A Study on Sustainable Water Conservation and Management: A Need of the Community Residing At Vasai Region of Palghar District.

*Mr. Harshal Bendre
*(*HR Executive – Vivekanand Education Society Institute of Management Studies and Research); [M.A. (Geography), LLB, MBA, DPM&IR]*

ABSTRACT

Nowadays a great concern and worry have emerged all over the world as to what will happen to the earth considering the inherent effect of the frequent extractions of the natural resources such as coal, oil, petroleum etc. and even the precious resources like water. This has adversely distorted the ecosystem, thereby drawing the attention of the international communities, the government, general public, corporate bodies, policy makers, professionals and even politicians to take adequate measures aimed at addressing such scarcity problems. In this paper a study has been conducted to find the reasons of water shortages in Vasai region of Maharashtra and the reasonable measures to be adopted by the community for the sustainable water conservation and management by citing some references from few villages located at Gujarat, Rajasthan and Karnataka States, where some effective measures have been adopted for getting a break through to solve this problem.

Introduction:

Water scarcity has emerged as a prominent issue for communities across the country. In fact, one of the most critical natural resources issues facing communities today is managing the supply and availability of water. Nearly every region of the country has experienced water shortages in the last five years. Water supplies have decreased due to the drying up of streams, the decline of groundwater levels because of over pumping, contamination of water resources, and an increase in drought conditions caused by climate change.

As the supply of available water has decreased, demand for water has grown. Population growth, increased land development sprawl, and enhanced consumption patterns amplify water demand, alter the locations at which water is obtained, change the purposes for which water is sought, and degrade watershed lands.

To exacerbate the problem, the growth is high-demand. Water use in India has increased by 115% from 1950 to 2015, compared to a population growth of only 92%. The rise in water demand combined with the decline in water supplies can have very serious consequences for communities. Water is necessary to support all "biological life, natural processes, communities, the economy, society, and future generations." Current water consumption practices are unsustainable and must be altered. To meet the demand for water supply in the future, communities will need to work to conserve and reallocate existing water resources. Residents conservation of water should also be encouraged. The planning, management, regulatory, and enforcement powers of communities should be used "to secure public water supplies from the threats of scarcity and long-term unsustainability, whether from over-consumption, waste, drought, flood damage, degradation and pollution, or other sources." The objective of this study is to create a platform for communities residing at Vasai – Virar region to overcome these challenges through organizing around and operating under key sustainability principles and practices.

Geographical aspects of Vasai Taluka:

Vasai Taluka is a part of Palghar district in Maharashtra. Geographically it is situated between East 72.480 to 72.540 Latitudes and North 19.240 to 19.280 Longitudes. On the eastern side there is Bhiwandi and Wada Taluka and on

the west is the Arabian Sea. On the north the Vaitarna river separates Vasai Taluka from Palghar Taluka and on the south it is separated from Thane main land by the Vasai creek. Vasai has two small sea ports, one at Arnala in the north and the second at Vasai in the south. Earlier Vasai was a small island port comprising of the region between modern day Agashi, Bolinj, Umrale, Sopara right up to Juchandra (Naigaon East). The creek in between connected to the Ulhas river, made it possible to commute between Agashi and Thane by a water way. Archaeological finds have also established that Sopara was once an important sea port of western India. Trade flourished from Sopara to Cyelon during the Ashoka period. Over the years silt and deposits from the Vaitarna and Ulhas river brought from the eroding mountain range of Sahyadri accumulated in this creek and a rich patch of fertile land mass was formed. Although this hampered the fishing industry eventually it made modern day Vasai a very fertile agricultural land mass. Vasai today is divided into two parts by the north south traversing western railway. The west comprises of coastal and agricultural plain and the east is mostly a hilly region with dense jungles at certain points. The natives, stay on the western side and prefer to carry on their agriculture and fishing activities for their everyday livelihood. Few of them also commute to the city every day for work. The eastern side is more populated by new settlers who make their living by taking up jobs in the city. The natives of Vasai always had a liking and love for music, dance, drama, paintings, crafts and sculptures.

Comparative features of population 2001 - 2011:

Comparative population of Vasai Taluka according to 2001 and 2011 census is increased from 91,000 to 2,96,118.66 The total population has increased from 7,65,863 to 13,42,134. The urban area of Vasai Taluka is growing rapidly. The population growth was higher in urban area compared to rural area. In rural area it was found that population has reduced to 1,20,901 from 2,77,262 while that of urban area has increased to 12,21,233 from 5,18,601. The male female ratio has shown slight improvement i.e. from 880 females in 2001 to 887 females per 1000 males in 2011.

(Source: 2001: GOI census commission, 2011: Tehsil office, Vasai, * Provisional 67)

Area wise population:

Vasai Taluka includes rural as well as urban area.

The total population of Taluka as on today is about 1.221 million.

Climate:

There is a meteorological observatory in the district at Dahanu. The records of this observatory are taken as representative of the meteorological conditions in Vasai. But in the interior parts temperatures are likely to be slightly lower in the cold season and higher in the hot season than at Dahanu. Being a coastal area in Vasai temperature varies from 22°C to 36°C. The variation of temperature during the day and between the three seasons is not large. After February temperature progressively increases till May which is the hottest month with the mean daily maximum temperature at 32.90°C. in the summer season and in June before the onset of the monsoon day temperature may sometimes go above 37.0°C. in the coastal parts while in the interior it may be a couple of degree higher. The oppressive heat is on most days relieved by cool sea breezes particularly in the coastal regions. The afternoon thundershowers on some days during the hot season also bring welcome relief. On the onset of the south-west monsoon by about the first or second week of June the temperature decreases a little. From about beginning of October when the south-west monsoon withdraws day temperature increases, and in October and November days are nearly as hot as in the summer, while nights become progressively cooler. After November, temperature decreases. January is the coldest month in the year. The mean daily maximum temperature is 27.70°C. and the mean daily minimum temperature is 16.80°C. In the cold season cold wave sometimes affects the area when the night temperature may go down to less than 10.0°C.

Owing to the proximity of the sea, the area on the whole is very humid nearly all the year round. During the south-west monsoon season the sky is heavily clouded to overcast. In the rest of the year sky is clear or lightly clouded.

Rainfall:

Average annual rainfall is 2000–2500 mm and humidity is 61-86%, making it a humid per humid zone. Rainy season i.e. June to September, accounts for about 94 per cent of the annual rainfall. July is rainiest month with a rainfall of about 40 percent of the total annual rain. The rainfall increases from the coast towards the interior.

Reasons of Water Shortages in Vasai Region:

- The route cause of water shortage in Vasai is ignorance of the Community with respect to water usage. Water shortages both in the form of stress and scarcity are emerging very fast and Vasai is also experiencing similar shortages. Meanwhile, area's supply of water is rapidly decreasing due primarily to mismanagement of water resources, although over-pumping and pollution are also significant contributors. Most of the fresh water is getting polluted in Vasai – Virar region is due to washing of clothes, animals on the river basins by the local communities. The major reason for the water scarcity in this region is industrial pollution. There are many factories coming up in eastern part of Vasai. Many multinationals have started their business in different parts of Vasai. 'Valiv' is industrially developed area along with small industrial pockets near Virar, Vasai and Nallasopara. The major industries in the area are chemicals, electronics, pharmaceutical, plastic, printing press, spare parts, salt pans, artificial fibres, textiles, paints, edible items etc. They emit their chemical and other solid waste regularly in the rivers and sea water. Similarly, the entire waste material of nearby cities, towns and villages surrounded in this region is also flown regularly from Nallhas in to the creeks, rivers and sea water. Locals from Vasai – Virar region dump their sewage water into Vasai Creek.

- Many communities residing in this region use groundwater for their water supplies, and they view groundwater pumping as an ideal resource because it is convenient and groundwater is readily available. Although it was once thought that the supply of groundwater was endless, it is now evident that this is not true. As population, sprawl, and water consumption have increased, more groundwater has been necessary to sustain water supplies. Additionally, land development and population growth affects underlying groundwater by altering patterns and rates of groundwater recharge, causing the initiation of new abstraction, and adversely affecting groundwater quality. Water table levels are dropping across the region as groundwater recharge is exceeded by groundwater pumping. The local residents having their own wells are selling the ground water to the lobby of water tankers.

- Growing population, as everyone is aware, is common and a serious concern as it will create further burden on the per capita water availability in Vasai Region. Comparative population of Vasai Taluka according to 2001 and 2011 census is increased from 91,000 to 2,96,118.66. The total population has increased from 7,65,863 to 13,42,134. The urban area of Vasai Taluka is growing rapidly due to the development of the new residential clusters. Thus, the per capita water availability is also started reduced drastically over the last ten years due to the over consumption.

- A zone called 'Bavkhals' (local name of the traditional water pond) are filled up permanently from last ten years for the construction purposes.

- Another reason of the scarcity of the fresh water is reduction of diameter of lakes in this region. On account of artificial demarcation of boundaries of the lakes and while beautification of lakes, their diameter is reduced, thus restricting their natural water resources. For example, 'Chakreshwar Lake' in Nalasopara city.

- Climate change is also a one of the problem by causing erratic and unpredictable weather, which could drastically diminish the supply of water coming from rainfall and rivers and wells as well. As demand for potable water starts to outstrip supply by increasing amounts in coming years, Vasai will face a slew of subsequent fresh water problems.

Suggested Measures to adopt the sustainable Water Conservation by the Community:

1. **Water Supply Planning:**

Water supply planning involves "the assessment of ground water and/or surface water supplies and the design of means to capture, treat, and distribute the water to users." Water supply planning is beneficial in that, it helps communities to take a proactive approach to assess existing and projected water demand, and then to identify potential resources by asking how much water is available, how much water will be needed, and what alternatives are available to meet that need. It helps to address the cumulative effects of a region's water withdrawals, which can be especially beneficial for areas that are rapidly growing.

Water supply planning focuses on "the volume, flow, and transportation of water, both within water sources but also from source to site(s) of use. Decisions are made about: the number of acre-feet per unit of time that a water user may withdraw and put to use outside of the water body; the volume, flow, and pressure of groundwater pumping; the cubic-feet-per-second that does or must flow past a certain point in a river or stream; and the quantity and rate of recharge of an aquifer or return flow into surface water. However Vasai – Virar Municipal Corporation has adopted the above method for the adequate water supply, but due to ignorance and the mismanagement by the community residing here and due to some technical and operational aspect of the corporation, the above method is not fully working in this area.

Jepar village of Surendranagar District in Gujrat is the best example where the water supply planning has got 100% success. This village has embraced the decentralized community managed water supply system in 2006. It has developed a water distribution system, which allows all 160 households to have tap connections and enjoy 24x7 water supply. The village's two sources of water – a well and Narmada pipe water supply system – supplement each other to ensure regular safe water supply to the village. The total storage capacity is an Elevated Storage Reservoir (ESR) of 50,000 litres and one sump of 20,000 litres. Before the village adopted the 24x7 water supply system in 2006, the supply was available for about two hours a day and the average consumption of water was around 400 litres per day per household. When each household was assured of 24x7 supply, the consumption per household reduced to 250 litres per household, thus saving 25,000 litres per day which represents 38 percent of the water previously distributed. Power consumption reduced too by 4.39 units per day or a decrease in one-third of the previous electricity bill; an annual saving of about Rs. 7,900.

2. Recycling of water:

The wastewater from industrial or domestic sources can be used after proper treatment, for irrigation, recharging ground water and even for industrial or municipal use. If agricultural lands are available close to cities, municipal waste water can be easily used for irrigation.

3. Conservation of water in domestic use:

There is a large scope of conserving water at house hold level. A general awareness among the people about the importance of water and its availability and need for conservation can help in minimizing wastage to a large extent. Losses during water supply also need to be prevented by reducing the leakages. Some of the ways for improving the efficiency of water use at household level are:

- Reduce wastage-leaking pipes mean that lot of water never reaches to the people. In Bolinj (near Virar) estimated losses are 35-40 %.
- Closing of taps while not in use.
- Use low flush toilets-reducing the amount of water used each time the lavatory is flushed.
- Build latrines and compact toilets which can turn human waste into clean, useful manure. This is much cheaper than connecting toilet to a piped sewage line.
- Use bowls to wash vegetables, dishes instead of running tap.
- Greater use of recycled water 'grey water in the home. Instead of using potable or treated water use bath and shower water for watering the plants.
- Use washing machine or dish washer when it is fully loaded.

4. Reduce the loss of water

There are numerous methods to reduce losses due to evaporation and to improve soil moisture. Some of them are listed below:

Mulching i.e. the application of organic or inorganic materials such as plant debris, compost, etc., slows down the surface run-off, improves soil moisture, reduces evaporation losses and improves soil fertility. Soil covered by crops slow down run-off and minimize evaporation losses, hence, fields should not be left bare for long periods of time.

- Ploughing helps to move the soil around. As a consequence it retains more water thereby reducing evaporation.

- Shelter belt of trees and bushes along the edge of agricultural fields slow down the wind speed and reduce evaporation and erosion.

- Planting of trees, grass, and bushes breaks the force of rain and helps rainwater penetrate the soil.

- Fog and dew contain substantial amounts of water that can be used directly by adapted plant species. Artificial surfaces such as netting-surface traps or polythene sheets can be exposed to fog and dew; the resulting water can be used for crops.

- Contour farming can be adopted in hilly areas and in lowland areas for paddy fields. Farmers residing here should recognize the efficiently of contour based systems for conserving soil and water.

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- Salt-resistant varieties of crops has to develop in this region, because these can grow well in saline areas of Vasai, Arnala, Satpala, Rajodi, Kalamb etc. on account of which overall agricultural productivity is increased without making additional demands on fresh water sources. Thus, this is a good water conservation strategy.

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- Desalination technologies such as distillation, electro-dialysis and reverse osmosis are available.

5. Reuse of wastewater:

This method of conservation is suggested to the community of Vasai area because wastewater contains lots of nutrients. Its use for irrigation saves these nutrients. It improves the productivity of crops and soil fertility General utilization of wastewater through reuse and recycling improves water use efficiency. In fact, wastewater is a resource rather than a waste since it contains appreciable amount of nitrogen, phosphorus and potash. Stabilization ponds can be used for fish aquaculture. The effluent can also be used for cultivation of short-term and long term, ornamental, commercial and fodder crops.

Benefits of reuse:

Practical experience has shown that wastewater reuse not only reduces the demand for fresh water but also can improve environmental quality. Reuse of treated wastewater has the following benefits:

- Make up for the shortage of water supply (reduces demand on good quality water)

- Reduces the wastewater discharge thus reducing water pollution.

- Results in cost reduction.

The potential applications of reusing of treated wastewater are in the following fields or areas:

- Agricultural use through irrigation of crops as well as for improving river amenity.
- Industrial cooling especially in large industrial enterprises.
- Reuse in municipal public areas such as watering lawns, parks, play grounds and trees.
- Flushing toilets in hotels and residential districts.
- Reuse of the treated wastewater for urban landscape purposes.
- Treated waste water can also be used for groundwater recharging.

6. Untreated water:

Water or grey water can also be reused for various purposes.
Grey water is defined as untreated household wastewater, which has not come. Grey water is defined as untreated household wastewater, which has not come into contact with toilet waste. It can originate from the shower bath, bathroom, washing basin, clothes washing machine and laundry trough. In our country nearly half of the wastewater is used for irrigation. Many municipalities sell their wastewater to the farmers. Many industries are buying the wastewater and using it.

7. Artificial recharge to groundwater:

Artificial recharge to ground water is a process by which the ground water reservoir is augmented at a rate exceeding normal rate of seepage and replenishment. Any man-made scheme or facility that enhances seepage water to an aquifer may be called to be an artificial recharge system. Ground water exploitation is inevitable in urban areas. But the groundwater potential is getting reduced due to certain adverse effects of urbanization. These are:

- increase in water demand.
- more dependence on ground water use.
- over exploitation of groundwater.
- increase in run-off, decline in well yields and fall in water levels.
- reduction in open soil surface area.
- reduction in infiltration and deterioration in water quality.

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Hence, a strategy to implement the ground water recharge, in a major way needs to be launched with concerted efforts by various governmental and non-governmental agencies and public at large to build up the water table and make the ground water resource, are liable and sustainable source for supplementing water supply needs of the urban dwellers. Recharge of groundwater through storm run-off and rooftop water collection, diversion and collection of runoff into dry tanks, play grounds, parks and other vacant places are to be implemented by Vasai – Virar Municipal Corporation. The Municipal Corporation of Vasai Virar should help to the people and the local builders for adopting suitable recharge method in one's own house or building through demonstration and offering subsidies for materials and incentives.

Methods of artificial recharge in urban are as follows:

- Water spreading.
- Recharge through pits, trenches, wells, shafts.
- Roof top collection of rainwater.
- Road top collection of rainwater.
- Induced recharge from surface water bodies.

Benefits of artificial recharge in urban areas:

- Improvement in filtration and reduction in run-off.
- Improvement in groundwater levels and yields.
- Reduces strain on town municipal corporation water supply.
- .Improvement in groundwater quality
- .Estimated quantity of additional recharge from 100 sq. m. roof top area is 55.000 litres.

8. Water Pricing:

Developing and implementing pricing strategies that help to achieve economic efficiency and demand management could be one of the most beneficial options communities can use to balance water supply and demand. Effective water pricing can enhance water conservation by inducing consumer efficiency and conservation. When consumers do not pay the actual costs for water, or when they pay a decreasing or flat rate when consuming more water, water tends to be wasted.
The price of water is often much lower than it should be. Currently, the rate that most consumers pay for water in Virar and Vasai is only for the costs associated with delivering the water. They do not pay a commodity charge for the actual water. Many communities in this region do not even charge for water service, thus further encouraging wasteful water use. If users are forced to pay higher prices for water, or even to pay for water based on the amount they use, they will be encouraged to carefully examine their water usage habits. Many water pricing methods can be

used to achieve greater water efficiency and conservation. Simply increasing the per-gallon price of water can substantially reduce water use. Additionally, volume discounts should be repealed. This can help to remove any disincentives for conservation.

A tiered pricing system, in which consumers pay more per gallon as they use more water, can also be effective. Many communities currently use a declining block-rate structure, which charges lower rates for consumers that use the most water. This actually discourages water conservation. Instead, incentives to conserve should be created by implementing an inverted block-rate structure. This inverted rating system "targets the heaviest consumers and makes them pay considerably more for their excessive use. Higher rates are imposed as consumers use more water. For example, the Irvine Ranch Water District in southern California has used a tiered pricing system approach to encourage water conservation. The District charges consumers higher rates per gallon as more water is used. A baseline charge for each user was established for necessary water usage. Any water use that exceeds this baseline amount incurs an incrementally higher charge. By implementing its tiered pricing system, along with additional conservation measures, the Irvine Ranch Water District has been able to substantially decrease per capita water use in its service area.

9. Water Metering:

Fundamental to pricing water effectively is the implementation of metering. Universal metering is a necessary tool for enhancing water system management and water conservation. Metering can help to accurately determine customers' water usage, and thus ensures that their water bill charges correspond appropriately. This can not only help to price water efficiently, but can also inform customers of their exact amount of water usage. Often providing this information encourages greater water conservation from consumers.

To make metering effective, meters should be read at fixed and regular intervals to ensure precise comparisons and analysis. Additionally, utilities should ensure that meters are accurate. Readings that are not accurate "will give misleading information regarding water usage, make leak detection difficult, and result in lost revenue for the system." Meters should also be sized appropriately. Meters can under-register water use if they are too large for a customer's particular level of use. Testing, calibration, repair, and replacement of meters are also is an essential to an effective metering strategy.

Dakshina Kannada, a coastal district in Karnataka bordering Kerala, is situated on the western coast of India adopted meters for household connections coupled with volumetric-based tariff and computerized billing and collection in Dakshina Kannada District. This is unique in rural India. In 2010, here were about 43,000 metered connections against less than 4,500 prior to adoption of this practice. But after adoption of this strategy water wastage has substantially decreased in this area.

10. Efficient Irrigation Practices:

Efficiency in irrigation is most essential, if the community wants to face the challenge of water crisis. As most of the crops are watered through flood irrigation, over 70% of the water used for irrigation is wasted here. Furthermore, as the water supplied is not measured in Vasai – Virar region and farmers have a tendency to flood the field with excessive water without any additional cost. Such a practice has been creating a negative impact by way of increased cost of leached nutrients, pollution of ground water, increase in soil salinity and increase of pests and diseases. It is high time that India compels the farmers to adopt micro-irrigation systems, which will not only reduce the water requirement but also bring down the cost of production, while increasing the area under irrigation. The Municipal Corporation also should consider enforcing a ban on flood irrigation in Vasai. (Flood irrigation is an irrigation technique in which a field is essentially flooded with water which is allowed to soak into the soil to irrigate the plants). Simultaneously, metered supply of irrigation water, recovery of water cost, promotion of micro-irrigation systems and involvement of water users' group for water distribution would significantly help in improving the water use efficiency and reducing the cost of agricultural production.

11. Rain Water Harvesting and Conservation:

Rain Water harvesting and Conservation means to understand the value of rain and to make an optimum use of rain water at the place where it falls. It is in fact the activity of direct collection of rain water. The conservation of rain water so collected can be stored for the direct use or can be re-charged into the ground water. The main goal of

Water Harvesting is to minimise the flow of rain water through Drains/Nallhas to the rivers without making any use of the same. The Ground Water level is depleting and going down and down in this area from the last few years due to over extraction. Thus Rain Water Harvesting and conservation aims at optimum utilisation of the natural resource, that is rain water which is the first form of water that we know in the hydrological cycle and hence is a primary source of water for us. The rivers, lakes and ground water are the secondary sources of water. On account of the lack of knowledge about the Rain Water Harvesting and Conservation method, the people residing at Vasai area depend entirely on such secondary sources of water and in the process it is forgotten that, the rain is ultimate source that feeds to these secondary sources. The value of this primary source of water must not be lost.

12. Control of Water Pollution:

Excessive use of water for agriculture, industries and domestic uses is leading to water pollution, because such excess water is transformed into saline water, sewage or effluent. Thus, rewards and punishments should be introduced for persuading people to make optimum use of the precious water. Discharge of sewage and affluent into water bodies and rivers must be banned and recycling of waste water must be pursued and enforced. This will help in keeping the water sources clean and reducing the future demand for water. Treated sewage and effluent can be used for agriculture and industrial production.

13. Desalination of Sea Water:

Over 70% of the global water resources being saline. Economic desalination of sea water is an excellent option to meet the future shortage of sweet water particularly to meet the human consumption. Presently, desalination of sea water is expensive and non-popular. However, with solar power, desalination can be a viable alternative to meet the water needs in coastal areas like Vasai, Agashi, Kalamb, Rajodi etc.

14. Research and Development:

There is a need for investing in research related to ground water monitoring, weather forecasting, breeding water efficient and drought resistant crops and varieties which can cope up with the changing climatic conditions, arising due to global warming. There is also a need for promoting multidisciplinary researchers to study various aspects of water resources, conservation, efficient storage, reduction of losses and sustainable utilisation of water resources in this locality.

15. Afforestation:

Afforestation on degraded forests, wastelands as well as river banks should be promoted in this region on priority to facilitate soil conservation, recharging of ground water and preventing flooding of rivers and siltation of water reservoirs.

16. Restorations and Maintenance of Water Bodies:

Traditional and natural wetlands and water bodies like tanks, jheels, chors and village ponds, etc. have been badly neglected in this area in the last few decades. These structures should be restored, maintained and used properly and these water bodies should not be allowed to be encroached upon for any other land use.

17. Role of NGOs:

NGOs with the requisite competence should be asked to come forward, motivate and train the potential leaders and competent individuals from the community or smaller NGOs. To facilitate and support the work of the NGOs, the concerned nodal departments/ministries (Ministry of Rural Areas, Irrigation departments, Forest departments, Ministry of Urban Areas for Neighbourhood User Groups) should play a suitable role.

To ensure sustainability and enhancement of the benefits, the concept of community participation was used in a drinking water project for the first time in the history of three districts of Northern Rajasthan. A consortium of five leading NGOs, led by the Indian Institute of Health Management and Research, implemented the community

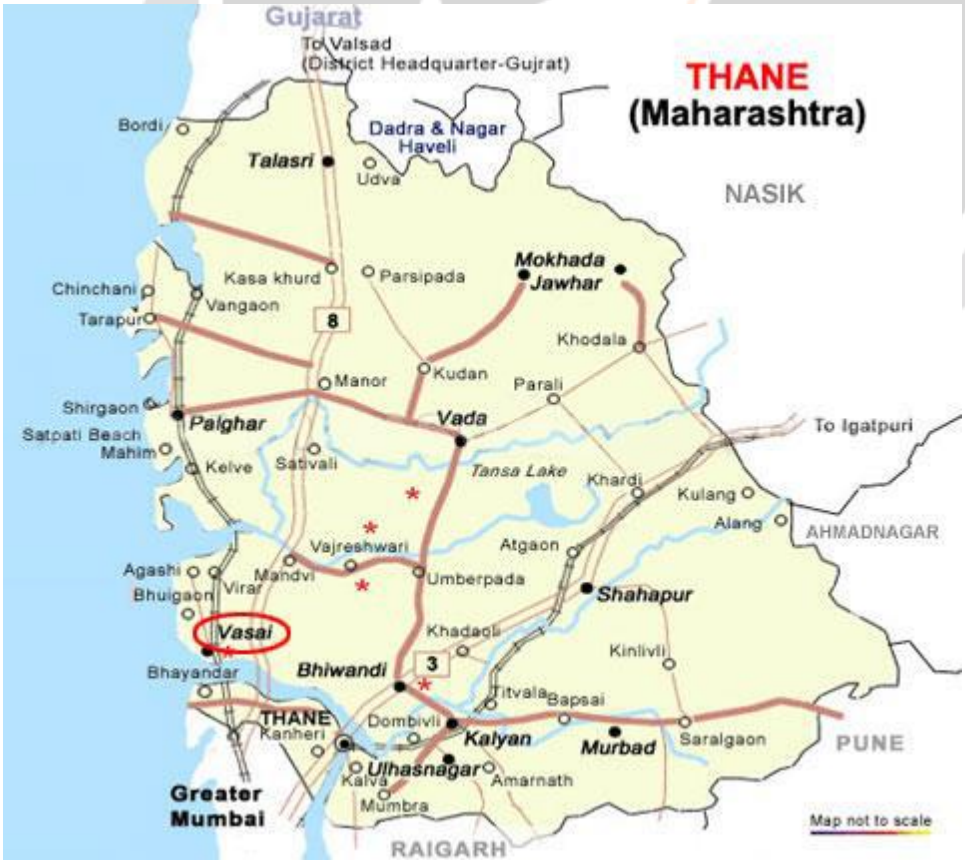
participation approach using a variety of tools such as brochures and flyers, door-to-door campaign, village-level consultations, school meetings, puppetry and folk media. A Water and Health Committee manages the water distribution system in each village. The community was motivated through awareness building for payment of bills, water conservation, equal and fair distribution to all villages, health education measures and sanitation measures. As women were the main beneficiaries of improved water supply and also the principal target group for health education, women's participation was the key element across all these activities. The implications of ownership are that the community had the right to decide on planning, designing, implementing, monitoring, operating and maintaining the installations of the system within its village.

Thus NGOs are playing a vital role for the conservation and the management of water resources. But unfortunately NGOs working in Vasai region are not much active.

Conclusion:

Vasai – Virar region is not really a water deficit region, but due to severe neglect and lack of monitoring of water resources development projects, mismanagement, lack of awareness of the community residing in this area, Vasai experiences water stress from time to time. Further neglect in this sector will lead to water scarcity during the next 1-2 decades. It is therefore necessary to prevent this crisis by making best use of the available technologies and resources to conserve the existing water resources, convert them into utilisable form and make efficient use of them for agriculture, industrial production and human consumption. Finally, awareness and orientation of all the water users to change their lifestyle to conserve water, can help the community to tide over the water crisis in the future. The challenge is manageable provided we have favourable policies and mechanisms to persuade our community residing here to change their lifestyle.

Thus from the above discussion we can conclude that, there is a serious need to take a serious measures by the Community residing in Virar – Vasai area, otherwise within the next 1 – 2 decades, the water stress will become a serious problem in this region.



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ANNEXURE:

Sr. No.	Person Contacted	Designation	Date of Visit	Time of Visit
1	Shri. Vishal Joshi	Local Resident, Bolinj Naka, Virar	15/11/2015	7:00 pm.
2	Shri. Jameel Salmani	Owner, Medical Store, Padmavati Nagar, Virar	15/11/2015	2.30 pm.
3	Shri. Sandeep Mhatre	Local Resident, Bhuigaon, Vasai	22/11/2015	11:00 am.
4	Shri. James Furtado	Local Resident, Nanbhat, Nalasopara.	22/11/2015	2:00 pm.
5	Shri. Vitthal Kamble	Member, H.M. CHS, Bolinj, Virar West	25/11/2015	12:00 Noon

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