2015-16

PROTEIN

Program to Revitalize Overall health of Tribals by Ensuring the Intake of Nutritious food

Promotion of Nutri-Gardens and its allied activities to address malnutrition

The Energy and Resource Institute
WESTERN REGIONAL CENTER

The Energy and Resources Institute

...towards global sustainable development

For more information

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Introduction

TERI has been actively working in collaboration with GKN Sinter Metals Pvt. Ltd. for the past two years and has successfully implemented the following projects in the year 2014-15.

1. **PROTEIN**
   While conducting an analysis of the scope of LaBL in these villages, TERI understood the extent of malnourishment that exists in the Palghar district. TERI, with the help of GKN Sinter Metals Pvt. Ltd., decided to distribute nutritional supplements in these areas as an immediate intervention to address malnourishment. Also, TERI conducted regular awareness and capacity building workshops to introduce healthier food options, encourage vegetable cultivation in nutri-gardens, and the preparation and consumption of healthy food.

2. **LaBL (Lighting a Billion Lives)**
   The main objective of the project was to provide the villagers with at least the minimal lighting requirements for their daily activities. TERI has successfully implemented the LaBL program in 7 villages of Palghar district, providing the villagers with the means to fulfill at least their minimal lighting requirements, **300 solar powered lanterns,** to carry out their daily activities with fewer difficulties. .

Promotion of Nutri-Gardens and its allied activities to address malnutrition

Background

Having successfully completed Phase 1 of the PROTEIN project in collaboration with GKN Sinter Metals Pvt. Ltd in the previous year, TERI scaled up the activities in June 2015 to implement Phase 2 and to address the existing issues such as water scarcity, malnourishment, lack of awareness of modern agricultural techniques, apathy towards the judicial use of available natural resources and fewer revenue generating options. Thus, TERI selected Pathardi village in order to ensure long term sustainability of the region.

Site Introduction

Pathardi village is situated at a very remote location in the Mokhada block of Palghar district and has a population of 280 people, of which almost 99 percent belong to the Scheduled tribes. This tribal village falls under hot and humid climatic conditions but remains dry for most of the year and is dominated by a hilly terrain leading to dense contours. Poverty and a lack of resources have given rise to malnutrition among the children and women, bringing the area under great stress. Furthermore, the remote location of the Pathardi village and its difficult terrain makes it difficult for the villagers to access water, making the cultivation of vegetables during summers a great challenge. The commute to the vegetable markets, too, becomes difficult due to a lack of access to local/ personal vehicles. Hence, they tend to visit the markets only once a week to buy vegetables, leaving them with fewer food options through the week. Thus, children and women become more vulnerable to malnourished conditions during this period of the year.

Picture 1 Google image of the distance travelled by the villagers to access market place

Source: Google Earth

Objectives

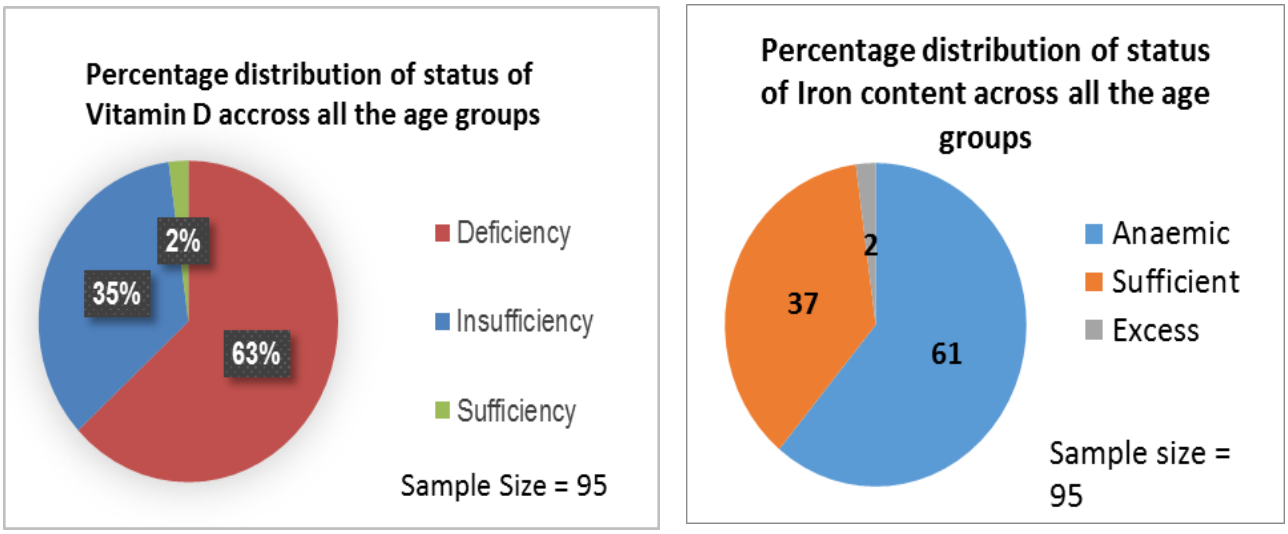
Considering the challenges faced by the villagers, the following objectives were enlisted to circumvent the issues at the household level.

1. Sourcing of Nutri Food through specific interventions
2. Capacity Building of stake holders, especially women and youth, to innovatively grow and use nutritious food ingredients to enhance their diet.
3. Vegetable Shop/ Outlet to be set up for the sale or distribution of vegetables

Observations

Health Status

TERI conducted a Health Check-up camp to analyse the micro-nutrient deficiency in the children belonging to the age group of 2-13 years, women above 19 years of age and pregnant women. The sample size of the collected blood samples was 95. It was assessed that more than 60 % of the women and children have iron and vitamin D deficiency *(For details refer to Annex 1)*.



Picture 2: Percentage distribution of status of Vitamin D and Iron deficiency across the sample size

Water scarcity

Malnourishment and water scarcity are indirectly part of a vicious cycle; though these factors are interlinked in a complicated manner, and water scarcity contributes to the persistence of malnourishment. Hence, there is a need to improve the local environment that would directly have a positive impact on the health and nutrition as this could enable breaking this vicious cycle. There is also a need to focus on providing them with access to basic nutritious products to meet their daily dietary requirements. Another major problem for the fulfilment of nutritional requirements is the usage of existing natural resources. The accessibility to water resources is difficult and tiresome as the village is located on the hillocks while the water sources are located downstream. The hill-slopes and rocky terrain increases the surface run off and the water which precipitates rapidly trickles down to the catchment settling far from the village. This not only affects the **accessibility** but also the **quality** and the **quantity** of water available to the tribal communities for their daily needs. Women daily fetch more than 80 lit of water per family covering an average distance of 1.5 km, thus spending a lot of their time and energy. Apart from this, more than 79% of the existing water sources, mostly wells, are uncovered, raising serious concerns on the quality (contamination due to soil erosion, waste dumping, poor hygienic practices and so on) as well as the quantity (evaporation losses, wastage) of water.

Figure 1Women carry heavy load of water for household consumption and abandon kitchen gardens during summer months.

Thus, the inconvenience of accessibility to water resources not only discourages them to adopt healthy sanitary practices but also refrain them from vegetable cultivation for self-consumption. Hence, as a pilot study, TERI implemented appropriate strategies to cultivate nutritious food at the household level and improve the accessibility to water by integrating water conservation as well as recycling and reusing water.

Strategies and Interventions

1. Sourcing of nutri-food through specific interventions

A sustainable source of fresh vegetables is essential to gradually reduce malnutrition in the village. Thus, inculcating the idea of cultivating nutritious varieties throughout the year is important. Being non-commercial farmers, villagers practice only rain fed agriculture and highly depend on the cultivated grains and a few selected millets for the rest of the year. This results in a shortage of nutritious food and consumption of only selected vegetables which are easily and cheaply available in the market.

Following are the probable reasons for the micro-nutrient deficiency observed within the sample size

1. Fixed dietary patterns and a lack of food diversity leading to essential nutrient deficiency
2. Increased requirement of a particular nutrient with respect to age and physical and mental development
3. Increased excretion through sweat or poor well-being

Although, **Vitamin D** deficiency *(For RDA [Recommended Dietary Allowance] please refer to Annex 2)* can also occur due to:

- lower intake of Vitamin D rich food as compared to its recommended levels
- Limited exposure to sunlight
- Inadequate absorption of vitamin D from the digestive tract.

However, based on TERI's survey, the main reason could be **insufficient intake of fatty food,** it has been proved that the presence of fat in a Vitamin D rich meal significantly enhances absorption of Vitamin D[1]. However, the villagers rarely consume any fatty food and solely depend on vegetable oil. Their daily intake is as low as approx. 31gm/day which is around 30% less than the recommended daily intake of fat i.e40 g/day[2] for an average adult diet doing heavy work to meet their nutritional needs.

Interventions and their impact

Immediate Solutions

Intervention to overcome Vitamin D deficiency:

Mushrooms are considered as the only vegetarian source rich in vitamin D,.[3]. It is also known to be rich in protein. Thus, dry mushroom powder was distributed to encourage its consumption as part of the daily diet. A workshop was conducted to elaborate on its benefits, uses and different preparation methods.

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[1] Bess Dawson-Hughes et.al., ***Dietary Fat Increases Vitamin D-3 Absorption,*** Journal of the Academy of Nutrition and Dietetics, February 2015 Volume 115, Issue 2, Pages 225–230

[2] http://ninindia.org/dietaryguidelinesforninwebsite.pdf

[3] http://www.powerofmushrooms.com.au/health-nutrition/health-nutrition/vitamin-d/

Intervention to overcome Iron deficiency:

According to the National Institute of Health, average daily level of iron intake sufficient to meet the nutrient requirements from age group 14 to 50 and above is given the table below:

Table 1 Recommended Daily Allowance for Iron

Age	Male	Female	Pregnancy	Lactation
14–18 years	11 mg	15 mg	27 mg	10 mg
19–50 years	8 mg	18 mg	27 mg	9 mg

Source: National Institute of Health

TERI encouraged the villagers to consume green leafy vegetables which could be cultivated locally. Thus, to initiate and increase the consumption of these vegetables, **TERI** provided them with the seeds and saplings mentioned in the table below:

Table 2: Recommended green leafy vegetables.

Vegetable per 100 gm	**Iron (mg)**
Moringa oleifera, raw leaves	4
Beta vulgaris, tender leaves	3.57
Amaranthus caudatus, cooked leaves	3
Colocasia esculenta, steamed leaves	1.7
Basella alba, cooked	1.2

Source:http://nutritiondata.self.com/facts/vegetables-and-vegetable-products/2349/2

Figure 2: Distribution of Mushroom powder and drumstick cooked with the use of mushroom powder as an important ingredient.

Long-term Solutions

TERI carried out the following interventions to encourage villagers, especially women to cultivate vegetables even during the summer months of the year.

Intervention 1: Promotion of Nutri-gardens

- The importance of Nutri-gardens was highlighted in providing the essential nutrients in the diet. With this, the significance of food consumption patterns and diversity needed in the diet was also emphasized.
- To complement the awareness workshop, A **"Nutri-garden Competition"** to encourage cultivation of diverse vegetables was arranged.
- Easy methods of irrigation such as bottle and mud pot irrigation as well as the use of organic fertilizers through compost pits were promoted during the competition.

Figure 5 Seed distribution to the participants of Nutri-garden Competition

Figure 3 Beans grown in the backyard through Nutri-garden initiative

Figure 4 Effective mode of irrigation and the use of organic fertilizers for nutri-gardens was carried-out by the women of Pathardi village

Impact of the intervention

Figure 6 Change in the landscape at the house of a beneficiary of the program.

Intervention 2: Making water available for growing veggies during the summer season

It was of paramount importance to provide water during the summer months of the year for successful implementation of the nutri-gardens. Thus, a survey was conducted to assess the water requirement of the villagers. The survey of a total of 50 households (HH) revealed the following

Table 3: Water requirement of a HH in Pathardi village

Purpose	**Quantity/ HH (min 4 members) (liters)**	**Qualitative requirement**	**Existing water source**	**Water carried on head by women/HH**	**Possible water sources**
Cooking and drinking	20-30	Very good (bacteriologically free)	Wells	✓	Rainwater harvesting & maintenance of the existing water sources
Bathing	50-70	Good			
Washing clothes and utensils	30-40	Good	Stream and wells		
Cleaning the flooring and other application	20	Moderate	Wells	✓	Recycling grey-water generated from bathing and washing (if any)
Cultivation of Nutri-gardens	30			✓	
Total	150-190			120-150	

Thus, from the above table it is observed that the grey water (the water used for bathing and washing utensils) could be treated effectively and reused. With this objective, grey-water treatment systems were installed at the household level. A simple sand filter which treats water at the primary level were installed in 7 households. These houses were selected by examining the condition of the bathrooms and the appropriate outlets. Considering the filtration losses, approximately 40 litres of water were collected per household.

Thus, the people were encouraged to use the treated water for the nutri-gardens. The water leftover was used for other secondary purposes.

These systems indirectly reduced the trips made by women to fetch water for secondary

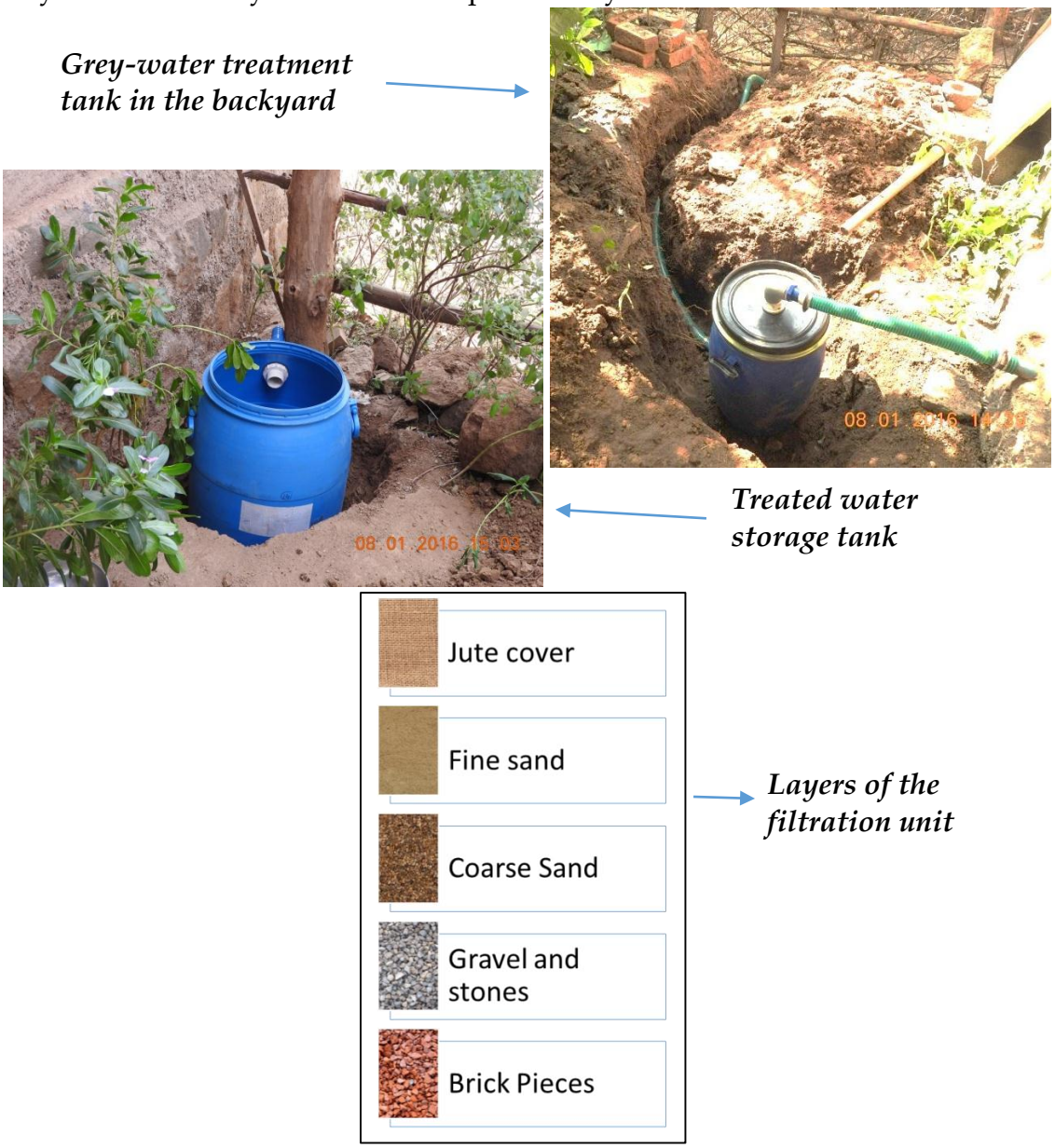


Figure 7 Grey-water treatment system installed at household level (above), composition of the treatment tank (below)

purposes and provided them with more time to maintain and establish nutri-gardens. With an effective working of the grey water treatment units following results could be

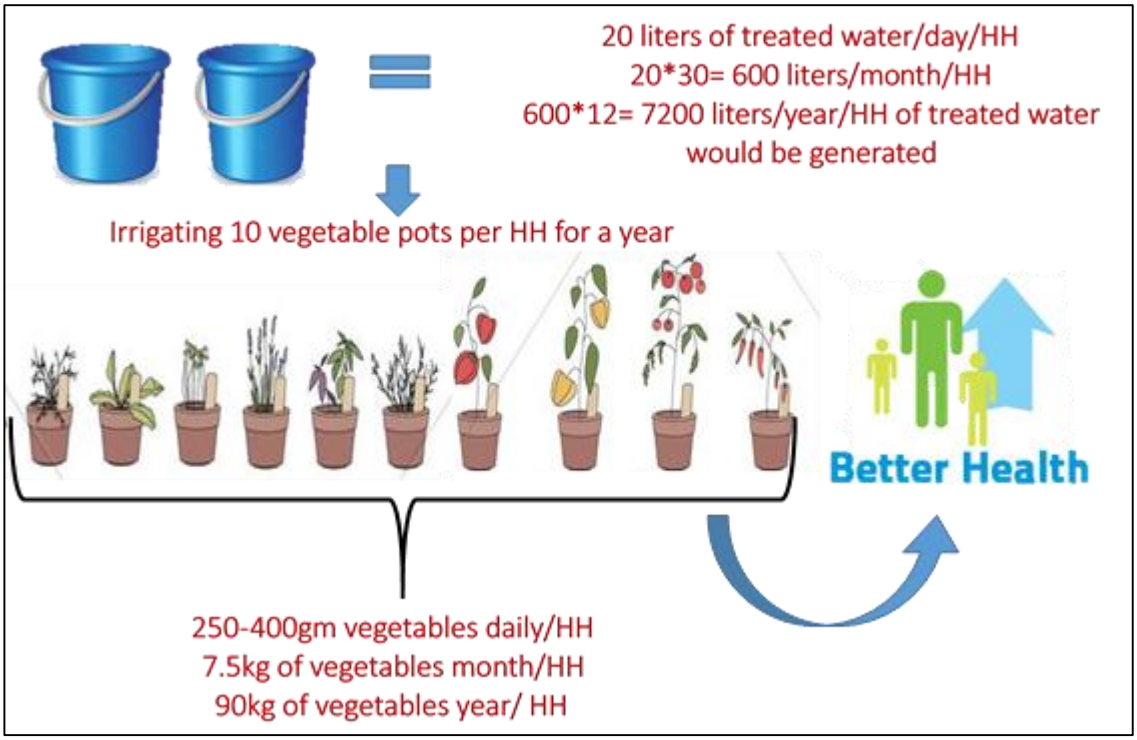


Figure 8 Expected output from the established systems in terms of water recycled, vegetables produced per annum per HH

achieved.

As shown in Figure 8, a minimum of 20 litres of water get generated per day with the help of grey-water treatment system. With this, approximately 10 varieties of vegetables could be grown in the backyard. After a certain period, even if each pot yields 250 gm of vegetables per day, it would account to 7.5 kg of vegetable per month and approx. 90 kg of vegetables in a year. This would not only help villagers to be self-reliant for fresh vegetables but also provide them with a nutrition sufficient diet.

Impact of the intervention

- Grey-water treatment systems proved to be a sustainable option for perennial nutri-gardens.
- Water at the door step helped women in minimizing the trips of fetching water for secondary purposes, in turn resulting in reducing their workload and stress.
- It has a potential of easy replication in other remote tribal villages.
- This could also generate a revenue option for the local youths and plumbers.

Intervention 3: Training of the youth on grey-water systems and its application

10 local youths were given hands on training to install the grey-water treatment systems. Along with this a local plumber was identified to provide them with the essential materials required and the provision of the facility was ensured through identification of a local shop located in the market of Khodala village. Thus, the linkage formed between the consumer and the service provider helped in promoting the activity and in turn created a revenue opportunity at the village level.

Figure 9: Training workshop on grey-water treatment systems on World Wetlands Day to elaborate the significance of constructed wetlands

Intervention 4: Assessment of the existing and an alternative water source structures

Non-availability of water has been a persistent challenge encountered during the implementation of the project. Villagers of Pathardi face acute water scarcity for almost 3 months of the year. Availability of drinking water also becomes a great challenge during this time. Thus, TERI assessed the status of the natural and only water sources in the village, comprising of one pond and two wells.

Figure 10 Pond and well located in the vicinity of the village

a. Water quality analysis of existing wells

Except the total coliform count, the indicators of water quality were found to be within the permissible limit. The possible reason could be the intrusion of sewage water, poor hygiene or poor maintenance of the wells. Thus, it is of paramount importance to repair and maintain the existing structures to avoid the contamination of drinking water sources.

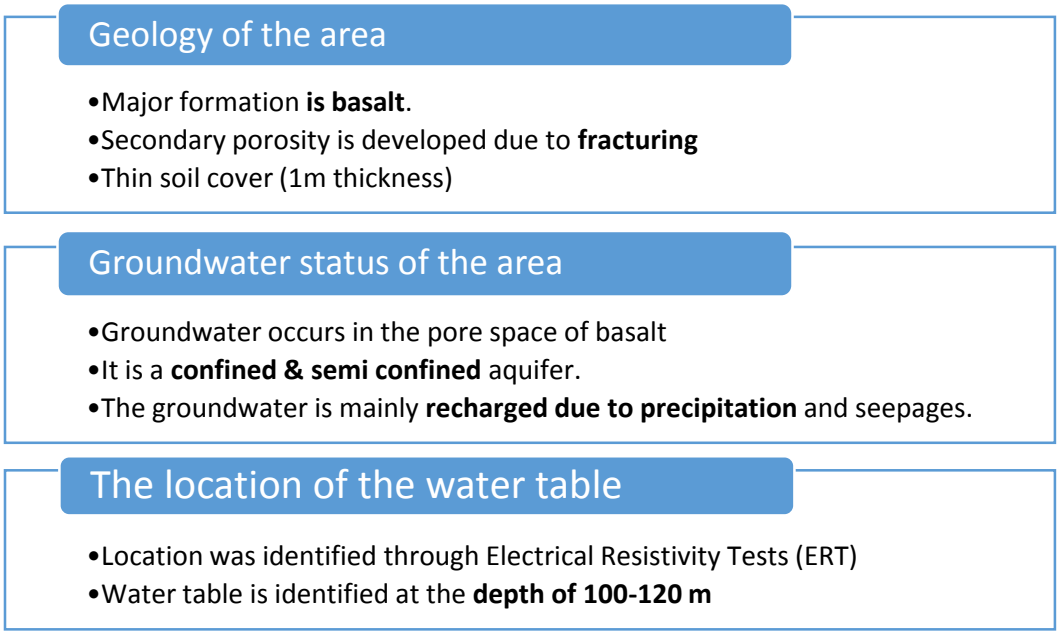
Table 4 Water Quality Analysis of the collect samples

Sr. No	Parameters	Well 1	Well 2	Upper Permissible limit (IS 10500:1991)
1	pH	5.89	6.40	6.5 – 8.5
2	Electronic Conductivity	235.4	202.6	--
3	Turbidity	14.08	4.91	10 NTU
4	Suspended Solids	10	11	--
5	TDS	143	134	500mg/l
6	TS	304	300	--

7	Acidity	<5.1	NIL	--
8	Alkalinity	115.20	86.40	200mg/l
9	Chlorides	25.95	64.87	250mg/l
10	Fecal coliform	23	23	10per 100ml
	E Coli	+ve	+ve	-ve
11	Sulphate	103.24	108.76	200mg/l
12	Phosphate	1.138	1.055	--
13	Total hardness	114	57	300mg/l
14	Nitrite	0.173	0.178	--
15	Nitrate	0.515	0.522	45mg/l

b. Hydrogeological investigation of Pathardi village

To explore the possibility of making water available even during the crucial dry months of the year, TERI investigated the hydro-geology of the area which showed the following results



Picture 3: Hydrogeological report of the area

Thus, the possibility of drilling the bore well/ rainwater harvesting structure would be explored further. An extra source of water would complement the existing wells and directly benefit the villagers in fulfilling their water requirement. Thus, exploring the option of bore well

or live spring already identified in the village shall also serve the purpose of improving the water supply quality and in turn health status of the villagers.

c. De-siltation of the pond

A natural pond was in the village stored fresh surface run off water during monsoon season and beyond for few months. De-siltation of the pond was carried out to enhance the water holding capacity which can later provide water for irrigating trees in the riparian zone around the pond especially in the summer months. The observations regarding enhanced water holding capacity would be taken in the current year post monsoon.

In order to explain the importance of the developing and maintaining the natural water bodies in and around the village, TERI celebrated "World Wetlands Day" on 2nd February 2016 at Pathardi. TERI using this event as an opportunity, conducted an awareness workshop on conservation of natural wetlands and adoption of man-made wetlands. A capacity building and training program was also undertaken on how wetland conservation practices can improve the quality and quantity of water available for drinking and secondary applications, like irrigation of Nutri-gardens (kitchen gardens) and flushing.

The activities conducted during the program are as follows:

- Natural wetland conservation drive: Women were encouraged to offer 'shramadan' (help) to clean the pond. Thus, through Community participation, around 25 women were motivated to clean the pond.
- De-siltation of up to 4ft was carried out by deploying mechanical devices

Figure 11 De-siltation carried out with community participation and with the help of the mechanical device

Intervention 5: Fruit plantation and afforestation activity

TERI provided fruit tree saplings of Papaya, Custard Apple and Amla, to the villagers for plantation in the backyard of their house before the on-set of monsoons. This shall further ensure a long-term supply of seasonal as well as economically important fruits.

Figure 12 Fruit tree distribution at the household level

2. Capacity Building of stake holders, especially women and youth to innovatively grow and use nutritious food ingredients to enhance the quality of diet.

Training of the youths

Being non-commercial farmers, motivation to undertake vegetable cultivation on a small scale was extremely important. Thus, an awareness workshop about different farming practices was undertaken. Three local youths were selected and received a structured training and excursion on **"General Greenhouse Management" at Horticulture Training Centre, Talegaon.** This encouraged them to undertake modern agricultural interventions and effectively cultivate vegetables for sustainable supply of nutritious food.

Figure 13 Awareness and training workshop of the youths of the village

Impact

The training exposed them to different types of farming practices other than traditional/ rain fed agriculture. It helped them to understand different techniques and methods to identify and control pests and recognize the importance of undertaking organic farming. The dietary importance of vegetables along with the sale & market demand was precisely explained through this training.

3. Vegetable Shop/ Outlet to be set up for the sale or distribution of vegetables

This shall be an on-going activity with robust implementation of the vegetable cultivation practices at individual and community level. TERI would further develop market linkages for selling locally grown vegetables.

A small activity was carried out with respect to the sale of fortified food. TERI has trained the women from a neighboring village of the Palghar district to prepare "*khakhras*" which is a popular snack item by adding dry powder of spinach/ fenugreek leaves and mushroom to wheat flour base. The product was distributed by the Women Self Help Group (SHG) members of Wada block.

Figure 14 The SHG members of Wada block interacted and distributed nutritious khakhras to the villagers

On witnessing the benefits of training given to SHG members, women of Pathardi were highly inspired to empower themselves to prepare fortified food to tackle malnourishment. Thus TERI encouraged them to undergo similar training as a means of revenue generation.

Moreover, the *Khakhras* were highly appreciated with respect to their taste and appearance.

Thus, the sale of nutritious food was facilitated in the village with the help of other villagers.

Outreach

TERI participated in the three-day **International conference on Innovations in Sustainable Water and Waste Water Treatment Systems (ISWATS)** held on 21-23 April 2016. An abstract was submitted on the initiatives taken at Pathardi village to recycle and reuse grey-water for irrigating nutri-gardens. The specific highlights of the project such as community participation and the grey-water treatment unit installation workshops was explained through a poster presentation. The results and the projected impact of recycling water at the household level to cultivate food was very well appreciated by the onlookers and received encouraging comments by the experts as well as the professionals present at the conference.

Figure 15 Poster presentation at ISWATS conference in Pune

Photo Library

Figure 16 Mr. Hemant Nighojkar, MD, GKN Sinter Metals Pvt. Ltd. and Dr. Ujjal Bhattacharjee, Head CSR, GKN Sinter Metals Pvt. Ltd presented the awards to the winners of the "Nutri-Gardens" competition

Figure 17 Women and school children during the health check-up camp

Figure 18 The winner of the competition using smokeless Chula

Annex 1: Report of the health check-up camp

				Male : 70 - 180 Female : 60 - 180		DEFICIENCY : <20 ng/ml , INSUFFICIENCY : 20-30 ng/ml , SUFFICIENCY : 30-100 ng/ml, TOXICITY : >100 ng/ml	
NAME	SEX	AGE	Age Group	Iron	Iron (Interpretation)	25-OH VITAMIN D (TOTAL) (ng/ml)	25-OH VITAMIN D (Interpretation)
GAURAV NATH ANANT WADH	M	7	0-12	33	Anemic	7.78	Deficiency
RANJANA YADAV MUKNE	F	23	19 Above	53	Anemic	10.04	Deficiency
KOMAL KRUSHNA PATIL	F	5	0-12	24	Anemic	10.62	Deficiency
ROSHAN KAILASH THALEKAR	M	5	0-12	36	Anemic	10.98	Deficiency
MAYURI EKNATH TELVADE	F	3	0-12	< 15	Anemic	11.04	Deficiency
YOGITA RAMDAS PATEKAR	F	21	19 Above	41	Anemic	12	Deficiency
BHUMIKA YASHWANT BENKULE	F	9	0-12	104	Sufficient	12.53	Deficiency
MEENA RAMADS SARAKTE	F	30	19 Above	65	Sufficient	12.7	Deficiency
MANGAL TUKARAM SARAKTE	F	26	19 Above	67	Sufficient	12.8	Deficiency
JYOTI SHIVRAM PAWAR	F	12	0-12	55	Anemic	12.86	Deficiency
JEEVAN SUNIL HUMARE	M	8	0-12	25	Anemic	12.87	Deficiency
MRS.HIRABAI BALKRUSHNA BENDKULI	F	38	19 Above	190	Excess	13.45	Deficiency
NAMRTA EKNATH WAGH	F	10	0-12	74	Sufficient	13.6	Deficiency
HIRA BALU GAVATE	F	18	13-19	89	Sufficient	13.76	Deficiency
RUSHIKESH SUNIL TALWADE	M	8	0-12	35	Anemic	13.85	Deficiency
VAISHALI DEVIDAS SARKATE	F	8	0-12	50	Anemic	13.86	Deficiency
SUSHEELA NIVRUTI SARKATE	F	7	0-12	44	Anemic	14.09	Deficiency
ANITA YASHWANT BENKULE	F	35	19 Above	69	Sufficient	14.12	Deficiency
SANDEEP GANESH WADH	M	9	0-12	67	Anemic	14.14	Deficiency
DEEPALI KAILASH TALWADEKAR	F	8	0-12	21	Anemic	14.23	Deficiency
MANOJ KRISHNA PATIL	M	7	0-12	31	Anemic	14.53	Deficiency
AJAY MOHAN PATEKAR	M	9	0-12	25	Anemic	14.66	Deficiency

SEETARAM TELVADE	F	26	19 Above	125	Sufficient	15.41	Deficiency
MRS.SANGITA SANTARM MUKANE	F	30	19 Above	46	Anemic	15.71	Deficiency
YOGITA RAGHUNATH PAWAR	F	17	13-19	31	Anemic	15.72	Deficiency
MEENA MOHAN PATEKAR	F	30	19 Above	26	Anemic	16.31	Deficiency
YAMUNA VASANT BENKOLI	F	40	19 Above	60	Sufficient	16.46	Deficiency
SONALI RAMESH MUKNE	F	4	0-12	133	Sufficient	16.64	Deficiency
DEEPALI SHANTARAM MUKANE	F	5	0-12	21	Anemic	16.83	Deficiency
GAURI MADHUKAR SHINDE	F	25	19 Above	143	Sufficient	16.83	Deficiency
RAVINA MOHAN PATEKAR	M	7	0-12	33	Anemic	16.85	Deficiency
MRS.ALKA SHIVRAM PATIL	F	25	19 Above	44	Anemic	16.99	Deficiency
KARAN RAMESH MUKANE	M	6	0-12	96	Sufficient	17.08	Deficiency
ROHINI RAJENDRA BENKULE	F	9	0-12	78	Sufficient	17.12	Deficiency
KISHORE SUNIL HUMRE	M	6	0-12	42	Anemic	17.42	Deficiency
VIMAL DINKAR SHINDE	F	25	19 Above	98	Sufficient	17.52	Deficiency
SACHIN RAJU GHATAL	M	8	0-12	30	Anemic	17.6	Deficiency
GHANSHYAM SANJAY TALVADE	M	6	0-12	20	Anemic	17.68	Deficiency
PRAVIN DINKAR SHINDE	M	7	0-12	81	Sufficient	17.7	Deficiency
KAVITA KAILASH THALEKAR	F	22	19 Above	46	Anemic	17.73	Deficiency
MEENAKSHI LAKSHMAN JADHAV	F	9	0-12	27	Anemic	17.86	Deficiency
BHARTI KRUSHNA PATIL	F	30	19 Above	122	Sufficient	17.94	Deficiency
SHAKUNTALA PANDURANG BENKOLI	F	39	19 Above	48	Anemic	17.96	Deficiency
MEERA JIATENDRA NADGE	F	20	19 Above	20	Anemic	18.04	Deficiency
ROHIT MOTIRAM CHAUDHARY	M	3	0-12	< 15	Anemic	18.1	Deficiency
MOHINI SHANTARAM MUKANE	F	18	13-19	20	Anemic	18.2	Deficiency
ROHIDAS RAMU TALVADE	M	9	0-12	63	Anemic	18.22	Deficiency
MAMTA SANTRAM MUKHANE	F	7	0-12	91	Sufficient	18.28	Deficiency
GULAB GANESH WAD	F	25	19 Above	186	Excess	18.3	Deficiency
GULAB SHANKAR GHATAL	F	10	0-12	78	Sufficient	18.35	Deficiency
RANJANA SUNIL HUMBRE	F	25	19 Above	70	Sufficient	18.91	Deficiency
ANITA ANANT WADE	F	25	19 Above	139	Sufficient	18.95	Deficiency

KAVITA SANJAY TELVADE	F	24	19 Above	42	Anemic	19.01	Deficiency
SAHARDA SANJAY TELAVADE	F	6	0-12	44	Anemic	19.05	Deficiency
VIJAY LAXHMAN JADHAV	M	6	0-12	41	Anemic	19.08	Deficiency
MANGLA EKNATH TELAVDE	F	24	19 Above	20	Anemic	19.31	Deficiency
VANITA UMAKANT BENDKULE	F	30	19 Above	139	Sufficient	19.48	Deficiency
SANKET JANU GHATAL	M	9	0-12	49	Anemic	19.69	Deficiency
SHEETAL SANTOSH MUKANE	F	10	0-12	124	Sufficient	19.73	Deficiency
PINTI NIVRUTI SARAKTE	F	5	0-12	89	Sufficient	19.99	Deficiency
ANIL SADANAND MUKANE	M	5	0-12	78	Sufficient	20.15	Insufficiency
ALKA PANDURANG THADEKAR	F	26	19 Above	105	Sufficient	20.51	Insufficiency
DHANASHREE MOHAN PATEKAR	F	3	0-12	< 15	Anemic	20.67	Insufficiency
RUSHIKESH DILIP GAHALE	M	7	0-12	56	Anemic	20.89	Insufficiency
MONIKA GANESH WAD	F	4	0-12	52	Anemic	20.9	Insufficiency
ANJANA DEVCHAND VAD	F	19	13-19	21	Anemic	20.93	Insufficiency
VARSHA RAMA GHATAL	F	7	0-12	53	Anemic	20.94	Insufficiency
GANGUBAI DEVANAND BENKOLE	F	40	19 Above	91	Sufficient	20.95	Insufficiency
SANIKA DILIP GAHALE	F	4	0-12	95	Sufficient	21.06	Insufficiency
NEELAM RAMDAS SARAKTE	F	16	13-19	102	Sufficient	21.1	Insufficiency
DHARSHAN SANJAY TELAVADE	M	4	0-12	20	Anemic	21.16	Insufficiency
SANTOSH BALU GAWTHE	M	9	0-12	43	Anemic	21.35	Insufficiency
DEEPALI PRAKASH WADH	F	9	0-12	39	Anemic	21.44	Insufficiency
PUSHPA DEVIDAS SARAKTE	F	33	19 Above	76	Sufficient	21.87	Insufficiency
SAHIL LAKSHMAN KHADE	M	7	0-12	31	Anemic	21.91	Insufficiency
VENU RAJU GHATAL	F	25	19 Above	105	Sufficient	22.26	Insufficiency
PINTYA DEVIDAS SARAKTE	M	4	0-12	51	Anemic	22.37	Insufficiency
SWAPNA RAMA GHATAL	F	4	0-12	18	Anemic	22.71	Insufficiency
KALPNA KRISHNA MUKNE	F	30	19 Above	59	Anemic	22.99	Insufficiency
PRAVIN SHANKAR GHATAL	M	7	0-12	59	Anemic	23.05	Insufficiency
MANGAL SHANKAR GHATAL	F	28	19 Above	171	Sufficient	23.19	Insufficiency
HEERA DINKAR VIMAL	F	6	0-12	82	Sufficient	23.68	Insufficiency

VIDYA SUNIL THALEKAR	F	3	0-12	22	Anemic	24.72	Insufficiency
BHUSHAN DEVIDAS SARKATE	M	6	0-12	34	Anemic	24.73	Insufficiency
SUNITA SUNIL THALEKAR	F	25	19 Above	77	Sufficient	24.97	Insufficiency
TEJASHVINI JITENDRA NADGE	F	3	0-12	< 15	Anemic	25.02	Insufficiency
PINTYA DEVIDAS SARAKTE 2	M	2	0-12	30	Anemic	25.04	Insufficiency
BHUSAHAN SHIVRAM PATIL	M	7	0-12	49	Anemic	25.57	Insufficiency
SRHAVANI DINESH VARGHED	F	4	0-12	74	Sufficient	25.62	Insufficiency
PAYAL NIVRUTI SARAKTE	F	2	0-12	33	Anemic	26.01	Insufficiency
MRS.HIRABAI DEVANAND BENDKULI	F	38	19 Above	95	Sufficient	26.67	Insufficiency
RAVINDRA RAJU GHATAL	M	7	0-12	66	Anemic	28.47	Insufficiency
MEERA DILIP GAHALE	F	24	19 Above	57	Anemic	29.2	Insufficiency
CNADRA RAMESH MUKANE	F	32	19 Above	71	Sufficient	33.96	Sufficiency
SHOBHA NIVRUITI SARAKTE	F	26	19 Above	30	Anemic	37.6	Sufficiency

Annex 2: Recommended Dietary Allowances (RDAs) for Vitamin D and Iron

Iron				
Age	**Male**	**Female**	**Pregnancy**	**Lactation**
Birth to 6 months	**0.27 mg***	**0.27 mg***		
7–12 months	11 mg	11 mg		
1–3 years	7 mg	7 mg		
4–8 years	10 mg	10 mg		
9–13 years	8 mg	8 mg		
14–18 years	**11 mg**	**15 mg**	**27 mg**	**10 mg**
19–50 years	**8 mg**	**18 mg**	**27 mg**	**9 mg**
51+ years	8 mg	8 mg		

Vitamin D				
Age	**Male**	**Female**	**Pregnancy**	**Lactation**
0–12 months*	**400 IU (10 mcg)**	**400 IU (10 mcg)**		
1–13 years	600 IU (15 mcg)	600 IU (15 mcg)		
14–18 years	600 IU (15 mcg)	600 IU (15 mcg)	600 IU (15 mcg)	600 IU (15 mcg)
19–50 years	**600 IU (15 mcg)**	**600 IU (15 mcg)**	**600 IU (15 mcg)**	**600 IU (15 mcg)**
51–70 years	600 IU (15 mcg)	600 IU (15 mcg)		
>70 years	800 IU (20 mcg)	800 IU (20 mcg)		

Source: https://ods.od.nih.gov/factsheets/VitaminD-HealthProfessional/#h2