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Anushka Umesh Sawarkar Miss

*Individual*, sawarkar\_anushka@yahoo.com

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## A CASE STUDY ON SELF-SUSTAINABLE VILLAGES OF INDIA

### Cover Page Footnote

I would like to take this opportunity to thank Padma Bhushan Hon. Shree Anna Saheb Hazare and Padma Shree Hon. Shree Popatrao Pawar for taking the time from their busy schedules and for giving me this golden opportunity to do this wonderful project - A case study on self-sustainable villages of India. I am sincerely grateful for their aspiring guidance and support. I would also like to thank Hind-Swaraj Trust for accommodating me in their campus to conduct my research.



# A Case Study on Self-Sustainable Villages of India

Anushka Umesh Sawarkar  
sawarkar\_anushka@yahoo.com

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**ABSTRACT:** This case study is written with the purpose of understanding the main causes that led to the development of the mentioned five villages, under the guidance of Padma Bhushan Hon. Shree Anna Saheb Hazare and Padma Shree Hon. Popatrao Pawar. Earlier, these villages suffered from low agriculture output due to water deficit, leading to low economic output. However, today, by adapting the five principles outlined in the study, they were able to amplify the economic power sustainably for the whole community. Although these principles are not new, their successful implementation via ingenious techniques, and leadership by overcoming hurdles and hindrances is what made the projects successful and helped the community flourish. The study is based on primary data collected, by taking in first hand record of information from the residents of the villages.

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## INTRODUCTION

Tucked away in the Deccan plateau, in a drought prone zone with just 400-500 mm rainfall per year (Maharashtra n.d.), there reside five self-sustaining villages. Ralegan-Siddhi, Wadule, Panoli, and Sangvi-Surya are all situated in close proximity to each other - under 5-7 km of radius. Hiware bazaar is situated in Nagar Taluka (35 km from Ralegan-Siddhi). Around 45 years ago, limited methods of rain water collection and low rainfall led to poor harvest in these villages. On an average, production from one household was barely sufficient for a year. Households fell into poverty; people started consuming alcohol at a higher rate. Due to low-income opportunities, residents started migrating out of the villages in search of livelihood.

## ANALYSIS

Development of these villages was successful because it was supplemented by five principles preached by Hon. Shree Padma Bhushan Anna Hazare. Galvanized by their success, the other four villages adopted these as well.

### 1. Kurhad bandi – Ban on Cutting Trees

“We face irreversible damage to the natural world and the collapse of our societies. It may sound frightening, but the scientific evidence is that if we have not taken dramatic action within the next decade, we could face irreversible damage to the natural world and the collapse of our societies”, said David Attenborough (Attenborough n.d.). Reduction in green cover of the Earth has led to accelerated heat trapping, leading to an increase in carbon dioxide

and consequently, global warming. The villagers made the decision to halt the cutting down of trees, and took it upon themselves to increase the plantation area and grass cover on the hills. This not only helped in reducing temperatures but also in retaining rainfall and recharging the groundwater table.

## 2. Charai bandi – Ban on Grazing

Farmers would take their cattle to graze in the surrounding hills. Excessive grazing leads to the grass losing its hold on the topsoil. This is a major contributor to soil erosion. Disproportion occurs when the rate of soil erosion is higher than the rate of replacement. Top soil not only helps in water retention, but also affects the agricultural land and quality of food grown. Once land has lost its nutrients, it becomes barren and cannot sustain agriculture. Since grazing causes topsoil to lose its constitution, it can be easily carried away by rainwater and wind. Airborne topsoil acts as an air pollutant causing several diseases. Another major environmental concern is that the topsoil ends up washed away in rivers, lakes, streams and dams making aqueducts more susceptible to flooding.

To reduce topsoil erosion in these villages, and to retain rainwater, open grazing was banned on the hills. Cow grazers were asked to cut fodder from abandoned land or use fodder from their farm (unrequired grass). Because of this, grass was able to grow without any hindrance and trees planted in the villages grew taller. People abided by the rule and started feeding their cattle in their barns.

For the purpose of increasing rainwater retention efficiently, various structures such as Deep CCT (CCT n.d.), and loose boulder structures have been constructed. Deep CCT, for example, helps to break down flow of rain water and retain water. This supplements ground water level to rise. Topsoil is preserved and rainwater is easily absorbed in the ground.

## 3. Shramdaan – Voluntary Labour

It has been observed that people care very little for things that are given to them for free and this leads to exploitation of the given resource. For any project, workers sent by the government usually work with the aim of completing the work quickly with no regard to quality of work.



Figure 1: Villagers performing Shramdaan to build CCT

Villagers did not care much about these developments either as there was little to no ownership experienced by the villagers. Such development work often fails and becomes redundant, and additionally, expenditure goes to waste. There is a huge psychological factor attached to *Shramdaan*; apart from forging dignity of labour, it brings in equality and acceptance of diversity in the society. To bring these villagers together, leaders started asking every household to send one member every month to perform *Shramdaan*. Most of the watershed development structures were constructed by the people of the villages. This gave people a sense of belongingness. They not only started to appreciate the structures and developments, but also felt like they were involved in the development in their own village. The simple yet very effective technique facilitated endorsement from villagers. Asking each family to send one member to provide the labour for physical implementation was nothing new but an ingenious way to include every single family in the developmental project. These principles were applied across the villages, and progress was apparent in following

areas. The concept of 'killing two or more birds with one stone' was employed when implementing strategies to ensure the success of these projects.

#### **4. Nasha bandi – Ban on Alcohol consumption and production**

In the year 1982, Ralegan-Siddhi was in a deep state of poverty, with no crop yield, scarce water, and lack of employment. To make matters worse, people started diving into alcoholism as they saw no upshot to the situation. Some started making alcohol due to lack of other profitable employment opportunities and others consumed it. There were around 40 country liquor shops in Ralegan-Siddhi, and the youth of the village took it upon themselves to ensure that country liquor production ceased. After successful implementation of watershed management, the youth of the village had given their complete support to Anna Hazare when he suggested halting alcohol production and sale. By now Anna Hazare had gained the trust of the youth through the success reaped by the watershed management project. It was able to cut through the hurdle of convincing the youth of the relative importance of breaking the cycle of alcoholism and poverty. Subsequently, by the year 1995, sale of tobacco, cigarettes, beedis, and gutka had been prohibited.

The other four villages witnessed the economic and communal evolution achieved by Ralegan-Siddhi from the discontinuation of alcohol and tobacco, and adopted the same principles. Today all the five villages are free from alcohol addiction.

#### **5. Nas bandi – Population Control and Family Planning**

In villages, especially those with low economic outputs, people tend to have larger families. General belief is that with more hands to work, the income brought into the household would increase. Another reasoning of parents is that they will be looked after by at least one child, due to lack of retirement support. Furthermore, the desire to have at least one

son for maintaining the inheritance within the family tends to get the parents to try for additional kids even when they may not be able to afford it. Big families, particularly with limited or low income, tend to struggle economically and this leads to financial difficulties, mainly in dire environmental conditions. Whereas in the case of family planning, education was essential to change mindset; in this case the easiest way involved practical rather than education.

Anna Hazare along with the leaders of the villages went around explaining the benefits of having small families, and convincing them to give up orthodox thinking of requiring a son. Things started to change slowly; villagers began to understand the benefits of having limited children. They were able to fulfil their family needs and their children's educational needs to the best of their ability without any compromises.

#### **WATERSHED MANAGEMENT**

India faced one of its most devastating droughts in the years 1971-1972 (Revadekar n.d.). Agricultural production was scarce. To avoid such a situation in the future and to ensure that enough water is stored, construction of various structures along Ralegan-Siddhi began with the help of the Tata Relief Fund. Nala Bund and Percolation Tank were built to collect rain water.

Farmers were a little sceptical to use a part of their land to build these structures, however, once they saw the results in the form of increased water level in the wells and availability of water until the month of January, their hesitation vanished. Now, Ralegan-Siddhi has 45 Earthen Nala Bunds, 10 Cement Bunds, and 16 Gabion Bunds. Hiware Bazar started building these structures in the year 1982 and today there are 52 Earthen Bunds, 32 Stone Bunds, and 9 Check Dams. Wadule started adopting this idea around the year 2002, and today they have 40 Nala Bunds, 3 large Farm Ponds, and 20 Check Dams. Panoli started construction based on this

model in the year 1985 and today they have 60 Nala Bunds, 70 Check Dams, and 9 large Farm Ponds. Sangvi-Surya also began their construction around 2002 and today they have around 40 Nala Bunds, 40 Check Dams, and 2 large Farm Ponds. Farm Ponds were another successful structure that helped in water storage. Some of the farm ponds have the capacity to contain approximately 1 crore litres of water.

To stop the loss of topsoil by means of rainwater, loose boulder structures (Ranch development) and Deep Continuous Counter Trenches (Deep CCT) were built with the help of the villagers (through the concept of *Shramadaan*). Ranch development helped in reducing soil erosion and water flow, which in turn increased ground water level. As of now, the number of wells is 135 in Ralegan-Siddhi, 240 in Hiware Bazar, 100 in Wadule, 60-90 in Panoli and Sangvi-Surya. Rainwater harvesting has been pivotal in turning around the economies of these villages as agriculture, which is the main source of income for these villages, is heavily dependent on water.

To make all this possible and cut through obstacles such as closed mindsets of the villagers, Anna Hazare employed the principles of *Shramdaan* – a concept that implies charity of labour. This simple concept, although not new, increased participation from the villagers, enabled them to recognise the direct benefits of the projects implemented

rather than just forecast it, and developed a latent ownership of the projects implemented by the villagers. This ownership not only helped develop support for these projects but also created a sense of value for the labour provided. This in turn developed respect and recognition from the villagers toward the projects which improved the maintenance of said projects.

## AGRICULTURE

Watershed management facilitated higher water availability. As access to water became easy, farmers switched from traditional to modern methods of farming. These employ new and scientific methods of farming which are quick, efficient, and easy to undertake, resulting in capital gain and crop consistency. Villages which could not successfully grow one crop in the past, started growing up to 3 crops a year with the help of sufficient water. On average, families earned up to ₹70,000 a month, with some earning even up to ₹2,00,000 a month. Neither do all farmers have equal areas of land to cultivate, nor are all the lands equally fertile. Small landowner/farmers ventured into the dairy business. Along with low maintenance costs, the dairy business also provides additional income. This business supplies farmers with dung compost which helps



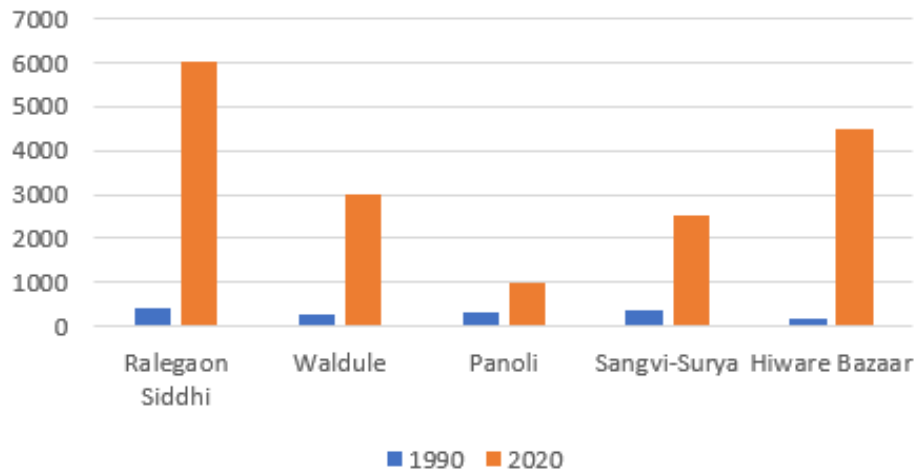
Figure 2: Continuous Contour Trenches (CCT)



Figure 3: Farm Pond located in Ralegan-Siddhi



## Milk Production per day



Source: *Dagadu Mabhare (Farmer and Dairy entrepreneur, Ralegan-Siddhi)*

enrich soil for better quality output. Companies such as Amul, Patanjali and Prabhat to name a few, started conducting business with the farmers of these villages.

Along with the dairy business, poultry and goat farming are also practiced. Average revenue from a medium size poultry farm, with 3000-5000 chickens, is usually ₹40,000 to ₹50,000 per month.

Adoption of technologies such as drip irrigation, sprinklers, and tractors grew with increased disposable income. A handful of large-scale farmers could afford to invest in tractors for farming. Small scale farmers usually rent the farming equipment from large-scale farmers. The amount charged for renting tractors/equipment is on an hourly basis which helps owners to cover the maintenance cost. Here, the intention of the tractor owner is to cover costs by charging minimally, rather than creating a source of income by charging higher rates.

Drip Irrigation is said to save up to 50% of water, however, the set up and maintenance cost of the same is slightly expensive. Farmers availed subsidies for micro irrigation under Pradhan Mantri Krishi Sinchayee Yojna. With such technological developments and water collection, farmers are able to grow various kinds of fruits and vegetables. One of the latest technological developments is the use of solar panels; the energy produced is used to run the irrigation systems. Cameras are placed on a pole to monitor the farm and farmers can start the motor for irrigation by placing a phone call. They also get notified in case of any issue such as loss of electricity.

### HEALTH

Every village has a government medical centre called a sub-centre. A doctor is appointed for every sub-centre along with two to five nurses (depending on the population and availability). These centres are responsible for carrying out all the schemes introduced by the government. They also carry out various immunization programs.

It has been observed in these five villages that the sub-centres are well maintained and a majority of the people turn to them for medical attention. One of the current programs being carried out is treatment of non-communicable diseases related to heart and diabetes. Under this program, along with medication, centres hold yoga seminars and other wellness activities for patients. Immunization is a critical issue for a developing country such as India, and these villages have recorded 100% voluntary immunization rate. No added benefits had to be offered to convince the parents of children to get their child immunized.

### **EDUCATION**

As the economic power of the villagers started to increase, they were able to save money to send their kids for higher education (graduation, post-graduation). All five villages have good quality schools. One of the bigger schools is situated in Ralegan-Siddhi which attracts students from neighbouring villages as well. The school believes in personal, educational, and social development of the students. Schools are technologically up to date, and most of the classes are conducted using digital tools. Most of the younger generation aims to pursue higher education in agriculture or food technology with the goal of developing their farming output.

### **WOMEN EMPLOYMENT**

As technology started to ease farming, women were able to move away from a day's hard work and start small saving corporations (Bachat Gat), which helped them raise capital to start small businesses which included sowing covers for transporting vegetables, paper bags etc. Members contribute small amounts of money on a monthly basis for a few months until the group has enough money to start lending. The funds could then be re-loaned to mem-

bers or others in the community for any purpose. There are around 30 Bachat Gats around the villages. The concept was introduced to these villages by an NGO called MASUM.

### **SOLAR ENERGY**

Due to an abundance of clear sky and a low maintenance cost, a solar energy plant with 5,960 plates, spread across 10 acres of land was set up in Ralegan-Siddhi. On a good day, it produces around 9 megawatts of energy which is supplied not only to Ralegan-Siddhi but also to five other surrounding villages (Panoli, Wadule and Sangvi-Surya being 3 of them). On days with low solar light, it produces around 2 megawatts of power. The village runs on this solar power from 6 in the morning till 6 in the evening, and is later supported by electricity. It is a government funded project which is situated on land that is less suitable for agriculture. Farmers who gave up their land receive ₹3,000/- per year for every acre of land given. This amount is recalculated every 5 years.

### **CLEAN VILLAGES**

Few years ago, the state of the villages was in trouble. The waste management system was inadequate. A majority of the people did not have access to toilets which led to open defecation. Villages decided to build toilets in every household. Heaps of garbage from the roads were cleaned, and students were taught the importance of hygiene and cleanliness in schools which was continued by parents at home. Wells around the villages were disinfected using compounds like alum, bleaching powder, and potassium permanganate. Access to cleaner drinking water improved the villagers' health. Around every house, soak-pits were dug to dispose of the wastewater from the household which prevented it from flowing onto the roads and creating puddles or breeding grounds for mosquitoes.



By-products of dung, biofuel, and organic fertilizers were incorporated and the excess was disposed of outside the villages in dung yards. This kept flies and other insects at bay, and kept the barns clean. Diseases such as dengue, diarrhoea, and malaria were brought under control.

Another major factor that was hindering the cleanliness of the village was the spitting of tobacco and gutka along with their small wrappers, and plastic bags were thrown on the road. The banning of these products helped the village reduce the pollution associated with them drastically. The usage of cloth bags by shopkeepers is an example of this.

### SELF-SUSTAINING VILLAGES

**1. Economic development:** These villages were on the verge of starvation; food production was minimal, but with the help of watershed management and agricultural output growth, supplemented by dairy and poultry, the economic state of the families in these villages started to revive. The standard of living increased. On average, the per capita income increased up to ₹8,00,000 - ₹10,00,000 per annum. Villages in which bicycles were hardly found, now had bikes as a common mode of transportation. Houses moved from traditional cooking systems like clay stoves to cylinder gas, biogas, and induction. Houses are now made of RCC (reinforced cement concrete) as opposed to make-shift metal roof tops. Given that the produce of the village has increased, transportation emerged as an alternative employment opportunity for some. People have started returning to villages from the nearby big cities as they now promise a comfortable life for these families.

**2. Credit Cycle/Loans:** To facilitate development, increase standard of living, and expand business, people tend to take loans. Village residents were not well versed in banking requirements for loans. Earlier, they found it difficult to fulfil the prerequisites, hence took loans from money-lenders at large rates of interest. People were starting to get

caught up in debt traps. To help farmers and the villagers, Pat Sanstha was started in Ralegan-Siddhi. Other villages have different branches of Pat Sanstha. They eased the process of acquiring loans with minimum paperwork. Some villages even have three branches of Pat Sansthas. It has been observed that the people have a 100% rate of repayment of loans. There has been no record of default payment, and the ROI ranges from 4% to 9% depending on the deposit period. 90% of the people also end up paying back instalments on time. The other 10% face an issue depending on variation in agriculture output, however there is no defaulting in repayment. Along with this, Hiware Bazaar made the formal credit system readily available to the villagers by opening a branch of the Bank of Maharashtra in the village.

**3. Social upliftment:** Economic upliftment on most occasions compliments social upliftment, and this has been the case among the five villages. Water collected via watershed structures is used diligently only for agricultural activities. Residents help in the welfare of the village by donating money, physical labour, and land (barren land). With added income and family planning, the number of girls attending schools has increased. People choose to spend on their daughters' education rather than their marriage. Families want their daughters to become financially independent along with the sons. These villages have also formed a committee called Tanta Lotta, composed of 7 village members (male and female) which helps resolve family property distribution issues. They act as mediators between both the parties and focus on resolving the issue outside of court.

**4. Women upliftment:** Earlier, women did not have any information about the workings of banks - how to open an account or deposit money in the bank. Bachat Gats started to encourage the members who borrowed money in a month to go to the bank and open her account to deposit that money. This gave them the confidence to be indepen-

dent. This money was used for various purposes; some of the women used the money to start a small business, others, to buy 10-15 chickens or to buy dairy animals. Women began to contribute financially in their homes. Some women even worked on daily wage for 1-2 days a month to earn money that can be put up in Bachat Gats. With so many women coming together, they started to share their experiences, problems, and provided sound advice to each other. Passing of knowledge increased, be it about the schooling of their children or family issues, marriage in the family or tips in farming. They no longer needed to request money from the earning members of the family and started taking their decisions independently. They also experienced a sense of contentment for contributing towards the betterment of the family and fulfilling their needs and wants.

Along with this, there has been a rise in the number of women holding high level positions in villages. As of now, Wadule's Sarpanch is a woman. There are 5 women Gram Panchayat members in Ralegan-Siddhi, and 3 women Gram Panchayat members in Hiware Bazar. In the last 5 years, Ralegan-Siddhi has had two women Sarpanches.

### **CONCLUSION**

The above presented development occurred in these five villagers because they adapted the aforementioned five principles. Watershed structures were successful in saving water only after people from every village started contributing to building them. Structures built by the government failed to assist in water collection. Success from watershed management branched out into surplus agricultural output, better education and health, women development, and clean surroundings. Government employees assigned to these villages do not dread living here and proactively work for the betterment of the villages.

Over the last 30 years, residents of these five villages have experienced increased ground water levels and the luxury of water directly flowing into their wells, thereby eliminating bore to pull out water. By continuing to preserve trees and grass, water flow is strong, along with lower temperatures around the village due to abundant green cover.

Villages have also been able to successfully control population by understanding the importance of smaller families.

Hence, if not all, implementing few of these key principles such as ban on grazing, family planning, ban on cutting trees, and shramdan across villages can help in creating self-sustainable villages.

Ralegan-Siddhi and its surrounding villages stand as a testament to the rest of the villages across the country by proving that the implementation of certain economic and social principles can go a long way in increasing the standard of living and overall conditions of the village.

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