

## **SIGNIFICANCE OF WATERSHED MANAGEMENT PROGRAMME IN INDIA**

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“Water is the resource which can change the socio-economic conditions in even the most deprived places. Water is required for any kind of industry, which in turn results in prosperity”.

-Hazare, Anna (1998), from his practical experiment of Ralegaon Siddhi

“My fear is that we’re headed for a period of water wars between nations. Can we afford that in a world of globalization and tribalisation where conflicts over natural resources and the numbers of environmental refugees are already growing?”

-Klaus Toepfer, Head UNEP (1999)

The first statement emphasizes the importance of water for survival and development of a society and the second statement reveals the fears over increasing water scarcity.

Water is the most vibrant form of the natural resources available on this earth. The need of water is obvious for every living organism for its very existence and survival. It is almost impossible to visualize a world without water. Water is a unique commodity which can never have an alternative and an increased supply creates greater demand.

Water resources support 40 percent of global food production through irrigation and 20 percent of global fish yield through aquaculture (FAO 1996: 2). Water resources also help in generating 640,000 megawatts of power, constituting 20 percent of the global power supply. For instance, in 63 countries, hydropower accounts for more than 50 percent of total power production and in 23 of these, it accounts for more than 90 percent of total power supply.<sup>1</sup>

Water demand is increasing due to fast-growing population and expanding scale of economic activities. Since 1950, the population has more than doubled. With about 1.2 billion people, India is the world’s second most populous country. India is on track to become the world’s most populous country in the not-so-distant future, however. Both Census and UNPD projections anticipate that India’s population will exceed China’s (1.3 billions) by 2025.<sup>2</sup>

Urbanization, the major consequence of population growth and economic expansion, put serious pressures on both quantitative and

qualitative dimensions of water resources.<sup>3</sup> Water demand is also growing due to the broadening perspective of water and its ecological, ethical, and cultural roles. Water is needed to meet not only human needs which include water supply for domestic use, drinking water, municipal and industrial uses, agriculture, irrigation, livestock management, hydro-electric power, navigation improvement, drainage and flood control, outdoor recreation, fish and wildlife conservation but also the needs of the water-based ecosystems that form part of the global life-supporting system.

India's demand for water is growing at an alarming rate. Industry accounted for about 20 per cent of water withdrawals and four percent of water consumption worldwide. According to the Ministry of Water Resources (MoWR), industrial water use in India stands at about 50 billion cubic meters or nearly 6 per cent of total freshwater abstraction. <sup>4</sup> According to Government of India report, 1999, it was pointed out that the requirement of water for irrigation in India will grow more than 50 per cent in the next 50 years. <sup>5</sup>

India's aggregate water demand is expected to rise to 1498 billion cubic meters by 2030 with agriculture accounting for 81 per cent of the consumption, industry 13 per cent and municipal and domestic sectors accounting for seven per cent. This is an increase from the present 800 billion cubic meters. <sup>6</sup>

Table -1 gives the sector wise consumption of water in India.

Globally, water use has been growing at more than twice the rate of population over the last century and by 2025 about 1.8 billion people will be living in countries or regions with absolute water scarcity while about two-thirds of the world population would be living under conditions of water stress.<sup>7</sup>

**TABLE-1**  
**SECTOR WISE CONSUMPTION OF WATER IN INDIA**

<b>S NO</b>	<b>SECTOR</b>	<b>% OF WATER CONSUMPTION</b>
1	Agriculture	76.0
2	Power generation	6.2
3	Industries	5.7
4	Domestic sector	4.3
5	Transport and other	7.8

Source: The India infrastructure report (1996)

Distribution of water in time and space is uneven and hence the judicious utilization and management of water resource is of utmost importance.<sup>8</sup>The per capita water has reduced from about 5277m in the year 1955 to the level of 1970m in the year 1998. Water disputes have already started between world nations and interstates. Some of the important interstate water disputes in the country are Kaveri

Water dispute between Karnataka, Kerala and Tamil Nadu; the Krishna water dispute between Maharashtra, Karnataka and Andhra Pradesh; the Tungbhadra river water dispute between Andhra Pradesh and Karnataka; the Parambikulam, Aliyar and Bhavani river water dispute between Tamil Nadu and Kerala; the Godavari river water dispute between Maharashtra, Andhra Pradesh, Madhya Pradesh, Karnataka and Orissa; the Narmada river water dispute between Gujarat, Madhya Pradesh, Maharashtra and Rajasthan; the Mahi river water dispute between Gujarat, Rajasthan and Madhya Pradesh; the Ravi and Beas river water dispute between Punjab, Haryana, Rajasthan, Delhi, Jammu and Kashmir; the Yamuna river water dispute between Uttar Pradesh, Haryana, Himachal Pradesh, Punjab, Rajasthan, Madhya Pradesh and Delhi; the Karmanasa river water dispute between Uttar Pradesh and Bihar; and the Barak river water dispute between Assam and Manipur.

This shows that there is an urgent need for conserving and generating water resources. <sup>9</sup> **Watershed Management Programme** has been projected and accepted as the logical way to conserve and preserve the precious resource 'water'.

Watershed management programmes have emerged as an appropriate strategy to manage natural resources (land, water and forests) and to provide sustainable livelihood to the rural poor. It is a holistic concept which tries to integrate several components like soil and water conservation, forestry development, agriculture, horticulture, livestock development etc. It has led to several dimensions of sustainable development, e.g. ecological sustainability (check in soil erosion, check in rate of silting, groundwater recharge etc.), economic sustainability (increase in crop intensity and crop productivity, milk production, etc.) and social sustainability, (equitable distribution of common property resources like water, forest produce and ensuring peoples' participation).<sup>10</sup>

The principal reasons to take watershed management as a holistic task for the development of mankind are as following:

#### **Decrease in per capita arable land area:**

The arable land area (% of land area) in India in 1950s is 54.8% and in 2010 is 49.1%. A noticeable decrease is seen in the total arable land area. In addition to soil degradation, prime agricultural land is also being converted to industrial, urban, recreational, and other non-agricultural uses. Urbanization is a principal threat to prime agricultural land, especially in densely populated countries (e.g., China, India).<sup>11</sup>

In view of the ever-shrinking arable land resources, it is important to identify and implement strategies for restoration of degraded soils and intensification of existing prime agricultural land.

Watershed Management is an appropriate option to implement these strategies.

### **Natural Resources Degradation:**

Degradation of soil and water resources is a global threat. Oldeman (1994) reported that out of a total degraded land area of 1965 Mha, over 300 Mha (about the size of India) are strongly degraded on a world scale. These lands have lost their productive capacity, and restoration can only be achieved through major investments.

Problem of degradation of land in the rainfed or dry-land areas in the 1990s is likely to have proceeded at more than twice the rate observed in the 1980s, basically on account of soil erosion from run-off.<sup>12</sup> Land and water degradation threaten food security for many of the poorest living in South Asia, Africa and Latin America and India is no exception. The degradation also contributes to persistent poverty. Negative trends in resource degradation are a challenge that must be tackled to meet poverty alleviation.<sup>13</sup>

About 144.43 M ha of the total land in India is under water and wind erosion. About 260 M ha of the land area is drought prone (Table -2). Thus the total problem area is about 173.65 M ha.<sup>14</sup>

Table -2 gives the Land Degradation problems in India.

**TABLE -2**

#### **LAND DEGRADATION PROBLEMS IN INDIA**

<b>Sl.No</b>	<b>Description / Classification of Area</b>	<b>Area Mha.</b>
1.	Geographical Area	329.00
2.	Area subjected to Water and Wind Erosion	144.30
3.	Total Drought Prone Area	260.00
4.	Typical Land Degradation Problems	
	(a) Water logged area	8.53
	(b) Alkaline Soils	3.58
	(c) Saline Soils	5.50
	(d) River	3.97
	(e) Shifting cultivation	4.91
	(f) Average annual area affected by shifting cultivation	1.00
	(g) Rivering and torrents	2.73
	(h) Average annual encroachment by raviners	8000 ha
	(i) Total typical problem	29.22
	<b>Total Problem Area</b>	<b>173.65</b>

Source: Wasteland Development Board, 1992.

As seen from the table -2, out of 329mha of total area of the country, 173.65mha is degraded. In fact, according to the Ninth Five Year Plan Document, soil erosion is contributing to degradation in about 45 per cent of the cultivable area of the country. The estimates of wastelands range from 76 million hectares to 175 million hectares. In a densely populated country like India, one cannot afford to let so much land remain idle. Hence a strategy based on watershed management is essential to effective erosion control and restoration of degraded soils.<sup>15</sup>

### **Watershed Management and Agriculture:**

Agriculture is directly linked to many aspects of sustainable development including alleviation of poverty, sustainable consumption and production, management of natural resources, capacity building as well.<sup>16</sup>

Indian agriculture is subject to the vagaries of monsoon. Irrigation facility is one of the significant factors contributing to agriculture development in India. Despite various schemes of the Government to extend facilities for irrigation only around 40% of the net cultivable land has been irrigated so far while the remaining 60% is rain-fed.<sup>17</sup>

In the absence of irrigation facilities, agriculture is nothing more than a gamble". Sir Charles Travillion observers, "In India, irrigation is everything, water is more important than even land because when irrigated the productivity of soil rises almost six times".<sup>18</sup>

Hence the scope of Watershed Management Programme is tremendous and it has to be given the prime importance in the government schemes.

### **Importance of Watershed Management Programme in Mitigating Droughts:**

Drought is a creeping disaster, which brings large scale starvation, malnutrition, migration, unemployment and poverty. Overtime soil erosion has increased, ground water levels have gone down and consequently the severity of drought has increased leading to ecological degeneration. Droughts are becoming increasingly severe in the recent period.

Drought connotes a situation of water shortage for human, cattle and agriculture consumption resulting in economic losses, primarily in agriculture sector. Drought leads to a situation of decreased food production, decreased availability of dairy and livestock products, loss to industries directly dependent on agricultural production, increased cost of water and other commodities, reduction of economic development and growth etc.

Drought is a common phenomenon in one or other part of India. Arid and semi-arid regions, practicing largely rainfed agriculture are more prone to drought than the other climatic zones; Fifty four districts in the country together with parts of another 18 districts contiguous to them are identified as drought prone.

Evidently, the existing interventions for drought proofing have failed to counteract the overall processes of degradation of natural resources. This calls for evolving an overall policy frame-work that provides adequate incentive and opportunities for soil and moisture conservation, through watershed development

### **Over exploitation of ground water:**

The importance of groundwater in Indian economy can be hardly overemphasized. Estimates state that groundwater sources account for as much as 70%-80% of the value of farm produce attributable to irrigation. India's agriculture is closely tied to the availability of groundwater as we can see it from the increase in groundwater irrigation than canal irrigation. During drought years, groundwater happens to be the predominant source of irrigation. Groundwater provides the greatest measure of security on all the three fronts sought by farmers: timeliness, adequacy, and reliability.<sup>19</sup> Besides, groundwater is the source of four-fifths of the domestic water supply in rural areas and around half that of urban industrial uses. Hence, groundwater's role as a catalyst of rural development as well as poverty alleviation cannot be denied.

While groundwater development has had important implications for the economy, the overuse of groundwater has also been emerging as a major concern.<sup>20</sup> Ground water is being used at a faster rate than the rate at which it is being recharged. Overexploitation of groundwater is a major and serious problem in states of Punjab, Haryana, Delhi, Tamilnadu, Rajasthan etc.

At the country level, there is phenomenal increase in groundwater structures thus putting pressure on groundwater resources. The extent of extraction has increased significantly over the years as the number of wells and tube wells has gone up substantially.<sup>21</sup>

Watershed management happens to be a useful technology for effectively recharging the groundwater by water and soil conservation methods.

### **Desertification:**

Desertification refers to a special type of land/soil degradation, where desert like conditions spread to the areas on the fringe of the desert in semiarid and arid regions. Desertification implies decline in soil quality leading to reduced biological productivity and

environmental moderating capacity of land in arid regions. Desertification may happen as a result of natural and anthropogenic or human-induced factors. The global land area prone to human induced desertification is about 1.02 billion ha or 20% of the total dryland areas of the world (UNEP, 1991).<sup>22</sup> Desertification is an especially severe problem in dry regions in India. An appropriate strategy for desertification control may involve natural resource planning at the watershed level through watershed management programme.

### **Deforestation:**

Forests are important ecosystems because of their impact on global hydrological cycles, biodiversity, and numerous social, economic, and political issues, however, forests are rapidly dwindling. The global annual rate of deforestation is estimated at 12.37 Mha out of a total remaining area of 1505 Mha or 0.82%/yr.<sup>23</sup>

India has 76.52 million hectares of recorded forest area (Forest Survey of India, The State of Forest Report, 1997) as against 33 percent of National Forest Policy of 1988.<sup>24</sup> Per capita availability of forest in India is 0.07 ha which is much lower than the world average of 0.8 ha. A large part of these forests is degraded and productivity is very poor.

The rate of deforestation in country is very high and between 1970 to 1990 it was up to 1.5 million ha per year. The total forest degraded lands estimated by Government of India, Ministry of Environment and Forests is 35.89 Mha.

Watershed Management can play a crucial role in planning for a judicious management of forest ecosystems, and in restoration of degraded soils.

### **Water Scarcity:**

Water crisis is usually viewed in terms of an increasing imbalance between water supply and demand. The increase in population at geometrical rate and over use of water for various purposes are considered to be the major reasons for decreasing the water resources in the world.<sup>25</sup>

When the annual per capita availability of renewable fresh water in a country or a region falls below 1700 cubic meters, it is held to be a situation of water stress. If the availability is below 1000 cubic meters, the situation is labeled as that of water scarcity. And when the per capita availability falls below 500 cubic meters, it is said to be a situation of absolute scarcity (Engleman and Roy 1993).

The per capita availability of water in the country is 1545 cubic meters as per the [2011 census](#). The average annual per capita availability of water in the country, taking into consideration the

population of the country as per the 2001 census, was 1816 cubic meters which reduced to 1545 cubic meters as per the 2011 census, denoting that the per capita water availability in the country is reducing progressively due to increase in population. Also there are reports that demand for water in India would rise dramatically to about 833 cubic kilometers in 2025 and 899 cubic kilometers in 2050 due to increase in population, rapid urbanization and a growing GDP with significant lifestyle changes.<sup>26</sup>

It is estimated that by the year 2025, as much as two-thirds of the world's population-estimated to have expanded by an additional 2.6 billion people will be living in conditions of serious water shortage and one-third will be living in conditions of absolute water scarcity.<sup>27</sup>

Crisis can be averted by improving water use and management. Adopting watershed technology can address the problem of water scarcity to a major extent.

### **Importance of Watershed Management to food security and the greenhouse effect:**

India's principal issue of the 21<sup>st</sup> century is food security and environment quality. Despite the phenomenal advances made in agricultural technology, India's food production has not kept pace with the increase in population. India is ranked at number 67, way below neighboring countries like China and Pakistan, in 2010 Global Hunger Index by the International Food Policy Research Institute. <sup>28</sup> Degradation of soil and water resources and lack of appropriate technology to address the basic issue of resource management are the primary factors responsible for low agricultural productivity. Important among environmental issues are poor water quality and the accelerated greenhouse effect.

The problem of food security needs to be addressed at immediately. As one of the world's largest emitters of greenhouse gases India contributes significantly to global warming. Watershed Management programme decreases greenhouse effect and increases food security.

### **Climate Change:**

The climate change strongly influences the reduction of water amount and quality because the large level of increase in carbon emission by the effects of global warming pollutes the drinking water resources dangerously.

Climate Change will affect the health, growth and productivity of crops, livestock, fish, forest and pasture in different ways. It will, also have an impact on the incidence of pests and diseases, biodiversity and ecosystems. Frequent changes in weather parameters, more importantly temperature and precipitation would not only threaten



food production but also access, stability and utilization of food resources.

According to the “2005 Millennium Ecosystem Assessment”, the climate change will cause loss of biodiversity by the end of this century.<sup>29</sup> Recognizing this, it is necessary that India should address the issue of climate change by developing strategies that conserve soil and water resources on watershed basis.

### **Global Warming:**

Another serious issue is that of global warming. The atmospheric concentration of CO<sub>2</sub> and other greenhouse gases is rapidly increasing (Lal et al., 1995ab; 1998ab). Emission of greenhouse gases from soil to the atmosphere is accentuated by soil degradation and desertification processes are driven by deforestation, land misuse, and soil mismanagement. Adoption of improved watershed management technologies has a potential to sequester C in soil, enhance soil quality, improve productivity, and mitigate the greenhouse effect.<sup>30</sup>

### **Mitigating the Migration:**

Migration of labourers, especially rural to urban is on the increase. A typical case is the drought-prone Mahaboobnagar district in Andhra Pradesh, which has had high migration rates for several decades. It is now well known for the legendary Palamur labourers who work in construction all over India. The neighboring district of Ananthapur is also highly drought prone and is one of the poorest districts in India. There, too, seasonal migration has become routine (Rao, 2001).

There is an interesting relationship between agriculture, natural resources and migration. A common understanding is that deteriorating agriculture leads to out migration and improving the natural resource base and generating employment in rural areas can mitigate migration.

Watershed projects has the strong potential of employment generation that varies across regions depending on cropping intensity and labour intensive crops grown in that region. This resulted in minimizing migration of landless and other labour in the villages.

### **Poverty and Watershed Management Programme:**

The watershed programmes has increasingly become more poverty focused. There has been a shift from assessing the impact of watershed management on regeneration of natural resource base, health of the environment and agriculture productivity to enhance to overall impacts on poverty and livelihood security in a sustainable manner.<sup>31</sup>

Natural Resources Management and Poverty alleviation should be considered as two-sides of the same coin. Watershed management per se does not reduce poverty. But watershed programme conserves natural resources which lead to improved agricultural productivity. Agriculture is a key driver of development and poverty reduction in rural areas. Growth in agriculture usually generates the greatest improvements for the poorest people. <sup>32</sup>

The figure -1 clearly explains how watershed technology works in addressing the problem of poverty.

### **Sustainable Development:**

The sustainable development is defined as “Meeting the present needs by the rational use of the available natural resources and at the same time addressing the needs and requirements of the future generation” by United Nations. Sustainable Development is also defined as the development, which incorporates ecological, economic and socio-cultural sustainability. Sustainable development hints at the rational use of scarce resources with the support of the people and economic policies and adopting strategic environmental management practices.

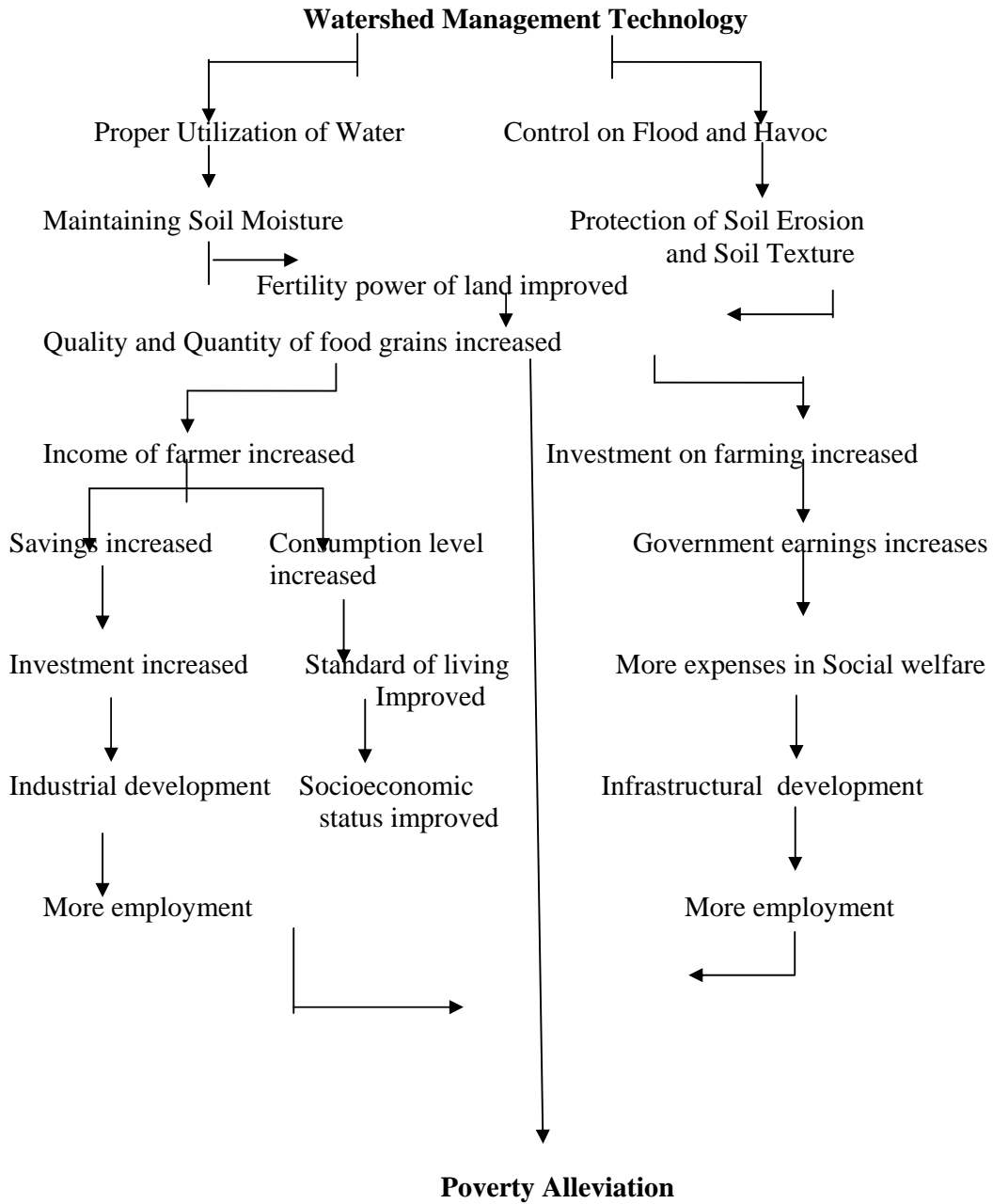
United Nations Conference on Environment and Development, Rio de Janeiro, 3–14 June 1992 and the World Summit on Sustainable Development in 2002 at Johannesburg re-emphasized the need for strengthening the three pillars of sustainable development, viz. economy, society and the environment. The watershed forms an appropriate unit which links all these three components and has a direct bearing on human lives. Thus Watershed Programme is an instrument for achieving Sustainable development

### **Conclusion:**

For all the above said problems and reasons faced by the world nations in general and India in particular, Watershed Management Programme has emerged as a panacea. Problems of rain fed agriculture in semi-arid areas, which are characterized by low productivity, degraded natural resources due to deforestation and desertification, widespread poverty due to livelihood insecurity, acute water scarcity can be addressed effectively by Watershed Management Programme.

Hence Watershed Management Programme must get the foremost priority among the various objectives, in our National Rural Development policy for the overall development of rural areas.

**Figure-1 Watershed management technology in poverty alleviation**



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# **IMPACT OF WATER PURIFICATION PLANT-A CASE STUDY OF ITUKALAPALLI GRAM PANCHAYAT IN ANANTAPUR DISTRICT**

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## **INTRODUCTION**

This case study relates to the impact made by the water purification plant on the lives of the villagers in Itukalapalli village panchayat. This plant established in 2009, is quenching the thirst of villagers for fluoride free pure drinking water. This case study also reveals the utility and strength of public – private partnership in delivering services to the villagers.

## **OBJECTIVES OF THE STUDY**

- The case study aims at examining and analyzing
- The impact made by the water purification plant in the panchayat
  - The utility of public private partnership in providing drinking water service to the villagers
  - To study peoples satisfaction

## **METHODOLOGY**

The study is purely empirical. The study is undertaken on the basis of primary and secondary data. The data was collected through interview schedule, internet, discussions, and official documents.

## **PROFILE OF ITUKALAPALLI VILLAGE PANCHAYAT**

Itukalapalli village panchayat is one of the 25 panchayats ( 32 villages ) of the Anantapur Mandal, 10 km from Anantapur district head quarters. The Panchayat comprises of two villages- Itukalapalli and Chinnakunta. The total population of the panchayat is 3000. Out of which 1450 are females and 1550 are males. The average literacy rate of the panchayat is 80 percent which is much higher than India's average literacy rate 65.38% and Andhra Pradesh's literacy rate which is 60.5%. . The male literacy rate is 72.1% and female literacy rate is 60%. The village panchayat consists of Sarpanch, presently reserved for ST category and 10 ward members. There are 110 Scheduled Caste families, 60 Scheduled Tribe families (Chinnakunta village), 300 Backward caste families and 75 other caste families.

Agriculture is the main stay which is mainly rainfed. Groundnut is the major crop of the area.. Other important crops are rice ragi, jowar, bajra.

2.1% of the panchayat population is employees of Sri Krishnadevaraya University which is a walk away. 20% of the villagers in the panchayat have job cards under NREGA. Nearly 250 individuals of the panchayat are employed in the stone crushing industry in and around the panchayat limits.

Self-help groups are working actively in the village panchayat. There are five self-help groups in the two villages, helping the rural women in getting micro-credit facilities through various banks and

supporting them in establishing their own enterprises like kirana shops, sheep rearing, cattle rearing etc.

The panchayat has received an award of 2 lakhs under Nirmal Puraskar for 100 percent individual household toilets.

100 percent of the houses in the panchayat are pukka houses. 200 houses have been constructed by the government in the panchayat in the past 3 years under Indira Awas Yojana. The individual just pays a deposit of 500 rupees and the remaining is borne by the government.

The two villages have very good road connectivity. National highway 205 passes through the panchayat. 80 percent of the panchayat is covered by cement and concrete roads. All the streets have street lights and are maintained properly by the panchayat.

Panchayat health assistant visits the panchayat regularly and helps the villagers in eye operation, vasectomy and tubectomy operations, vaccination programmes etc.

Assistant agricultural officer suggests the farmers in choosing the type of crop to be cultivated in that particular season. He writes on the blackboard of the panchayat office about the crops, diseases and their prevention. Seeds and fertilizers are supplied to the farmers at subsidized rates. Every effort is made to make agriculture more scientific, efficient and productive.

The panchayat has taken Watershed programme in a serious manner. It has constructed check dams, rock fill dams, repaired village tanks and encouraged villagers to plant trees across their farms to avoid soil erosion. This has resulted in the increase of ground water level in the panchayat region.

#### **FUNCTIONING OF THE PANCHAYAT:**

The village panchayat conducts general body meetings and grama sabha meetings regularly which is not the case in many panchayats. For every 3 months, general body meeting is convened with panchayat members (Sarpanch + 10 ward members) participating.

Gram Sabha is a body consisting of all the voters of the panchayat. For every six months, the Gram Sabha meeting is conducted with all the voters participating in it. Gram Sabha reflects the true democratic spirit. It is here in the Gram Sabha, strong demand was made by the villagers for water purification plant.

There is active participation of the villagers in the grama sabha meetings. 75% of the panchayats population is educated youth and it is directly reflected in the participation of the village panchayat activities. All the decisions relating to the panchayat are taken in a democratic and participative manner.

#### **FINANCES OF THE PANCHAYAT:**

The panchayat gets funds from the central government under the five year plans, grants from state government according to the recommendations made by the state finance commission. The state

legislature also authorises a panchayat to levy, collect and appropriate taxes, duties, tolls and fees. Itukalapalli panchayat is collecting house tax, water tax for individual tap connections, duties on panchayat land sales and purchase etc. 3.75 lakhs funds is given to the panchayat during 2008-2009(from central and state governments).

#### **DRINKING WATER FACILITY:**

Water has always been perceived as a gift from the gods as it rained from the heavens. Great civilizations flourished on river banks. People and land prospered where there is plenty of water and abundant rainfall. Though the panchayat is situated in the drought prone Rayalaseema region, it is blessed with enough water resources.

There are 12 bores and two water tanks in the panchayat which supply drinking water to the panchayat. Water is also supplied to the villagers day after day under Sri Satya Sai project. During summer, when the bore wells are dried up, the panchayat supplies water through water tankers (5000 lts capacity).

Water is a key component in determining the quality of our lives. Today, people are concerned about the quality of the water they drink. Although water covers more than 70% of the Earth, only 1% of the Earth's water is available as a source of drinking. Yet, our society continues to contaminate this precious resource. Today, drinking water treatment at the point-of-use is no longer a luxury, it is a necessity.

Though there is no water problem in the panchayat, none of the available water is pure and fluoride free. Supplying pure drinking water to the panchayat was a big challenge as it is short of resources to start water purification plant on its own. The answer came in the form of public- private partnership.

#### **PUBLIC- PRIVATE PARTNERSHIP**

With the initiation taken by the present local MLA, MPTC member, Sarpanch, the villagers and the Venkara Sai Trust, water purification plant was set up in the Itukalapalli village in November 2009. Thus quality drinking water facility is ensured to all the families in the panchayat.

According to the standard agreement between the panchayat and the Venkata Sai Trust, for the first 10 years, the trust will maintain the plant and retain the revenue made from it .At the end of 10 years the plant will be handed over to the panchayat, after which the panchayat gets the right to revenue.

The panchayat supplies water to the plant. Electricity connection is given to the plant in the name of panchayat.

Awareness campaigns were organized by the panchayat educating the villagers' the importance of clean water, ill effects of chlorine and fluoride, water borne diseases.Since 80% of the villagers in the panchayat are literates they understand the advantage of clean water.



The plant occupies 1700ft of land. Due to the plant, employment is generated for three members – one manager cum operator, one watchman and one driver for delivering water to other villagers.

**COST OF THE PLANT**

**Table 1**

<b>Item</b>	<b>Cost(in lakhs)</b>
Site of the building	1 lakhs
Construction of the building	2 lakhs
Machinery	6 lakhs
Maintenance	1 lakhs
<b>TOTAL</b>	<b>10 lakhs</b>

**Table showing cost of the plant**

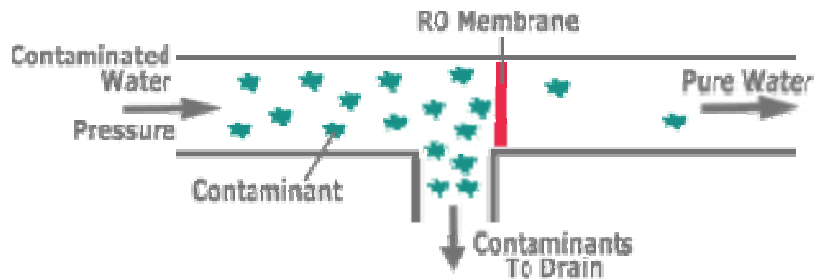
The total cost of the plant is 10 lakhs. Paritala Memorial Trust (in the name of late Paritala Ravi Ex MLA) has contributed 60% of the cost of the plant and the remainig by Venkata Sai Trust. The land was given by local MPTC member at minimal price (much lower than the market price).

**TECHNOLOGY**

The plant employs Reverse osmosis technology.Reverse osmosis, also known as hyperfiltration, is the finest filtration available today. It is effective in eliminating or substantially reducing a very wide array of contaminants.

The plant is composed of an array of granular activated carbon (GAC) pre-filters, the reverse osmosis membrane, a storage tank, and a faucet to deliver the purified water.

There are two tanks (5000lts each),one for contaminated water and one for filtered water.



The purification plant removes substantial amounts of most inorganic chemicals (such as salts, metals, minerals) most microorganisms including cryptosporidium and giardia, and most (but not all) inorganic contaminants.

	Bacteria and Viruses	Bad Tastes & Odors	Chlorine	Fluoride	Hydrogen Sulfide	Heavy Metals	Nitrates	Radon	Sediment	Iron	VOC's
●	●	●	●	●	●	●	●	●	●	●	●

● = Effectively Removes      ● = Significantly Reduces      ● = Minimal or No Removal

The reverse osmosis technology of the plant effectively removes bacteria and viruses, bad taste and odors, chlorine and fluoride, heavy metals, nitrates, sediments and iron; significantly reduces hydrogen sulfide, and voc's

**COST OF THE WATER**

Processed water at the purification plant is sold at Rs 2 for 20 liters can. At the time of registration, each customer is required to pay an amount of 60 rupees per connection. The customer has the advantage of receiving any number of water cans by just paying 60 rupees a month. Customer register maintained by the manager cum operator traces buying patterns.

Water is also delivered to people's homes at an additional cost of Rs6 per can for transport charges. The plant not only caters to the needs of the Itukalapalli panchayat but also to neighboring villages like Aukuthotapalli, Krishnamreddypalli, Sri Krishnadevaraya University,periphery areas of Anantapur town. There are 250 connections in the Itukalapalli village alone and 100 connections in the neighboring villages.

**IMPACT**

The biggest impact of the plant has been on health. The villagers feel that plant water is an answer to many diseases. Public opinion on the impact of the plant on health is taken from 100 households. Table 2 gives the opinion of the households before purification plant and Table 3 gives the opinion after purification plant on various diseases.

**Table 2**

**Table showing occurrence of diseases before plant water**

Disease	Percentage
Body pains	92
Joint pains	90
Cough and Cold	68
Dental Problems	98
Skin Problems	24
Other water borne diseases	86

**Table 3**  
**Table showing occurrence of diseases after plant water**

<b>Disease</b>	<b>Percentage</b>
Body pains	38
Joint pains	40
Cough and Cold	58
Dental Problems	34
Skin Problems	19
Other water borne diseases	41

From the above tables it is evident that disease occurrence has reduced significantly after using plant water.

Public opinion taken from the villagers on random basis reported that they are benefited from water purification plant (table 4)

**Table 4**

<b>Response</b>	<b>Percentage</b>
Benefited	73
Not Benefited	24
Not Affordable	3

G.Rammohan used to get botteled drinking water from Sri Krishnadevaraya University at 15Rs per 20 liters can. Now he is very happy that for Rs60 a month, he can get any number of cans.

B.Venkatramudu says that the panchayat water is very hard and tasted salty. But the plant water is sweet and soft.

T.Rajendra and many others feel that after using plant water, illnesses like joint pains, body pains, cough, cold, dental problems have reduced.

Many people in the panchayat have colored teeth due to the presence of fluoride in the water. Plant water seems to be an immediate solution. G.Ramesh says that his family is using the plant water just because of this problem.

During Winter and Rainy seasons, many households boil water for patients and small kids. Now they have an easy and cost effective way – plant water.

Recently when the plant was closed for two days due to some technical problem, some villagers went to neighboring village; Kandukur (3km away) to get plant water .From this it is evident that the plant has greatly impacted the lives in the panchayat.

#### **THE OTHER SIDE**

Many elderly people in the panchayat feel that they have been drinking bore water for years together, nothing happened and hence no reason to shift to plant water.

For some price is a constraint. Rangamma, a widower and her three children lives on widow pension and cannot afford even 60 Rs per month for plant water.

Ganganna complains he did not like the taste of the plant water.

### **PROBLEM AREA**

- Transport is a major problem. Due to raise in petrol and diesel prices, the transport incharge wants to hike the transport charges which is opposed by the villagers resulting in argument between the villagers and the transport incharge
- Electricity is another major problem. There is frequent power cut in the village which cuts down the plant's capacity.

### **SUGGESTIONS**

- More awareness campaigns need to be organized.
- Electricity and Transport problems need to be addressed.
- The panchayat should take steps to supply water at free of cost/subsidized rates for those who are unaffordable. After all pure drinking water is the right of every individual.

80 percent of the villagers of the panchayat are satisfied by the works of the panchayat and 20 percent feel that more can be done like:

- Since old bores are drying up, there is need to dig new bore wells.
- More houses are to be sanctioned under Indira Awas Yojana. The government should give the land for the construction of houses under this scheme, where there is no land.
- Some illegal elements in the panchayat are breaking the street lights. The panchayat should take care that these are not entertained and street lights are to be maintained even more efficiently.
- The farmers of the panchayat feel that the quality of seeds and fertilizers supplied at subsidized rates is to be increased. The panchayat should play a role in this regard.
- Villagers should be motivated to participate actively in the Gram Sabha meetings across party lines.
- Village panchayats should take initiation in laying cement and concrete roads in the remaining part of the villages where it is not laid.
- The villagers are demanding for a post office branch.
- The panchayats should strive to make self finances by laying taxes such as entertainment tax (for cable connection), tax on kirana shops etc.
- Villagers strongly demand for drainage system.

## **CONCLUSION**

The case study illustrates how a public -private partnership created a win- win situation for all the stakeholders in the panchayat. With this partnership, universal access to clean drinking water seems like an achievable goal.

No doubt Itukalapalli village panchayat stands as a model to other village panchayats but as the society is dynamic a lot of progress has to be done to meet the growing needs of the community at large.

The journey of the PRI's is not a smooth sailing. They are facing lot of ups and downs. So is the case with Itukalapalli Panchayat. Finance is the major constraint in the development process of the Panchayat. Development works are put on hold because of financial crunch. Central and State governments should take care of it. The Panchayat should also concentrate on mobilising its own funds by collecting taxes on the stipulated subjects.

The politicians, bureaucrats and the villagers should work with commitment and dedication for the development of the village. Though there are no Castes and Class disturbances in the Panchayat, there are disturbances on political party basis. These should be resolved keeping the welfare of the Panchayat in view.

More training sessions should be conducted in the Panchayat for Sarpanch, Ward members and the villagers. They should be made aware of the power and functions given to them. It is to be noted that there are no complaints regarding disbursement of pensions. The villagers of the Panchayats are leading a quality life as there are good employment prospects, education and infrastructure facilities.

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