D.E.S.I. Power ™

G-20 Event: 21st July 2023

"Decarbonising India: Business Driven Solutions to Empower Rural India"

DECENTRALISED ENERGY SYSTEMS INDIA PVT.LTD.

D.E.S.I. POWER

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Done

हिंदुस्तान रिपोर्ट

अररिया के जोकीहाट बहारबाड़ी में वर्ष 2000 में हुई थी देशी पावर की स्थापना

अवसरः जी-20 अंतरराष्ट्रीय सम्मेलन में जिले की भागीदारी

अररिया, संवाददाता। जिले के लिए ये गौरव की बात है कि जिले में पिछले दो दशक से अक्षय ऊर्जा या नवीनीकरण ऊर्जा क्षेत्र में काम कर रही देशी पावर को गोवा में आयोजित जी: 20 के एक सत्र में शामिल होने के लिए आमंत्रित किया गया था। जी-20 सम्मेलन का ये सत्र 21 जुलाई को आयोजित हुआ था।

आयोजन क्लीन एनर्जी मिनिस्ट्री की ओर से किया गया था। देशी पावर का प्रतिनिधित्व देशी पावर के निदेशक एकलव्य शरण ने किया। ऐसी जानकारी वरिष्ठ खेल प्रेमी और समाजसेवी सत्येन्द्र नाथ शरण ने दी। बताया कि देशी-पावर को भारत में डीकार्बोनाइजिंग इंडिया बिजनेस ड्रिवेन सॉल्यूशन टू एम्पावर रुरल इंडिया पर जी 20- 2023 क्लीन एनर्जी मिनिस्ट्री (सीईएम) द्वारा आयोजित अंतरराष्ट्रीय स्तर के सम्मेलन में शामिल किया गया।

बताया गया कि देशी पावर की स्थापना उनके बड़े भाई और डा एचएन शरण ने की थी। गौरतलब है कि अररिया के मूल निवासी डा शरण विश्वविख्यात ऊर्जा वैज्ञानिक हैं। ऊर्जा समाधान द्वारा गांव का विकास और रोजगार सृजन को केंद्र में रखते हुए डॉ. शरण ने वर्ष 1996 में बायोमास आधारित नवीनीकृत ऊर्जा की अवधारणा पर काम करना शुरू किया था। और आखिरकार वर्ष 2000 में देसी पॉवर की स्थापना हुई।

सत्येन्द्र शरण ने बताया कि जोकीहाट प्रखंड के बहारबाड़ी गांव में वर्ष 2003-04 में जो बायोमास आधारित बिजली उत्पादन प्लांट लगा था वो अब भी संचालित हो रहा है। वहां उत्पन्न बिजली का इस्तेमाल गांव के घरों और दुकानों में रौशनी आदि के लिए हो रहा है। मांग पर खेत पटवन के लिए भी बिजली दी जाती है। साथ ही सोलर प्लांट भी चल रहा है। इसके अलावा चकई गांव में भी बायोमास और सोलर दोनो प्लांट संचालित हैं।

शुक्रवार को गोवा में आयोजित जी 20 अंतरराष्ट्रीय सम्मेलन में बात रखते देशी पावर के निदेशक एकलव्य शरण। (फाइल फोटो)

- अक्षय ऊर्जा यानी नवीनीकरण ऊर्जा क्षेत्र में काम कर रही देसी पावर
- गोवा में क्लीन एनर्जी मिनिस्ट्री द्वारा आयोजित हुआ था सम्मेलन

बायोमास प्लांट में कृषि अवशेष व लकड़ी का इस्तेमालः बताया गया कि बिजली उत्पादन के लिए बायोमास प्लांट में कृषि अवशेष और लकड़ी के टुकड़ों आदि का इस्तेमाल होता है। श्री शरण के मुताबिक गोवा सम्मेलन में देशी पॉवर के निदेशक एकलव्य शरण के साथ साथ गांव के अन्य सहकर्मी गुरुदेव मालाकार, भालो देवी व राधा देवी ने अपने अपने अनुभव रखे। उन्होंने कहा कि ऐतिहासिक महत्व वाले सम्मेलन में हिस्सा लेना कम्पनी से जुड़े लोगों के अलावा जिले वासियों और विशेष रूप से बाहारबाड़ी के लोगों के लिए गौरव की बात है।

About DESI Power

(www.despower.com)

- **EmPower Partnership Projects: since 1996**
- **Field-testing and adapting energy technologies for rural energy applications.**
- **Building, owning and operating decentralised power generation (biomass, biogas, PV and Hybrid), Micro Grids (probably the first one in India) and Tiny Grids.**
- **Project development and ”Engineering, Procurement, Construction, Operation and Maintenance” [EPCOM] services for village plants.**
- **Load development and management.**
- **Financial engineering, project packaging and fund raising.**
- **Training and skills development of villagers with focus on women.**

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Sustainable Rural Development
Electricity, Water, Farming, Enterprises, Clean Cooking, Hygiene and Training

Contribution to Meet Sustainable Development Goals (SDG) for Villages

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Sustainable Rural Development

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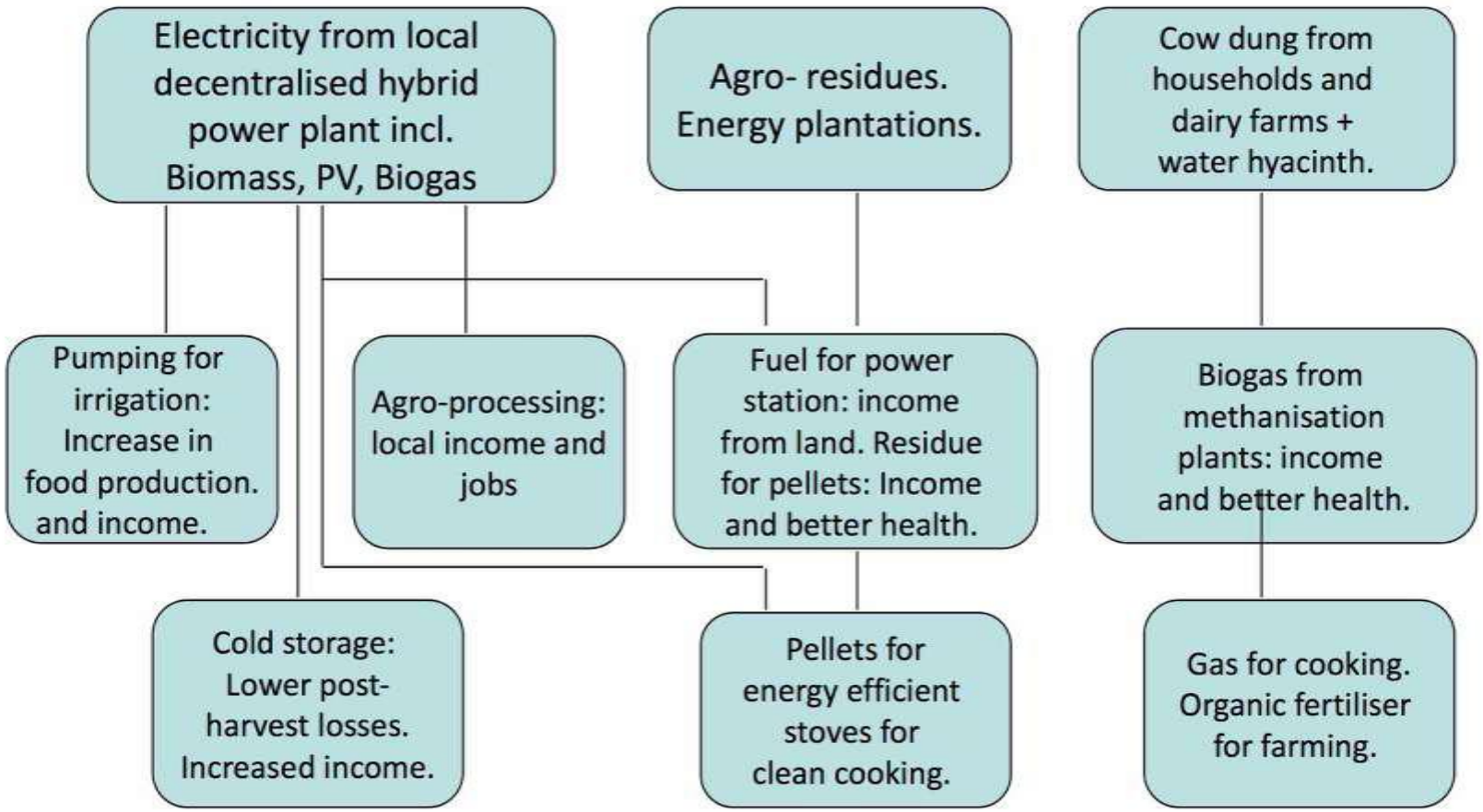
DESI Power EmPower Partnership: Integration of Resources, Technologies and Value-addition



About DESI Power Foundation

(www.desipowerfoundation.org)

- *To provide training and skill development courses for villagers and project staff.*
- *To built and nurture pilot projects for subsequent large scale replication.*

1. **DESI MANTRA Training Centre (2006).**
2. ***Energy Plantations for fuel and food.***
3. ***Clean Biomass Cooking Fuels.***
4. ***Organic Farming for Increased Income of Small Farmers***
5. ***Sanitation and Biogas Centre.***

PROJECT BENEFITS

Decarbonizing Development:

- *Our solution is based on local renewable resources used with reliable, locally manageable and clean technologies for local communities in a cost effective manner*
- *Kerosene replaced in the houses with CFL/LED bulbs*
- *Substituted diesel based irrigation pumps and engines with clean energy powered systems.*
- *Converted DG operated units with electricity.*
- *Clean cooking solutions through biomass pellets and biogas provides health benefits to women.*
- *Promotion of energy plantations (chemical free growing) as cash crop for farmers also ensures security of biomass supply.*

PROJECT BENEFITS

Cost-Benefits of the project:

- *Reliability of supply to ensure regular operation of productive local enterprises.*
- *Supply of energy at an affordable rates to the local communities and businesses.*
- *Tariff and service costs are based on of meeting Capex and Opex conditionalities.*
- *Optimising hybrid (Biomass + Solar) plants ensures reliable management of loads at the lowest generations costs during the day and night.*
- *Local jobs are created by the promotion of micro enterprises in the villages*
- *Timely and affordable supply of water helps farmers increase their crop cycle at a lower cost and increases their income.*
- *Promotion of energy plantation enhances the income of farmers and helps maintain affordable, reliable and profitable electricity supply.*
- *The entire process helps to improve the GDP of the village as most of the value added and benefits remains within the village economy.*
- *Training of villagers enables them to get employment and also become entrepreneurs.*
- *Other benefits are: Carbon savings, Foreign exchange saving and reduction in migration*

SCALABILITY

Viability of the project:

- *Village development projects today are no longer only about supplying electricity to the households and commercial loads but they deal with issues of land, energy, agriculture, jobs, training, empowerment of villagers, specially women, and climate change.*
- Proper planning and optimisation of DRE driven village development ensures profitability and minimized risks for investors. Total participation of local people, use of local resources and maximum local retention of benefits in the village make such projects viable.
- *The potential for large scale replication of such projects is enormous. Locally optimized solutions using DRE based hybrid microgrid provide the basis for low-risk investments in service businesses for household, irrigation, clean cooking energy & IT; in micro-enterprises, e.g., for food and vegetable processing, seeds and nurseries, fisheries and cattle feed; and in training and skills development centres.*

CHALLANGES

Financing Challenges:

- *Finance is the key not only for building microgrids but also for rural service businesses and enterprises.*
- *Rural conditions vary greatly but one global common thread is that there is no local investment capital available in villages of The Global South.*
- *The key to finding external finance and investors is, however, to provide them with bankable project proposals based on hard local data and conditions with a dependable analysis of local risks.*
- *Such investment proposals can be prepared now at project-affordable costs by using dynamic modelling tools which are state-ot-the-art today for large complex projects.*
- *DESI power and its partners have developed, tested and qualified such models for planning and optimising hybrid or mono microgrids which are themselves profitable and can supply reliable electricity to meet diverse 24x7 rural demands at affordable tariffs.*
- *The model can be extended to do risk analysis for individual investors, owners and promoters of micro-enterprises and for lending banks.*
- *The model delivers options to decision makers who can chose bankable project configurations which meet their criteria and are also bankable.*
- *Foundations, Climate Funds, Clean-Tech Promoters, Carbon traders and Development Banks and CSR funds are needed to minimize the risks of the owners and private social and patient investors by providing soft-funds which can enable a large number of commercial pilots to be built in the next few years.*
- *The role of the Government remains vital. A regulatory framework is needed for microgrids to work together with the local last-mile local grids (“Discoms”) alongside a financial framework which incentivises CO2-free social and economic development of villages.*

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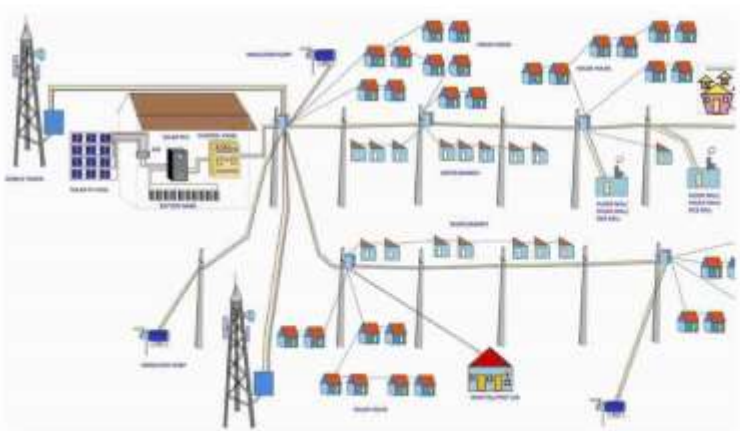
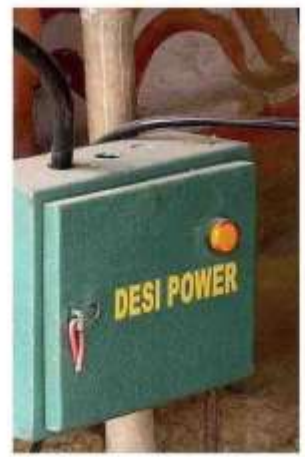
DESI Power Power Plants and Micro Grids: Hybrid, Biomass and Solar PV.





DESI Power Chakai: Hybrid Microgrid for Productive Use Application







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DESI Power Chakai: Base Load for Gasifier-Engine and PV to Supply Clean Cooking Fuel

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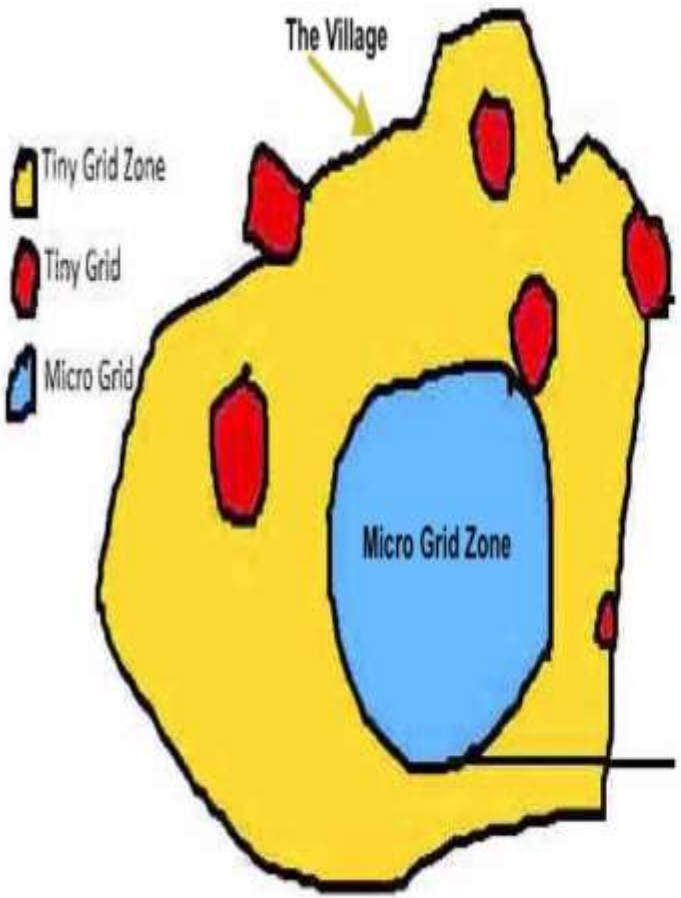
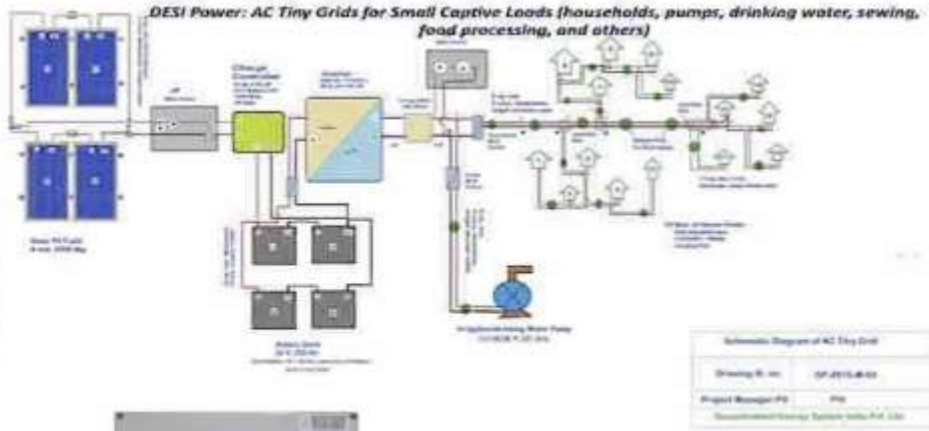
DESI Power: AC and DC Tiny Grids for Small Captive Loads





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Tiny Grid: irrigation water, lighting and mobile charging

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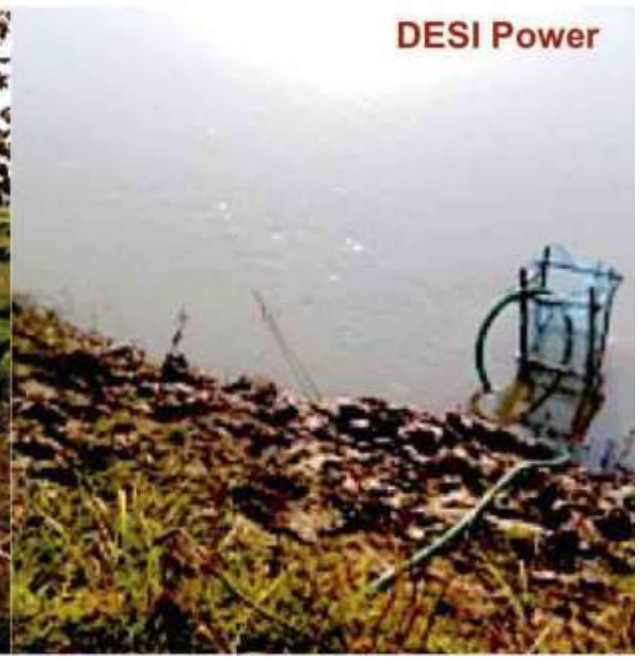
Tiny Grid: mobile pumping for irrigation water



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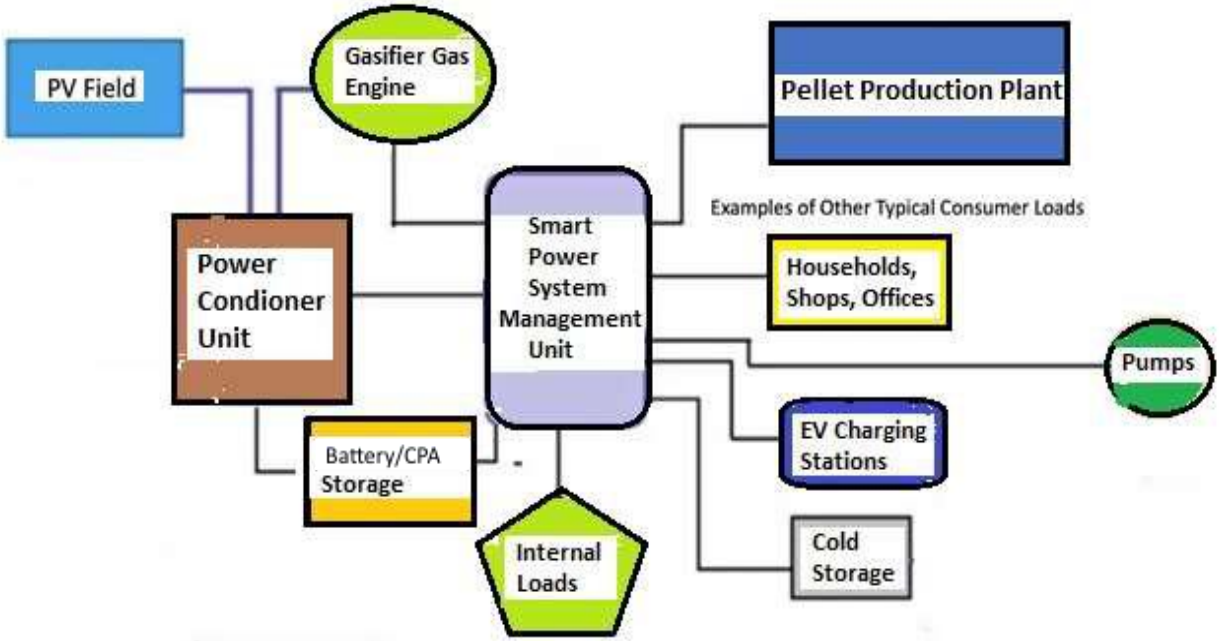
Biomass generation, procurement, processing and management

Biomass management: energy plants, plantations and agro-residues

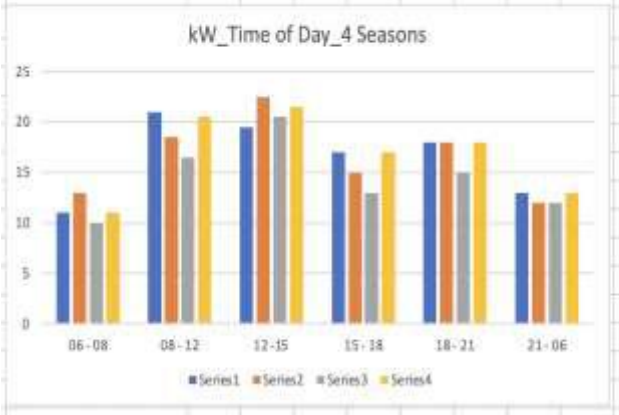
Microgrids: Optimisation for Achieving Economic, Social and Climate-Change Goals

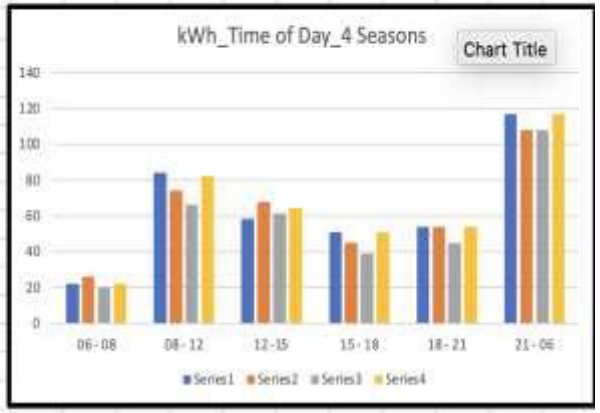
Example of a PV-Biomass Hybrid Microgrid in Bihar: Typical Plant Configuration and Loads.



Time of Day	06 - 08	08 - 12	12 - 15	15 - 18	18 - 21	21 - 06	Season
	06 - 08	08 - 12	12 - 15	15 - 18	18 - 21	21 - 06	
kW	11	21	19.5	17	18	13	Winter
	13	18.5	22.5	15	18	12	Summer
	10	16.5	20.5	13	15	12	Rains
	11	20.5	21.5	17	18	13	Autumn

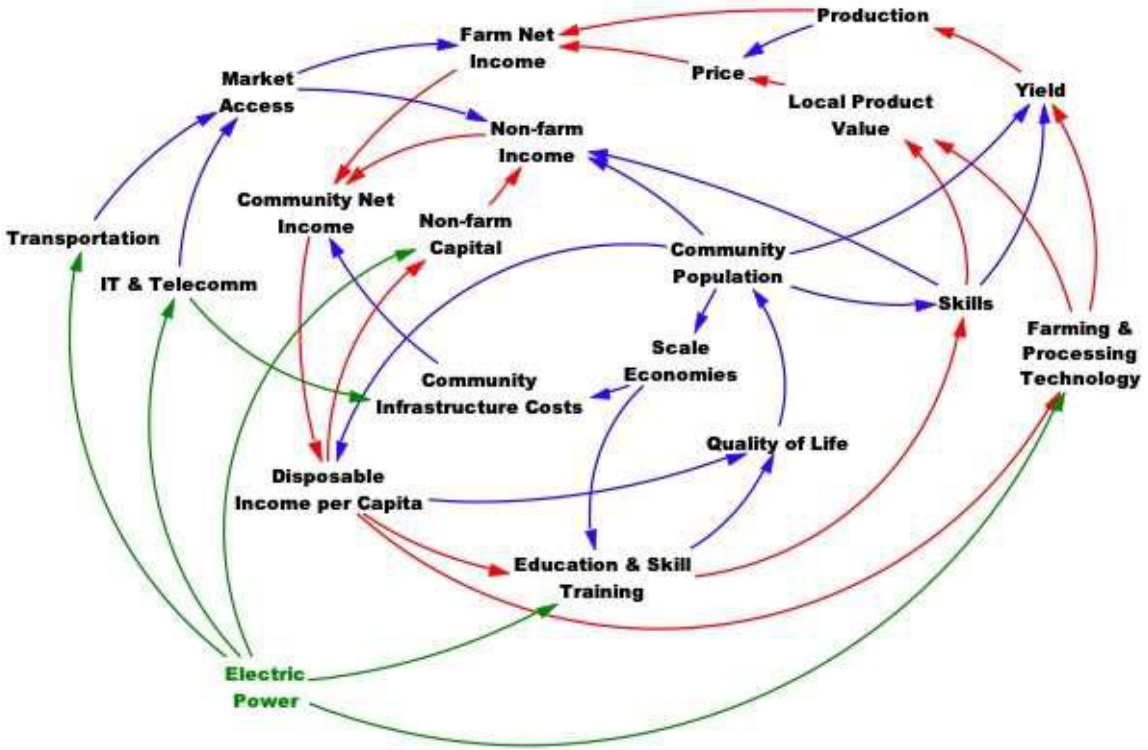
Time of Day	06 - 08	08 - 12	12 - 15	15 - 18	18 - 21	21 - 06	Total kWh	Avg. kW
	06 - 08	08 - 12	12 - 15	15 - 18	18 - 21	21 - 06		
kWh	22	84	58.5	51	54	117	386.5	16.1
	26	74	67.5	45	54	108	374.5	15.6
	20	66	61.5	39	45	108	339.5	14.1
	22	82	64.5	51	54	117	390.5	16.3

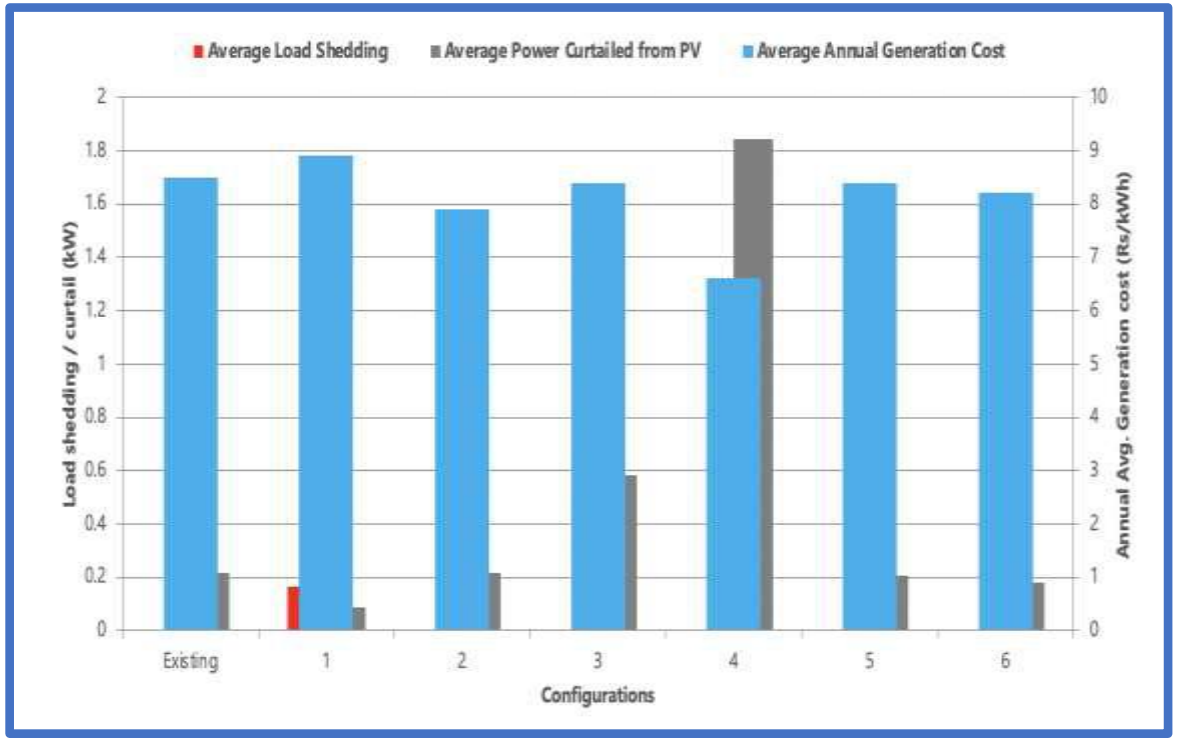




Microgrids: Optimisation for Achieving Economic, Social and Climate-Change Goals

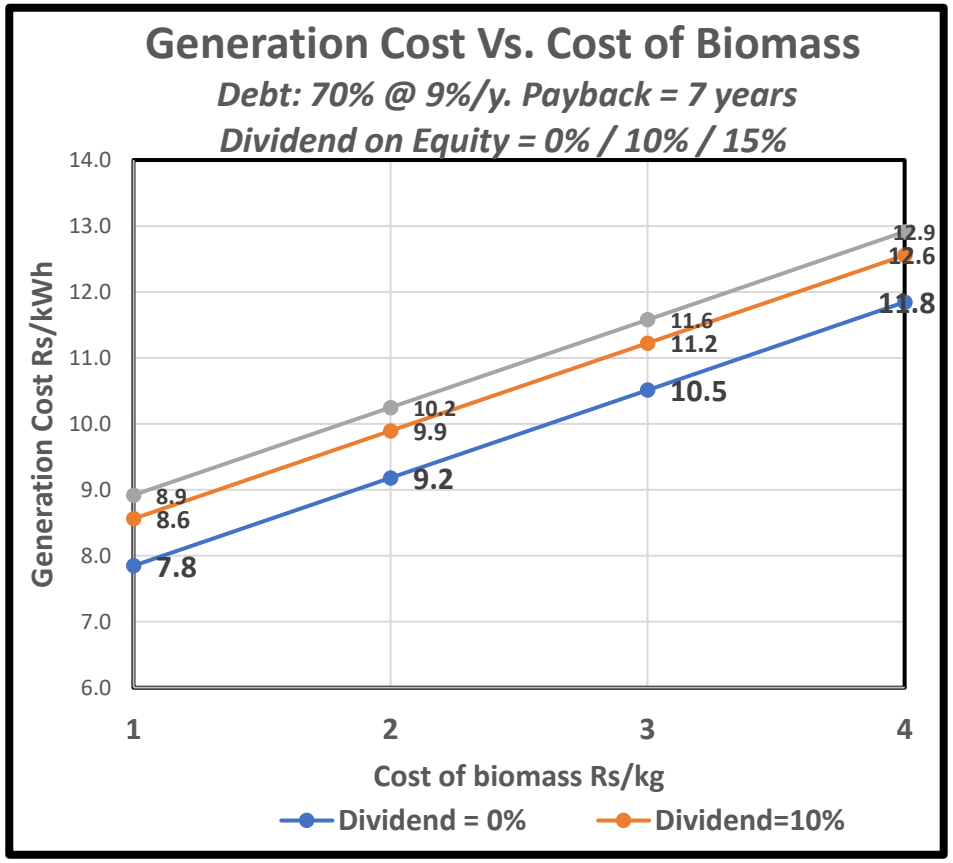
Example of a PV-Biomass Hybrid Microgrid in Bihar: Dynamic Modelling for Specified Loads and Plant Configurations.

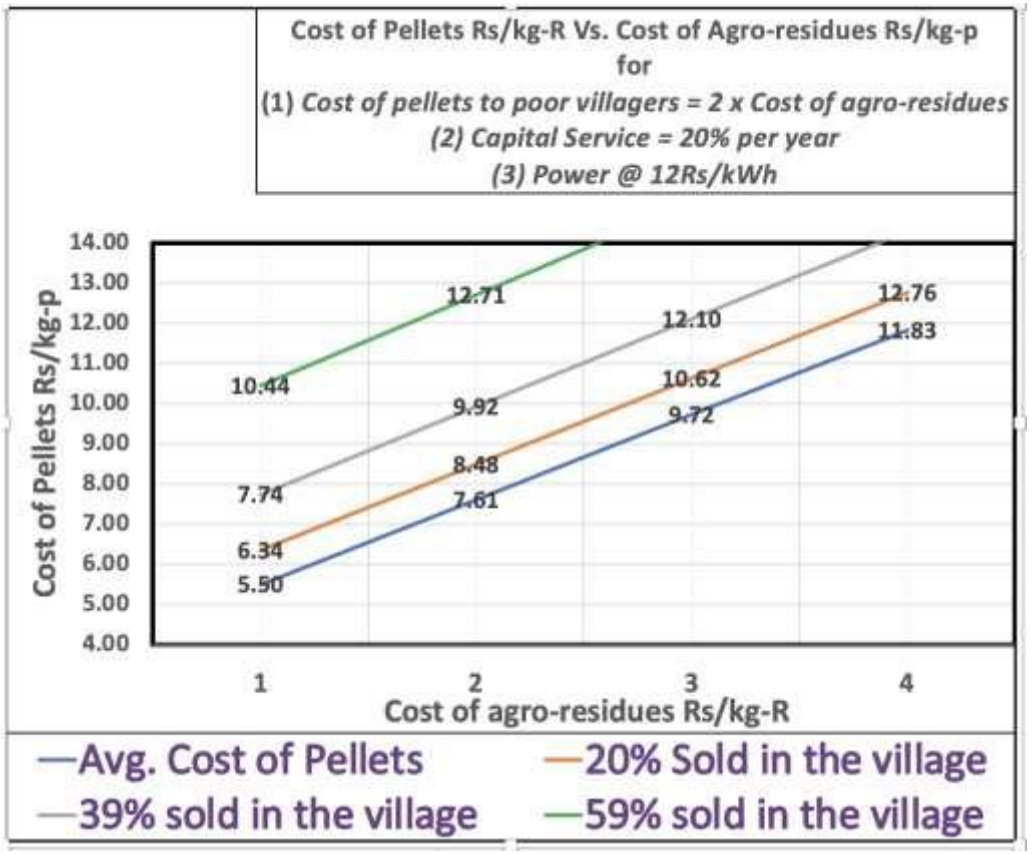




Microgrids: Optimisation for Achieving Economic, Social and Climate Change goals

Example of a PV-Biomass Hybrid Microgrid in Bihar: Costs of Generation and Pellets for the Optimum Plant Configuration.





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DPF: Madhumakhhi Farming Project
A Direct Intervention in Farming for Increased Farm Income without Chemical Fertilisers and Fossil Fuels

Food and Forest Revolution (KrishiKranti21) is the "Green Revolution" of 21st Century.

Goal: to feed the people on this planet healthily without chemical fertilisers and fossil fuels.

They make "*KrishiKranti21*" work:

- Farmers and farm workers
- Soil and soil organisms
- Worms, bees and insects
- Trees and plants
- Animals
- Sunshine and water
- Local sources of renewable energy.

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DPF: Madhumakhhi Farming Project

A Direct Intervention in Farming for Increased Farm Income without Chemical Fertilisers and Fossil Fuels

What do we expect the Madhumakkhi Project to deliver in 3 to 5 years?

Milestones:

- End of Year 1:
  - Switch to 100% organic farming.
  - 15 poor farmers (women and men) organised into a team with a manager and a trained accounts assistant.
  - 50 Amrit Mitti beds established and first vegetables sown.
  - 3000 fruit, timber and medicinal trees planted.
  - System of row planting with around 20-30 species of plants in each field understood.
  - Achieved: Harvest 10% of the target income of the farmers from MF.
- End of Year 2:
  - 500 Amrit Mitti beds established.
  - 6000 fruit and timber trees planted.
  - 20-30 species of plants in each field established.
  - Marketing links explored in India and abroad.
  - Target: Harvests are 30% of the target income of the farmers from MF.
- End of Year 3:
  - Some marketing links established.
  - Target: Harvests 50% of the target income of the farmers from MF.

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DPF: Madhumakhhi Farming Project
A Direct Intervention in Farming for Increased Farm Income without Chemical Fertilisers and Fossil Fuels

Challenges:

- Our soil is degraded: loss of natural nutrients and micro-organisms.
- Livelihood and wellbeing of farming communities in the Global South at grave risk:
  - Costs and access to CO2-free chemical fertilisers a severe problem.
  - Availability and costs of water and energy additional burden.

Tasks:

- Rebuild the quality of farming lands.
- Recreate the biological efficiency of a natural forest.
- Mix trees, food, fruit and vegetables to maximise yields and income.
- Produce fertiliser in the field with local biomass and other local bio-fertilisers.
- Use renewable energy for power, water and processing.

Establish a regenerative farming system without any fossil fuel.

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DPF: Madhumakhhi Farming Project

A Direct Intervention in Farming for Increased Farm Income without Chemical Fertilisers and Fossil Fuels

Started in 2021





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DPF: Madhumakhhi Farming Project

A Direct Intervention in Farming for Increased Farm Income without Chemical Fertilisers and Fossil Fuels

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DESI Power Foundation in Baharbari: Tiny Grid, Biogas, Clean Cooking, Guest House, DESI Gaon Safai Centre








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DPF: Kisanon Ki Bari

Organic Fertiliser, Mobile Pumps, Vegetables, Medicinal Plants, Spices, Fruit & Energy Plantations, Mushroom.

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DESI Power Foundation: DESI MANTRA

(www.despower.com)

- Trust Founded in 2006.
- The first course of DESI MANTRA Training Centre: 2006
- Training and skills development of villager. Focus on enabling villagers to participate fully in planning and implementing projects and on O&M and managing them. Women involved both as teachers and trainees.
- Coverage extended to irrigation and processing of farm products.
- Managing the Safai Centre

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People

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DESI MNATRA Training Centre, Araria: in the classroom, in the field and on the job.

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DESI MANTRA Training Centre: Capacity Building and Empowerment

Class Room Training:

DESI_MANTRA trained women working with DESI Power

Village Plant Manager at work

On site technical training of trainees at Gaiyari site

On job training at site

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DESI MNATRA Training Centre, Araria: Focusing on School Children and Villagers.