Half Yearly Progress Report

FLUOROSIS MITIGATION IN THE SELECTED VILLAGES OF SONBHADRA

DISTRICT, UTTAR PRADESH"

Duration: April 2023 to September 2023

Submitted to

People for Progress in India (PPI)

By

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Brief description of Problem:

Banwasi Seva Ashram (BSA), a voluntary organization located at Govindpur, has identified many cases of Fluorosis in dozens of villages of Chopan, Dudhi and Myorpur blocks

(https://www.indiawaterportal.org/articles/fluoride-testing-and-fluorosis-mitigation-sonabhadradistrict-uttar-pradesh-study-peoples).

These blocks are dominated with tribal communities. Recently, a study was carried out by BSA and PSI Dehradun in 21 Gram Panchayats for drinking water quality tests and estimated fluoride content which showed fluoride concentrations between 1.1 – 5.4 mg/L in surface water and 0.5 – 5.9 mg/L in groundwater.Also in this joint study, a serious occurrence of Fluorosis (for both Dental and skeletal Fluorosis) was observed.

Village description:

In villages near BSA, such as Kusmaha and Govindpur, we found a high prevalence of dental and skeletal fluorosis.

1. **Village Kusmaha**:

The village Kushmaha falls in Sonbhadra district, situated in the state of Uttar Pradesh, with a population 1439. The male and female populations are 747 and 692, respectively. The size of the area is approximately 6.1 square kilometres. The fluorosis affected population is 848 according to a study conducted in the year 2004. In one school, 23 out of 37 students were found to be affected by dental fluorosis and 8 people were seriously suffering with skeletal fluorosis. 72% of the total available water sources have been found to contain more than 2 mg/L of fluoride, and one water source showed a fluoride concentration of 10mg/L.

2. **Village Govindpur**:

The village Govindpur falls in Sonbhadra district, situated in the state of Uttar Pradesh, with a population 562. The male and female populations are 304 and 258, respectively. The size of the area is about 6.14 square kilometres. According to a study conducted in year 2004, the population affected by fluorosis is 355,with dental fluorosis being particularly prevalent. 81 % of the total available water sources have been found to contain more than 2 mg/L of fluoride concentration.

Goal of the Project:

Ensuring fluorosis mitigation in selected villages and establishing a model for fluorosis mitigation.

Objectives –

In this phase, we will establish with more clarity the relationship between severity of fluorosis, and regular use of fluoride free drinking water as well as diet rich in nutritional supplements.

- The intervention in the1st&2ndphases will be continued to involve more volunteers and the entire community.

- Ayurvedic Doctors and research scholars from BHU will be involved as observer of the process. With their support, emphasis will be placed on using specific medicinal herbal nutritional supplements rich in calcium & vitamins.
- The emphasis will be on the communityadopting all intervention as part of their daily routines.
- Established modal will be shared with a larger group and the concerned authority.
- Environment Scientists from People Science Institute Dehradun will continue their association with the project.

Project Plan –

The proposal has been implementation of our study strategy and the mitigation approach for fluoride-affected target villages.

Tentative work plan form April 2023 to Sep 2023							
SN	**Activities**	**April-23**	**May-23**	**June-23**	**July-23**	**Aug-23**	**Sep-23**
1	Performance Check of Fluoride removal kit (Fluoride test) cartridges to be replace if necessary						
2	Training for recharge, maintenance and clean-up process of kit						
3	Training of kit users for qualitative fluoride testing						
4	Weekly visit of each house hold (75HH) Hamlet meetings and Register maintenance, Monitoring for Poshan Vatika & use of nutrition laddu& medicines						
5	Review meetings for Supervision/monitoring of implementations of the plans						
6	Distribution of nutritional and medicinal supplements: Ca, vitamin D, vitamin C and other nutritious calcium rich diet supplements (according to Medical test)						
7	Detailed health check-up of selected participants (S. Ca, Alk.Po4, Vitamin D and X-ray) & L.F.T in selected cases						
8	Urinary fluoride analysis						
9	Water quality (F, pH and TDS) monitoring of all water sources at Kusmaha and Govindpur (if any source selected for water supply, need testing of T Alk, THN, Fe, Hg etc.)						
10	Water level of both the villages						
11	Health Survey						
12	Quarterly Community meeting for regular use of kit and data sharing of water and urinary fluoride (Panchayat Level).						
13	Preparation of charts: impacts of fluoride, fluorosis, nutrition and set up FM centre with poster, information						
14	Quarterly follow-up meetings of fluoride Mitigation plan with village health sanitation & nutrition committee						
15	Community meetings and ‘Sandes -Yatras' in selected fluoride effected villages						
16	Public Conference						
17	Data sharing at State level administration and press conference						

Details of work done from April 2023 – Sep 2023 :

Following works have been done and some are still in continuing process–

1. **Training for the maintenance (cartridge change) and clean-up process of the kit** was organised in the "Arogya- Kendra" of Banwasi Seva Ashram with the selected household person from Kushmaha and Govindpur village on 21st June 2023 for the sustainability of the efficacy of fluoride removal kits.

2. **Performance Check**: 64 Fluoride removal kits (Fluoride test) for efficacy of cartridges have been done. Out of which 19 kits showed very reduced efficiency of work so the cartriadge of those kits have been replaced. Other 15 kits may need cartridge replacement within few month (3 month or so) as their efficiency has little bit on lower side . rest are working in good capacity. In the last few months we will check again, as &when required cartridges will be replaced.

3. **Medicinal and Nutritional Interventions:** We have given Calcium, Vitamin D, Vitamin C, to moderate and severely affected dental and skeletal fluoride cases and Iron to severely anaemic persons.

   For the promotion of making "nutritious-laddus"timeto time at there home we provided training to 22 participants from kusmaha and govindpur villages on how to prepare "nutritional-laddus" (using rostedTil, Methi and Jiggery/Mahua combined). For this very purpose we have encouraged community people through our tola meetings to preserve 4 KG Til from their agricultural produce and continuously motivating them to make a habit of including calcium rich vegetables, fruits (Gus berry and Guava) and agricultural produce in their daily diet in which ever it is available time to time.

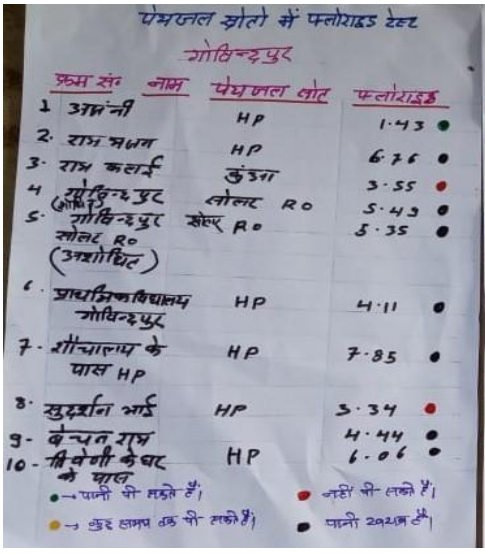
4. **PoshanVatika**: We have organised a community meeting for the establishment of Kitchen Garden (PoshanVatika) in the month of May and June & distributed seeds(Bottle-gourd, bitter gourd, Brijal etc.) in 30 those householdswhich were having water availability in summer season and are willing to save it from free cattle grazing. And now due to repeated awareness motivational discussions in community and "Tola- meeting "now by the month of September to our happiness 60 kitchen gardens have been established having green leafy vegetables and some fruit plants. Others also getting motivated and trying to grow few green leafy vegetable's for home.

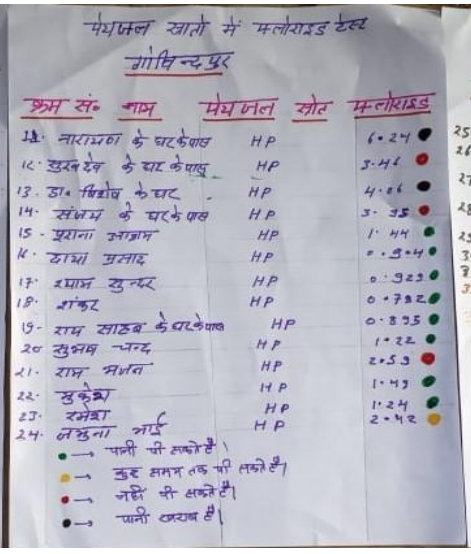
4. **Tola Meetings** : We have Organised "Tola- meetings" time to time in Kushmaha and Govindpur villages to discuss the feedback of fluoride affected individuals, and to collect the status of behavioural changes on the fluoride issue among the community. In the Tola-meetings many people came happily with positive results saying that there is significant improvement in there walking and working capacity due to reduction in joint and muscle pain-swelling. Some said digestion- bloating, flatulence problem is now rare occurrence to me which has increased my stamina enthusiasm to do my daily work.

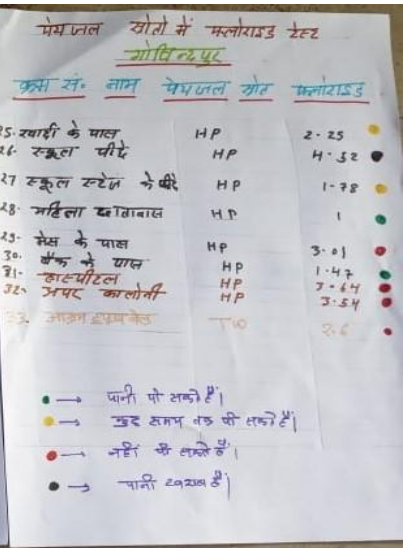
5. **Distribution of herbal medicine:** For the fluoride mitigation, Ayurvedic medicine (Godanti, Prawal, Yashtimadhu and Raktchandan) has been prepared under the supervision of Prof Anand (BHU)and will be provided to the 41 Fluoride affected persons from those house- holds who are regularly using de-fluoridation water kits. This will be distributed from October onwards. List of the persons has been prepared to whom herbal medicine have to be distributed.

Community meeting and awareness:

In both the villages community interactions were done in which they were informed about the fluoride concentration in their drinking water sources. Drinking water sources of both the villages Kushmahaand Govindpurwere marked with green, yellow, red and black showing the level of fluoride. Green safe, Yellow Under the danger, Red cannot be use but be used for drinking purpose but can be used for bathing, washing utensils & cloths etc., and black cannot be used either way.







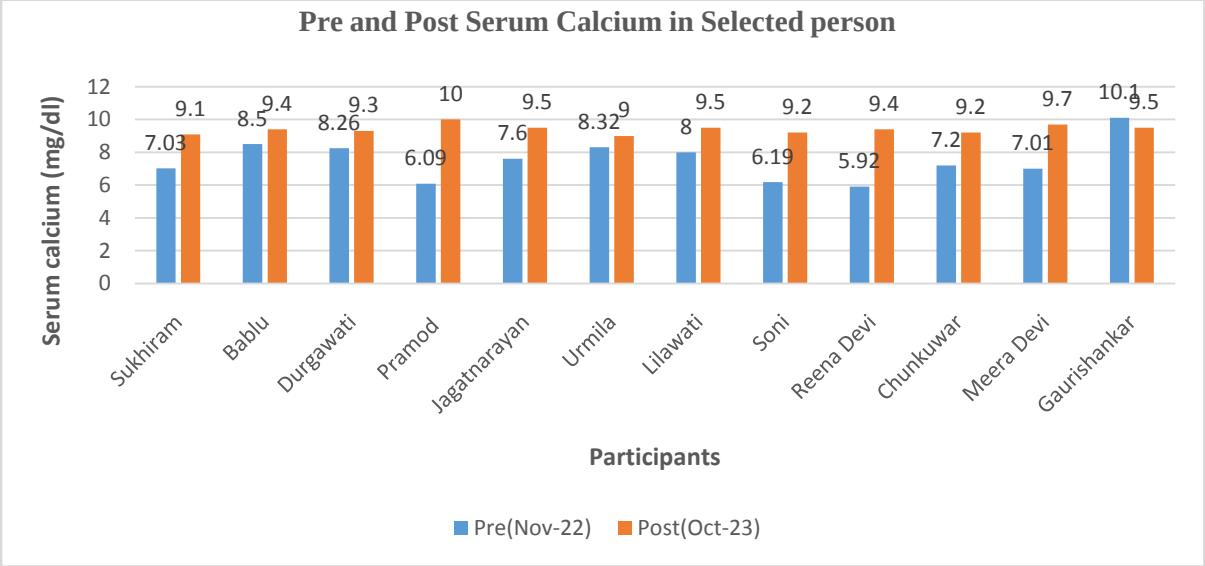
Performance Check of Watsan Fluoride Removal Kit: We have tested 64 kits for Cartridges efficiency. Out of these 19 filter cartridges were found to be having very low efficiency as for as fluoride removal is concern so they have been replaced already with new one. There are 15 kits in which efficiency of fluoride removal is little bit decreased so they will also need replacement after few months i.e. Two to Three month or so. The remaining Thirty filter kits cartridges are still working with good efficiency.

Table: showing the details of the Fluoride concentration in source and after filtration of those 19 kits in which now cartridges has been replaced with new ones.

S.No	Name	Name of Source	Fluoride conc.in source	Fluoride Conc. after Filter	Cartridge Change
1	Meera	Well	2.63	2.08	Done
2	Akhilesh	Well	1.02	0.931	Done
3	Kmala	Well	2.73	2.13	Done
4	Sanjay	HP	3.21	1.72	Done
5	Reena	HP	2.41	2.14	Done
6	Bheemsingh	HP	2.09	1.85	Done
7	Raisingh	HP	1.92	1.67	Done
8	Shanti	RO	2.06	1.83	Done
9	Kalawati	HP	1.9	1.64	Done
10	Punam	HP	2.61	2.2	Done
11	Rama	HP	1.84	1.64	Done
12	Rajendara	RO	2.16	1.32	Done
13	Suchita	HP	1.72	1.06	Done
14	Pushpa	HP	1.28	1.11	Done
15	Chhediram	HP	1.52	0.834	Done
16	Arvind	HP	2.36	2.33	Done
17	Usha	HP	2.17	1.29	Done
18	Ramashankar	Well	2.61	2.39	Done
19	Manoj	HP	2.45	1.97	Done

Table : showing the details of Pre and Post Serum Calcium in Selected person

S.No	Name	Father/ Husband	Serum Calcium	
			Nov-2022	Oct-2023
1	Sukhiram	Ramvilash	7.03	9.1
2	Bablu		8.5	9.4
3	Durgawati	Raju	8.26	9.3
4	Pramod	Jamuna	6.09	10
5	Jagatnarayan		7.6	9.5
6	Urmila	Sudarshan	8.32	9
7	Lilawati	Omprakash	8	9.5
8	Soni	Dharmendar	6.19	9.2
9	Reena Devi	Shrawan	5.92	9.4
10	Chunkuwar	Kewalram	7.2	9.2
11	Meera Devi	Bakkal	7.01	9.7
12	Gaurishankar	Gajju	10.1	9.5



October 2023 we tested serum calcium levels for the few sample group of people who were tested for serum calcium in November 2022 also. To our enthusiasm the results are showing increase in serum calcium level in all selected persons except one in which also it has not gone beyond lower limit of normal.

Future Activities:

Regular monitoring and impact analysis of 75 selected persons • Water DE fluoridation kit monitoring and Fluoride testing • Urinary fluoride Testing • Serum calcium and some other blood test of selected participants • X-ray • Nutrition Interventions • Monthly Record keeping
Analysis of Impact • Detailed Comparison study of fluoride in water sources and urinary fluoride • Analysis of health improvement wrt Fluorosis
• Nutritional Study of RO water and in selected natural drinking water sources for quality parameters
• Improvement in drinking water security plan and need based testing of water quality • Protection and conservation of secured water sources in Village
• Development of actionable water security plan for each one in Village.

Community meeting and Preparation of Fluoride Mitigation Plan • Meeting with VHNSC and focus on fluorosis Mitigation plan as an agenda for Gram Sabha
Large scale Sandesh Yatra in nearby villages and a conference to disseminate the outcome. Meeting with Govt implementing agencies and district administration

Challenges:

1. Though both the villages are located near BSA, it took some time to convince the people that the fluorosis mitigation work is for their health benefit as well as for the improvement in health of community as a whole.
2. As they have suffered a lot due to Fluorosis and are hopeless &frustrated due to no active action taken till date from the responsible officials, even though these villages have been visited and interviewed many a times by them and also by renowned media, for story coverage. Few families are very much reluctant to actively participate in any of our project activities and to use nutritional interventions despite of repeated Tola meetings.
3. We have visited every selected household many a times but some people have shown lesser interest and concern to avail the interventions. As due to low socio economic conditions most of the men in the villages work as daily wage labourers & go to nearby townships, while most women work in their agricultural field's. Therefore, meeting them was challenging, and we had to set the meeting based on their availability.

Leanings:

1. A holistic/integrated approach is required for water resources management.
2. Issues of water quality in the area need to be scientifically proved and co-related with the geology of the area. Other quality parameters need to be incorporated during mitigation plan development.
3. Urinary fluoride measurement proved to be a good indicator of the consumption of safe drinking water by the people. Health improvements can be related with this data.
4. Government support is important to scale-up the work.
5. Continuous education and individuals counselling on fluorosis problems as and when required is needed repeatedly time to time. As seriously affected people are unenthusiastic & frustrated due to their reduced working capacity and health issues so they leave the interventional activities intermittently after few months. So they need continuous contact, counseling and motivation for a long period of time till there is a permanent recommended behavioural change is seen in them.

Photographs of Various activities

1. Training & replacement of cartridge after performance

2. Blood sample collection & demonstration of Nutritious Ladoo preparation

3. Poshan Vatika

5. Staff Meeting for action plan

6. Tola Meetings

7. Education & extension activities

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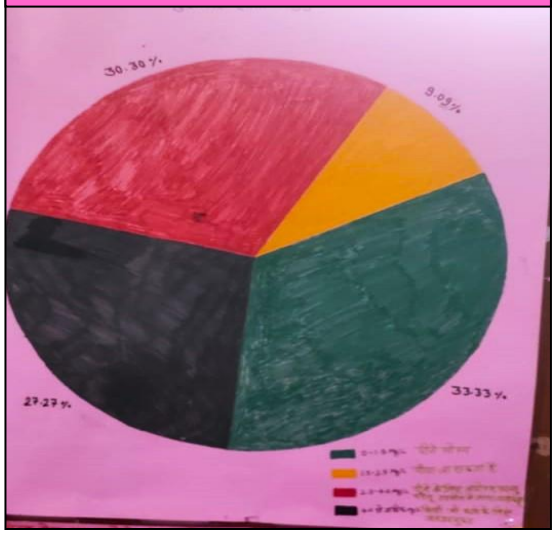

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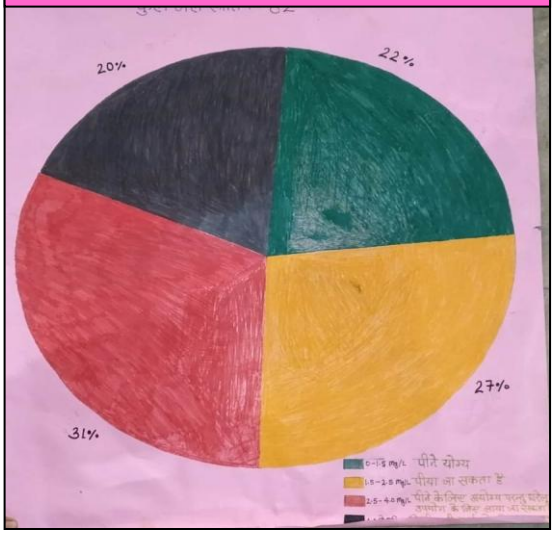

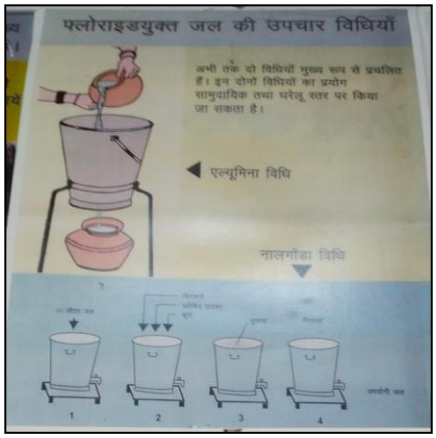

8. Posters & IEC materials

Thank You