



Study and Development of Smart Village

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Abstract: A smart village is aware of its residents, available resources, and relevant services and programs. It understands what it needs and when it requires it. The rural population requires the same level of quality and status of life as persons living in suburban and urban areas. The idea behind the "Smart Village" concept is that technology should be used to promote development by enabling education and local economic opportunities, boosting health and welfare, increasing democratic engagement, and improving the general quality of life for rural village people.

Index term – Introduction, concept, requirement, benefits, awareness program, information of Mutkeshwar village, preparation of report, total cost, photos.

1.0 INTRODUCTION_:

1.1 Background of the study

A community with access to global markets thanks to digital technologies and open innovation platforms." Although there is no official definition of a "smart village" in EU legislation, there are a number of defining

characteristics connected with the smart village concept, with local community involvement and the use of digital tools viewed as important factors. Local people's participation in improving their economic, social, and environmental situations, collaboration with other communities,

social innovation, and the development of smart village initiatives are all part of the notion. Many elements of living and working in rural locations can benefit from digital technologies. The smart village concept also implies the use of smart solutions in both the public and private sectors across a broad range of applications.

In India, a rural area is a geographic location outside of cities and towns, and rural areas are also known as 'village.' Agriculture, coupled with fishing, cottage industries, ceramics, and other small businesses, is the main source of income in many communities. A community having a maximum population of 15,000 people is

classified as a "Village" by the Indian Planning Commission. A large portion of India's rural population lives in nucleated villages, which most typically take the shape of a shapeless agglomeration. Because India is primarily a rural country, the concept of smartness is not even considered in rural areas. The term "rural" refers to all places that are not classified as urban. In India, there are around 6, 38,588 rural units or villages. According to the 2011 census, rural areas have 68.84 percent of the population, while urban areas only have 31.16 percent. Villages are the beating heart of the Indian country. As a result, for the country's general development, attention must be paid to the grassroots level, which means that the Indian village should be the focal point. People are migrating in significant numbers from rural to urban regions, which has its own set of risk criteria, and there are still numerous villages in India with dense populations. As a result, the major goal is to smarten the villages by providing basic amenities, education, job creation activities, and technology, among other things. "The best, quickest, and most efficient way is to build up from the bottom," said Mahatma Gandhi. Every community must develop into a self-contained republic. This does not necessitate courageous resolutions. To make it smart, it takes daring, corporate, and intellectual labor.

1.2 Present scenario of the Mutkeshwar Village :
Mutakeshwar / Khadule is a Village in Gagan Bavada Taluka in Kolhapur District of Maharashtra State, India. It belongs to Desh or Paschim Maharashtra region . It belongs to Pune Division . It is located 40 KM towards west from District head quarters Kolhapur. 340 KM from State capital Mumbai. Mutakeshwar / Khadule is

surrounded by Radhanagari Taluka towards South , Vaibhavawadi Taluka towards west , Panhala Taluka towards North , Karveer Taluka towards East .This Place is in the border of the Kolhapur District and Sindhudurg District. Sindhudurg District Vaibhavawadi is west towards this place .

This settlement is home to people from Katkari tribal community of Maharashtra. This settlement is located in one part of the Gaganbavada village. The other group of people that resides in the Gaganbavada village belongs to the local Maratha community. Historically there has been a wide developmental gap between these two sections of this village, despite being part of the same geography. Such disparity is common in many rural (and urban) parts of India. Inequality in opportunities to earn a livelihood, to good education; access to basic amenities, including, medical facilities, clean drinking water, electricity and clean environment; is widespread in many parts of rural India. CRISIL team wanted to take up an initiative to showcase the impact of bringing in focused development to such isolated and forgotten parts of our rural landscape. However, right from the stage of conception, our goal was not to urbanize these villages, but to bring about holistic changes keeping the local social and environmental fabric intact. Our objective was to understand the imminent problems that a village faced and bring about visible changes in the scene.

1.3 Problem Statement

Some of the issues and challenges that the residents face are,

1. Lack of educational facilities – There is a primary school in the village till grade 4. Some children study beyond grade 4 in a school in the nearby village (Chouk). However, due to lack of transportation many of the students drop-out (especially, girl child).
2. Lack of clean drinking water – The well in the village is dried up, and the water table in the village is very low. This situation has been further exacerbated due to the multiple drought years. There is a water connection in the village which gets intermittent water supply from the neighboring dam. On days when there is water supply, it lasts for only an hour or two, and is not sufficient for the village. For the additional needs, women have to walk some distance to gather water from a nearby river (which is only seasonal and may not be clean), or a hand-pump in the other part of the village.
3. Lack of Sanitation facilities and poor hygiene – Open defecation is a way of life in the village and despite some households having constructed toilets next to their houses, don't use them. Scarcity of water supply also dissuades the villagers from using the toilets. The surrounding area in the village is littered with plastic and other trash, with no designated area for the collection of garbage. The hut are plastered with cow dung and is known to cause worm infestation in children.
4. Lack of occupational opportunities – The village has no vocational training

programme. Villagers are, therefore, forced to take up jobs which only require physical labor. Skill development is an area where the village can benefit massively from.

5. Bad road conditions
6. Street Lights are not provided

1.4 Objectives of The Project

- i. To study the Smart Village concept.
- ii. To assessment status of the facilities in Mutkeshwar village.
- iii. To carried out cost analysis for Smart Village implementation in Mutkeshwar village.
- iv. To develop a model for Mutkeshwar Village.
- v. To suggest recommendations.

2.0 LITERATURE REVIEW

This review synthesizes the current literatures that are germane to smart village facilities and its management. The purpose is to highlight the issues useful to the successful completion of this study. However, it must be stated that this review is eclectic due to the fact that there are limited works in this area. Thus, the review is divided into some major sections namely concept of smart village and its management, facilities management, and empirical studies. The first is broken down into concept of smart village tools. in the second point how to make a smart village by the using of different components are explain in details. The composed of definitions and scope of facilities, advantages of different facilities, its uses, its benefits. They study the project report deals with study and development of smart

village. Smart village is one of the energy access acts as a catalyst for development in education, health, security, productive enterprise, environment that in turns support further improvement in energy access. This report focuses on improved resource use efficiency, local self-governance, access to assure basic amenities and responsible individual and community behavior to build happy society. Smart village by taking smart decisions using smart technologies and services.

2.1 Concept of Smart Village:

Smart Village was one of concepts for the developed villages in India. This concept was developed by Viswanadham and Vedula in their book entitled “Design of Smart Village”. A smart village model followed a model from smart city as an effect of integrated technology changes to be implemented in the remote areas. The aim of smart village was to help it solve all problems through the implementation of ICT (Information and Communications Technology) and GIS (Geographic Information System). Nowadays, Indonesia has implemented the concept of “nawacita” for regional development, this program prioritized the development in rural area. Smart village concept focused on the role of technology in building governance and public services. Technology used by Muke and Nilesh in their research was able to be used by people lived in rural area in order to improve their quality of life. The use of technology utilized by villagers was able to make them become more responsive. Smart village model based on the concept of “Access to Information for Everybody” in which ICT (Information and

Communications Technology) service was reached easily by villagers through IIIC program.

2.2 Different Components for Making Village Smart

- i. Magic pit
- ii. Solid Waste management
- iii. RO Water
- iv. Bio Gas
- v. Rainwater Harvesting
- vi. Roads
- vii. Gutters
- viii. Income Sources
- ix. Education
- x. Street Lights
- xi. Good Governance
- xii. Health Care Facilities
- xiii. Women Empowerment
- xiv. Transportation
- xv. CCTV Cameras

2.2.1. Magic Pit

Magic pit is covered porous walled chamber that allows water slowly soak into the ground. Magic pit can offer a cost efficient opportunity for partial treatment of waste-grey or storm water and relatively safe way of discharging it into the environment and therewith recharging groundwater bodies.

As waste water percolates through the soil from a magic pit, small particles are filtered out by the soil matrix and organics are digested by micro-organisms. Sub-soil layers are water permeable in order to avoid fast saturation.

2.2.2 SOLID WASTE MANAGEMENT

Introduction

In rural areas, examples of solid waste include wastes from kitchens, gardens, cattle sheds, agriculture, and materials such as metal, paper, plastic, cloth, and so on. They are organic and inorganic materials with no remaining economic value to the owner produced by homes, commercial and industrial establishments. Most household waste in rural areas is organic, with little inorganic material, and is non-toxic. Because of its environment - friendliness, composting is a highly suitable method of waste management in rural areas.

Solid-waste management, the collecting, treating, and disposing of solid material that is discarded because it has served its purpose or is no longer useful. Improper disposal of municipal solid waste can create unsanitary conditions, and these conditions in turn can lead to pollution of the environment and to outbreaks of vector-borne disease—that is, diseases spread by rodents and insects. The tasks of solid-waste management present complex technical challenges. They also pose a wide variety of administrative, economic, and social problems that must be managed and solved.

Solid-waste characteristics:

- Composition and properties
- Generation and storage
- Collecting and transporting
- Transfer stations
- Solid-waste treatment and disposal
- Incineration
- Digesting and processing
- Sanitary landfill

- Constructing the landfill

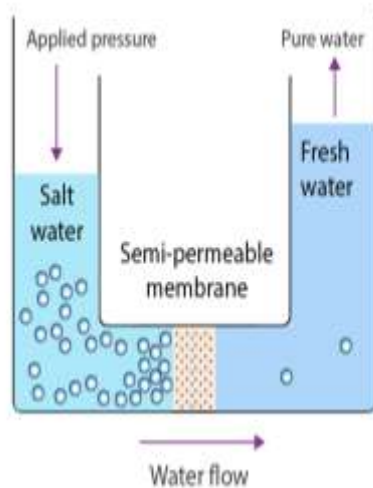
2.2.3 RO PLANT

A reverse osmosis factory is a manufacturing facility that performs the reverse osmosis process. By pushing water over a membrane, reverse osmosis is a typical method for purifying or desalinating polluted water. Reverse osmosis water can be used for a variety of things, including desalination, wastewater treatment, pollutant concentration, and dissolved mineral reclamation. To desalinate one cubic metre of water, an average modern reverse osmosis system requires six kilowatt-hours of electricity. A large volume of salty briny waste is produced as a result of the operation. The goal for these facilities is to reduce energy consumption, employ sustainable energy sources, improve the desalination process, and innovate in the waste management area to deal with the trash. Reverse osmosis water purification units are self-contained water treatment systems that use reverse osmosis. They are typically used in the military.

Reverse osmosis is one of the oldest and most popular separation techniques used mainly for the purification of water. The process was mainly adopted for desalination of seawater in the year 1950, where the whole process was relatively slow and limited to certain laboratories. However, after a lot of research and advancements in technology, there were significant developments especially in the field of polymers and the production of efficient membranes.

Today, this technique is extensively used by many around the world to purify water for

industrial, residential, commercial and scientific purposes. While reverse osmosis technology is one of humanity's important scientific innovations we will develop a basic understanding of the whole process.



2.2.4 BIOGAS PLANT

A biogas plant is a facility that allows anaerobic digestion to take place in an oxygen-free environment. Simply described, it's a man-made system that converts trash into sustainable energy and fertilisers while also having a positive impact on the environment.

The biogas manufacturing process is made feasible by three primary components of a biogas plant:

- a waiting area
- a digestive system(or fermentation tank)
- a holder for gas

2.2.5 RAINWATER HARVESTING

Rainwater harvesting is the process of collecting and storing rainwater that falls on roofs, parks, roadways, and other open areas. This runoff

water can be kept or recharged into the groundwater system.

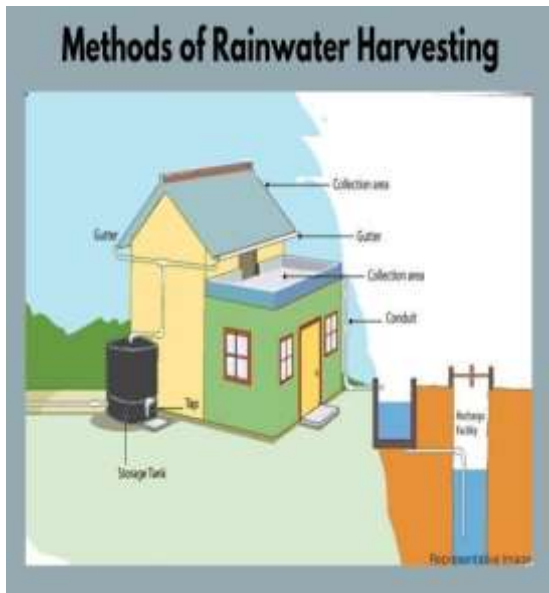
The following components make up a rainwater harvesting system:

- a catchment where water is captured and stored or recharged
- a conveyance system that transports the water harvested from the catchment to the storage / recharge zone
- a first flush to flush out the first spell of rain, a filter to remove pollutants, storage tanks, and/or various recharge structures.

Rainwater harvesting is the process of collecting and storing rainwater in natural reservoirs and tanks, as well as the infiltration of surface water into subterranean aquifers.

- Rainwater collection can take many forms, including: Harvested directly from roof tops and stored in tanks.
- During the monsoon, monsoon runoff and water in swollen streams are collected and stored in subterranean tanks.
- Small ponds can be used to store water from flooded rivers.
- Rainwater collection and transport to percolation tanks. To make it easier to discharge into the ground.
- For buildings in the village, however, we use roof rainwater gathering. Most any surface – tiles, metal sheets, plastic, but not grass or palm leaf – can be used to catch rainfall and supply clean water and year-round storage with rooftop harvesting. Water for gardens, irrigation of annual crops, pastures, and

trees, residential and livestock consumption, and ground water recharging are among the other uses. Everyone in the village is required to collect rainwater.



INCOME SOURCE:

Agriculture is the largest source of income in villages, followed by poultry, dairy products, animal conservation, and nursery businesses.

HOW CAN WE WORK ON THIS?

- Soil and Water Resources.
- Agriculture
- Animal Husbandry
- Education
- Health, Hygiene and Sanitation
- Women Empowerment
- Rural Infrastructure

Animal Husbandry

Need to Intervene:

Since conditions are not favourable for animal husbandry, steps should be taken to improve the level of awareness through counselling and discussions. Farmers should be informed about animal husbandry during the intervention phase. Thus, they can be given an opportunity to increase their income through affiliate activities like dairy, biogas and fisheries.

EDUCATION

The Surva shiksha Abhiyan is one of the current plans for universalizing education for everybody. This is one of the world's largest educational endeavors. A considerable number of places in India's school system are designated for affirmatively scheduled castes, scheduled tribes, and other disadvantaged communities. Children between the ages of 6 and 14 are entitled to free and compulsory education as a fundamental right. The "10+2+3" educational system is followed regularly by the central and most state boards. At this pattern, a 12-year study is completed in school or college, followed by three years of graduation for a bachelor's degree. The first ten years are divided into five years of elementary education, three years of upper primary, and two years of high school. Women's education has a critical part in raising living conditions in the country. By encouraging and promoting children's education, a greater women literacy rate improves the quality of life both at home and outside the house. Providing various facilities with the most up-to-date current technologies, such as e-learning, aids in the expansion of children's knowledge. Various

activities are carried out in school to strengthen the skills of students so that they can progress in their lives and become decent members of society.

SMART HEALTHCARE FACILITIES

Health literacy promotion the eWay, which uses smart phones to deliver authorized, validated, personalized health information to a pre-defined community. This could be exploited if public Wi-Fi is available.

Telemedicine-enabled pre-hospital management in smart ambulances for emergencies, trauma, and other conditions Remote health monitoring at home, which minimizes hospital bed occupancy by converting a home into a health-care ward.

For the first time, scientific and statistical examination of health-care outcomes, incidence prevalence, and follow-up will be possible.

WOMEN EMPOWERMENT

Women have an important part in the growth of the country.

By encouraging and promoting children's education, a higher women literacy rate improves the quality of life both at home and outside the house

There are various self-help groups created by women in Mutkeshwar village that help to improve their image in society.

GOOD GOVERNANCE:

- E-Governance resulting in better service delivery.

- Ensuring regular and punctual attendance of government and panchayat staff.
- Time bound services and delivery in line with department's citizens Charters.
- Holding of gramsabhas at least four times a year.
- Holding of balsabhas every quarter.



Gram Panchayat

TRANSPORTATION

A 35-seat minibus with a one-rupee ticket is available for usage. The bus service is free for female students. The District Rural Development Agency provided the entire money for this bus (DRDA). Ticket revenues are used to cover the costs of providing this service.

LOUDSPEAKERS

Loudspeakers were installed in every area of the village. Key announcements such as the holding of gramsabhas, the payment of taxes, the payment of energy bills, the payment of telephone bills, and other important announcements as needed and required. The people also listen to prabhatiya and bhajans, or prayers, in the morning.

CCTV CAMERAS

CCTV cameras are installed in the school and colleges. Cameras are installed at a prime junction of the village so that the litterbugs can be spotted and punished

WI-FI CONNECTION

Free Wi-Fi is provided for the village. After consuming 100 MB data the connection will be terminates and user can re-login after a 10 minute gap.

ROAD

We can supply two types of roads in Mutkeshwar village: cement concrete roads and paver block roads (cement concrete roads: dust and wet weather damage to the road using modern technologies at a low cost. (Paver block road: Paver block road is a type of road that is used to improve drainage.) Construction is simple, and the time required is significantly shorter than that of a cement concrete road. Paver block roads are less expensive than cement concrete roads and are more suited.

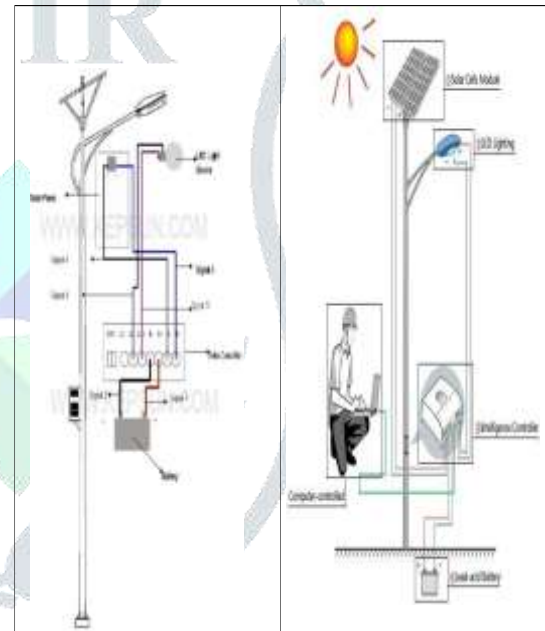
SOLAR STREET LIGHT

Introduction

One of the most abundant sources of renewable energy is the sun. How to tap this unlimited and free energy source is made simpler with solar cells or photovoltaic cells. You have probably seen solar panels attached to the pole of some street lights. These street lights are no doubt sun-powered and are experiencing complete autonomy from the grid.

A solar street light is powered by solar panels integrated or mounted on the pole. It has a smart, rechargeable battery that powers an LED lamp.

Solar street lights are one of the newest technologies which support green initiatives. They are environmental-friendly, smart and economical lighting solution. Solar LED Street lights help deliver a favourable living environment with reduced operation and energy costs. Around the globe, some countries have already converted traditional street lights to LED street lights which proved to bear advantageous results.



RESULT

After applying all this services and technique the overall problems of Mutkeshwar village are reduced. Due this the cultural, social(Improving the well-being of every individual in society, increase self-sufficiency, reduce the poverty), economical (due to various businesses economical status and standard of living increases), environmental (use of natural resources reduce the pollution and plantation brings the friendly environment), educational (e-

learning and other modern techniques increases the level of thinking and personal development), living standard and overall status of village increases. Because of that village become self-dependent and contributes towards the development of nation.

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