

IMPACT ASSESSEMENT CSR PROGRAM 2020-2021 BHARAT FORGE LIMITED

Inner Road Construction
Reverse Osmosis Plants
De-silting and Lift Irrigation
Health and Sanitation



Table of Contents	Page
Acknowledgement	3
Vision and Mission	4
Executive Summary	5
Detailed Report- Introduction	11
Project 1 Inner Road Construction	17
Project 2 Reverse Osmosis Plants	24
Project 3 De-silting and Lift Irrigation	32
Project 4 Health and Sanitation	38
Annexure 1	43

Assessment Team

Project Director- Dr. Suchitra Mankar
Program Assessment Director- Nikhilesh Paradkar
Field Co-ordinator- Jitendra Kumar
Data Entry Operator- Ashish Uttekar



Acknowledgements

This report assesses the impact attributed to certain CSR funded interventions by Bharat Forge Ltd in the period 2020-2021. Impact assessment was undertaken during Feb-March 2022.

We wish to acknowledge the cooperation and understanding received by the study team from Bharat Forge during the entire exercise.

Any assessment needs cooperation of all stake-holders, village, elders, communities or staff. We acknowledge with gratitude the involvement of all stake-holders. They were cooperative, prompt, interested and enthusiastic in their interactions and inputs.

Special mention is made of the efforts of Shri Sagar Kale who accompanied us and coordinated our visits.

Finally we acknowledge the effort of Dr. Leena Deshpande and the entire CSR team. They provided valuable inputs and direction throughout assessment process.

Dr (Gp Capt) Suchitra Mankar MD
Founder Director
Doorstep Health Services





Vision

“We believe in giving back to society in some measure what we have gained from it”

CSR initiatives aim to improve economic standing of the community through projects aimed at village development.

Mission

Work in 100 villages in five districts on five major indicators.

- Water harvesting
- Livelihoods
- Health
- Education
- Internal roads

In addition, work is done in the areas of

- women empowerment,
- protection of environment,
- Swachh Bharat
- Skill education

Impact Assessment Report - Executive Summary

Doorstep Health Services was commissioned by Bharat Forge Ltd to assess the impact of the following projects.

Project	Location
Internal Roads	Bhivari, Udachiwadi, Kalewadi
Reverse Osmosis Plants	Bhivari, Bopgaon, Chambli, Udachwadi, Kalewadi
De Silting / Lift Irrigation	Bopgaon, Vanpuri, Kalewadi, Zendewadi
Roof reconstruction of PHC	Singapur
Provision of equipment for PHC	
Construction of toilet block for School	Singapur

Objectives

Study through independent evaluation the projects undertaken by Bharat Forge
To make recommendations for future interventions.

Assessment framework

Parameters laid down by **Organisation for Economic Co-operation and Development (OECD)** were utilized to grade each project. Based on the evidence and information, the team rated each project as Very High, High, Medium, Low and Very Low on a scale of 0-100%. Each member marked it independently and the findings were averaged out to reduce bias. Each project was studied to see which Sustainable **Development Goals (SDG)** it was aligned with. Project was also studied in terms of input, output, outcome and impact. This table is at Annexure2.

Elements

- **COHERENCE** how well does the intervention fit?
- **RELEVANCE** is the intervention doing the right things?
- **EFFECTIVENESS** is the intervention achieving its objectives?
- **EFFICIENCY** how well are resources being used?
- **IMPACT** what difference does the intervention make?

Rating

Very High (81-100%)
High (61-80%)
Medium (41-60%)
Low (21-40%)
Very Low (0-20%)

Methodology

Multiple techniques were used for assessment of initiatives

- Study of secondary data, records and documents.
- Visits by the assessment Team.
- Observation of the functioning of the initiative.
- Discussions with stakeholders and officials
- Analysis of observations and calculation of savings/costs
- Survey using a predetermined instrument(questionnaire).
Annexure1

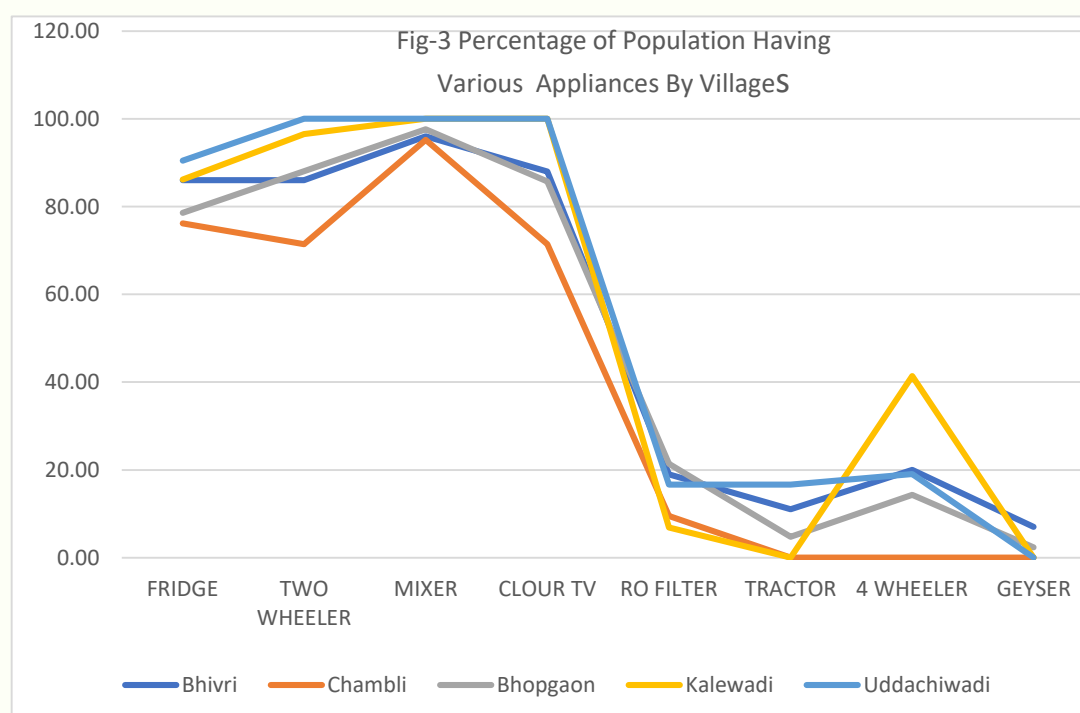
Geography, Rainfall and Climate. The area has low rain fall and is in the rain shadow of the Sahyadri ranges. The climate of the area is characterised by three distinct seasons: summer, monsoon and winter.

Irrigation. No major irrigation project is constructed within Purandar Taluka. The villagers of the area informed the team that bandharas/dams constructed by the Government earlier are old, poorly constructed and maintained. Over the years they have developed crack and leakages, silt has built up; all of this reducing capacity of holding water. Many plans have been approved but are yet to be executed.

Agriculture. Jwari, Bajra ,Wheat, Sugarcane, Onion, Gram, Groundnut ,Sunflower are the common traditional crops, as they need less rainfall. Sugarcane and fruits like Grapes, Custard Apple, Pomegranate and Figs etc. are becoming popular in few areas which have benefited from increased water availability. The visit showed us a lot of farming done through drip irrigation. Polyhouses had been created and cash crops were abundant especially so in Kalewadi . Harvest variety and quality has improved as a result of many initiatives. work to improve ground water, irrigation and water harvesting is being undertaken by Government and Private CSR initiatives. Modern methods of farming are also helping gain better harvests.

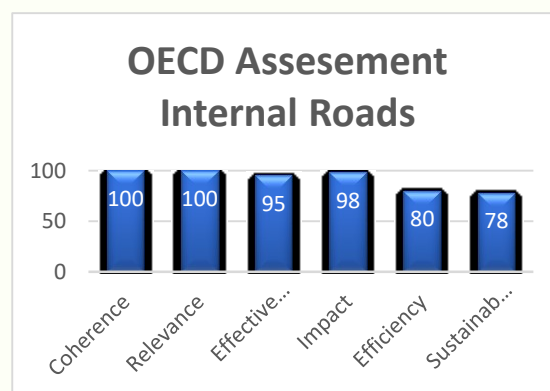
Economic Conditions.

The average monthly income for the family of 16000-20000/pm. Most houses(more than 80%) owned refrigerators, two wheelers, mixers and colour TV. 14.7% had domestic RO Filters (Fig-3). This indicates that most families were economically comfortable and fairly modern in their lifestyle. During discussions one could see that the population is quite aware, and aspirational. It is keen to absorb new technology.



Summary of Assessment

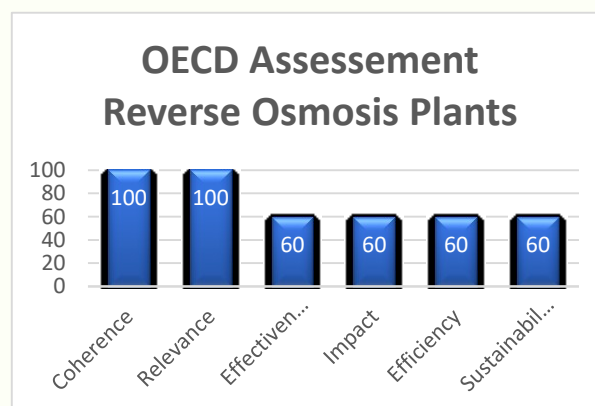
Project 1-Internal Roads Construction Bhivari, Udachiwadi, Kalewadi



Input	Output	Outcome	Impact
<ul style="list-style-type: none"> Construction of cement / WBM road for movement of traffic:- Bhivari 230mx2.5m concrete at INR 682750/- Udachiwadi 800x4m WBM at INR 1017600/- Kalewadi 269x2.5m concrete at INR 792488/- Allocation of land for construction of the road. Assistance in being able to obtain the land from the locals Villagers handing over land for betterment of their village. 	<ul style="list-style-type: none"> Bhivari 100% traffic enroute to Garade follow the shorter route. 100% traffic enroute to Garade don't go through the village. Approx. INR 1356194/- worth fuel saved per year Udachiwadi 100% harvest lifted from the fields using vehicles / tractor trolley. Distance reduced by 1.4km for move of each vehicle Approx. INR 563122/- worth fuel saved per year Kalewadi 100% vehicular traffic going to the main road uses this road. 	<ul style="list-style-type: none"> Reduction in traffic jams, accidents in the village. Reduced environment pollution, fuel consumption due to use of shorter route. Reduced travel time of man and material. Better driving experience. More time in tending to field than for travel to and fro.. Farm produce reach the markets fresher and faster . Increased income from farm produce of the farmers. No bogging down of vehicles during rains Less wear and tear of vehicles 	<ul style="list-style-type: none"> Improved quality of life Reduction in long term impact from pollution. Improved socio economic conditions. Enhanced business opportunities Improved village aesthetics Aids in Overall Village Development

Recommendations. Internal roads, especially where they reduce travel or help in decongestion have a good return on investment, are sustainable and improve economic activity and aid in village development. This activity should be continued after careful selection and calculation of expected impact prior to initiation.

Project 2-Reverse Osmosis Water Filtration Plants Bhivari, Bopgaon, Chambli, Udachiwadi, Kalewadi



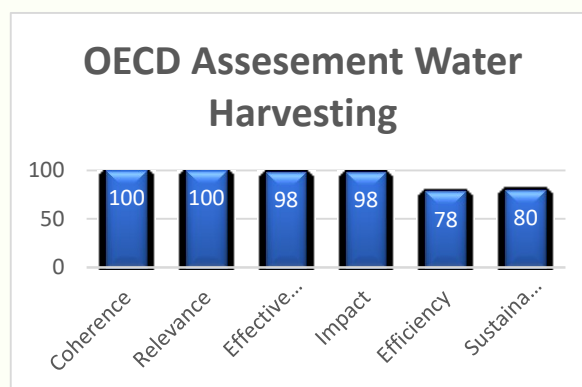
Input	Output	Outcome	Impact
<ul style="list-style-type: none"> • Provision of space by the village panchayat • Provision of water filtration plant • Provision of electricity to run the plant • Provision of manpower to oversee the running of the plant 	<ul style="list-style-type: none"> • 5x Water filtration Plants available for provision of filtered water. • 20000 litre RO water is the output capability of the plant. • Between 60 to 200 jars of water sold every day. • 70% population use RO water • 1x Operator per plant gets employment. • 65% input water available as effluent. 	<ul style="list-style-type: none"> • Good, clean potable water available for drinking on filtration. • Water related ailments reduced on consumption of filtered water. • The presence of plant has created awareness for drinking safe water • Gram Panchayat now responsible for Cost of running the plant and provision of water 	<ul style="list-style-type: none"> • Improved health of villagers , improved productivity , revenue generation from plant • Increased expenditure and responsibility by Gram Panchayat • Reduced availability of village piped water supply as some water diverted to RO plant • Effluent generated available for restricted reuse and needs planning.

Recommendations.

- The plants need to be supported till they are sustainable on their own and break-even which may take up two years
- The working of plant, documentation of sale, revenue and expenses, maintenance should be monitored closely.
- The cost of water for sale may be reviewed upwards to meet maintenance and electricity costs.
- A detailed plan for use of effluent needs to be implemented.
- Water chlorination of RO water may be ensured.

Project3- Water Harvesting

Bopgaon, Vanpuri, Zendewadi Kalewadi



Input	Output	Outcome	Impact
<ul style="list-style-type: none"> Bopgaon – INR 17,33,000/- water pipeline (3500m) and 3 phase electric supply with DP provided. Kalewadi – Approx INR 31,21,690/- worth water pipeline and desilting project carried out Zendewadi – Desilting of Bandha at cost INR 10,12,902 Vanpuri – Desilting Pazar Talav at INR 7,93,849/- 	<ul style="list-style-type: none"> Bopgaon-Capability of pumping 1,00,000 litre of water daily. Improved water table for approx. 650 hectares Kalewadi-17,894 cu m desilting carried out 3200 m of water pipeline available Zendewadi- 20,000 cu m of desilting carried out 2478.5 TCM increase in the storage capacity 2km road repaired using excavated soil along the bandharas. Water table improved in additional 140 ha of land Vanpuri- 23,812 cu m of desilting carried out at Pazar Talav Silt used to improve soil condition in 50 acres Water table improved in 644 ha of land 	<ul style="list-style-type: none"> Capacity of Bandhara increased Water availability for longer periods Silt available as manure for fields Increase of water table More number of harvests Increase in variety of crops e.g. Those requiring more water Fruit farming increased 	<ul style="list-style-type: none"> Improved quality of life Improvement in economic and financial conditions. Diversification of business Better revenue Rapid improvement in village development. Rapid improvement in village development.

Recommendations. More such projects may be introduced.

How to measure impact be embedded into part of the program

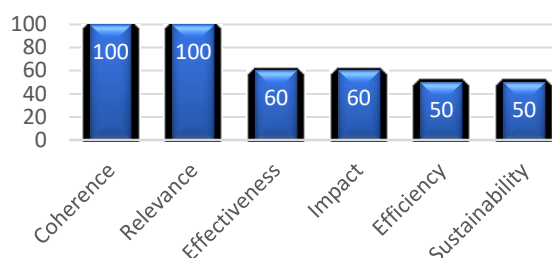
At Zendewadi and Vanpuri, impact needs to be assessed after one year is completed.

Project 4-Health Hygiene and Sanitation- Singapur

SDG-3



OECD Assessment Health and Sanitation



Input	Output	Outcome	Expected Impact
Health Centre <ul style="list-style-type: none"> • INR 2,95,608/- spent in repair and construction of the roof. • Medical Equipment and computer purchased for HC 	<ul style="list-style-type: none"> • Re- roofing has been completed. • Repair of walls carried out. • Medical equipment provided :- • Thermal gun- 4 • Pulse oximeter-4 • Glucometer-4 • Glucometer strip- 250 • Computer and printer-1 Spray machine-1 	<ul style="list-style-type: none"> • HC capability and functionality has increased • Number of cases seen not increased • HC aesthetics improved 	<ul style="list-style-type: none"> • Expected impact needs to be assessed after One year • Training of the staff at HC would improve impact.
Toilets <ul style="list-style-type: none"> • INR 4,36,000/- spent on construction of the toilets 	<ul style="list-style-type: none"> • School Toilet repaired:- 2x girls toilets created 6x boys urinals created 2x tanks (500 litre and 1000 litre) water storage tank for toilet created 	<ul style="list-style-type: none"> • Toilets used by community • Water connections need to be functional • Children dropout rate may reduce • Improved Hygiene and Sanitation subject to maintenance 	<ul style="list-style-type: none"> • Improved school attendance • Higher percentage passing high school • Better opportunity on leaving school

Recommendations. Interventions in the sphere of health are important for overall development. Infrastructure may be provided along with support for functional and process improvement to derive maximum benefit. A committee to oversee functioning and to provide guidance can transform the clinic into a hub for community health.

Detailed Impact Report

Scope of Work

1. Based on the scope given by Bharat Forge, the assessment team proceeded with the following:
 -
 - a. Identifying any changes resulting from programme intervention, establish causal connections between the changes and the programme inputs and measure the magnitude of change (if prior data available).
 - b. Determine how effectively and efficiently the programme have been implemented and
 - c. extent to which the net benefits have been achieved.
 - d. Examine to what extent has the intervention achieved its objectives (outputs and outcomes) or will do so in the future.
 - e. Recommendations (if any) to make the programs more effective and sustainable.
 - f. Quantifying (wherever possible) the intended and unintended, direct and indirect impacts of the programme/intervention on the people and the community.
 - g. Defining how has the intervention affected the overall situation of the target beneficiaries and stakeholders

Methodology

2. The assessment team used multiple techniques to elicit information and evidence to enable it to make a judgment on how an individual initiative has performed. Techniques used were:
 -
 - a. Study of secondary data as available, records and documents. Many documents and photographs were provided by Bharat Forge. Sarpanch of Villages provided records of water usage, money collection, population etc. It was noted that as Sarpanch change frequently, their knowledge on many aspects was lower than expected., Agriculture and irrigation Departments were approached for harvest details, rain fall, land under irrigation. DHS used the used the data to the extent it was available.
 - b. Visits by the assessment Team. The assessment team visit all the sites, multiple times to observe the functioning of the projects, to survey population and gather information from officials.
 - c. Observation of the functioning of the initiatives. This was done at each village along with local NGO partner representative.
 - i. Vehicle traffic on each internal road was measured and recorded.
 - ii. OPD care was observed at the PHC at Singapur.
 - d. Discussions with stakeholders. Discussions were held with stakeholders- Sponsor, NGO Partner, local Government, Villagers and health staff at PHC.

- e. Survey using a predetermined instrument(questionnaire) (Annexure-1). A survey was conducted at the villages (N-486) to understand the following: - services
 - i. Basic demography.
 - ii. Socioeconomic status.
 - iii. Perception of villagers regarding rainfall, water level, water quality, ailments
 - iv. Usage of water Filtration plants
 - v. Reasons for using or not using RO filter water.

Assessment

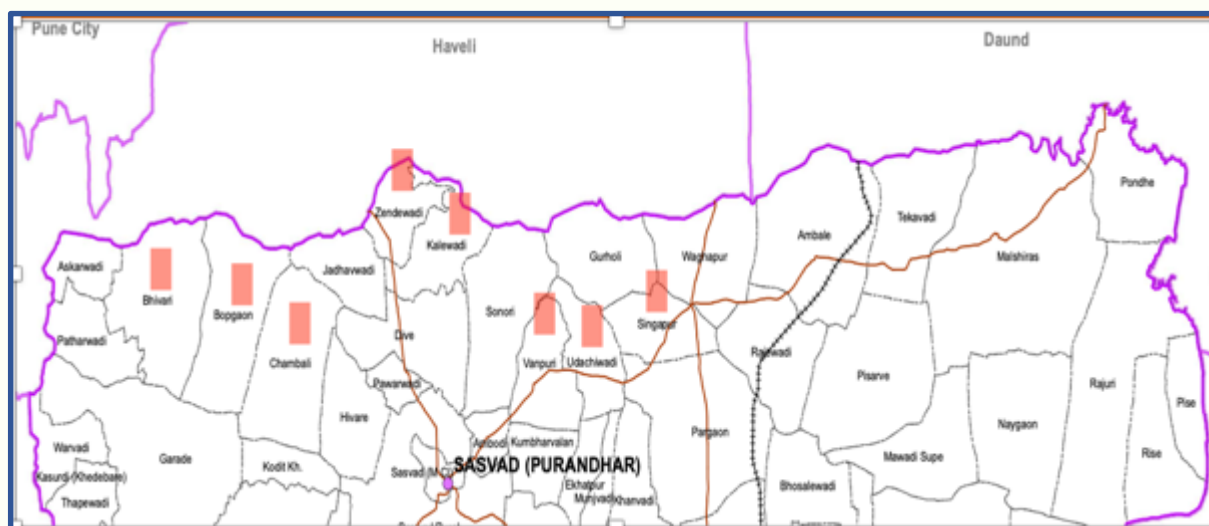
- f. Based on information collected data was analysed and used to assess the project.
- g. **Assessment Parameters.** Parameters laid down by **Organisation for Economic Co-operation and Development (OECD)** were utilized to grade each project. They are explained in brief below.
 - i. **Coherence:** Check the compatibility of the intervention with other interventions in a country, sector or institution. This was further checked for (i) Internal Coherence: addresses the synergies of the intervention with the Bharat Forge CSR Policy and the priority sub sectors. (ii) External Coherence: the consistency of the intervention with similar program by the state or central government was considered.
 - ii. **Relevance:** Ascertain whether the intervention responds to the felt needs/priorities of the CSR catchment area. The relevance is context specific to the geography in which the intervention is being implemented.
 - iii. **Effectiveness:** Study the extent to which an intervention is achieving or has achieved its objectives. This includes whether an intervention has attained its planned results, the process by which this was done, which factors were decisive in this process and whether there were any unintended effects.
 - iv. **Impact:** This criterion examines the significance of the intervention and its higher-level results, meaning how much it mattered to those involved.
 - v. **Efficiency:** The assessment focused on economic efficiency in terms of leverage and unit costs of outputs.
 - vi. **Sustainability:** This examines whether the initiative has financial, economic, social, environmental and institutional capacities needed for the likelihood of net benefits continuing over the medium and long term.
- h. **The team rated each project as Very High (81-100%)/High (61-80%)/Medium (41-60%)/low (21-40% / Very Low (1-20%) for each element in the framework.** Each member marked the project independently and the findings were averaged out to reduce bias.
- i. Impact. This aspect was also studied in terms of activity, output, outcome and Expected Impact. This term has been used in lieu of Impact for few projects based on their date of completion.

Results

3. The villages where projects were assessed were Bhivari, Bopgaon, Chambli, Udachiwadi, Kalewadi, Vanpuri Zendewadi and Singapur. All the villages are located in Purandar Taluka

of Pune District in Maharashtra -India (Fig-1). Agriculture is the primary occupation. However, lack of water is the major obstacle to economic development. Over Exploitation, declining water level, Limited Aquifer Potential and Water Scarcity -in lean period- are the main issues affecting livelihoods and development. Villages closer to Pune city, seem to be more prosperous. Due to urbanization, better amenities, and increase in land value

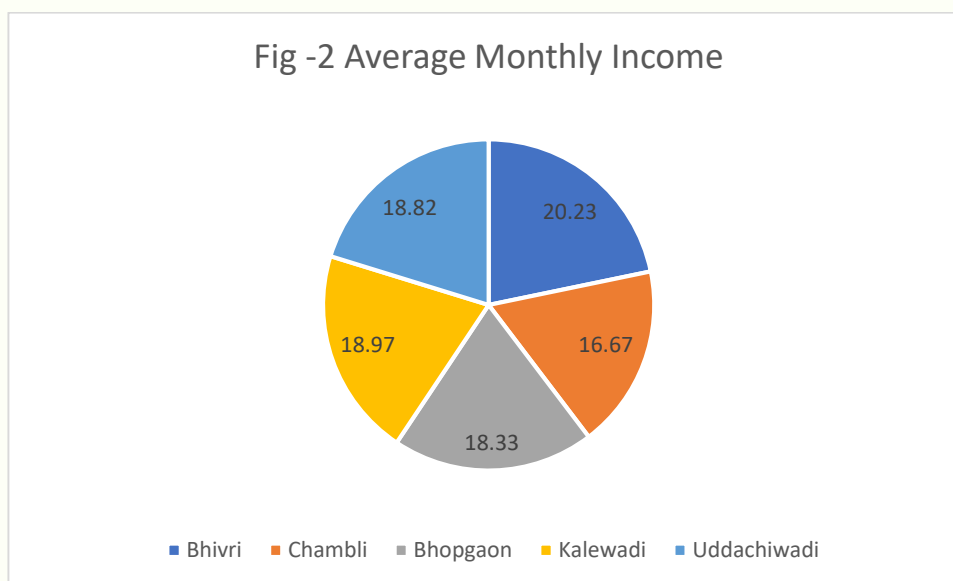
Fig-1 Villages with Projects in Purandar Taluka, Pune District, Maharashtra, India



Geography, Rainfall and Climate

4. The area has low rain fall and is in the rain shadow of the Sahyadri ranges. The Taluka is categorized as Semi-Critical, as per Ground Water Resources Estimation carried out by Central Ground Water Board in March 2013.
5. The area experiences sub-tropical to tropical temperate monsoon climate with a hot summer and general dryness throughout the year except during the south-west monsoon season. The climate of the area is characterised by three distinct seasons: summer, monsoon and winter. Typical summer months are from February to May, with maximum temperatures ranging from 30 to 40 °C. Winter months are October to January. Purandar taluka receives average annual rainfall of 556.4 mm.
6. **Irrigation.** No major irrigation project is constructed within Purandar Taluka. However, The State Water Conservation Department, Agricultural Department, Social Forestry along with Zilla Parishad has constructed various water conservation structures, like percolation tanks, check dams, nala bunding, farm ponds, vanrai bandharas etc. These structures are constructed by the various Govt and NGO at suitable sites. At present, under Jal Yukt Shivar Scheme of Agriculture Department, check dams and farm ponds are being constructed. The villagers of the area informed the team that bandharas/dams constructed by the Government earlier are old, poorly constructed and maintained. Over the years they have developed crack and leakages, silt has built up; all of this reducing capacity of holding water. Many plans have been approved but are yet to be executed.
7. **Agriculture.** Jwari, Bajra ,Wheat, Sugarcane, Onion, Gram, Groundnut ,Sunflower are the common traditional crops, as they need less rainfall. Sugarcane and fruits like Grapes, Custard Apple, Pomegranate and Figs etc. are becoming popular in few areas which have benefited from increased water availability. Source : 'Superintendent of Land Record, Commissioner of Agriculture Pune.

8. **Average Monthly Income.** Based on our survey, villagers reported an average monthly income for the family of 16000-20000/pm. Bhivari was the most affluent. (Fig-2)



9. **Appliances.** Though monthly income was stated as around twenty thousand for the family, the household were comfortable and had most essential amenities and appliances. It was seen that most houses (more than 80%) owned refrigerators, two wheelers, mixers and colour TV. 14.7% had domestic RO Filters (Fig-3). This indicates that most families were economically comfortable and fairly modern in their lifestyle. Kalewadi had the highest number of four wheelers indicating increasing prosperity. During discussions one could see that the population is quite aware, and aspirational. It is keen to absorb new technology. Socio economically the population is not poor. The visit showed us a lot of farming done through drip irrigation. Polyhouses had been created and cash crops were abundant especially so in Kalewadi. Harvest variety and quality has improved as a result of many initiatives. Work to improve ground water, irrigation and water harvesting is being undertaken by Government and Private CSR initiatives. Modern methods of farming are also helping gain better harvests.
10. **Perception of Villagers (Table-1).** Villagers were asked to state their agreement/disagreement with certain statements (Table-1) below. The options were on a Likert Scale. -strongly agree (SA 1 mark), agree (A, 2 marks), can't say (CS, 3 marks), disagree (D, 4 marks), strongly disagree (SD, 5 marks). The responses of the participants were entered and the average was entered for each statement for each village. So if average was 2 it meant that there was agreement on the statement, If the score was 2.5 it meant that the average perception was somewhere between agree and not sure. 3 would mean that there was average disagreed with the statement. Detailed tables are placed as Annexure 2. Almost all villages were satisfied with the electric supply in the village. All villages also agreed with the statement that water table had improved recently. There was less agreement with number of harvests increasing and also regarding quality of drinking water. Details are given as remarks against each statement.
11. The above paragraphs give an overview of the villages, their perceptions and socio economic status. The area is developing fast due to many initiatives. The villagers are educated, socioeconomically sound and progressive in their thinking. There is adequate electricity, mobile networks and roads are in good condition.

Table1-Perception of villagers on Various Statements

Water supply in village is adequate

8a	SA	A	Cs	D	SD	Average Marks
Bhivari	26.00	40.00	2.00	30.00	0.00	2.37
Chambli	4.76	76.19	4.76	14.29	0.00	2.29
Bopgaon	4.76	21.43	2.38	71.43	0.00	3.40
Kalewadi	10.34	55.17	6.90	27.59	0.00	2.52
Udachiwadi	1.96	66.67	0.00	31.37	0.00	2.61

Remarks: Many did not feel that water supply was adequate

Family income has increased in past year

8b	SA	A	Cs	D	SD	Average Marks
Bhivari	7.00	66.00	18.00	9.00	0.00	2.29
Chambli	0.00	71.43	23.81	4.76	0.00	2.33
Bopgaon	0.00	83.33	4.76	11.90	0.00	2.29
Kalewadi	0.00	86.21	10.34	3.45	0.00	2.17
Udachiwadi	0.00	80.39	13.73	5.88	0.00	2.25

Remarks: Most agreed that family income had increased

Rainfall is Adequate since past two years

8c	SA	A	Cs	D	SD	Average Marks
Bhivari	9.00	79.00	6.00	6.00	0.00	2.09
Chambli	0.00	90.48	9.52	0.00	0.00	2.10
Bopgaon	0.00	90.48	2.38	7.14	0.00	2.17
Kalewadi	0.00	3.45	3.45	0.00	0.00	2.03
Udachiwadi	0.00	76.47	21.57	1.96	0.00	2.25

Remarks: Rainfall has been adequate was the common perception

Harvests have Increased

8d	SA	A	Cs	D	SD	Average Marks
Bhivari	6.00	60.00	19.00	14.00	1.00	2.44
Chambli	0.00	85.71	9.52	4.76	0.00	2.19
Bopgaon	0.00	83.33	11.90	4.76	0.00	2.21
Kalewadi	0.00	82.76	6.90	10.34	0.00	2.28
Udachiwadi	0.00	76.47	15.69	7.84	0.00	2.31

Remarks: 14% in Bhivari felt harvests had not increased. Rest agreed that harvests had increased

Village drinking water quality is good

8e	SA	A	Cs	D	SD	Average Marks
Bhivari	8.00	46.00	33.00	13.00	0.00	2.51
Chambli	0.00	66.67	33.33	0.00	0.00	2.33
Bopgaon	0.00	26.19	64.29	9.52	0.00	2.83
Kalewadi	3.45	13.79	10.34	62.07	0.00	3.41
Udachiwadi	0.00	37.25	43.14	19.61	0.00	2.82

Remarks: Surprisingly a large percentage agreed with the statement

Village water causes kidney stones

8f	SA	A	Cs	D	SD	Average Marks
Bhivari	4.00	36.00	60.00	0.00	0.00	2.56
Chambli	0.00	66.67	33.33	0.00	0.00	2.33
Bopgaon	0.00	40.48	57.14	2.38	0.00	2.62
Kalewadi	3.45	79.31	17.24	0.00	0.00	2.14
Udachiwadi	0.00	86.27	13.73	0.00	0.00	2.14

Remarks: Most were unsure about this.

Electricity supply to home is adequate

8g	SA	A	Cs	D	SD	Average Marks
Bhivari	9.00	91.00	0.00	0.00	0.00	1.91
Chambli	0.00	100.00	0.00	0.00	0.00	2.00
Bopgaon	0.00	100.00	0.00	0.00	0.00	2.00
Kalewadi	3.45	96.55	0.00	0.00	0.00	1.97
Udachiwadi	0.00	100.00	0.00	0.00	0.00	2.00

Remarks: Everybody felt that electric supply was adequate

Ground water table level has increased recently

8h	SA	A	Cs	D	SD	Average Marks
Bhivari	0.00	75.00	16.00	9.00	0.00	2.34
Chambli	0.00	95.24	4.76	0.00	0.00	2.05
Bopgaon	0.00	97.62	2.38	0.00	0.00	2.02
Kalewadi	3.45	86.21	10.34	0.00	0.00	2.07
Udachiwadi	0.00	94.12	0.00	0.00	0.00	2.06

Remarks: Large percentage agreed that ground water level had increased

Project 1

Internal Roads Construction



Bhivari, Udachiwadi, Kalewadi

12. **Introduction.** In the villages under study the main connecting roads are well maintained. However the internal roads are often in disrepair or not constructed. Though the responsibility lies with the Panchayats, the process of approval, fund allocation, is full of delays and red tape. Political forces, financial shortfalls, prioritization all play a role. Even when the roads are constructed the quality of construction often is not adequate.
13. The lack of well-made internal roads obstructs economic development in the Village besides causing hardship on a daily basis to all those who use it. In line with its vision of all round development of villages, Bharat forge took upon itself the task of building internal roads. The roads construction completed in Bhivari, Udachiwadi and Kalewadi was assessed. Details are as given in Table-2.

Table-2 Details of Internal Road Construction

Place	Dimension	Type	Cost (Rs)	Beneficiary	Year
Bhivari	230m*2.5m	Concrete	6,82,750	2400	2019-2020
Udachwadi	800m*4m	Water Bound Macadam	10,17,600	1600	2019-2020
Kalewadi	269m*2.5m	Concrete	7,92,488	2500	2018-2019

14. **Internal Road at Bhivari.** Prior to the road construction undertaken by Bharat Forge, the entire traffic on the Bopdev- Saswad -Pune road would go through Bhivari Village in order to access adjoining villages(Garade, Pagarwadi etc). The village road was narrow with shops on either side. Local traffic, pedestrians, merchants, customers and school children all used this road along with traffic from the main road passing through. This had multiple disadvantages.

15. Some of them were:-

- Frequent traffic jams.
- Accidents reported as at least one per month.
- Reduced safety for the villagers.
- Increased use of fuels.
- Increased noise and environmental pollution.
- The traffic passing through the village also faced delays as well as other issues mentioned above.

16. The main road traffic had no other option as a patch of road about 230m long that connected the main road that bypassed Bhivari was non-existent . A diagrammatic map is placed below to explain this better (Fig-4). The road construction reduced the distance travelled by 1.2 km and also reduced the congestion, pollution and jams on the village road. State of earlier road and new road (Fig-5)is placed below.

Fig-4 Map Showing the Bhivari traffic movement before and after Road Construction



Fig-5 Road Condition Before and After at Bhivari



17. **Internal road at Udachwadi** . This road connects the village with the agricultural fields. Earlier as there was no road, the labourers faced many issues. They had to walk the distance of about 800m morning and evening. The overgrowth made walking difficult and nettles, insects and reptiles caused their own issues. During rain the sodden earth made walking difficult. Taking the harvest out from the fields had to be done manually as no vehicle would reach the area. Else it had to be carried manually to the main road and then put on vehicles. Road constructed by Bharat Forge provided much needed access, speed of transportation and safety to the villagers. Produce could now be transported quickly reducing transit time. Diagram for road is placed as Fig 6. Before and After pictures for Udachiwadi are placed as Fig6a.

Fig-6 Diagram of Road construction Udachiwadi



Fig-7 Before and After -Road at Udachiwadi



18. **Internal road at Kalewadi.** A patch of road at the turnoff for Kalewadi village on the Hadapsar Saswad road was in a state of disrepair. Commuters found it difficult to go to the village. Many tourists also used the road to visit Malhar Fort and it was difficult to negotiate this stretch. The vehicles, slowed down faced increased wear and tear and this created an unpleasant experience affecting tourism. The road constructed by Bharat forge reduced the issues mentioned . The vehicles moved smoothly and the road also provided tangible evidence of development. The road also provided a positive impetus to tourism. See Figure-8 and Fig-9.

Fig-8 Road Created at Kalewadi

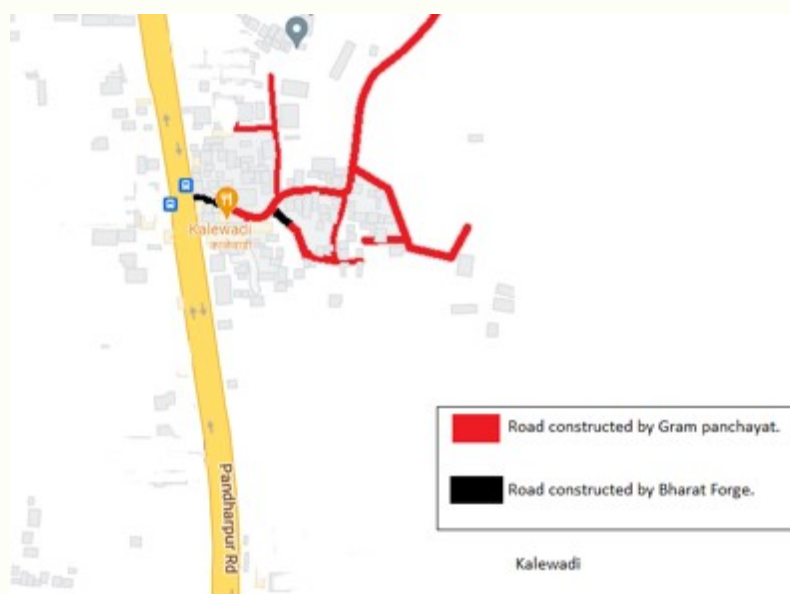


Fig-9 The Road in Kalewadi Village



19. **Analysis.** To understand the magnitude of impact DHS conducted a short survey. The number of vehicles that used the stretch of new road in a period of 2 hours for all the three roads was counted for three days at various times. This was averaged out. The details are in Table-3 below.

Table-3 Average number of Vehicles Passing on Roads in Two Hours

Villages	Bus/Trucks	Four wheelers	Two-wheeler	Other Vehicles (autorickshaws, tempos, tractors, goods carriers)
Bhivari	4	24	54	48
Kalewadi	1	22	60	50
Udachiwadi	0	0	16	25

20. **Calculations.** The following Assumptions were made:-

- Four wheeler mileage 12km/l
- Two Wheeler mileage 40km/l
- All other vehicles mileage 10km/l
- Cost of fuel (petrol or diesel) Rs95/l
- Traffic on all roads calculated for eight hours by multiplying the observed traffic for two hours. Eight hour traffic was assumed on all roads

Bhivari

21. **Cost Benefit.** Due to shorter travel by 1.2 km, each four wheeler saved Rs 9.50 Thus 24 vehicles saved Rs 228/- in 2 hours. Fuel saved per day (in eight hour period) was Rs 912/-. Calculating similarly for two wheelers one vehicle saved Rs 2.85. Thus 54 vehicles saved Rs 615.60 in an eight hour period. For all other vehicles The amount saved was Rs 2188/- per day. Adding the savings of all three vehicles Rs 3715.60/- was saved in a day. **The yearly saving just on fuel was Rs 13,56,194. Reduced wear and tear, shorter travel time, improved safety would add further value.**

22. Cost of construction of the road was Rs 6,82,750. And cost saving was **Rs 13,56,194** Thus the cost of the project has been recovered within six months of construction. Being an all-weather concrete road it is expected to have a life of at least 10 -15 years. The intangible advantages that accrue to Bhivari in terms of reduced accidents, congestion, pollution are also considerable.

Udachiwadi

23. The new WBM road reduced travel distance by 3km per vehicle/person. (1.5km each way for those using vehicles and going via main road). The new road measuring 800m is now used twice a day (1.6km). So actual saving of distance is approximately 1.4 km per vehicle. **By the same method of calculation as above, the yearly saving on fuel alone was Rs 5,63,122** (cost of road Rs 10,17,600) The return on investment just in terms of fuel cost is significant and cost would be recovered in two years' time. Savings of manhours, reduced fatigue, speedy transport of produce, increased economic activity are additional benefits.

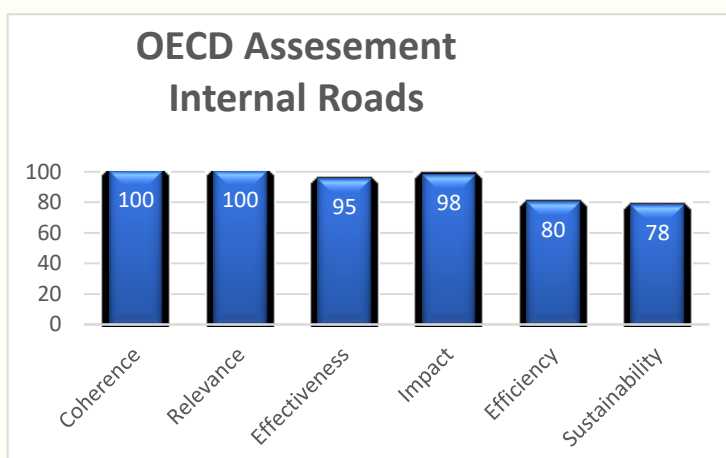
24. **Kalewadi.** There was no travel distance that was reduced. The benefits are a better approach to the village, reduced wear and tear, rapid movement of vehicles carrying produce, reduced pollution and a pleasant experience for the tourists going to Malhar fort. This was applicable to all vehicles.

25. **Assessment.** Assessment of the project of internal roads is as given below. The project scores very high in all parameters. Impact assessment in terms of input, output, outcome and impact is also brought out the high level of impact. **Impact Assessment is placed as Annexure 2.**

26. **Recommendations.** We recommend that internal roads, especially where they reduce travel or help in decongestion have a good return on investment, are sustainable and improve economic activity and aid in village development. This activity should be continued after careful selection and calculation of expected impact. This activity helps achieve overall aim of all round village development.
27. **Sustainable Development Goals (SDG).** The project is directly aligned with SDG 9- build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation SDG

Assessment of Internal Roads Project on OECD parameters

Assessment Project 1: Inner Roads	
Coherence	Very High
Relevance	Very High
Effectiveness	Very High
Impact	Very High
Efficiency	High
Sustainability	High



Impact Assessment

Input	Output	Outcome	Impact
<ul style="list-style-type: none"> Construction of cement / WBM road for movement of traffic:- . Bhivari 230mx2.5m concrete at INR 682750/- . Udachiwadi 800x4m WBM at INR 10,17,600/- . Kalewadi 269x2.5m concrete at INR 7,92,488/- Allocation of land for construction of the road. Assistance in being able to obtain the land from the locals Villagers handing over land for betterment of their village. 	<ul style="list-style-type: none"> Bhivari 100% traffic enroute to Garade follow the shorter route. 100% traffic enroute to Garade don't go through the village. Approx. INR 1356194/- worth fuel saved per year Udachiwadi 100% harvest lifted from the fields using vehicles / tractor trolley. Distance reduced by 1.4km for move of each vehicle Approx. INR 5,63,122/- worth fuel saved per year Kalewadi 100% vehicular traffic going to the main road uses this road. 	<ul style="list-style-type: none"> Reduction in traffic jams, accidents in the village. Reduced environment pollution, fuel consumption due to use of shorter route. Reduced travel time of man and material. Better driving experience. More time in tending to field than for travel to and fro.. Farm produce reach the markets fresher and faster . Increased income from farm produce of the farmers. No bogging down of vehicles during rains Less wear and tear of vehicles 	<ul style="list-style-type: none"> Improved quality of life Reduction in long term impact from pollution. Improved socio economic conditions. Enhanced business opportunities Improved village aesthetics Aids in Overall Village Development

Project 2

Reverse Osmosis Water Filtration Plants



Bhivari, Bopgaon, Chambli, Udachiwadi, Kalewadi

28. **Introduction.** Village water supply is ground water based. The gram panchayat collects the water chlorinates it and supplies to the village. This system is still prevalent. During monsoon TCL or chlorine solution is provided for super chlorination. While this may make the water biologically safe, the water continues to have high levels dissolved solids and salts. The water is hard and its taste is also brackish. To provide villagers with good quality drinking water, Reverse Osmosis technology based water filtration plants were set up in various villages. Five of these were assessed. The locations were Bhivari, Chambli, Bopgaon, Udachiwadi and Kalewadi. Details are given in Table-4 below.

Table-4 Details of RO based Water Filtration Plants

Name of Village	Bhivari	Bopgaon	Chambli	Udachi wadi	Kale wadi
Population*	6000	5000	3500	1200	2500
*As per Sarpanch of villages					
Date of Installation	Oct-21	Oct-21	Oct-21	Oct-21	2019
Start of working	01 Jan 2022	Nov-21	Nov-21	Oct-21	Oct-19
Plant cost (Rs)	3,73,125	3,73,125	3,73,125	3,73,125	3,30,400
Building/Fitting	2,50,000	2,25,000	2,00,000	30,000	40,000
Building and fittings or tank contribution by villagers in Bhivari, Bopgaon and Chambli. Building by Zilla Panchayat and fittings by villagers at Udachiwadi and Kalewadi					
AMC cost (Rs) Warranty is 2yrs	Under warranty	Under warranty	Under warranty	Under warranty	30,000
Operator Payment (Rs)	Done by peon of the Panchayat	4000 pm	4000pm	2000 pm	5000 pm
Electricity bill P/M(Rs)	370/-	N/A	Approx 2,500	Approx.850	Approx 2500
Some have separate meters; other pay it with the Gram panchayat bill					
Pre-paid card holder min recharge	Data N/A	Data N/A	Data N/A	58 Rs 50-200	150 Rs 100-300
Sale of Jars Per Day as per panchayat during	200	200	100	60	150

Selling Price	Rs.1 per lit& Rs.10 20lit jar	Rs.1 per lit& Rs.10 20lit jar	Rs.1 per lit& Rs.10 20lit jar	Rs.1 per lit& Rs.10 20lit jar	Rs.1 per lit& Rs.10 20lit jar
Water Testing report RAW/purified	N/A	N/A	N/A	Available	N/A
Money collected	01/01/2022 to 01/03/2022 Rs 2000/-	01/11/2021 to 31/01/2022 Rs 14130/-	01/11/2021 to 31/01/2022 Rs- 38,300/-	01/10/2021 to 28/02/2022 Rs- 19,630/-	Sep2021 to Feb 2022 Rs- 1,02,950/-
Use of wastewater	For plantation	Released in village washing pond	Under planning	Use in school toilet plantation	To houses for utensil cleaning.

29. The plant was provided by Bharat Forge. It has a two year warranty. During this six monthly change of two carbon filters (costing Rs 850/- each is included.) Change of membrane filter set (Rs 51000/-) is not. After two years each village will require to spend Rs 51000/- for filters and negotiate maintenance contract(AMC) for the plant with manufacturers. The cost of AMC would be approximately 30000/- per annum.
30. Water Use By RO Plants. Water for input is taken from the village supply itself. So a part of water that normally went to village homes, now is used in the plant. In the summer there is a need to monitor whether sufficient water is available for running the plant and for supply in villages. It was noted that the plants generate large effluent. For every four litres of water input, 1.5 litre of filtered water is generated and 2.5l is discarded as effluent. This is a huge amount of water and a plan for its reuse is of utmost importance, especially in an area with low water supply.
31. Electricity is paid for by the Gram Panchayat. Water is sold at Rs 10/- per jar of 20 l or Rs1/- per litre.
32. 70% of population surveyed uses RO water. (that's is 12740 of total population of 18200.) Though informed that approx. 100 jars are sold per day, the actual amount based on money collected seems to be much lower. Documents of collection are not always well maintained. Monthly cards have been supplied in Udachiwadi -58 Cards-and Kalewadi-150 cards. No data is available for other three villages. This is revenue is included in the total collection details provided by each village.
33. Few private filtration plants operate in the villages . These supply to large party events and no villager purchases from them for day to day needs.
34. The water reports before and after RO were available for only one village (Fig 10). These were studied. The report shows that the raw water is much improved after RO filtration chemically. However the RO treated water is showing coliform organisms and is unacceptable for drinking. It may be kept in mind that once water goes through any filtration process, it can still be contaminated thereafter. Thus chlorination of water to ensure some residual chlorine is advisable. Else there is a false sense of safety created. All parts of the plant, especially the jars


etc must be regularly cleaned. The stored water should be chlorinated and checked for residual chlorine. Failing this the water may taste good, yet be unsafe.

Fig -10 Chemical and Biological Water Reports for Raw and RO filtered Water

Raw Water

Information Provided By Customer :-
a) Sample Marked As :- **Raw Water(Purandar Upsa)**
b) Packing :- Plastic Bottle c) Preservation :- At 2° to 8° C
Date of Sample Receipt in the Lab:- **21/02/2022**
Date(s) of testing :- **21/02/2022 to 28/02/2022**
Location of performance of Test:- In-house
Discipline of Testing :- **Chemical Testing**
Product Group :- **Water & Residue in Water**
Sub Group :- **Ground / Surface Water**

Sr. No.	Test Done	Result	Unit	Permissible Limits as per IS 10500:2012	Test Method
01.	pH at 25°C	8.0	-	6.5 to 8.5	IS 3025 (part 11)
02.	Total Dissolved Solid	292	mg/l	2000, max	IS 3025 (part 16)
03.	Total Hardness as CaCO ₃	136.68	mg/l	600, max	IS 3025 (part 21)
04.	Alkalinity as CaCO ₃	140.76	mg/l	600, max	APHA -2320-B
05.	Chlorides	21.52	mg/l	1000, max	IS 3025 (part 32)
06.	Sulphate as SO ₄	15.86	mg/l	400, max	IS 3025 (part 24)
07.	Nitrate	42.11	mg/l	45, max	APHA -4500-NO ₃ -B
08.	Fluoride as F	0.12	mg/l	1.5, max	APHA -4500-F-D
09.	Iron as Fe	<0.03	mg/l	1.0, max	APHA -3500-Fe-B
10.	Arsenic as As	<0.005	mg/l	0.01, max	IS 3025 (part 2)

Reviewed by  P.T.O.  **Kanchan Pol**
Authorized Signatory
Chemical Testing

Sample Type :- Water Sample
Quantity of sample received :- 250 ml
Sample collected by :- Customer Sealed/Unsealed :- Unsealed
Information Provided By Customer :-
a) Sample Marked As :- **Raw Water(Purandar Upsa)**
b) Packing :- Sterile Plastic Bottle c) Preservation :- At 2° to 8° C
Date of Sample Receipt in the Lab:- **21/02/2022**
Date(s) of testing :- **21/02/2022 to 28/02/2022**
Location of performance of Test:- In-house
Discipline of Testing :- **Biological Testing**
Product Group :- **Water**
Sub Group :- **Ground / Surface Water**

Sr. No.	Test Done	Result	Unit	Limits as per IS 10500:2012	Test Method
01.	Coliform	175	MPN Index / 100 ml	Not Specified	IS 1622
02.	Faecal coliform	63	MPN Index / 100 ml	Absent/100ml	IS 1622
03.	Escherichia coli	Present	Per 100 ml	Absent/100ml	IS 1622

Remark :- Based upon results of above parameter the water sample does not conform to the Permissible Limits as per IS 10500:2012.
Note :- Sample retention time: 15 Days after report date.

Reviewed by  P.T.O.  **Kanchan Pol**
Authorized Signatory
Chemical Testing



 **Jyoti Gawade**
Authorized Signatory
Biological Testing

END OF REPORT

RO Water

Information Provided By Customer :-
a) Sample Marked As :- **RO Water**
b) Packing :- Plastic Bottle c) Preservation :- At 2° to 8° C
Date of Sample Receipt in the Lab:- **21/02/2022**
Date(s) of testing :- **21/02/2022 to 28/02/2022**
Location of performance of Test:- In-house
Discipline :- **Chemical Testing**
Product Group :- **Water & Residue in Water**
Sub Group :- **Drinking Water**


Sr. No.	Test Done	Result	Unit	Acceptable Limits as per IS 10500:2012	Test Method
01.	pH at 25°C	6.7	-	6.5 to 8.5	IS 3025 (part 11)
02.	Total Dissolved Solid	34	mg/l	500, max	IS 3025 (part 16)
03.	Total Hardness as CaCO ₃	9.18	mg/l	200, max	IS 3025 (part 21)
04.	Alkalinity as CaCO ₃	15.30	mg/l	200, max	APHA -2320-B
05.	Chlorides	7.83	mg/l	250, max	IS 3025 (part 32)
06.	Sulphate as SO ₄	1.81	mg/l	200, max	IS 3025 (part 24)
07.	Nitrate	9.56	mg/l	45, max	APHA -4500-NO ₃ -B
08.	Fluoride as F	<0.1	mg/l	1.0, max	APHA -4500-F-D
09.	Iron as Fe	<0.03	mg/l	1.0, max	APHA -3500-Fe-B
10.	Arsenic as As	<0.005	mg/l	0.01, max	IS 3025 (part 2)

Reviewed by  P.T.O.  **Kanchan Pol**
Authorized Signatory
Chemical Testing

Information Provided By Customer :-
a) Sample Marked As :- **RO Water**
b) Packing :- Sterile Plastic Bottle c) Preservation :- At 2° to 8° C
Date of Sample Receipt in the Lab:- **21/02/2022**
Date(s) of testing :- **21/02/2022 to 28/02/2022**
Location of performance of Test:- In-house
Discipline :- **Biological Testing**
Product Group :- **Water**
Sub Group :- **Drinking Water**

Sr. No.	Test Done	Result	Unit	Acceptable Limits as per IS 10500:2012	Test Method
01.	Coliform	22	Per 100 ml	Absent / 100 ml	IS 15185
02.	Faecal coliform	Absent	MPN Index / 100 ml	Absent / 100 ml	IS 1622
03.	Escherichia coli	Absent	Per 100 ml	Absent / 100 ml	IS 15185

Remark :- Based upon results of above parameter the water sample does not conform to the Acceptable Limits as per IS 10500:2012.
Note :- Sample retention time: 15 Days after report date.

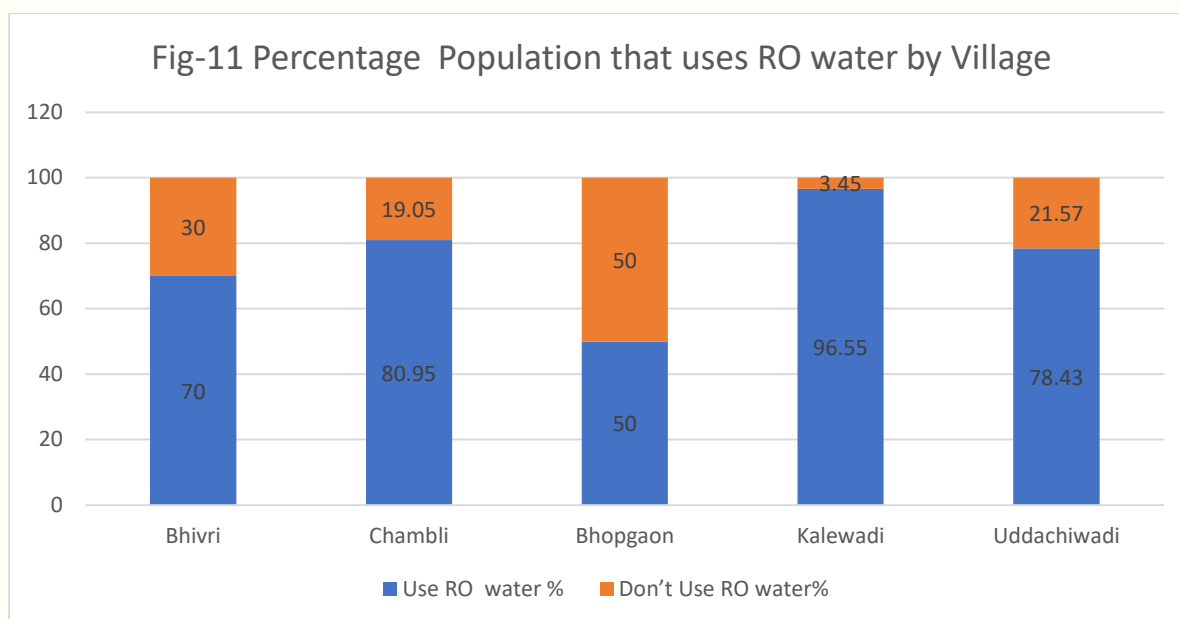
Reviewed by  P.T.O.  **Kanchan Pol**
Authorized Signatory
Chemical Testing

 **Jyoti Gawade**
Authorized Signatory
Biological Testing

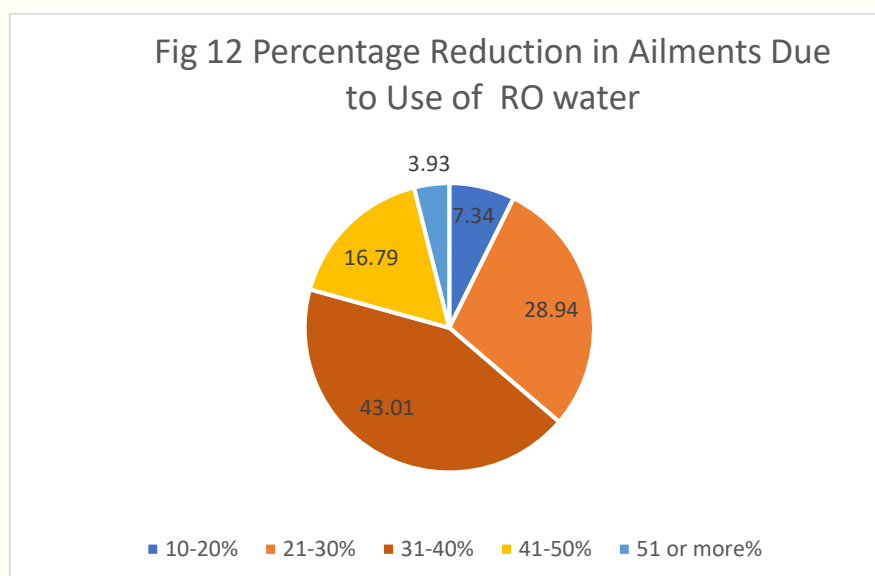
END OF REPORT

35. A survey was undertaken to understand the degree of usage of the RO plants in the villages. The findings are given below.

36. RO water Usage. About 70% overall utilized water from the installed plants. Water from RO was used maximally by Kalewadi(96.55%) and least by Bopgaon (50%) (Fig 11).

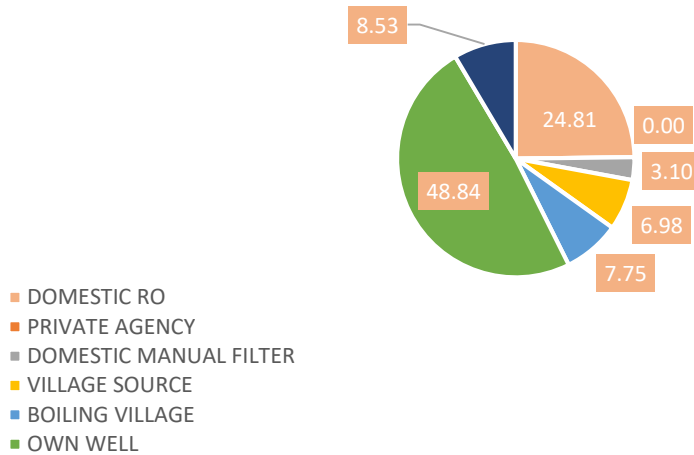


37. Prior to installation of the plants village supply was used as main source of drinking water. Well water and borewell water was also used.
38. **Amount of Water used.** On an average all families used 20 jars of water in a month. About 10% augmented this with water from other sources. Exception was Chambli , where no other source was used. places
39. **Water Carriage.** Most collected water using two wheelers or by walking with the jar if living close by. Distance from the plant dictated who used the water. The wadis that were far away, had not received village supply and had created own systems using well water/borewells.
40. **Reduction in Ailments.** As per the perception of villagers, Reduction in water borne disease was to the tune of 20-50% (Fig 12).



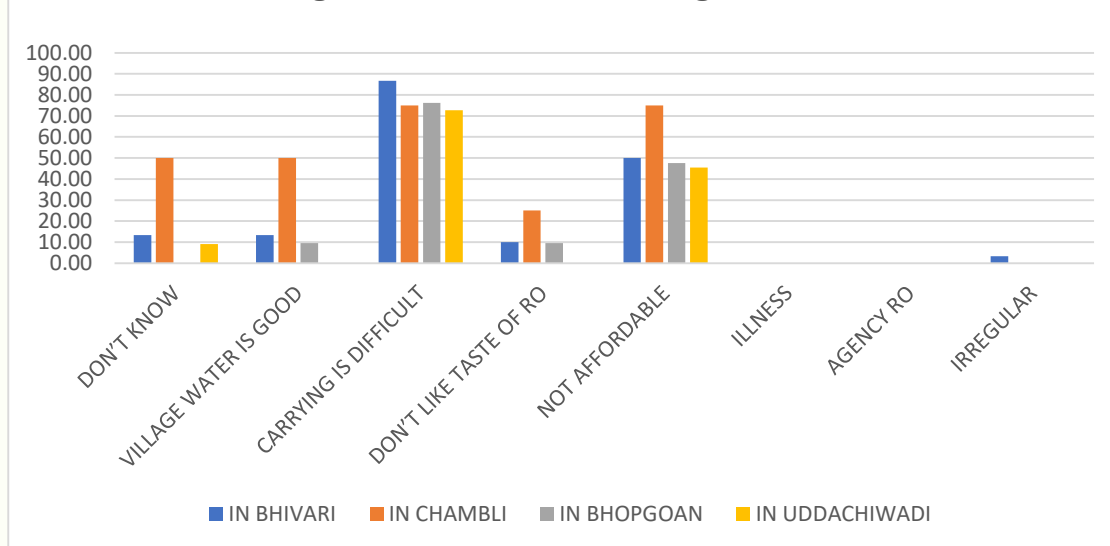
41. **Survey of Those who did not drink RO water from the Plant (Fig-13).** Nearly half used water from their own well. About 25% had domestic RO filtration plants installed at their homes. Others used chlorinated village water. No one purchased water from the private agencies.

Fig-13 Drinking water arrangement for those not using RO



42. **Reasons for not using RO water(Fig 14).** The commonest reason was that it was difficult to transport water home every day. During discussions it was noted that the wadis that were far away from the plants faced this problem. Also this became the task not of the women but the men in the family. The second common reason given was affordability. This was not just about the cost of water, but since many had their own well, and lived a distance away, it was overall more convenient to use own water.

Fig-14 Reasons for not using RO water



43. **Cost Analysis for One RO Plant (Table-5).** The Capital Cost is Rs 573000. Considering the cost over 60 months(depreciation period), it works out to 9550 per month. The operational cost is as given above to Rs 20750 per plan per month. To break even at current rate of sale (Rs 10/jar)there should be a sale of 2100 jars per month or approx. 70 jars per day at each plant.

Table-5 Cost analysis For RO Plant

Capital Cost	Rs	
	3,73,000	
Building Fitting	2,00,000	Total Cost over 60 months
Total Cost	5,73,000	9550
Operational Cost per month		
Electricity	2500	
Operator	4000	
Water cost	?	Since 65% is not utilized huge amount of effluent is generated.
Annual Maintenance Contract	2500	Approx Rs 30000 per year
Capex	9550	Share of capital cost
Filter change	2200	Rs 51000 every two years
Total Mthly cost	20,750	

44. Based on details provided by the villages we see the following sale (based on money collection records) Table-6. The documents available show revenue collection much lower than the verbal statements on jars sold.

Table-6 Revenue Collection at the Village RO

Villages	Bhivari	Chambli	Bopgaon	Udachiwadi	Kalewadi
Money collected per month (Rs)	1000	4710	12766.67	4907.5	20590
Jars per month equivalent (approx. at Rs 10 for 20l)	100	471	1276	490	2059

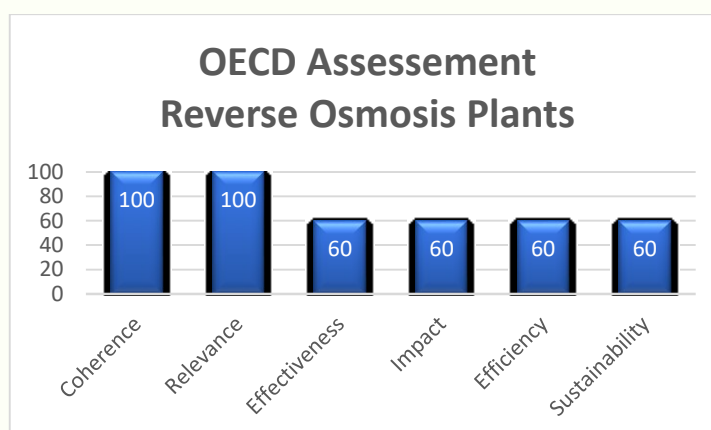
45. It may be seen that Kalewadi has nearly broken even after three years as they have sold water and created revenue of Rs 20590/-. Operational cost per month being Rs 20750/- per plant . Other places have not. Even if we remove 9550 -capex component -we see that every village must sell 1120 jars a month to have revenue of at least Rs 11200 to break even. Then, Kalewadi and Bopgaon break even . However, other villages are not meeting the expected amount of sale.
46. If this trend continues, then Gram Panchayat will have to bear the maintenance charges without adequate accruals.
47. The cost of water has not been taken into account. During summer season when village water supply is low, water may not be available for RO Plant. Good records of revenue collection, payments, cleaning of tanks, change of filters AMC must be done by the Panchayat. Else the plants may dwindle down in the next three to four years.
48. **Assessment.** The assessment based on OECD criteria and Impact Analysis is given below. The plants score medium to high on OECD parameters. Expected impact seems to not be high as the

population. **The project is aligned with SDG Goal 6.**-Ensure availability and sustainable management of water and sanitation for all. Impact assessment is placed as Annexure2.

49. **Recommendations.** We recommend the following:-

- The plants need to be supported till they are sustainable on their own and break-even which may take up two years
- The working of plant, documentation of sale, revenue and expenses, maintenance should be monitored closely.
- The cost of water for sale may be reviewed upwards to meet maintenance and electricity costs.
- A detailed plan for use of effluent needs to be implemented.
- Water chlorination of RO water may be ensured.

Assessment	Project 2: Reverse Osmosis Plants
Coherence	High
Relevance	High
Effectiveness	Medium
Impact	Medium
Efficiency	Medium
Sustainability	Medium



Input	Output	Outcome	Impact
<ul style="list-style-type: none"> Provision of space by the village panchayat Provision of water filtration plant Provision of electricity to run the plant Provision of manpower to oversee the running of the plant 	<ul style="list-style-type: none"> 5x Water filtration Plants available for provision of filtered water. 20000 litre RO water is the output capability of the plant. Between 60 to 200 jars of water sold every day. 70% population use RO water 1x Operator per plant gets employment. 65% input water available as effluent. 	<ul style="list-style-type: none"> Good, clean potable water available for drinking on filtration. Water related ailments reduced on consumption of filtered water. improved The presence of plant has created awareness for drinking safe water Gram Panchayat responsible for Cost of running the plant and provision of water 	<ul style="list-style-type: none"> Improved health of villagers , improved productivity , revenue generation from plant Increased expenditure and responsibility by Gram Panchayat Reduced availability of village piped water supply as some water diverted to RO plant Effluent generated available for restricted reuse and needs planning.

Project3

Water Harvesting



Bopgaon, Vanpuri, Zendewadi Kalewadi

50. **Introduction.** For reasons as detailed in the opening paragraphs Projects under this indicator were taken up in multiple villages. The projects were assessed in the Villages of Kalewadi, Zendewadi, Vanpuri and Bopgaon, Details of the project are as given in Table-7 below.

Table-7 Details of Water Harvesting Projects

	Measurement	Payment (Rs)	Beneficiary	Implementation date
Kalewadi				
Water Pipeline Project	3200 metres	21,52,535	2500	2017-2018
Desilting of cement Bandhara & nala	8530 cubic metres	4,44,538		2017-2018
Desilting of cement bandharas & nala	9364 cubic metres	5,24,617		2016-2017
Zendewadi				
Desilting of Bandhara	20000 cubic metres	10,12,902	1800	2019-2020
Vanpuri				
Desilting of Pazar Talav	23812 cubic metres	7,93,849	1500	2019-2020
Bopgaon				
Water Pipeline Project	3500 metres	17,33,000	3000	2020-2021

51. **Kalewadi.** At Kalewadi, desilting work was done in the Malhar Lake. The Government project named -Purandar Sinchan Yojana 's pipeline carried water from Mula Mutha rivers and passed close by. Though paper approval for supply to Kalewadi were available, the work had not been done. . A water pipeline from this Yojana to the Malhar Lake increased water availability throughout the year.
52. **Bopgaon.** Here water was lifted by a pump from Charnawati Odha to the Kanifnath Bandhara Three phase Electric supply and DP for the pump and a pipeline to the spot was also constructed. This helped lift water to the bandhara. Water was now available well beyond monsoon season and additional water was lifted as needed.
53. **Vanpuri and Zendewadi.** Desilting of the natural reservoirs not only helped to increase capacity to hold water, the nutritious silt was spread in fields enriching the soil and the excavated mud was used to increase the height of the dam and creating a two km road. Cracks and leaks were also repaired. Besides holding more water during the rains, the water seeped through the basin via natural channels well beyond the dam area. This led to greening and improved water table in the area.
54. **Assessment.** The cost of the entire water harvesting initiative is Rs 6661141/-. As a result of the interventions, all regions had more water year round and for longer periods. Water flowing through underground channels increased ground water level up to nearly 6km around the area.

At Vanpuri 150 hectares benefitted by the desilting. Quantitative data as regards agriculture produce before the projects and after were accessed from. The agriculture department (Table-8) This shows increase in area under fruit farming across all villages.

Table-8 Purandhar Taluka Villages Agriculture Details

VILLAGE	GEOGR AREA (Ha)	AGRI AREA (Ha)	FRUIT FARMING AREA 2019- 2020	YEARLY GROWTH IN FRUIT FARMING AREA									
				CUSTARD APPLE (Ha)			FIG (Ha)			GUAVA (Ha)			TOTAL
				2019 2020	2020 2021	2021 2022	2019 2020	2020 2021	2021 2022	2019 2020	2020 2021	2021 2022	
K	567	350	145	11	13.5	17.8	3	4	6	1.2	2.5	3	207.02
Z	622	320	82	4.5	6.3	8.2	2.3	3	4.5	3	3.5	5.2	122.5
V	735.66	644.25	126	9	11.5	14	1.5	2.2	4	1.2	1.9	2.5	173.8
B	1308.87	818.78	19	3	4.7	6	0.7	1.2	3.5	2	3.5	6	49.6

K-Kalewadi; Z- Zendewadi; V- Vanpuri; B-Bopgaon

55. Data of other produce was available only with Vanpuri (Table-9). It may be appreciated that now number of harvests have increased to four, there is farming even in summer and vegetables needing water are also being grown.

Table-9 Crop Details at Vanpuri

Kharif		Rabi		Summer	
CROPS	AREA Ha	CROPS	AREA Ha	CROPS	AREA Ha
Bajri	75	Jwari	160	Green Vegetable	5
Other Pulses	20	Harbara	68	Sitaphal	32
Mung Bean	15	Wheat	18	Guava	7
Chara	20	Peas	15	Other Fruits	12
Onion	3	Onion	28		
Tomato	12	Tomato	9		
Peas	35	Other Vegetable	10		
Other Vegetable	12	Kidney Beans	12		

56. The photographs of the areas clearly show the greening of surroundings, increased water storage and produce (Fig15-17). Our Village survey also brought out that villagers felt that water table and family income had increased in past couple of years.

Fig-15 Zendewadi Jun 2019 and Aug 2019



Fig-16 Bopgaon Greening has Improved

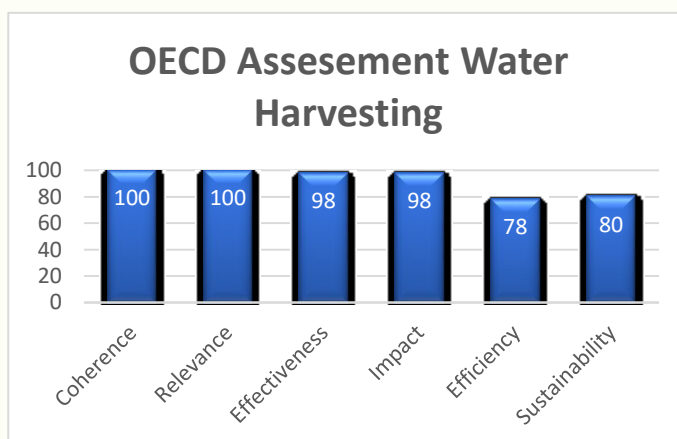


Fig-17 Fruit Produce has Increased



57. Over time, there may be ecological changes, changes in biodiversity , disease patterns etc due to increased water available. These would take a long time to develop and their impact is not studied here.
58. The activity has improved the revenue of the farmer and increased economic activity in the area. Kalewadi where the work was done earlier has now started exporting their produce, has diversified into fruit pulp processing, cold storage technology and is a predictor of similar progress in the other villages.
59. Nearly 40% of the persons surveyed in Kalewadi now own four wheelers, clearly a marker of economic prosperity.
60. **Assessment.** We rate the project of desilting and water harvesting as high to very high on OECD elements. (details below). Impact of the program would be high and the same may be assessed after a year is completed(Details Annexure 2).The project is aligned SDG Goal 2 and 6. Ensure availability and sustainable management of water and sanitation for all; and End hunger, achieve food security and improved nutrition and promote sustainable agriculture
61. **Recommendations.** The projects related to desilting and lift irrigation have sustained long term impact. The economic development of the area is improved. More such projects may be introduced. At Zendewadi and Vanpuri, impact needs to be assessed after one year is completed.

Assessment Project 3: Water Harvesting	
Coherence	Very High
Relevance	Very High
Effectiveness	Very High
Impact	Very High
Efficiency	High
Sustainability	High



Impact Assessment

Input	Output	Outcome	Impact
<ul style="list-style-type: none"> • Bopgaon – INR 17,33,000/- water pipeline (3500m) and 3 phase electric supply with DP provided. • Kalewadi – Approx INR 31,21,690/- worth water pipeline and desilting project carried out • Zendewadi – Desilting of Bandha at cost INR 10,12,902 • Vanpuri – Desilting Pazar Talav at INR 7,93,849/- 	<ul style="list-style-type: none"> • Bopgaon-Capability of pumping 1,00,000 litre of water daily. • Improved water table for approx. 650 hectares • Kalewadi-17,894 cu m of desilting work carried out • 3200 m of a water pipeline laid by BFL available • Zendewadi- 20,000 cu m of desilting work carried out at the bandhara • 2478.5 TCM increase in the storage capacity of water • 2km road repaired using excavated soil along the bandhara. • Water table improved in additional 140 ha of land • Vanpuri- 23812 cu m of desilting done in Pazar Talav • Soil removed used to improve soil condition in 50 acres • Water table improved in 644 ha of land 	<ul style="list-style-type: none"> • Capacity of Bandhara increased • Water availability for longer periods • Silt available as manure for fields • Increase of water table • More number of harvests • Increase in variety of crops e.g. Those requiring more water • Fruit farming increased 	<ul style="list-style-type: none"> • Improved quality of life • Improvement in economic and financial conditions. • Diversification of business • Better revenue • Rapid improvement in village development. • Rapid improvement in village development.

Project 4

Health Hygiene and Sanitation



Singapur

62. During the COVID pandemic there was urgent need to shore up health, hygiene and sanitation in rural areas to support a community hard hit by COVID 19. Bharat Forge provided much needed support in this direction in many villages. The projects undertaken at Singapur were included for study. Details are given in Table- 10 below.

Table-10 Singapur Work Details

Particulars	Measurements	Payment	Beneficiary	Implemented Date
Construction of toilet unit	Urinals-6,toilet-2 & washbasins-2	4,36,000	150	2020-2021
Infrastructure Primary Health Centre	Roof Reconstruction	2,95,608	2500	2021-2022
Equipment	Thermal gun- 4 Pulse oximeter-4 Glucometer-4 Glucometer strip-250 Computer and printer-1 Spray machine-1			

63. **Construction of the Toilet Unit.** The School Toilet at Singapur was in poor condition. The same was reconstructed as given in the table above. The need for toilets in a school goes far beyond hygiene and sanitation. It can make the difference between continuing in school or dropping out, especially for girls. The project was thus coherent and relevant. The toilet is located in the school ground but also has other buildings nearby. There is a RO water plant nearby, few offices and also the PHC. On observation it was noted that the toilet block was not used exclusively for the school but provided for the buildings nearby.
64. Visit to the block revealed that while the construction of the toilets was of good quality, there seemed to be few operational issues which were not allowing it to be used in a proper way. Some of these were:-
- There was no water in toilets. The procedure to fill the tank constructed on the roof was to get someone to climb on the roof and provide water through a hose.
 - Since there was no water, the toilets were not in a clean condition.
 - Soap was not available. Based on the smell in the toilets It seemed that the water problem was a long standing one.
 - There was no dedicated cleaning staff.

Fig-18 Toilet block-Before and After



65. **Roof Repair and Equipment for Health Centre (HC).** The HC was visited. The roof was well constructed and the veranda also was covered. The roof repair has been carried out well and has improved both aesthetics and functionality of the HC. Earlier the centre was not functional due to lack of a proper roof. Now the centre was functioning.
66. **Health Centre.** The functioning of the PHC was observed. The PHC stayed open from 10 am to 3 pm. It saw about 4-5 cases per day. No data on any referral was available. The number of cases seen at the health centre ranged from 154 in August to a maximum of 189 in September, after which numbers tapered off. The rooms inside were not laid out as per standard norms. There were bags, and belongings on examination beds (Fig-19-21).
67. The computer and printer provided by Bharat Forge was connected to Wifi for use in telemedicine as per assistant doctor. Records kept in computer were sketchy. Registers were available but records provided citing confidentiality.
68. The staff was asked to check vitals of the assessor. The equipment was not functioning due to lack of batteries. When queried about equipment provided, it was produced and was in brand new condition.
69. A case of injury reported during our visit. The case was not handled in the standard way. There was no attention in antiseptic procedures, no record of the case was entered.

Fig-19 Discussions at Singapur Health Centre



Fig-20 Rooms at the Health Centre



70. **Assessment.**

- a. **Toilet Block.** While The toilet Block is a much needed amenity its potential is not being fully utilized due to operational and maintenance issues. A pipeline to provide water to the tank needs to be provided. It could be from the effluent of water of the RO plant. There needs to be an accountable person who will ensure cleanliness, routine maintenance and availability of consumables.
- b. **Roof of Health Centre.** This was much needed as without it there was no scope for the health centre to function in a suitable manner.
- c. **Health Centre.** Operations and maintenance issues have reduced the impact of the excellent work done in providing equipment and infrastructure. Besides operational improvement, there needs to be improved accountability, good record keeping and support for training. Steps to increase Client footfall are needed.

71. The project is aligned with SDG Goals 3 (Ensure healthy lives and promote well-being for all at all ages) and Goal 4 (Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all).

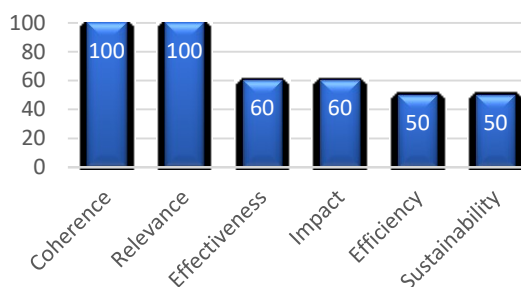
72. The project scores on OECD elements are given below. Impact analysis is given at Annexure2. As project is now, impact could not be well assessed.

73. **Recommendations.** Interventions in the sphere of health are important for overall development. Infrastructure may be provided along with support for functional and process improvement to derive maximum benefit. A committee to oversee functioning and to provide guidance can transform the clinic into a hub for community health.

Assessment Project 4: Health, Hygiene and Sanitation

Coherence	High
Relevance	High
Effectiveness	Medium
Impact	Medium
Efficiency	Medium
Sustainability	Medium

OECD Assessment Health and Sanitation



Input	Output	Outcome	Expected Impact
Health Centre <ul style="list-style-type: none"> • INR 2,95,608/- spent in repair and construction of the roof. • Medical Equipment and computer purchased for HC Toilets <ul style="list-style-type: none"> • INR 4,36,000/- spent on construction of the toilets 	<ul style="list-style-type: none"> • Re- roofing has been completed. • Repair of walls carried out. • Medical equipment provided :- <ul style="list-style-type: none"> • Thermal gun- 4 • Pulse oximeter-4 • Glucometer-4 • Glucometer strip-250 • Computer and printer- 1 • Spray machine-1 <ul style="list-style-type: none"> • School Toilet repaired:- <ul style="list-style-type: none"> 2x girls toilets created 6x boys urinals created 2x tanks (500 litre and 1000 litre) water storage tank for toilet created 	<ul style="list-style-type: none"> • HC capability and functionality has increased • Number of cases seen not increased • HC aesthetics improved <ul style="list-style-type: none"> • Toilets used by community • Water connections need to be functional • Children dropout rate may reduce • Improved Hygiene and Sanitation subject to maintenance 	<ul style="list-style-type: none"> • Expected impact needs to be assessed after One year • Training of the staff at HC would improve impact. <ul style="list-style-type: none"> • Improved school attendance • Higher percentage passing high school • Better opportunity on leaving school

Form No:

Village Name:

SURVEY FORM FOR WATER FILTRATION PLANT

1. Name
2. Sex: Female/Male
3. Age 18-28 /29-39 /40-50 /51-61 /62 or more
4. Number of Family Members
(Those who stay in the home for more than six months/year)
5. Total Average Monthly Family Income from all sources in thousands:
Below 10K /11-20/21-30/31-40/41-50/more
6. Distance From the RO Plant (Km) to your home
7. Which Appliances do you have at Home? Y/N

Fridge		Colour TV	
Two-wheeler		Tractor	
Mixer		RO filter	
4-wheeler		Geyser	

8. Please tick on the statement based your opinion

	Statement	SA	A	CS	D	SD
a.	Water supply in village is adequate					
b.	Family income has increased in past year					
c.	Rainfall is adequate in past three years					
d.	Now number of harvests have increased					
e.	Village drinking water quality is good					
f.	Village water causes kidney stones					
g.	Electricity supply to home is adequate					
h.	Ground water table level has increased recently					

9. Do you routinely use water from RO plant installed? Yes/No

If Yes-Go to 10**If No Go to 11**

10. For those who take RO water from Village

- a. Since when are you using RO water? (months)
- b. What were you using before RO water? Village water/ borewell/well
- c. How many jars(20l) of water do you buy per month?
- d. Do you use any other water for drinking? Yes/No
- e. How do you get the jar home? Two-wheeler/Cycle/walk/other
- f. Why do you buy the RO water? (Can tick more than one)

i. Village water quality is not good		ii. Convenient than buying domestic filter	
iii. Village Water is not available always		iv. Reduced illness	
v. RO water tastes better		vi. No need to chlorinate/boil water	

- g. Is the RO water supply regular? Very regular/regular/Irregular

- h. Has drinking RO water resulted in lower incidence of abdominal ailments? Yes/NO

If Yes 10- 20% | 21- 30% | 31-40% | 41-50% | 51-60% | 61-70% | 71 -80% | 81-90% | 91-100%

11. For those who don't take RO water from Village

- a. What is your current drinking water arrangement?

I. Domestic RO filter		II. Buy from private water agency	
III. Domestic Manual filter		IV. Drink directly from village source	
V. Boiling village water		VI. Drink directly from own well	
VII. Chlorinated Village Water			

- b. Why do you not buy RO water from Village?

i. Don't know about village RO plant		ii. Village water supply is good	
iii. Carrying water from there is difficult		iv. Don't like the taste of RO water	
v. Cost of water is not affordable		vi. RO water can cause illness	
vii. Other agency delivers RO water home		viii. RO water Supply is irregular	

