

# Productions Hubs for Agriculture

Promoted by Sustain Plus and CInI  
Enabling Enhanced Income, Nutritional  
Security and Climate Adaptation.

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## Introduction

The farm sector in India engages ~44% of India's workforce but contributes only 13% to its GDP<sup>1</sup> indicating low levels of earning compared to other sectors. At the same time, ~85% of all farmers in India are small or marginal.<sup>2</sup>

Further, within the sector, there is a significant disparity as small and marginal farmers and tribal communities in remote regions do not have the same level of access to suitable technological solutions (such as solar irrigation pumps) or the finance as compared to larger farmers. As they continue to use outdated agricultural practices and techniques, they remain trapped in a perpetual cycle of poverty. Climate change is likely to make things worse and thus adaptation measures are an urgent necessity.

While there are many issues, access to water, specifically access to reliable, efficient, and affordable irrigation is one of the most significant gaps in agriculture in many remote and aspirational areas. However, there are additional challenges including high reliance on diesel, high amount of crop loss, poor crop soil health, high amount of drudgery, lack of safety, lack of precision farming and lack of financial/market linkages.

Thus, **increasing farmers' income** by improving productivity of agriculture and livestock and reducing crop mortality can be done via the following:

- **Optimising production costs** by decreasing reliance on expensive inputs (e.g., diesel)
- **Reducing drudgery** by automating or mechanising typically laborious tasks
- **Improving farmers' quality of life** (e.g., nutrition, saved time, reduced drudgery)
- **Ensuring serviceability and ongoing support** (e.g., maintenance, repairs) for communities

As has been the experience of *Sustain Plus Energy Foundation (SPEF)* (set up by *CInI*, *Social Alpha* and *Selco Foundation*, has been focusing on scaling proven renewable energy technologies for meeting the aspirations of small holder farmers) a systematic '**production hub**' approach focused on all enabling stakeholders to address many of these issues can catalyse farm livelihoods significantly. In this document we will also outline that the interventions help the stakeholders in adapting to the changes in climate.

A production hub may be defined as a contiguous cluster of villages where actors in and around it enable an ecosystem for continuity of farm production (agriculture and livestock) and associated marketing.

A production hub can be catered to by a combination of processes to ensure production of high value crops and market access for farmers of crops and livestock.

A production hub typically includes:

■ **At least 100-150 small farmers with an aggregate of 25+ acres of crop command**

■ **A support system (mostly irrigation) which supports year-round farming (June to March)**

■ **A minimum of eight to ten metric tons of weekly production to increase farmer and trader interface to be 100 to 120 days of the year at the farm gate. The idea is to enable a minimum critical production volume that encourages/attracts traders to procure from the hub.**

The congregation of about 100 to 150 small farmers is usually necessary to gain the needed critical mass, especially to establish market linkages.

Based on *SPEF's* learning from Odisha and Jharkhand, for high value agriculture (HVA)<sup>3</sup>- a hub can typically expect to achieve an average yield of 6,000kg/acre per season and an average income of INR 39,000 per household per season. Thus, in the three seasons, the annual income is more than lakh Indian rupees from a land of size less than half an acre.

As access to energy remains a key inhibitor for irrigation even where water resources are available, applications like solar irrigation systems can offer multiple benefits for farmer livelihoods.

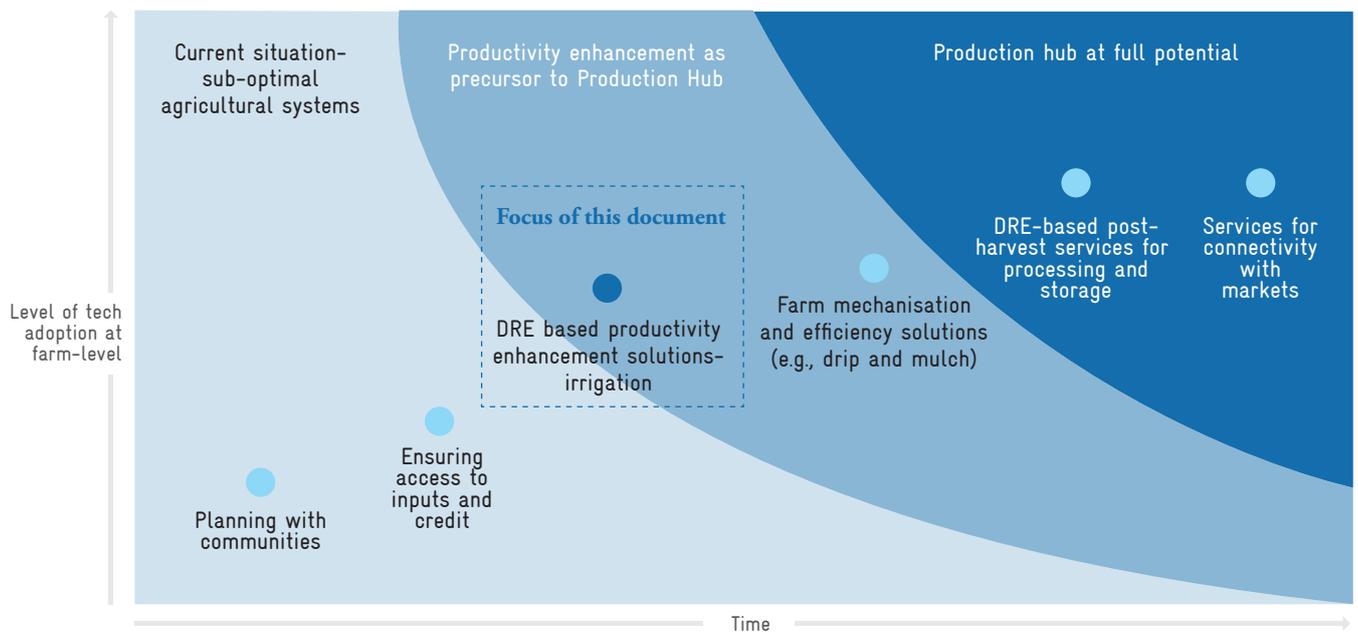
<sup>1</sup>Centre for Policy Research, Employment U-turn: Rural India is India's main employer; Down to Earth, Future of Indian Agriculture and Small Farmers: Role of policy, regulation and farmer agency

<sup>2</sup>Landholdings less than a size of two hectares (~five acres)

<sup>3</sup>High Value Agriculture includes crops (such as fruits and vegetables) that can yield produce worth a revenue of INR 1,500 per decimal (100 decimal= one acre)

When implemented effectively, irrigation solutions provide significant benefits to farmers, including increased farmer income owing to increased crop yield, additional cropping seasons and lower susceptibility to erratic rainfall. With the increase in production and associated efficiencies, demand and readiness for other components of the production hub, i.e drip and mulch, polyhouse nursery, cold storage, respectively increases. This helps

realise the potential of a full-scale production hub, contributing to further improvement in farmer incomes and quality of life. Through its work on solar irrigation systems, including helping communities adapt their cultivation practices sustainably, *SPEF* and its partners directly tackle the water-energy-agriculture nexus in these geographies.



## Increased investment in other applications typically running on distributed renewable energy

With increased experience, capital and trust from partners and stakeholders (e.g., financial institutions, government), farmers and communities are equipped to invest in other additional DRE solutions (e.g., drip and mulch, biogas, cold storage, automated grinders, roti (flat bread) making machines, that ultimately further strengthen the overall production hub.

- **Increased number of traders:** With the presence of higher crop yield and increased production, more traders come in to facilitate commerce between more buyers (end customers) and suppliers (farmers).
- **Increased entrepreneurial efforts:** With more advanced agriculture practices,

community members identify and develop ancillary services to support and promote the production hub (e.g., seed shop, farm equipment rentals, poly nursery), leading to increased local economic activity. *SPEF* has implemented over 3,500 production focused DRE technology solutions in the poorer and marginalised regions of India. It has implemented over 2,400 solar irrigation systems in remote and aspirational areas of geographies such as Andhra Pradesh, Assam, Gujarat, Jharkhand, Odisha, Maharashtra, Karnataka, Ladakh, Rajasthan, Uttarakhand, Uttar Pradesh and Madhya Pradesh.

**The process usually starts this way**

Utilising its existing founding networks, as well as other development actors, it co-designs the service model with communities, applying a rigorous business model perspective to ensure that the solution is viable, operable, and sustainable.

1. In partnership with the implementation partner and community, *SPEF* coordinates key implementation details to determine the scale and scope of the solution, end user affordability and ability to secure innovative financing, the network of stakeholders (e.g., vendors), as well as capacity building and training needs of community members.

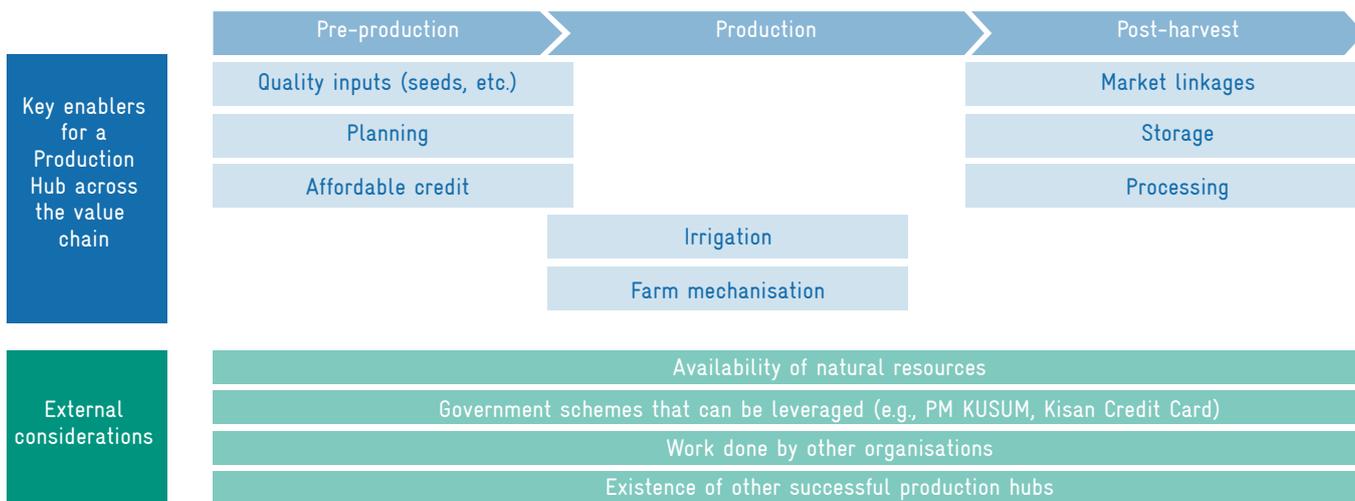
2. *SPEF* then supports the implementation of the solution at scale and develops benchmarks for evaluation and scalability.

3. In a cooperative effort, *SPEF* and the implementation partner regularly monitor progress, documenting outputs, outcomes and challenges to enhance and replicate learnings, processes and models in the future.

The process can be illustrated as below:



**A production hub value chain is made up of three primary stages:**



Activities enabled by *SPEF* straddle across the value chain. The pre-production stage of the value chain has led to improved irrigation and productivity enhancement. *SPEF* has implemented approximately 125 hydroponic systems and 120 polyhouse (greenhouse) sheds. In the production stage of the value chain for productivity enhancement, *SPEF* has implemented 123 livestock-related solutions and solar egg incubators. In the post-production stage of the value chain, it has implemented approximately 125 post-harvest solutions for processing (e.g., millets processing, rice huller, spice grinder, apricot/spices/herbs dryer, mustard oil extractor) and 43 solutions for packaging and storage (e.g., cold storage) in geographies across India.

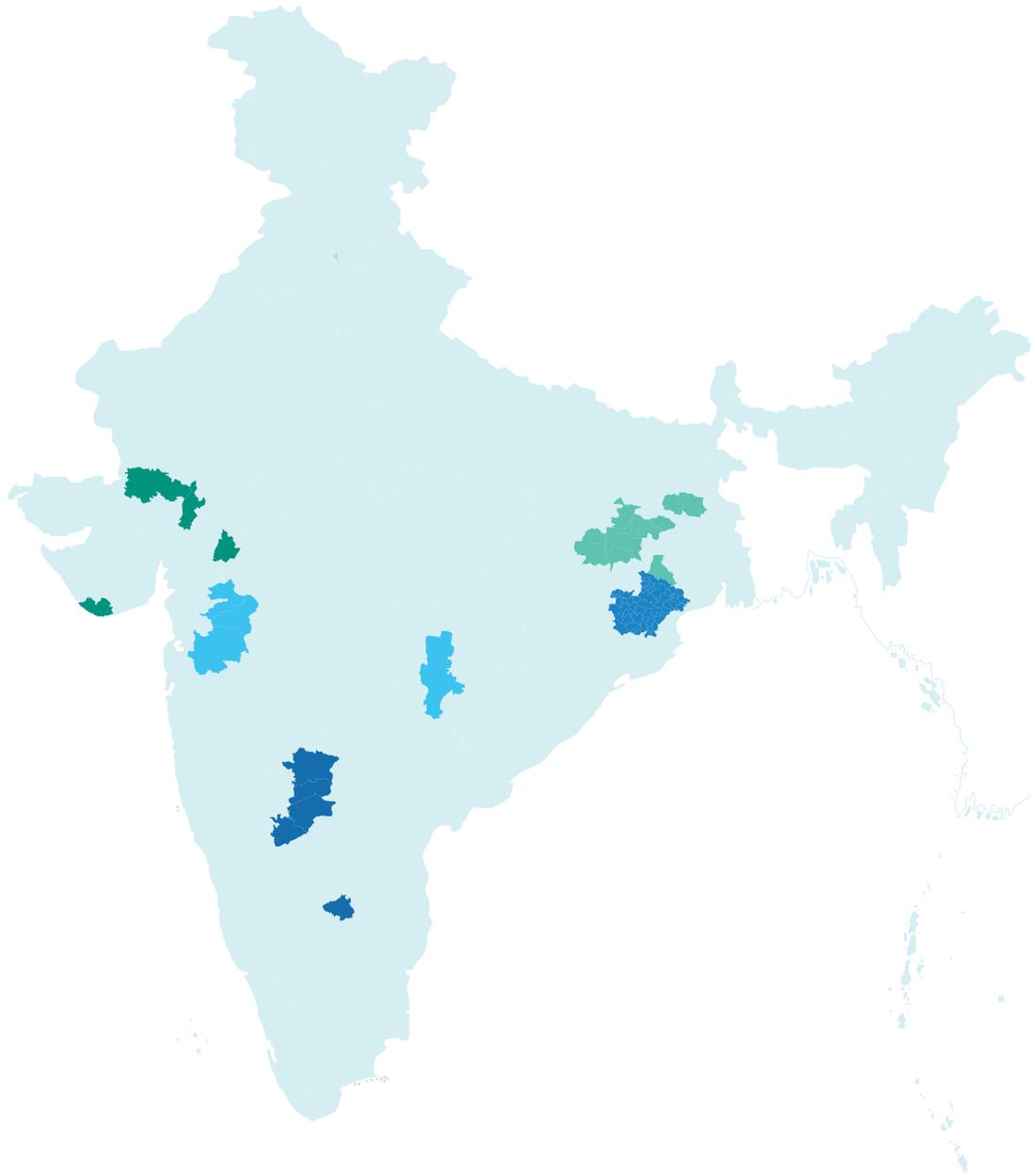
The *SPEF* programme of *CInI* is the runners up for the Ashden Awards 2022 in the awards stream of ‘Energising Agriculture’. The Ashden Awards which aim to accelerate climate innovations is two decades old. The potential awardees are found out via a rigorous global search. Winners and finalists enjoy grants, publicity, new connections, and endorsement from globally recognised

climate experts. After the award, the *Ashden Foundation* often works with the awardees to possibly scale up their impact and inspire others, in the process often helping businesses, charities, governments and others to increase their impact. As we can see, this is one of the most prestigious awards in the areas of Decentralised Renewable Energy, wherein *CInI* has been the only organisation from India in the finals. The Production Hub programme wherein the DRE integration has been done at a scale for improved agriculture and helping the small and marginal farmers meet their aspirations of becoming *Lakhpatis* (millionaire) has been the programme submitted for the award.

Under the Indo-German development cooperation project ‘Climate Adaptation and Finance in Rural India (CAFRI NABARD) commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ), the *Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH* and the *Sa-Dhan Association* are collaborating with *CInI* and *SPEF*, to enhance access to capital for the various production hubs to facilitate a scale-up.



**\*Production hubs in Gujarat, Maharashtra, Jharkhand, Odisha and areas of operation in Karnataka**



**Gujarat**

- Banaskantha
- Dahod
- Banswara
- Limkheda
- Sabarkantha

**Jharkhand**

- Bokaro
- Chandrapur
- Panchmahal
- Deoghar
- Dhanbad
- Dumka
- East Singhbhum
- Gumla
- Hazaribagh
- Khunti
- Lohardagga
- Ramgarh

**Maharashtra**

- Gadchiroli
- Nandurbar
- Nashik
- Dhule

**Odisha**

- Keonjhar
- Mayurbhanj

**Karnataka**

- Gulbarga
- Raichur
- Koppal
- Sidlagatta
- Bagepalli (KnK)
- Yadgir

\*States where sensitisation of FIs have been organised. There are plans to cover other geographies.

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