

IMPLEMENTATION OF HYBRID SYSTEM MODELING AND POWER EFFICIENCY ENHANCEMENT FOR SMART VILLAGE

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ABSTRACT: *Smart Village defines its citizens, available resources, services and schemes in place. Know what you need and when you need it. The Smart Village Initiative focuses on better resource efficiency, empowering local self-government, access to basic safe and responsible amenities, and individual and collective behavior to build a vibrant and happy society. The economic part of the model calculates spent fuel, and kilo hours are obtained per watt of fuel saved, and the total cost of fuel. The environmental part of the model calculates 2, particles (PM) and x emitted into the atmosphere. Simulation was performed on a real system basis in the rural area of Bihar West of Purnia for three situations: 1) Diesel only; 2) Diesel Battery and 3) PV with diesel battery using one year period.*

KeyArea: *Hybrid Model, Smart Village, Dissel Energy, Battery Energy, PV Cell, MATLAB*

I. INTRODUCTION

A rural area is a geographic area that is located outside cities and cities, while rural areas are also known as "the village" in India. In these villages, agriculture is the main source of livelihood along with fishing, handcrafts, ceramics, etc. According to the Planning Commission of India earlier, the settlement is considered to have a maximum population of 15,000 "village". Many rural residents of India live in desolate villages, which usually have a form of settlement described as a meaningless conglomerate. India is a country dominated by rural areas, not even thinking about the concept of rural intelligence. All areas not classified as urban areas are considered rural. The number of rural units or villages in India is approximately 6, 38,588. According to the 2011 census, the rural population is 68.84%, while urban areas only have a population of 31.16%.

1.1 Smart Village and its Importance: The idea of smart people in the current context seems more moderate because there are limits to the growth of cities that create urban forests, where the population per kilometer of land is much higher than the required standards. Initially, taking the child's steps into a national campaign will begin when the fruits of this effort begin to bear fruit, which will undoubtedly be visible to everyone sooner than expected.

1.2 Aims of Smart Village

- Homes with access to toilet, safe drinking water and regular power.
- A Smart Village knows all information about its citizens, available resources, applicable services and schemes.
- Every household has diversified livelihood opportunities and/or micro enterprise. Microenterprise a business

operating on a very small scale, esp. one with a sole proprietor and fewer than six employees.

- Maintain its Identity, culture and Heritage
- Plans for development based on People, Assets and Service Centric information and tracks its progress.
- It works towards Revenue generation.
- Has functional solid/liquid waste management system.
- End all preventable maternal deaths and infant deaths which means proving good basic health facilities in Health care centered
- 100% institutional deliveries
- Interacts with Government, NGO's, Social Entrepreneurs, Experts for its needs
- Functional toilet, potable water electricity available in schools, health centers.
- Awareness on new technologies that can be implemented in villages, farms and nearby places. E.g. Drip Irrigation, Solar Panels Lighting Systems on streetlights etc.
- Good facilities for Domestic animals like dogs and cattle: dispensaries, pond for cattle, veterinary hospitals and vets

II. LITERATURE SURVEY

[1] Rural Village Water Resources Management Project This article examines community-driven multiple use water services (MUS) as pioneered by the Rural Village Water Resources Management Project (RVWRMP) in the Far and Mid-Western development regions of Nepal. These regions are characterized by poverty, remoteness, rugged terrain, food insecurity, water scarcity, and post-conflict legacy. [2] A Development Of Smart Village Implementation Plan For Agriculture The current study mainly aimed to investigate the Malaysian Smart Village project in a rural community which is labelled as Kg Besting in Malaysia. Specifically, the study intended to address the major issues faced by the community of farmers, identify the Smart Village indicators and put forward a strategic plan for the Smart Village implementation. It was carried out among Malaysian farmers in Kg Besting community in Malaysia. Data was collected through a survey, focus group interviews and documents. [3] Smart City and Geospatial Information Availability, Current Status in Indonesian Cities developing smart city requires many types of information, including geospatial information. Geospatial information serves as the base data from which other data will be referenced upon. The production, provision and dissemination of geospatial information in Indonesia are regulated by Law 4/2011 on Geospatial Information.

However, only few areas have been mapped at the scale of 1:10,000 and 1:5,000. This situation left many cities without large scale map able to depict building footprints or parcel boundaries. To obtain information on the geospatial information availability in Indonesian cities, a survey has been carried out nationally from April – July 2015, as part of a research on spatial data infrastructure. 90 cities/districts participated in the survey. The findings show that majority of the cities/districts have limited availability of large scale topographic maps and land parcel maps. With regard to developing smart cities. [4] Tourism development of historical riverbanks in Jatinom Village There are some archeological remain artifacts of the Jatinom village founding figure and an Islamic preacher. In the present, the area of Jatinom has been developed into a religious Tourism village although most pilgrims only come to the place at the tradition ceremony only. The study aims to develop the tourism of Jatinom by maximizing the potential of riverbanks condition. It employed a descriptive-qualitative approach.. The results show that the tourism development could be realized by combining a religious tourism with nature-based tourism, connecting the tourism objects through easy access, and improving the quality of landscape. [5]. Employment and Unemployment situation in India Human society is developing with rapid momentum and achieved various successes for making its livelihood better. The civilization is witness for various changes related to it's the development through different catalysts like industrial development, green revaluation, science and technology, etc. [6] The Indian smart village: Foundation for growing India A smart village knows about its citizens, available resources, applicable services and schemes. It knows what it needs asnd when it needs. Smart village initiative focuses on improved resource-use efficiency, empowered local self-governance, access to assured basic amenities and responsible individual and community behaviour to build a vibrant and happy society. The present research paper discusses about rural development in developing world for the up-liftman of livelihood of the rural masses.

III. PROBLEM IDENTIFICATION

The Village need to a supply a continuous supply of current .Most of Indian village struggling through power cut problems. Even near to town village are also getting problem for current supply. Solar system also reduced the problem associated with the village at very low cost. It must have some very find the used of diesel generator that will provide the supply through night and for making the irrigation purpose. This needs a high power supply. So a big lack of high gains current through PV.

IV. PROPOSED WORK

4.1 Proposed Work

The discusses the economic analysis and environmental impacts of integrating a photovoltaic (PV) array into diesel-electric power systems for smart villages. MATLAB Simulink is used to match the load with the demand and apportion the electrical production between the PV and diesel-electric generator. The economic part of the model

calculates the fuel consumed, the kilo watt hours obtained per gallon of fuel supplied, and the total cost of fuel.

The environmental part of the model calculates the 2, particulate matters (PM), and the x emitted to the atmosphere. Simulations based on an actual system in the remote district of bihar were performed for three cases:

- 1) Diesel only;
- 2) Diesel-battery; and
- 3) PV with diesel-battery using a one-year time period.

The simulation results were utilized to calculate the energy payback, the simple payback time for the PV module, and the avoided costs of 2, x, and PM. Post-simulation analysis includes the comparison of results with those predicted by Hybrid Optimization Model for Electric Renewable.

V. PROPOSED METHODOLOGY

We have looked at the following technologies, ie small wind turbines, solar PV systems (PVS), batteries and diesel generators to support smart villages. In the hybrid system, the electric demand of the laboratory is coupled to AC, the diesel generator is connected to the AC power of the grid and the solar panel, wind turbine and batteries are connected to both sides of the DC. The conventional diesel generator (DG) is used to supplement the renewable energy system for peak loads and during periods of weak neutral system resources.

VI. SIMULATION & RESULT

Smart Villages are the need of the hour as development is needed for both rural and urban areas for better livelihood and technology will offer effective solution. The technological support already exists at the urban side and there is a tremendous pressure on urban landscapes due to migration of rural people for livelihood. Smart Villages will not only reduce this migration but also irrigate the population flow from urban to rural area as well.

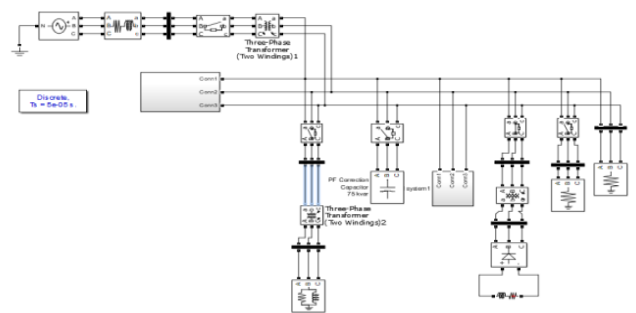


Figure 6.1. Top level Model

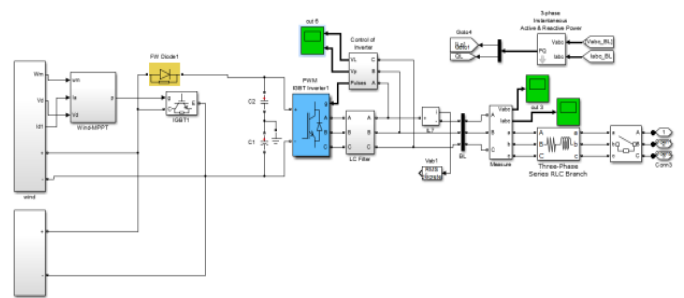


Figure 6.2 PV Wind Subsystem

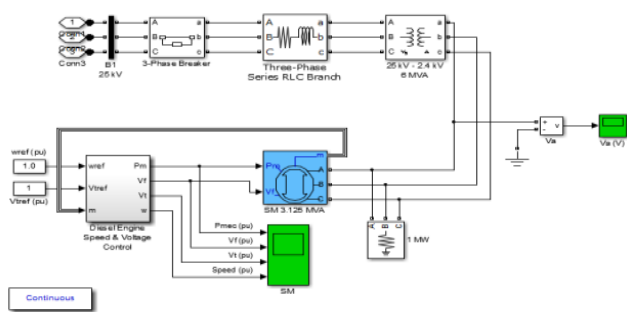


Figure 6.3 Diesel subsystem

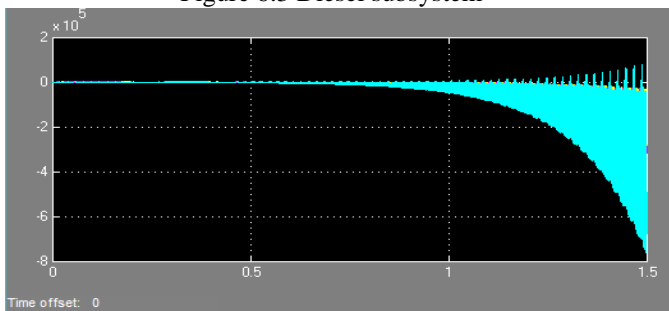


Figure 6.4. Output voltage of PV subsystem

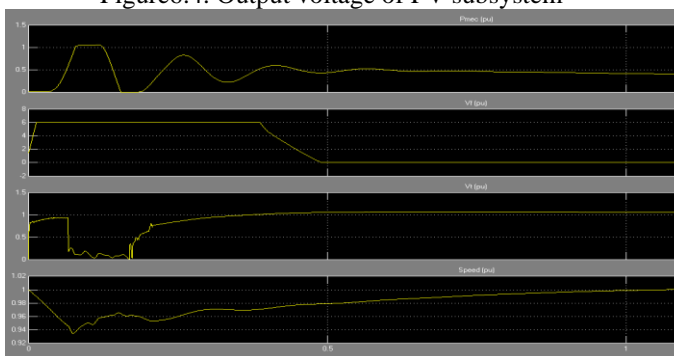


Figure 6.5. Output of Diesel subsystem

The alternator with battery and inverter is the most economical solution for the three boxes for download. PV, wind turbine, diesel generator with battery and inverter system is also a very good replacement solution has low electricity cost and net current cost. Although the cost of electricity from the proposed system is higher than the electricity of the grid, but because of the need to protect the environment and the current standard of living of rural communities, this hybrid system will play a good role country, such as India. The integrated model provides great efficiency for people to make this energy extremely intelligent.

REFERENCES

[1] Rural Village Water Resources Management Project, Kailali District, Nepal; Barbara van Koppen. International Water Management Institute, Pretoria, South Africa; b.vankoppen@cgiar.org Narayan Wagle. Rural Village Water Resources Management Project, Kailali District, Nepal.
[2] A Development Of Smart Village Implementation Plan For Agriculture: A Pioneer Project In Malaysia Norizan Abdul Razak1, Jalaluddin Abdul Malik2,

and Murad Saeed3 1Universiti Kebangsaan Malaysia, Malaysia, norjef@ukm.my 2Universiti Kebangsaan Malaysia, Malaysia, Universiti Kebangsaan Malaysia, Malaysia,
[3] Smart City and Geospatial Information Availability, Current Status in Indonesian Cities HeriSutantaa,b, *, TriasAdityaa,b, RetnoAstrinib A Department of Geodetic Engineering, Faculty of Engineering, Universitas Gadjah Mada, Yogyakarta, Indonesia Research Centre for Spatial Data Infrastructure Development (PPIDS), UniversitasGadjahMada, Yogyakarta, Indonesia
[4] Tourism development of historical riverbanks in Jatinom Village RiniHidayatia*, Sudaryonob, Djoko Wijonob, Budi Prayitnob A Department of Architecture Muhammadiyah University of Surakarta, Jalan.
[5] A.YaniTromolPos 1 Pabelan Surakarta, Indonesia bDepartment of Architecture and Planning GadjahMada University, JalanGrafika No.2 Bulaksumur Yogyakarta, Indonesia Employment and Unemployment situation in India, National Sample survey statistics ,Ministry of Statistics and Program implementation. http://mospi.nic.in/login_correct1.htm?rept_id=532&type=NSS
[6] Gandhi's Views & Work For Village Development Panchayat Raj, Harijan, 18-1-1922. <http://www.gandhimanibhavan>.
[7] Big Data project. N Viswanadham, Service Science & Engineering Research in India: Agenda for the third Service Revolution in India, Report presented to the Science Advisory Council tothe Prime Minister of India, July 16, 2010, IIC Delhi. David fresh water 2000, Direct and indirect rural development policy in a neo conservatineNorth America.
[8] Dr. Milind kulkarni 2010, International journal of research in engg science & technology.
[9] Zhao Whiffing 2009, International journal of research in engg science & technology
[10] N Viswanadham2010, Service Science & Engineering Research in India: Agenda for the third Service Revolution in India, Report presented to the Science Advisory Council to the Prime Minister of India,. Townships for Sustainable Cities 2012 Drivers of Nation.
[11] Village-level solar power in Africa: Accelerating access to electricity services through a socio-technical design in Kenya 2014 Solar power energy solutions for Yemeni rural villages and desert communities 2016.
[12] Gandhi's Views & Work for Village Development Panchayat Raj, Harijan, 18-1-1922.
[13] Smart Village Project, National Informatics Centre Competitiveness, National Competitiveness council report, National Competitiveness council.