sheet
10. AI-use statement
11. Ethics statement
12. References
13. Appendix: survey questions, interview guide, price observation sheet, photo log

17 Budget

Cash budget: **BDT 7,000** for the team.

ITEM	ESTIMATE (BDT)	NOTES
Local transport for field visits	2,000	Rickshaw, bus or CNG for 8 to 10 visits
Mobile data	1,000	For AKTI Survey and uploads, shared across the team
Printing consent scripts and the awareness sheet	1,000	60 to 80 pages
Sample water purchases for price records	2,000	One jar and several bottle sizes; keep receipts, they are evidence

ITEM	ESTIMATE (BDT)	NOTES
Optional TDS meter	1,000	Only if the team chooses the optional measurement
Total	**7,000**	

Estimated hours: about 80 hours per student across 13 weeks (planning 11, field work 34, analysis 15, writing 16, review 4). **Reward:** 2,500 raindrops for each student on the team.

18 Before-you-start checklist

- [ ] Our study area is one named ward, mahalla, union or neighbourhood, and we wrote down why we chose it.
- [ ] Every team member has a parent's or guardian's agreement.
- [ ] Our AKTI Survey is built in Bangla with the 20 questions, tested on 3 to 5 people, and fixed.
- [ ] We have the consent script in Bangla and English and know the three separate permissions.
- [ ] Location (geo-tagging) is turned on in every phone camera we will use.
- [ ] We have a field diary (paper or shared document) with columns for date, time, place, what happened.
- [ ] We have a price observation sheet with price ÷ litres ready to fill.
- [ ] We know who does what: price recorder, survey lead, interview lead, writer.
- [ ] We have read the Ethics and safety section and the Rainflower AI-use rules.
- [ ] We have found the official piped water tariff for our area and written down the source.
- [ ] We have a plan for storing raw data privately and sharing only summaries.
- [ ] We know our first-sample target for the advisor review: 10 to 20 responses, 5 prices, 1 to 2 interviews, 5 photos.

19 Glossary

- **Tariff:** the official price a water authority charges, usually per 1,000 litres.
- **Price per litre:** price ÷ number of litres; the only fair way to compare a jar, a bottle and a bill.
- **Median:** the middle value when numbers are sorted; less affected by one very high or low value than the average.
- **Self-reported:** information a person gives about themselves, which may not be exact.
- **Sample:** the group of households you actually reached; not the whole population.
- **Non-response:** people who refused or were not home; always count them.
- **Pilot:** a small test run of the survey to find confusing questions.
- **Geo-tag:** location data stored inside a photo file when location is turned on in the camera.
- **TDS:** total dissolved solids, a number from a cheap meter; not a measure of safety.
- **Willingness to pay:** the most a person says they would pay for something, often studied for safe water.
- **Informal seller:** a person who sells water without being part of a company or authority.

- **Awareness outcome:** something your study gives back to the community, here the "Know Your Water Price" sheet.

20 Submission guide

Submit through your claim page on Rainflower, one stage at a time. Each stage opens when the previous one has passed. Your AI research assistant reviews every submission within a day and tells you what is met, what needs work, and what to do next. Stage 2 waits for your coordinator's checklist; stage 3 waits for your advisor's review; stage 7 goes to the coordinator's final checklist and then to Rainflower review and grading.

At stage 7 your evidence package manifest must list: the AKTI Survey export (CSV), the price observation sheet, every interview file with its date, place and the three consent answers, every photo with its log line, the field diary, the analysis spreadsheet, and the final paper. Keep the originals; upload the manifest and the files Rainflower asks for.



RESEARCH PAPER 3 OF 4

Water at School: Comparing Drinking and Handwashing Access in Two Secondary Schools

Thirsty Classrooms: Counting Water Points, Queues and Soap in Two Schools

RESEARCH QUESTION

In two named secondary schools, how many enrolled students share each working drinking water point and handwashing station, and how long do students report waiting at these points during the morning break?

2–5 students TEAM	**about 48** HOURS EACH	**13** WEEKS
1,000 raindrops ($2) REWARD PER STUDENT	**BDT 3,200** EXPENSE BUDGET	**Dhaka, Chittagong, Noakhali, Sylhet** REGIONS

Read online and claim it at rainflower.world/research/proposals/water-at-school

IN THIS PROPOSAL

01 Summary
02 Why this matters
03 Background
04 Research question and hypothesis

05 Who should do this
06 Evidence plan
07 Survey design
08 Sampling and limits
09 Interview guide
10 Photo and observation plan
11 Optional measurements
12 Timeline
13 Analysis plan
14 Ethics and safety
15 Expected outcomes and limitations
16 Paper outline
17 Budget
18 Before-you-start checklist
19 Glossary

01 Summary

This project asks: in two secondary schools in the same area, how many students share each working drinking water point and handwashing station, and how long do students wait at these points during the morning break? The student team will count and photograph every water point and handwashing station in both schools, run a student survey on AKTI Survey (about 80 responses), time queues during a break, and interview teachers, caretakers and students. The two schools should differ in an obvious way the team chooses, for example one government and one private school, or one in a crowded area and one with more space. At the end, the team will be able to say, for these two named schools, how water-point density, queue time, soap availability and student trust in the water compare, and whether denser infrastructure actually means shorter waits.

02 Why this matters

In almost every school in Bangladesh, water is somewhere between the classroom and the playground: a tube well in the corner, a tap by the toilet block, maybe a cooler with a jar. Students rarely talk about this water, but it matters every day. If there are too few working taps, children miss drinking water in a hot classroom, or rush and miss part of the break. If soap is missing at the handwashing station, routine advice from teachers ("wash your hands before tiffin") has no way to be followed. Girls may face extra difficulty if there is no separate or private water point. None of this shows up in a textbook; it shows up only if someone walks around the school, counts the taps, times the queue, and asks the students and staff who actually live with it every day. A student team that does this for their own school, or two schools they can visit, produces something no published report has: an exact, dated picture of water access in that one building.

03 Background

- National school WASH (water, sanitation and hygiene) coverage figures exist at a broad level: government or UNICEF/WHO WASH-in-schools monitoring reports [verify].
- Guidelines on recommended student-to-water-point or student-to-toilet ratios in schools: Directorate of Primary/Secondary Education or DPHE school WASH standards [verify].

- General research on handwashing and disease reduction in schools: public health literature on school-based hygiene interventions [verify].
- Reports on gender-specific WASH needs in schools (privacy, menstrual hygiene management): UNICEF or BRAC WASH programme reports [verify].
- Studies on arsenic marking of tube wells (paint colour codes) and public understanding of them: DPHE arsenic mitigation reports [verify].
- News or NGO reports on broken water infrastructure in rural or urban schools: local newspaper archives or NGO case studies [verify].
- General behavioural research on queueing and perceived versus actual wait time: psychology or operations-research literature on waiting lines [verify].
- Local government data on number of registered secondary schools and their water source type, if published by the Upazila or District Education Office [verify].

04 Research question and hypothesis

Primary question: In two named secondary schools, how many enrolled students share each working drinking water point and handwashing station, and how long do students report waiting at these points during the morning break?

Secondary questions:

1. How does the ratio of working water points (and handwashing stations) per 100 enrolled students compare between the two schools?
2. Do students who report longer waits also report lower trust in the water's safety and lower satisfaction with facilities, and does this pattern differ by school or by gender?

Hypothesis: The school with fewer working water points per student will show longer reported queue times and lower satisfaction scores. A null result would be: queue times and satisfaction are similar across the two schools even though point density differs — this would suggest that break length, student habits, or staff supervision matter more than raw infrastructure count. Either result is a useful, reportable finding.

05 Who should do this

Team size: 2 to 4 students work best, because the project needs people inside two schools at once, plus someone managing the survey and someone managing photos and the field diary. A team of 2 can still do it by visiting the schools on different days. The team can have up to 5 students.

Regional fit:

- **Dhaka:** compare a crowded government school with a smaller private school, or a slum-adjacent school with a school in a better-off area.
- **Chittagong:** compare a hill-area school with a school near the port or city centre, where water infrastructure often differs sharply.
- **Noakhali:** compare a coastal school relying on a pond sand filter with one using a deep tube well.

- **Sylhet:** compare a haor-area school reachable mainly by boat with a town school on a main road.

Role split for a team of 4:

- Survey lead: builds and manages the AKTI Survey, tracks response numbers per school.
- Interview lead: schedules and records the interviews, manages consent forms.
- Photo and map lead: takes geo-tagged photos, keeps the photo log, sketches a simple map of each school showing water points.
- Data lead: keeps the field diary up to date, enters queue-timing data, and starts simple counts early so problems are caught before week 8.

06 Evidence plan

EVIDENCE TYPE	WHAT IT SHOWS FOR THIS QUESTION	HOW MUCH IS ENOUGH	WHY IT FITS
AKTI survey	Students' self-reported water source, wait time, soap availability, trust and satisfaction, compared across the two schools	At least 40 completed responses per school (80 total), spread across grades 9-12	Large enough to compare the two schools and to break results down by gender
Video interviews	Staff and student explanations of why infrastructure is the way it is, what has broken, what has been tried	6 to 8 interviews, covering at least 3 roles per school	Explains the "why" behind the counts and survey numbers
Geo-tagged photos	A dated, located record of every water point, handwashing station and its condition in both schools	All working and broken water points and handwashing stations photographed at least once, plus break-time queue photos	Lets the team and reviewers see the infrastructure, not just hear about it
Field diary	Dates, times, weather, who was present, and anything observed but not captured elsewhere	One entry per field visit (at least 10 entries)	Shows the study is dated and lets the paper discuss season or timing effects honestly

07 Survey design

Target platform: AKTI Survey (survey.aktiful.com). All questions are anonymous; no names, phone numbers or class sections that could identify an individual are collected.

1. Which school are you answering this survey for today? — Single choice: School A / School B *(the team assigns these labels privately; real school names are never typed into the public survey or the paper)*
2. What is your grade level? — Single choice: Grade 9 / Grade 10 / Grade 11 / Grade 12
3. What is your gender? — Single choice: Girl / Boy / Prefer not to say

4. On a normal school day, how many times do you drink water from a source at school? — Number (0 to 20)
5. Where do you usually get your drinking water at school? — Single choice: Tube well at school / Tap connected to pipe supply / Filter or purifier machine / Water cooler with jar water / I bring water from home / Other
6. If you usually bring water from home, why? — Multiple choice: Taste is better at home / I don't trust the school water / Not enough water points at school / No particular reason / Other *(shown only if Q5 = "I bring water from home")*
7. How often do you use a handwashing station at school? — Single choice: Several times a day / Once a day / A few times a week / Rarely / Never
8. The last time you wanted to wash your hands at school, was soap available? — Single choice: Yes / No / There was a dispenser but it was empty / I don't remember
9. During the morning break, how long do you usually wait in line to get drinking water? — Single choice: No wait / Under 1 minute / 1 to 3 minutes / 3 to 5 minutes / More than 5 minutes / I don't get water at school
10. How would you rate the taste of the water at school? — Scale 1 to 5 (1 = very bad taste, 5 = very good taste), plus option "I don't drink it"
11. Do you think the water at school is safe to drink? — Single choice: Yes / No / Not sure
12. Why do you think that? — Short text
13. Has the school's water point ever stopped working this term? — Single choice: Yes / No / I don't know
14. If yes, about how many days was it not working? — Number *(shown only if Q13 = Yes)*
15. Have you seen any colour mark (for example red or green paint) on the school's tube well showing whether the water has been tested for arsenic? — Single choice: Yes, I have seen a mark / No mark that I know of / I don't know what this means
16. Is there a separate water point or toilet area for girls at your school? — Single choice: Yes / No / I don't know
17. Where is the nearest working water point compared to your classroom? — Single choice: Same room or corridor / Same floor / Different floor / Different building / Outside the main building / I don't know
18. On days when it rains heavily, does getting water or washing hands at school become harder? — Single choice: Yes, much harder / A little harder / No different / Not sure
19. Overall, how would you rate the water and handwashing facilities at your school? — Scale 1 to 5 (1 = very poor, 5 = excellent)
20. Any other comment about water at your school? — Short text (optional)

Target respondent: students in grades 9-12 at School A and School B, with parental/guardian consent on file. **Response target:** 40 per school (80 total), roughly balanced across grades 9-12 and between genders if possible. **Recruitment:** work with a class teacher to announce the survey, distribute the parental consent slip at least one week before the survey day, and offer the survey during a supervised period (for example, a free period or homeroom) so students are not pulled out of lessons. **Pilot plan:** before full collection, give the survey to 3-5 students from your own class. Watch for: do they understand "working water point" and "handwashing station"? Do they understand the difference between Q9 (reported wait time) and Q17

(distance)? Is any question skipped often (a sign it is confusing)? Fix wording, then lock the survey before the first full sample.

08 Sampling and limits

Choose School A and School B in advance, based on an obvious contrast (government/private, urban/rural, large/small). Within each school, aim to survey one full section (classroom group) from each of grades 9, 10, 11 and 12, asking every present and consenting student to answer — this avoids picking only "easy" or friendly students. If a grade has more than one section, pick the section using a simple rule decided in advance (for example, the first section on the attendance list), not by preference.

What this sample can claim: a description of water access and student opinion for these two named schools, on the dates surveyed. **What it cannot claim:** that findings apply to all schools in the district, division or Bangladesh, or that queue-time self-reports are exactly accurate (they are estimates by students, not stopwatch measurements, unless paired with the optional timing protocol in Section 12).

Obvious bias and reduction: students absent on the survey day are left out (often the same few students each time) — note the absentee count in the field diary. Students may answer favourably if a teacher is standing nearby — administer the survey with minimal adult presence and explain that answers are anonymous and will not affect grades.

09 Interview guide

Roles to interview (aim for at least 3 per school, 6-8 total):

1. Head teacher or assistant head teacher
2. School caretaker or peon who manages the water point or tube well
3. A teacher who supervises breaks or hygiene lessons
4. A student council member or class prefect
5. An older student (grade 11 or 12) not already surveyed, for a longer view
6. A parent who regularly prepares a child's water bottle or tiffin
7. A tube-well mechanic or plumber who has serviced the school's water point, if known
8. A local DPHE, union parishad or NGO WASH field worker, if the school has had any NGO-installed water or handwashing system [verify local contact]

Interview questions (8-12):

1. How long has this water point / handwashing station been at the school?
2. Who is responsible for keeping it clean and working?
3. Has it ever broken down? What happened, and how long did it take to fix?
4. Is there a budget or fund for repairing or maintaining school water facilities?
5. Do you think the current water points are enough for the number of students? Why or why not?
6. Is soap usually available at the handwashing station? Who buys it?

7. Do girls and boys have equal and comfortable access to water and handwashing facilities?
8. Has any organisation (NGO, DPHE, WASA) ever tested, repaired or installed water facilities here?
9. What happens at this water point when it rains heavily or during a very hot month?
10. Have you noticed any colour marking on the tube well about arsenic testing? What does it mean to you?
11. What would you change first, if you could, about water facilities at this school?
12. Is there anything about school water that students or visitors usually do not notice?

Consent script

English: "Hello. We are students doing a school research project about water facilities at school, for the Rainflower programme. This is not a test and has nothing to do with your grades or position. First, I want to ask: are you willing to take part in a short interview about water at school? [wait for answer] Second, are you willing to let me record this conversation on my phone? [wait for answer] Third, is it okay if we use what you say, without your name, in our written report, which may be read by teachers and researchers outside the school? [wait for answer] You can stop at any time or ask us not to use something you said. Thank you."

Bangla: "আসসালামু আলাইকুম। আমরা শিক্ষার্থী এবং Rainflower প্রোগ্রামের একটি স্কুল গবেষণা প্রকল্পে কাজ করছি, যা স্কুলের পানি ব্যবস্থা নিয়ে। এটি কোনো পরীক্ষা নয় এবং আপনার ফলাফল বা পদের সাথে এর কোনো সম্পর্ক নেই। প্রথমে জিজ্ঞাসা করি, আপনি কি স্কুলের পানি নিয়ে একটি ছোট সাক্ষাৎকারে অংশ নিতে রাজি আছেন? দ্বিতীয়ত, আপনি কি আমাদের ফোনে এই কথোপকথন রেকর্ড করার অনুমতি দেবেন? তৃতীয়ত, আমরা কি আপনার নাম ব্যবহার না করে আপনার বলা কথা আমাদের লিখিত প্রতিবেদনে ব্যবহার করতে পারি, যা স্কুলের বাইরের শিক্ষক ও গবেষকরাও পড়তে পারেন? আপনি যেকোনো সময় থামতে পারেন বা কোনো কথা ব্যবহার না করতে বলতে পারেন। ধন্যবাদ।"

Recording tips: find a quiet corner of the school (staff room corner, under a tree, empty classroom) away from passing traffic noise. Hold the phone landscape (sideways). Keep each recording 3–8 minutes. At the start, say the date and the person's role out loud (for example, "12 October 2026, school caretaker, School A"), never their name. If someone prefers not to be filmed, record audio only or film their hands/the water point instead of their face.

10 Photo and observation plan

1. Each working drinking water source in the school (tube well, tap, filter, cooler) — shows what infrastructure actually exists.
2. Each broken or unused water point, if any — shows gaps between what should work and what does.
3. Each handwashing station, close enough to see if soap is present — directly answers the soap-availability question.
4. The queue at a water point during the morning break (wide shot, no identifiable faces) — shows real crowding, not just a count.
5. Any signage about hygiene, handwashing, or water safety on school walls — shows what messages students receive.
6. Any colour marking (paint) on a tube well related to arsenic testing — links to Q15 of the survey.
7. The distance/path a student walks from a typical classroom to the nearest water point — supports Q17.
8. The girls' toilet or water area entrance (exterior only, no people) — supports the separate-facility question.

9. Storage containers (jars, buckets, drums) kept near the office or near classrooms, if any — shows backup water practices.
10. General condition of the area around the water point (standing water, mud, drainage) — shows upkeep.
11. A simple hand-drawn map of the school marking every water point and handwashing station, photographed as a document.
12. The school entrance/signboard area, photographed without naming the school in the publicly shared caption (use School A/School B internally).

Location tagging: on the phone camera settings, turn on "Location" or "GPS tag" for the camera app before the first visit; confirm by checking that a new photo shows coordinates in its file details.

Photo log (fill in for every photo): photo number, date, time, place type (for example "tube well, School A courtyard"), short description of what it shows.

Rules: never show a child's face without explicit permission from the parent/guardian for that specific photo; never photograph inside a toilet block if anyone is present; always ask the head teacher before photographing the interior of offices or staff areas; store any photo that does show a recognisable minor's face in the private evidence package only, not in the public paper.

11 Optional measurements

- **OPTIONAL — stopwatch queue timing.** During one break per school, time how long five different students actually wait from joining the line to filling their bottle, using a phone stopwatch. This checks whether the survey's self-reported wait times (Q9) match reality. If this is skipped, the study still works using only the self-reported survey data, clearly labelled as self-reported.
- **OPTIONAL — TDS meter reading.** If a TDS (total dissolved solids) meter is available, record one reading at each water source, described as a rough indicator only. This never proves water is safe or unsafe to drink; it only adds a described number for later comparison. If unavailable, skip entirely — the study does not need it.
- **OPTIONAL — soap/dispenser count over time.** Visit each handwashing station on three different days (spread across different weeks) and simply note "soap present / absent" each time, to see if availability is a one-time problem or a pattern. If only one visit is possible, note that this is a single snapshot in the paper.

12 Timeline

STAGE	WEEKS	WHAT THE STUDENT DOES FOR THIS TOPIC	SUBMITTED AT END OF STAGE
1. Choose and plan	1–2	Pick School A and School B; agree on the contrast (government/private, urban/rural, etc.); draft research question; list all water points by a first walk-through	One-page plan naming both schools (internally), the contrast chosen, and the question

STAGE	WEEKS	WHAT THE STUDENT DOES FOR THIS TOPIC	SUBMITTED AT END OF STAGE
2. Permission, checklist and pilot	2-3	Get written permission from both head teachers; distribute parental consent slips; build survey in AKTI; pilot with 3-5 students; pilot one interview	Signed permission letters, consent slip template, piloted survey link, coordinator checklist passed
3. First sample and advisor review	3-4	Collect first 15-20 survey responses from one school; do first 2 interviews; take first round of photos	First-sample summary, advisor review, adjustments made
4. Full data collection	5-8	Reach 40+ survey responses per school; complete all interviews; photograph every water point/station; do queue observation (optional timing)	Full survey dataset, all interview recordings, full photo log
5. Analyse	9-10	Count water points and students per school; calculate ratios; summarise survey answers; build charts; compare schools	Draft tables and charts, written notes on patterns found
6. Write	11-12	Write the paper sections using the outline below; add AI-use statement; cite background sources	Full paper draft
7. Final review and submit	13	Coordinator checklist review; fix gaps; prepare evidence package; final submission to Rainflower	Final paper and evidence package

13 Analysis plan

Counts to make:

- Number of working water points per school; number of broken water points per school.
- Number of working handwashing stations per school, and number with soap present at time of photo.
- Enrolled students per school (ask the head teacher), used to calculate "students per working water point" and "points per 100 students."
- Survey response counts by grade and gender, per school.

Comparisons to make:

- School A vs School B: points-per-100-students, average/median reported wait time, soap-availability rate, average taste rating, average overall satisfaction rating.
- Girls vs boys within each school: reported wait time, trust in water safety, views on separate facilities.
- Self-reported wait time (Q9) vs any stopwatch-timed queue data (if collected).

Charts to draw:

- Bar chart: water points per 100 students, School A vs School B.
- Bar chart: distribution of reported wait-time categories (Q9), School A vs School B, side by side.
- Pie chart: drinking water source type (Q5), one per school.

- Bar chart: soap availability "Yes / No / Empty dispenser" (Q8), School A vs School B.
- Bar chart: overall satisfaction rating (Q19), School A vs School B.

Worked example (example, not a result): Suppose School A has 950 students and 4 working water points (0.42 points per 100 students), and School B has 500 students and 5 working points (1.0 points per 100 students). Suppose the survey shows 60% of School A students report waiting "3-5 minutes" or more, versus 20% at School B. This pattern would support the hypothesis that fewer points per student means longer waits. If instead both schools showed similar wait times despite the different ratios, that null-style result would suggest break length or student discipline matters more than point count — equally worth reporting.

14 Ethics and safety

Three permissions, asked separately, for every survey respondent and interviewee: (1) willingness to take part, (2) willingness to be recorded (audio/video/photo), (3) willingness to have anonymised material shared publicly. Permissions are recorded before any data collection, using the script in Section 10 and an equivalent short written line on the survey's opening screen.

Under 18: every student survey respondent and every student interviewee needs a parent or guardian's signed consent slip in advance, collected through the school at least one week before the survey/interview day. Students without a returned slip are not surveyed or interviewed, but can still be invited to the group photo log or helping count (non-data roles) if the school agrees.

Head teacher permission: a written permission letter from each head teacher is required before any fieldwork begins in that school; this doubles as the gatekeeper check for the coordinator's pre-field checklist.

Physical safety: all fieldwork happens inside school grounds during school hours, in daylight, with a teacher or staff member aware of the team's presence. Do not enter staff-only areas, the school's water tank/overhead storage, or any mechanical room without an adult present. Stay clear of any open well, tube-well platform edge, or wet/slippery area near a water point.

Data privacy: real school names, teacher and student names, and any identifying photo of a minor's face stay in the private evidence package only (seen by the coach, coordinator, advisor and Rainflower). The public paper uses "School A" and "School B" and describes people only by role (for example, "the school caretaker, interviewed 14 October 2026"). Raw survey data, recordings and photo files are kept in the private evidence package for the length of review and up to 12 months after final submission, then deleted by the student team or Rainflower coordinator.

15 Expected outcomes and limitations

Open questions the data could answer:

- Does the school with fewer water points per student really show longer self-reported waits, or does break length/supervision matter more?

- Is soap actually available when students need it, or is there a gap between "a dispenser exists" and "soap is there"?
- Do girls report different experiences (trust, separate facilities, comfort) than boys at the same school?
- Does a rainy day genuinely make access harder, by students' own account, even though the study itself does not depend on rain?

A null result (no real difference between the two schools) is still valuable: it would suggest that water access problems, where they exist, are not simply about counting taps.

Limitations (stated in advance):

1. Only two schools are studied; results describe these two schools only, not all schools in the region.
2. Wait times from the survey (Q9) are self-reported estimates unless paired with the optional stopwatch timing.
3. Students absent on survey day, or without returned parental consent slips, are missing from the sample, which may skew results (for example, if those students specifically dislike the water and avoid school activities related to it).
4. Field visits happen on a few specific dates; conditions (heat, rain, exam period) on those dates may not represent the whole year, and this should be discussed honestly in the paper.

16 Paper outline

- **Abstract** (150–200 words): the question, the two schools (as School A/B), method summary, headline finding.
- **Introduction**: why school water access matters, the research question, the two schools' basic contrast (without naming them).
- **Methods**: survey design and respondents, interview roles, photo/count protocol, dates of data collection, any optional measurements used.
- **Results**: counts and ratios (points per 100 students), survey tables/charts, interview themes with short anonymised quotes, photo evidence referenced by number.
- **Discussion**: what the comparison suggests, how it connects to the hypothesis, what the interviews explain about the numbers.
- **Limitations**: the four points from Section 16, plus any that arose during fieldwork.
- **Conclusion**: a plain-language answer to the research question and one concrete suggestion for each school.
- **AI-use statement**: what AI was used for (grammar, formatting, explaining concepts) and what it was not used for (no invented data, quotes or conclusions).
- **Ethics statement**: permissions obtained, consent process, how privacy was protected.
- **References**: background sources listed with type and [verify] where not personally checked.

Figures/tables to include: water-point ratio bar chart, wait-time comparison bar chart, source-type pie charts, soap-availability bar chart, satisfaction rating bar chart, a simple map or diagram of each school's water points, a photo plate (selected geo-tagged photos with captions).

Word range: 5,000-10,000 words for the main text (excluding references and captions).

17 Budget

ITEM	REASON	COST (BDT)
Printing consent slips and interview forms (200 sheets)	Parental consent slips and interview consent printouts for both schools	400
Local travel to second school (rickshaw/bus, ~10 round trips)	Visiting School B if it is not the student's own school	1,000
Mobile data top-up (3 months)	Uploading survey responses, photos, and accessing AKTI Survey	450
Notebook and pens	Field diary and photo log	150
Printing final photos for evidence package	A physical/printed set of key photos for the coordinator review	300
Light refreshment for interviewees (tea/biscuits, 8 interviews)	Local courtesy when interviewing staff and community members	600
Contingency (unexpected costs)	Covers small unplanned expenses	300
Total		**3,200**

Estimated hours per student: about 48 hours total across 13 weeks (each team member's own time, not summed across the team). Breakdown: Choose and plan (4 hrs), Permission/checklist/pilot (6 hrs), First sample (5 hrs), Full data collection (18 hrs), Analyse (6 hrs), Write (7 hrs), Final review (2 hrs).

18 Before-you-start checklist

- [ ] Both schools chosen, with a clear reason for the contrast between them
- [ ] Written permission obtained from both head teachers
- [ ] Parental consent slips drafted and ready to distribute at least one week before survey/interview days
- [ ] AKTI Survey account set up and the 20-question survey entered exactly as worded
- [ ] Survey piloted with 3-5 students and adjusted
- [ ] Phone camera location tagging turned on and tested
- [ ] List of interview roles confirmed, with at least one contact identified per role
- [ ] Field diary notebook ready, with a template for date/place/weather/notes
- [ ] Team roles assigned (survey, interview, photo/map, data)
- [ ] Coordinator pre-field checklist reviewed and passed
- [ ] Safety plan shared with family/guardian, including school visit days and times

- [ ] Budget advance collected and a simple expense log started

19 Glossary

- **Tube well (নলকূপ):** a hand- or power-operated pump that draws groundwater through a pipe.
- **Handwashing station:** a fixed place (sink, tap, or basin with a water container) set up for washing hands, ideally with soap.
- **WASH:** short for Water, Sanitation and Hygiene, a term used for these three topics together, especially in schools and public health.
- **Pond sand filter:** a simple community filter that passes pond water through layers of sand and gravel to make it clearer, mainly used in coastal areas.
- **Arsenic marking:** paint colour (often red or green) applied to a tube well after testing, showing whether its water has safe or unsafe arsenic levels.
- **DPHE:** Department of Public Health Engineering, the government body responsible for rural and small-town water supply.
- **WASA:** Water Supply and Sewerage Authority, the government body supplying piped water in big cities like Dhaka and Chittagong.
- **TDS meter:** a small device that measures total dissolved solids (a rough indicator of mineral content) in water; it does not test for germs or arsenic.
- **Geo-tagged photo:** a photo whose file includes the GPS location where it was taken.
- **Consent:** a person's clear agreement, given after understanding what will happen, before taking part in research.
- **Pseudonym:** a made-up label (like "School A") used instead of a real name to protect identity.
- **Field diary:** a dated written record of what the researcher did, saw, and noted during each visit.
- **Null result:** a finding showing no real difference or pattern between groups being compared.



RESEARCH PAPER 4 OF 4

Who Walks for Water? Time, Distance and Gender at Shared Water Points in One Neighbourhood

The Water-Fetching Clock: Measuring Time, Distance and the Gender Gap at Shared Tube Wells and Taps

RESEARCH QUESTION

In [the student's chosen lane, para or short street], how much time do households spend each day fetching water from shared tube wells or taps, and who in the household usually does this work?

2–5 students TEAM	**about 42** HOURS EACH	**13** WEEKS
1,000 raindrops ($2) REWARD PER STUDENT	**BDT 6,500** EXPENSE BUDGET	**Dhaka, Chittagong, Noakhali, Sylhet** REGIONS

Read online and claim it at rainflower.world/research/proposals/who-walks-for-water

IN THIS PROPOSAL

01 Summary
02 Why this matters
03 Background
04 Research question and hypothesis

05 Who should do this
06 Evidence plan
07 Survey design
08 Sampling and limits
09 Interview guide
10 Photo and observation plan
11 Optional measurements
12 Timeline
13 Analysis plan
14 Ethics and safety
15 Expected outcomes and limitations
16 Paper outline
17 Budget
18 Before-you-start checklist
19 Glossary

01 Summary

This project measures how much time households spend fetching water from a shared water point (a tube well or stand tap used by more than one household) in one lane, para or short street, and who in the household does this work. Students will run a short survey of 60-80 households in their chosen area, interview people who know the water point well (women who fetch, an elder, a mechanic, a local official), and take geo-tagged photos of the water point, the queue, and the paths households walk. They will compare fetching time and effort by distance from the source and by who does the fetching (woman, man, girl, boy, elder). At the end, the student will be able to describe, for their specific lane, how long water-fetching takes on a typical day, whether farther households pay more time, and whether this work falls mostly on women and girls there - a finding that matters directly to the families who live it.

02 Why this matters

In many Bangladeshi neighbourhoods, water does not arrive by itself. Someone walks to a tube well or tap, waits in line, fills containers, and carries them home - sometimes several times a day. This work takes time that could go to school, paid work, or rest. In many households it is done mostly by women and girls, which is part of why water access is not only a health issue but also a fairness issue.

Walk through your own para or lane and you will likely see the pattern already: a small cluster of containers waiting their turn at one tube well, a girl carrying a kolshi (pitcher) past the market on her way to school, a queue that is short at 6 a.m. and long at 6 p.m. Nobody has measured, for that specific lane, how many minutes this actually costs each household, or whether households that live farther from the source pay more of that cost. This project turns something everyone has seen into something that can be counted, compared and reported - for one real place.

03 Background

- Large shares of households in parts of Bangladesh rely on shared, not private, water sources, especially in informal and peri-urban areas - household survey and WASH sector reports [verify].
- Time spent collecting water is recognised internationally as a measurable burden that falls disproportionately on women and girls - WHO/UNICEF Joint Monitoring Programme reports [verify].

- Distance to a water source is commonly used as a proxy for burden in WASH research, with longer distances linked to less time for school and income work - WASH sector and development agency studies [verify].
- In Bangladesh, shared tube wells and public stand taps are common in slums, bustees and rural lanes, often serving groups of households rather than single homes - DPHE (Department of Public Health Engineering) and local NGO field reports [verify].
- Breakdowns of shared sources (broken hand pumps, leaking taps) can increase queueing time and push households toward farther or lower-quality backup sources - local NGO WASH monitoring reports [verify].
- Arsenic-marking paint on tube wells (commonly red for unsafe, green for safe) is a known feature of many Bangladeshi tube wells, though marking condition varies - DPHE arsenic mitigation documentation [verify].
- Division of household labour, including water fetching, is often described qualitatively in gender and development literature as "women's work," but local, countable evidence from specific lanes is rare - gender and WASH academic literature [verify].
- No published study appears to measure, for a single named Bangladeshi lane or para, the exact minutes per day spent fetching water compared with distance and with who does the work - this is the gap this project fills locally.

04 Research question and hypothesis

Primary question: In [the student's chosen lane, para or short street], how much time do households spend each day fetching water from shared tube wells or taps, and who in the household usually does this work?

Secondary questions:

1. Does total daily fetching time increase with distance from the household to the shared water point?
2. How does the person who usually fetches water (by gender and age group) compare with household members' own view of whose job it is, and does this affect school or work time?

Hypothesis: Households living farther from a shared water point spend more total minutes per day fetching water, and in most households, women and girls carry more of this time burden than men and boys.

What a null result looks like: fetching time does not clearly rise with distance in this sample (for example, because queue length matters more than walking distance), or the work is shared fairly evenly across genders and ages in this particular lane. Either outcome is a real and useful finding - it would mean the local pattern differs from what is often assumed, and the paper should say so plainly.

05 Who should do this

Suggested team size: 2 to 4 students work best (up to 5 can join), because the project needs door-to-door household visits, interviews on different schedules, and careful photo/map work at the same site, often at different times of day.

By region:

REGION	WHAT CHANGES LOCALLY
Dhaka	Choose a lane in a bustee or low-income para with shared standpipes or tube wells; WASA supply timing may also affect queueing.
Chittagong	Hillside or port-edge settlements often share tube wells across clustered homes; distances may be steeper, not just longer - note this in the field diary.
Noakhali	Tube wells may be spaced farther apart due to salinity in shallow water; some households may also collect from ponds as backup - record this as a second source.
Sylhet	Tea-garden labour lines or haor-edge paras often share a small number of tube wells among many households; note any tea-garden management role in water point upkeep.

Role split for a team of 4:

- **Survey lead** builds and manages the AKTI Survey, tracks which households have responded, and checks data quality.
- **Interview lead** schedules and records the video interviews, keeps the consent forms.
- **Photo and map lead** takes all geo-tagged photos, keeps the photo log, and draws a simple sketch map of the lane showing households and the water point(s) with approximate distances.
- **Data lead** keeps the field diary, cleans survey data, and builds the charts described in Section 14.

06 Evidence plan

EVIDENCE TYPE	WHAT IT WILL SHOW FOR THIS QUESTION	HOW MUCH IS ENOUGH	WHY IT FITS
AKTI survey	Self-reported distance, trips per day, minutes per trip, who fetches, by household	60-80 households	Gives a countable, comparable picture across many households in the same lane
Video interviews	Lived experience, history of change, maintenance problems, and views on who does the work and why	6-8 interviews, 3-8 minutes each	Adds detail and explanation the survey numbers cannot give alone
Geo-tagged photos	The water point's physical condition, the queue, paths, containers, and relative distances	15-25 photos across at least 3 visits at different times of day	Shows what the site actually looks like and supports the sketch map and queue-timing notes
Field diary	Dates, times of day, weather, who was present, any unusual events (e.g., source broken that day)	Entry for every single field visit	Lets the student explain context later - including any season or time-of-day effect

07 Survey design

Target: households that use at least one shared tube well or shared tap (not a private in-house connection) as a main or backup water source.

1. How many people live in your household? — **Number**
2. What is your household's main source of drinking and household water? — **Single choice:** Shared tube well / Shared tap or standpipe / Private tube well inside the home / Pond or river / Water vendor or jar water / Other
3. Is this main source shared with other households? — **Single choice:** Yes / No / Not sure
4. About how far is this water source from your home? — **Single choice:** Less than 50 metres / 50-100 metres / 100-200 metres / 200-400 metres / More than 400 metres / Not sure
5. On a typical day, about how many minutes does ONE round trip to fetch water take, including walking and waiting in line? — **Number (minutes)**
6. On a typical day, how many round trips does your household make to fetch water? — **Number**
7. Who most often fetches water for your household? — **Single choice:** Mother / adult woman / Father / adult man / Daughter under 18 / Son under 18 / Grandmother or elder woman / Grandfather or elder man / Hired help / Other
8. Besides the person named above, who else sometimes helps fetch water? — **Multiple choice:** Mother / adult woman / Father / adult man / Daughter under 18 / Son under 18 / Grandmother or elder woman / Grandfather or elder man / Hired help / No one else / Other
9. What is the age group of the person who most often fetches water? — **Single choice:** Under 12 / 12-17 / 18-40 / 41-60 / Over 60
10. Does fetching water ever make that person late for or miss school or work? — **Single choice:** Yes, often / Yes, sometimes / Rarely / Never / Not applicable
11. How many containers does your household usually fill per trip? — **Number**
12. What type of container do you mainly use to carry water? — **Single choice:** Bucket / Kolshi (pitcher) / Jerry can / Drum / Other
13. In the last month, has anyone in your household felt pain, tiredness or injury from carrying water? — **Single choice:** Yes / No / Not sure
14. At the busiest time of day, about how long do you usually wait in line at the water point? — **Single choice:** No wait / Under 5 minutes / 5-15 minutes / 15-30 minutes / More than 30 minutes
15. Does your household ever use a second (backup) water source when the main one is busy, broken, or dry? — **Single choice:** Yes / No
16. If yes, what is this backup source? (Leave blank if you answered No above) — **Short text**
17. In the past month, how many times was your main water source broken or not working? — **Number**
18. Who usually repairs or maintains your shared water source? — **Single choice:** A mechanic paid by the community / Union parishad (local government) / An NGO / No one / not sure / Other
19. How satisfied are you with the amount of time it takes to get water each day? — **Scale 1-5** (1 = Very dissatisfied, 5 = Very satisfied)

20. Do you think the time spent fetching water affects women's or girls' time for school, work or rest in your household? — **Single choice:** Yes, a lot / Yes, a little / No / Not applicable

Target respondent: one adult (18+) per household who knows the household's water routine well - usually the person who manages water or a parent/guardian.

Response target: 60-80 households.

Recruitment: go door to door along the chosen lane, both sides of the street, introducing yourselves as Rainflower student researchers. Use the consent script (Section 10) before starting. If a household declines, thank them and move to the next house; record the refusal in the field diary (no details needed, just a tally).

Pilot plan (3-5 households): Before the full round, test the survey on 3-5 households. Watch for: (a) whether "shared" is understood the same way by everyone (clarify with an example: "used by more than just your family"); (b) whether people can estimate minutes and distance without confusion - if not, show simple landmarks for distance bands; (c) whether Question 16 is skipped properly when the answer to Question 15 is "No." Fix wording with your coach before continuing, and note any changes in your field diary.

08 Sampling and limits

Who and how: choose one lane, para or short street segment with 2 to 4 shared water points serving roughly 30 to 80 households. Visit every household along both sides of the street in order (door to door), not just the easiest-to-reach ones. If the area is larger than your target sample, survey every second or third household in a fixed pattern (for example, every second house) rather than picking only friendly-looking homes.

What this sample can claim: a description of water-fetching time, distance and gender patterns for this specific lane, on the dates the data was collected. It cannot be used to describe the whole city, the whole region, or Bangladesh generally.

What it cannot claim: that findings apply beyond the study lane, or that the pattern is the same in every season - note the data collection dates and discuss possible seasonal effects (for example, dry-season wells running low, or monsoon mud slowing the walk) in the Discussion.

Obvious bias and how to reduce it: households that are home during daylight hours when students visit may differ from households where everyone works outside (for example, more likely to include stay-at-home caregivers). Reduce this by visiting at two different times of day (e.g., one morning round and one late-afternoon round) across the data collection weeks, and recording the visit time for each household in the field diary.

09 Interview guide

Roles to interview (choose 6-8):

1. A mother or other adult woman who regularly fetches water
2. An elder (man or woman) who remembers water fetching in this area years ago
3. A tube-well mechanic or pump repairer

4. A union parishad member or local official involved with water points
5. An NGO or DPHE field staff member working on WASH in the area (if available)
6. A school teacher or caretaker who may notice students arriving late
7. A community clinic worker (for health effects of carrying water)
8. An adult man or father, for his view on who does this work and why

Interview questions (use 8-12 relevant to the role):

1. Can you describe a typical day of fetching water for your household - how many trips, what time, and who goes?
2. How has the time it takes to fetch water here changed over the last 5-10 years, in your memory?
3. What problems do you see at the shared water point (long queues, breakdowns, arguments)?
4. In most households you know here, who usually does the water-fetching work, and why do you think that is?
5. Have you noticed children being late for school, or missing school, because of fetching water?
6. When the source breaks down, how long does it usually take to get fixed, and who fixes it?
7. Have you seen any conflicts or arguments at the water point? What were they usually about?
8. What would make fetching water faster or easier for people here?
9. (Mechanic) What usually breaks on this type of source, and how often do you repair it?
10. (Clinic worker) Have you seen health problems you think are linked to carrying water - back pain, falls, injuries?
11. (Official/NGO staff) Are there any plans to add more water points or fix broken ones in this area?
12. Have you noticed any change in who fetches water now compared to before - for example, more men helping than in the past?

Consent script - English

"Hello, my name is [name] and I am a student researcher with Rainflower, a youth water research programme. We are studying how water is fetched from shared water points in [name of lane/area]. I would like to ask you some questions.

First, can I ask: are you willing to take part in this interview? [wait for answer] Second, may I record this conversation on my phone? [wait for answer] Third, may I use what you say, without your name, in a research paper that may be shared publicly? [wait for answer]

You can stop at any time, and you do not have to answer any question you are not comfortable with. I will not use your full name, phone number or home address in the paper."

সম্মতি বার্তা - বাংলা

"আসসালামু আলাইকুম/নমস্কার, আমার নাম [নাম] এবং আমি রেইনফ্লাওয়ার যুব গবেষণা কর্মসূচির একজন শিক্ষার্থী গবেষক। আমরা [এলাকার নাম]-এ ভাগাভাগি পানির উৎস থেকে পানি সংগ্রহ নিয়ে গবেষণা করছি। আমি আপনাকে কিছু প্রশ্ন জিজ্ঞাসা করতে চাই।

প্রথমত, জিজ্ঞাসা করতে পারি: আপনি কি এই সাক্ষাৎকারে অংশ নিতে ইচ্ছুক? [উত্তরের অপেক্ষা করুন] দ্বিতীয়ত, আমি কি আমার ফোনে এই কথোপকথন রেকর্ড করতে পারি? [উত্তরের অপেক্ষা করুন] তৃতীয়ত, আপনার নাম ছাড়া, আমি কি আপনার কথা একটি গবেষণাপত্রে ব্যবহার করতে পারি, যা সর্বজনীনভাবে প্রকাশিত হতে পারে? [উত্তরের অপেক্ষা করুন]

আপনি যেকোনো সময় থামতে পারেন, এবং যেকোনো প্রশ্নের উত্তর না দেওয়ার অধিকার আপনার আছে। আমি আপনার পূর্ণ নাম, ফোন নম্বর বা বাড়ির ঠিকানা গবেষণাপত্রে ব্যবহার করব না।"

Recording tips: record in a quiet public place, phone held horizontally (landscape mode), 3-8 minutes long. At the start, say the date and the person's role out loud (for example, "October 2026, interview with a mother who fetches water"). If the person prefers not to show their face, record their hands, the water point, or point the camera slightly away from their face while keeping their voice clear.

10 Photo and observation plan

Turn on location tagging: in your phone's camera settings, turn on "Location" or "GPS tagging" so every photo saves the place it was taken. Check this works before your first field visit by taking a test photo and checking it shows a location in your photo gallery app.

1. Wide shot of the shared water point (tube well or tap) from a public spot - shows its design and general condition.
2. A queue of people waiting at the water point, taken from the side or behind - shows how busy it gets (avoid close-ups of faces).
3. Containers lined up waiting their turn - shows how people reserve their place in line.
4. The path from a sample household toward the water point - shows distance and ground conditions (mud, steps, obstacles).
5. Any arsenic-marking paint on the tube well (commonly red or green) - shows marking condition.
6. Any visible damage - broken handle, leaking pipe, cracked platform - shows maintenance state.
7. Standing water, mud, or other hazards around the water point - shows safety and hygiene conditions at the site.
8. Different container types used by households (bucket, kolshi, jerry can, drum) - shows carrying method and rough volume.
9. Any handwashing spot or drainage channel near the source, if present - shows sanitation features.
10. Any posted rule, sign or notice about the water point's use or timing, if one exists.
11. A wide shot of the lane showing the relative position of several homes to the water point - useful for your sketch map.
12. A mechanic or community member doing repair work, only with their clear permission.

Photo log: for every photo, write in your notebook: photo number, date, time, place type (e.g., "shared tube well, lane entrance"), and one sentence on what it shows.

Faces, children and homes: do not photograph anyone's face without their separate permission (the third consent question). Do not photograph children up close or inside anyone's home. Take photos only in public spaces such as the street, the water point, and its surroundings - never enter a private yard or home without the owner's clear invitation.

11 Optional measurements

These are OPTIONAL. The study works fully from survey, interview and photo evidence alone; use these only if time and comfort allow.

- **OPTIONAL - Queue timing:** use your phone's stopwatch to time how long 5-10 different people wait in line at three times of day (morning, midday, evening) on a non-random day. This adds an observed measure alongside self-reported wait times (Question 14).
- **OPTIONAL - Distance check:** use your phone's map app or simply count your own walking paces (and convert to metres) from 3-5 sample households to the water point, to check against the self-reported distance bands (Question 4).
- **OPTIONAL - Container count:** during one fixed 30-minute observation window, count how many containers are filled, to get a rough sense of total water point traffic.
- **OPTIONAL - Container size:** measure a sample container's height and width with a tape measure (in centimetres) to estimate its volume in litres, to add context to "number of containers" answers.

These measurements describe timing, distance and traffic. They say nothing about water quality or safety - this study does not test or claim anything about whether the water is safe to drink.

12 Timeline

STAGE	WEEKS	WHAT THE STUDENT DOES FOR THIS TOPIC	WHAT IS SUBMITTED
1. Choose and plan	1-2	Choose the exact lane/para, confirm it has 2-4 shared water points and 30-80 households; draft the research question and survey	Draft plan and chosen study area description
2. Permission, checklist, pilot	2-3	Get family and any needed local permissions; pilot survey on 3-5 households; refine wording	Coordinator checklist; piloted survey
3. First sample and advisor review	3-4	Survey first 15-20 households; conduct 1-2 pilot interviews; take first photos	First-sample summary for advisor review
4. Full data collection	5-8	Complete survey to target (60-80); complete 6-8 interviews; complete photo set at 3+ visits/times	Full survey dataset, interview recordings, photo log
5. Analyse	9-10	Clean data; build tables and charts comparing distance, time and gender	Draft tables/charts
6. Write	11-12	Write the paper following the outline in Section 17	Full draft paper
7. Final review and submit	13	Coordinator checklist review; revise; submit to Rainflower	Final paper and evidence package

13 Analysis plan

What to count:

- Average minutes per round trip and average trips per day, per household, to get total minutes per day per household (Q5 x Q6).
- Average total daily fetching minutes grouped by distance band (Q4).
- Share of households where the main fetcher (Q7) is: woman/girl vs man/boy vs elder.
- Share of households reporting missed/late school or work because of fetching (Q10).
- Share reporting pain/injury (Q13), broken source in the past month (Q17), and satisfaction score (Q19).

Comparisons to make:

- Total daily fetching minutes by distance band (near vs far).
- Gender of main fetcher compared with whether that person's school/work is affected (Q7 x Q10).
- Satisfaction score (Q19) compared with wait time band (Q14).
- Self-reported distance (Q4) compared with any observed/paced distance, if the optional measurement was done.

Charts to draw:

- Bar chart: average total daily fetching minutes by distance band.
- Pie or bar chart: share of households by who usually fetches water (gender/age categories from Q7).
- Bar chart: share of households reporting school/work effects (Q10), split by gender of main fetcher.
- Scatter or grouped bar: satisfaction score (Q19) against wait time band (Q14).

Worked example (example, not a result):

Suppose, from 70 surveyed households, the following average daily minutes by distance band were found:

DISTANCE BAND	EXAMPLE AVERAGE MINUTES/DAY (INVENTED)
Under 50m	18
50-100m	25
100-200m	34
200-400m	47
Over 400m	61

If the real data shows a similar rising pattern, the student could write: "In this lane, households farther from the shared tube well spent more time fetching water each day, consistent with our hypothesis." If the real data instead shows no clear rise, the student should report that plainly as a null result and consider other explanations (for example, queue length mattering more than distance).

14 Ethics and safety

Three permissions, asked separately, every time: (1) willingness to take part, (2) willingness to be recorded, (3) willingness to have responses used publicly (without name). Use the script in Section 10 for interviews, and a short written or read-aloud version for survey respondents before starting the AKTI survey.

Under 18: if any survey respondent or interviewee is under 18 (for example, a daughter who fetches water and whose view matters), get a parent or guardian's spoken or written agreement first, in addition to the young person's own agreement.

Privacy: never record full names, phone numbers, or home addresses in the survey or paper. Describe people by role only ("a mother who fetches water," "a tube-well mechanic"). Raw data (survey export, video files, photo files with location tags) stays in the private evidence package and is not published; only summarised, anonymised findings go in the paper.

Physical safety for this study: work only in daylight, in public areas (the street, the water point itself if it is a public space). Do not enter anyone's yard or home without a clear invitation. Stay clear of open wells, slippery platforms, or fast-flowing drainage near the water point. Tell a family member where you are going and when you will return before every field visit. Never climb onto water infrastructure (platforms, tanks, pipes) to get a photo.

Data retention: keep raw survey exports, interview recordings and photo files until the project is graded and accepted by Rainflower, then archive or delete as instructed by your coordinator.

15 Expected outcomes and limitations

Questions the data could answer:

- Does total daily fetching time rise clearly with distance in this lane, or not?
- Is water-fetching mostly done by women and girls here, or is it shared more evenly than expected?
- Does fetching water appear linked to missed school or work time for the people who do it?
- How often does the shared source break down, and does this push households toward backup sources?

A null or surprising result (for example, no clear link between distance and time, or fetching shared evenly across genders) is a genuine and useful finding - it means this lane does not follow the common assumption, and that is worth reporting honestly.

Limitations (stated in advance):

1. Self-reported minutes and distances are estimates, not measured times, unless the optional timing/pacing steps are done.
2. The sample is one lane/para and cannot represent the whole city or region.
3. Data collected in one season may not reflect fetching time in another season (for example, dry-season well levels or monsoon mud); this must be discussed, not ignored.
4. Households reached during daylight visiting hours may differ from households that are empty most of the day.

5. People may adjust their answers if they think the student represents an authority who could "fix" the water point, which could bias satisfaction or complaint-related answers.

16 Paper outline

- **Abstract** (150-200 words): the question, method, sample size, and headline finding for this specific lane.
- **Introduction**: why water-fetching time and gender matter, framed around the chosen lane, ending with the research question.
- **Methods**: study area description (without exact address), survey design, sample size and recruitment, interview roles, photo plan, dates of data collection.
- **Results**: survey findings with tables/charts from Section 14 (distance vs time, gender of fetcher, school/work effects), interview quotes by role, selected photo descriptions.
- **Discussion**: what the pattern means for this lane, how it compares with what interviewees said, how season or time of day may have affected results.
- **Limitations**: the points from Section 16, stated honestly.
- **Conclusion**: a short, honest answer to the research question for this lane, and one practical suggestion if the data supports it (for example, for the union parishad or NGO).
- **AI-use statement**: exactly what AI was used for (for example, grammar checking, table formatting) and confirmation that no results, quotes or conclusions were AI-written.
- **Ethics statement**: confirmation of the three-permission process, parental consent for minors, and privacy steps taken.
- **References**: types of sources used, each marked [verify] where not personally checked by the student.

Figures/tables to include: the distance-vs-time bar chart, the who-fetches-water chart, the school/work-effect chart, and the simple sketch map of the lane with the water point(s) marked.

Word range: 5,000-10,000 words for the main paper body (excluding references and statements).

17 Budget

ITEM	REASON	COST (BDT)
Local travel (rickshaw/bus/CNG for field visits)	Getting to and from the study lane across 13 weeks	3,000
Mobile data	Uploading survey responses, video interviews, and photos	1,000
Printing	Backup paper survey sheets and consent forms	500
Notebook and pens	Field diary and photo log	200
Tea/snacks for interviewees (courtesy, not payment)	Polite gesture of thanks, not compensation for answers	800

ITEM	REASON	COST (BDT)
Contingency	Unplanned small costs	1,000
Total		**6,500**

Estimated hours per student (whole project): about 42 hours per student.

Rough breakdown per student: Plan (4 hrs) + Permission/pilot (4 hrs) + First sample (5 hrs) + Full data collection (18 hrs) + Analyse (5 hrs) + Write (5 hrs) + Final review (1 hr) = 42 hrs.

18 Before-you-start checklist

- ☐ Chosen one specific lane, para or short street with 2-4 shared water points and roughly 30-80 households
- ☐ Confirmed the water point(s) are genuinely shared (used by more than one household)
- ☐ Told a family member about the study plan and field visit days
- ☐ AKTI Survey account set up and the 20 questions entered and tested
- ☐ Consent scripts printed or saved, in both English and Bangla
- ☐ Pilot survey run with 3-5 households and wording adjusted if needed
- ☐ List of 6-8 interview roles identified, with at least one contact per role
- ☐ Phone camera location tagging checked and working
- ☐ Field diary notebook ready, with a page per planned visit date
- ☐ Coordinator checklist review completed before starting full data collection
- ☐ Team roles assigned (survey, interview, photo/map, data) if working in a team

19 Glossary

- **Tube well (নলকূপ):** a hand-pump well that draws groundwater, often shared by several households.
- **Shared water point:** a tube well or tap used by more than one household, not a private connection.
- **Stand tap/standpipe:** a public water tap, often connected to a piped supply system.
- **Kolshi:** a traditional pitcher used to carry water.
- **WASA:** Water Supply and Sewerage Authority, the agency supplying piped water in some Bangladeshi cities.
- **DPHE:** Department of Public Health Engineering, a government agency involved in rural and tube-well water supply.
- **Union parishad:** the local government council at the union (small administrative area) level.
- **Arsenic marking:** paint (commonly red or green) used to show whether a tube well's water has tested safe or unsafe for arsenic.
- **Geo-tagged photo:** a photo saved with its location (coordinates) attached, using phone GPS.

- **Field diary:** a dated, ongoing notebook record of what was done, seen and said during fieldwork.
- **AKTI Survey:** the free online survey tool used by Rainflower students to build and run their surveys.
- **Consent:** a person's clear agreement, given separately for taking part, being recorded, and having answers shared publicly.
- **NGO:** non-governmental organisation, often involved in water and sanitation projects locally.
- **WASH:** Water, Sanitation and Hygiene, a common term for this field of work.
- **Null result:** a finding that does not show the expected pattern - still a valid and reportable scientific result.

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