

FLUORIDE SURVEY MANUAL

FLUORIDE AWARENESS CAMPAIGN
IN MADHYA PRADESH
ENVIRONMENT IN ACTION



August 2019

Fluoride Awareness Campaign (FAC) in Madhya Pradesh is an initiative of the Center for Sustainable Development at the Earth Institute, Columbia University, with the goal to apply research from Lamont Doherty Earth Observatory scientists to educational content that builds awareness and action-taking by communities and school members along with local partnerships.

Partner Institutions

- Alirajpur District Government led by Public Health Engineering Department (PHED)
- Columbia University: Center for Sustainable Development and Lamont Doherty Earth Observatory of the Earth Institute
- India Natural Resource Economics and Management (INREM) Foundation
- Pratham Education Initiative

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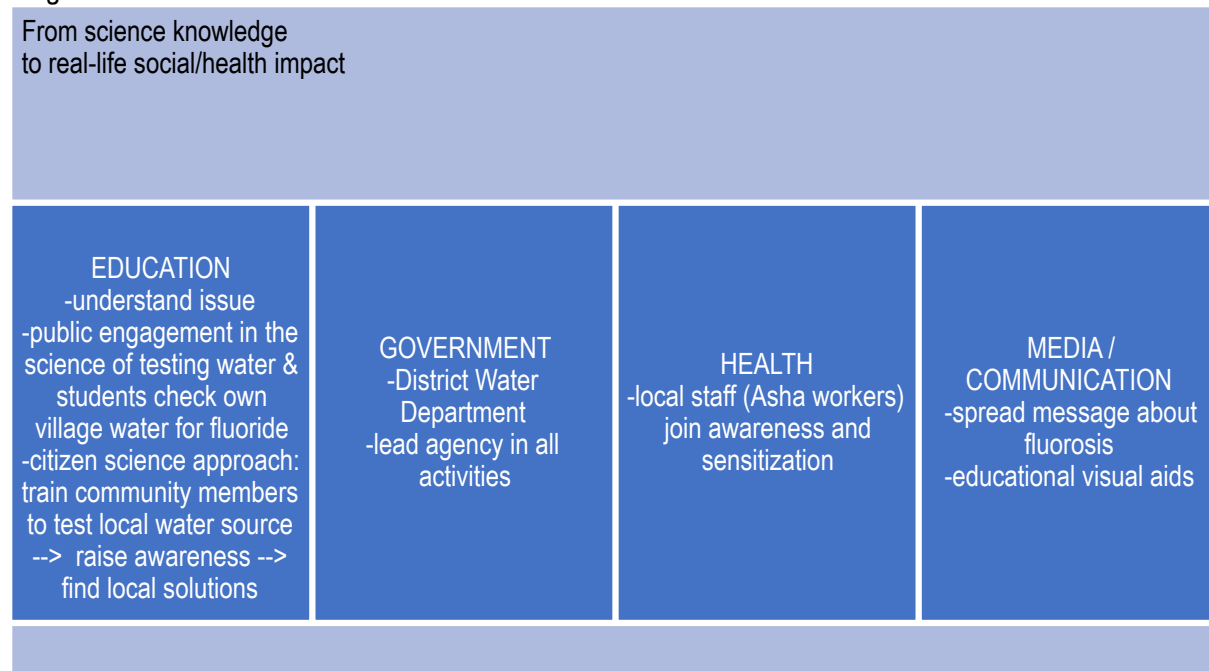
This **Fluoride Survey Manual** gives a brief background on the reason for fluoride testing as well as detailed instructions on how to administer fluoride testing and then educate the community by sharing fluoride testing results.

I. RATIONALE FOR FLUORIDE TESTING & AWARENESS

Tens and thousands of tubewells and handpumps over a large part of Western India have very high levels of Fluoride (F). Deficiency of F in the diet causes dental caries and osteoporosis but the chronic excess intake—caused by drinking groundwater with F above the WHO guideline of 1.5 mg/L—can cause severe dental and skeletal fluorosis.

Fluoride-enriched water has become a major public health issue in India. Of India's 32 states, 14 have been identified as "endemic" areas for fluorosis, with an estimated 25 million people impacted, and another 62 million "at-risk" (Kumar, et al., nd). High Fluoride in groundwater is influenced by the regional and local geological settings and hydrological conditions.

Fluorosis requires holistic treatment of various sectors – health, education, water and local government – coming together to find ways to prevent fluorosis. Even though cutting sectoral lines and addressing a social program is rare, this study intends to bridge different sectors to tackle fluorosis as illustrated in below diagram.



II. TIMELINE: TRAINING & DATA COLLECTION

Master in Social Work (**MSW**) **Students** from project-selected colleges will be **enumerators** (person collecting survey data) for the data collection proposed.

2019 September 2 – 3	<ul style="list-style-type: none">○ Pilot testing of mobile-based survey with 10-15 selected MSW students
2019 September 4 – 6	<ul style="list-style-type: none">○ Training of all 60 MSW students
2019 September 10 – 2020 April 30	<ul style="list-style-type: none">○ 45-day internship period○ Fridays & Saturdays Weekly (totaling 45 days)○ Data collection period of all 60 MSW students

III. TRAINING CONTENT

It will be **mandatory** for all enumerators to attend and actively participate in the trainings for data collection. Training will be provided by Columbia University and INREM teams. The main contents will cover:

1. **Fluoride and fluorosis knowledge** (led by INREM)
2. **Data collection and test results** (led by Dr. Lex Van Geen from Columbia)
3. **Data collection process and usage of educational materials** for community awareness, sensitization and mobilization (led by Dr. Radhika Iyengar from Columbia)

IV. DATA COLLECTION SITES

Enumerators will conduct data collection in **ONLY the Alirajpur BLOCK** (NOT all Alirajpur district).

- There are about **339 villages in Alirajpur block**.
- List of all villages in the Block can be found here:
<https://villageinfo.in/madhya-pradesh/alirajpur/alirajpur.html>

Alirajpur is a Tehsil / Block (CD) in the Alirajpur District of Madhya Pradesh.

According to Census 2011 information, the sub-district code of Alirajpur block is 03713.

The total area of Alirajpur is 2,138 km², including 2,119.01 km² rural area and 19.01 km² urban area.

Alirajpur has a population of 4,46,494 peoples. There are 74,674 houses in the sub-district.

V. DATA COLLECTION PROCESS: PART 1 of 2: VILLAGE LEVEL

At each data point (each water source in the village), the following steps needs to be completed. Please see below for details.



Step 1: Pack required data collection materials on the checklist

Before you begin data collection, please make sure you take the following materials to the data collection site.

VI. DATA COLLECTION MATERIALS FOR VILLAGE LEVEL TESTING: CHECKLIST

- **Village list &** Contact with one of the MSW Student Leaders who will lead the data collection
- **PHED Fluoride Kit**
- **Fully charged Mobile phone (with Survey CTO downloaded)** (carry charger or back-up battery)
- **2 Posters** supplied by PHED with Columbia University
- **Paint** (Yellow and Blue) supplied by PHED



Step 2: Plan efficient route for accessing all water points in your designated area

Step 3: Pipette out 4 mL of water collected from your water point, and pour it into the provided vial. Add 5 drops (approx. 1 mL) of Fluoride Reagent. After roughly one minute of mixing, compare the vial's color to the standard solutions present in your calibration box.

Take an unobstructed photo of your vial and your standard solutions in frame.

If your water sample appears to have a concentration of 4.0 mg/L, a dilution will be necessary.

Dilution Instructions: Use a pipette to draw up 3 mL of distilled water, then using the same pipette draw up in additional 1 mL of your sample. Add 5 drops (approx. 1 mL) of Fluoride Reagent. After roughly one minute of mixing, compare the vial's color to the standard solutions present in your calibration box. After determining the Fluoride concentration, multiply by four to adjust for the dilution.

Take another unobstructed photo of your vial and your standard solutions in frame.

Step 5: Enter data of fluoride level on mobile survey form (& send)

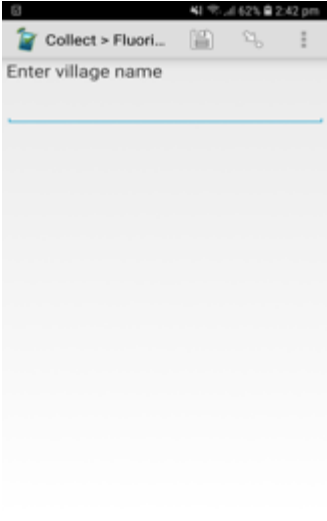
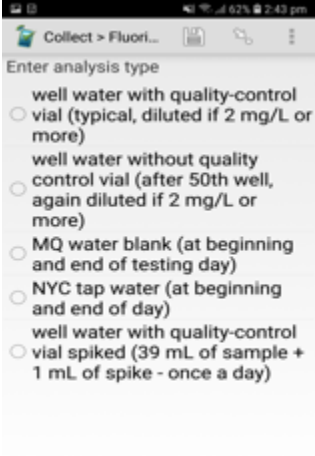
Send data back to server

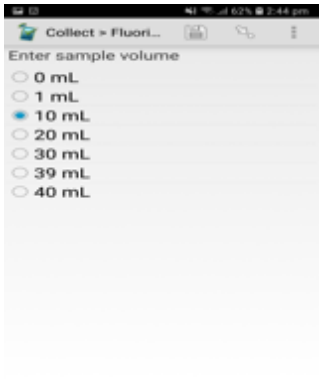
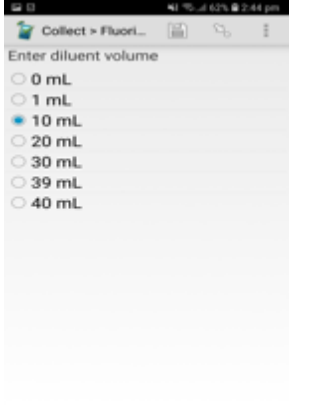
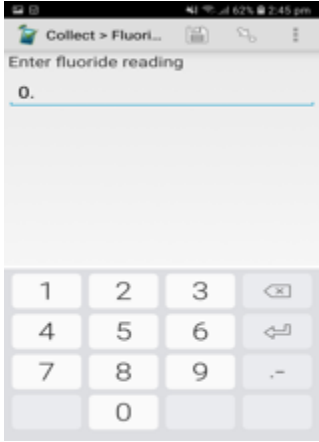
If no WiFi, send from WiFi (reception /

Make sure data is sent back

Can save but not send – make sure to send

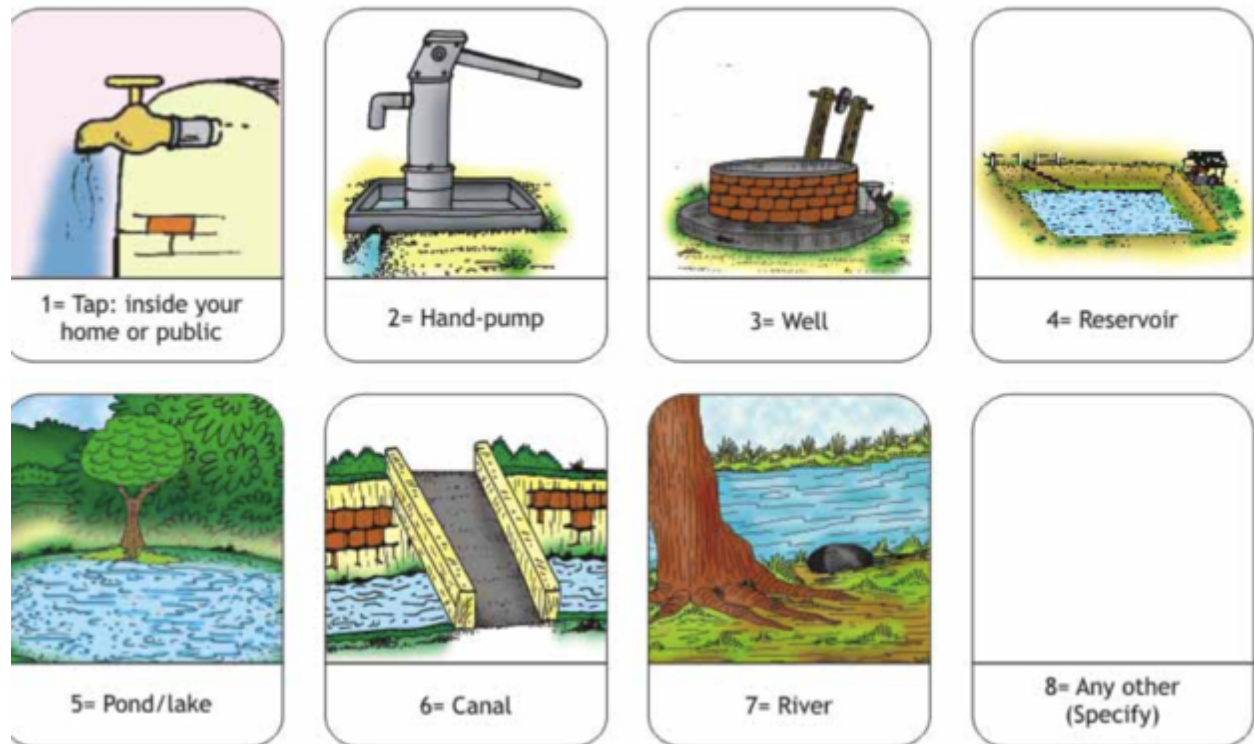
VII. Fluoride Alirajpur CTO Survey Updates for 2019 Data Collection

CTO Survey Questions during Pilot	Suggested Questions for Alirajpur Summer 2019
Date	Date
	<ul style="list-style-type: none"> • Village name • Block name- Fixed-Alirajpur Block • District name -Fixed-Alirajpur. • GPS coordinates
N/A	Data collection time <ul style="list-style-type: none"> • Time will be added automatically if survey is completed in the field..
N/A	Enumerator name <ul style="list-style-type: none"> • Suggestion to include Enumerator name
	<ul style="list-style-type: none"> • The Analysis Type to be simplified based on the new tool kit to be used <ul style="list-style-type: none"> ○ Which type of water source

<p>N/A</p>	<p>For consideration: Including a range for the *approximate amount of people accessing this particular water source</p> <ul style="list-style-type: none"> • 0-50 • 50-100 • 100-200 • more than 200 •
	
	<ul style="list-style-type: none"> • May be omitted if the data collection tool/kit is different than pilot tool kit
	<ul style="list-style-type: none"> • Reading value to be determined by the tool/kit to be used for data collection <ul style="list-style-type: none"> ○ Mg/liter ○ Color coding?

VIII. DEFINITIONS FROM SURVEY CTO FORM

Terminology	Definition as applied to project & survey
Water point	Refers to ALL water source in the village, from which people drink the water

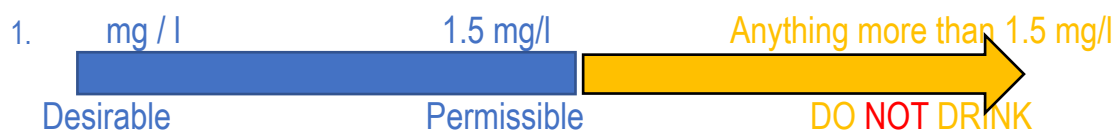


Source: Paheli Survey. ASER.

Step 6: Mark/paint every tested water point with correct paint color

- Every water point that has been tested should be marked afterwards BASED ON THE RESULTS
- 0 to 1.5 mg/l should be painted BLUE. BLUE means drinkable / permissible
- Anything above 1.5 mg/l should be painted YELLOW. YELLOW means **NOT** drinkable

Paint the water point **BLUE** or **YELLOW**?



Step 7: Show fluoride & fluorosis posters to people near water point

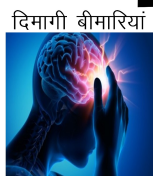
- Project-provided posters should be shared with all those near the water point at the time of testing



'Fluoride Awareness Campaign', Center for Sustainable Development
Earth Institute, Columbia University



पानी में फ्लोराइड की मात्रा अधिक है



दिमागी बीमारियाँ



स्केलेटल फ्लोरोसिस



डेंटल फ्लूरोसिस

pictures sourced from Fluoride Action Network,
huffingtonpost.in,indiawaterportal,
fab.cba.mit.edu, Biospectrumasia.medium.com

'Fluoride Awareness Campaign', Center for Sustainable Development
Earth Institute, Columbia University



हैंडपंप में पीला निशान मतलब पानी में फ्लोराइड है



हैंडपंप में नीला निशान मतलब पानी पीने योग्य है

pictures sourced from Fluoride Action Network,
fab.cba.mit.edu, huffingtonpost.in, indiawaterportal, flickr,
commons.wikimedia, artoflivingschools

IX. TOOLS FOR DISSEMINATING INFORMATION FOR AWARENESS & SENSITIZATION

Comprehensive community awareness and sensitization campaign is being planned, to incorporate various medium for disseminating the message on fluoride and fluorosis through the project. Wherever possible, the following mechanisms should be explored and used, if feasible, for the community in which the enumerators are surveying.

Media & Mass Communication

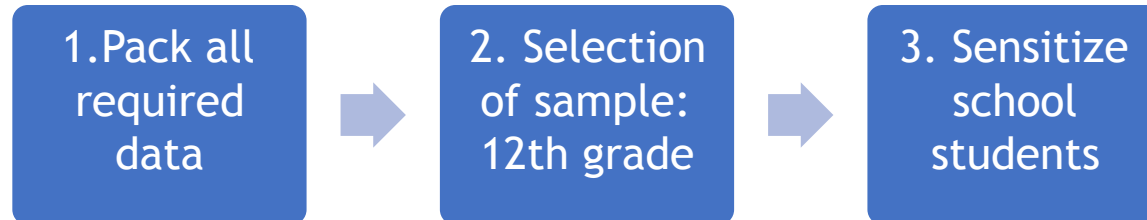
- **Marketplace** where people gather, through **flyers, brochures, posters** or a small table/ tent set up along with other vendors to share informational **brochures**
- **WhatsApp groups** with a point person (who creates the group chat room) disseminating relevant information and opening up to Questions & Answers (Q&A)

and discussions. This can also be a medium to share events or other drives planned in regards to fluoride and fluorosis

- **Verbal:** Word-of-mouth in the village communication channels, in formal and informal settings. This may include stakeholder and engagement group meetings / sensitization campaign with self-help groups, women’s associations or community social service organizations, health clinics and health organizations, local authorities on the level of fluoride in the water
- **Skits / theatre troupes**
- **Radio messages** and programs
- **Three-wheeler** with microphones moving around the village with messages on fluorosis and fluoride



X. DATA COLLECTION PROCESS: PART 2 of 2: SCHOOL LEVEL



Step 1: Pack required data collection materials on the checklist

Before you begin data collection at the schools, please make sure you take the following materials to the data collection site.

XI. DATA COLLECTION MATERIALS FOR SCHOOL LEVEL TESTING: CHECKLIST

- **School List &** Contact with one of the MSW Student Leaders who will lead the data collection
- **Government letter of permission**
- **PHED Fluoride Kit**
- **Mobile phone** (with Survey CTO downloaded)
- **Fully charged** mobile phone (carry charger or back-up battery for mobile phone)
- **Booklets** supplied by PHED with Columbia University
- **PowerPoint on Fluorosis** (Yiran’s PPT)

XII. Alirajpur Block School List

No.	School Code and Name
1	23490204013 - GHHS BAHARPURA
2	23490204011 - GHSS ALIRAJPUR

3	23490209122 - GIRLS HIGHER SECONDARY SCHOOL NANPUR
4	23490207407 - HIGH SCHOOL BARI
5	23490203407 - HIGH SCHOOL BORKUA
6	23490213402 - HIGH SCHOOL CHICALGUDA
7	23490205907 - HIGH SCHOOL DOBLAJHIRI
8	23490209710 - HIGH SCHOOL FAATA
9	23490211403 - HIGH SCHOOL KHANDALA
10	23490210509 - HIGH SCHOOL RAJAWAT
11	23490202111 - HS AJANDA
12	23490202608 - HS AMBARI
13	23490210708 - HS KHARKUA
14	23490202609 - HS THODSINDHI
15	23490207915 - HSS AAMBUA
16	23490204012 - HSS ALIRAJPUR
17	23490204805 - HSS BORKHAD
18	23490202112 - HSS LAKSMANI
19	23490209121 - HSS NANPUR
20	23490206803 - KANYA SHIKHSA PARISHAR ALIRAJPUR
21	23490204014 - Model High School (RMSA) Alirajpur
22	23490201705 - NEW HS ALI
23	23490207003 - NEW HS BHARAT KI CHOUKI

Step 2: Selection of sample: 12th grade students

Arriving at the School

When the enumerator arrives at the school, it is good practice to first meet with the school leadership and introduce the purpose of the visit and seek support, even if the government has already approved and given permission for the activity at the school.

1. Show and explain to the school leadership the visual aids (PPT and booklets) that you will show the students

2. Explain that a few selected students (ideally grade 12) will be requested to participate in the survey. Emphasize that the data collection is not meant to affect the students' grade in any way. The data will only be used to understand the information on fluoride and fluorosis in the community.
3. Make sure all activities are not disruptive to the regular class schedules: for example, students on break or lunch breaks should be used for the activity.

Selection of Sample

- All Grade 12 students present at school on the day of visit
- Emphasize that the students' participation and responses DO NOT affect their school grades in any way. Ensure that the Consent/Assent statements are read, reiterating the point that the survey is voluntary and they may withdraw if they are uncomfortable.
- Make sure students can read and understand written text. Enumerators should pay close attention and check that the students are understanding the questions. Enumerators can go over the questions with the students if the set-up is so that few different students are sitting together and can listen to instructions at the same time.

Step 3: Awareness & sensitization of school students with educational materials

Upon completion of the survey, use the PowerPoint on Fluorosis and mini booklets to engage students in the discussion about fluoride and fluorosis.

...



(Attach finalized PPT)

(Attach finalized mini booklet)