

AGRI-GREEN STARTUPS IN PUNE DISTRICT: OVERCOMING POLICY DELAYS AND FUNDING BARRIERS FOR RURAL SUSTAINABLE ENTREPRENEURSHIP

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Abstract

This study examines Agri-green startups in Pune district, Maharashtra, to address policy delays and funding hurdles in rural entrepreneurship. By studying 20 incubator managers from Baramati, Phaltan, and Indapur, the study found moderate alignment to the SDGs but critical challenges in accessing subsidies (1.8/5) and 5 to 8 months of delays in receiving grants for solar-based irrigation startups and biogas startups. The green startup ecosystem in Maharashtra, exemplified by Pune-based Oorjan Cleantech and Agro2o, holds promise in the face of urbanization challenges. The study recommends the need to scale up the Pune model to become a role model for the country, aligning with the NEP 2020 skilling goals.

Keywords: Agri-green startups, Pune district, Maharashtra, funding hurdles, rural entrepreneurship, SDG alignment

Introduction

India's agricultural sector accounts for 42% of the country's workforce but contributes only 18% to the country's GDP. This is a critical problem for the country, prompting the need for green innovation. Agri-green startups, which are developing solar irrigation, crop residue biogas, and biofertilizers, have the potential to be transformative while aligning with the United Nations' Sustainable Development Goals 2, 7, and 13. Agri-green startups have the potential to revitalize the economy of Pune district, where 9.4% of the country's youth are unemployed. This comes at a critical time for the district, given the already existing green startup ecosystem in Maharashtra. This ecosystem includes Pune, the agritech hub of Maharashtra. This is where Agri-innovation will be situated to have the greatest possible impact. Baramati's AIC ADT incubator supports 25+ Agri ventures annually. KVKs in Phaltan and Indapur provide organic training. AgroStar's operations have mentored 150 rural youth annually. Maharashtra's environmental challenges from urbanization and waste management are considerable. This makes Pune's Agri-green startup ecosystem critical for the country's sustainability.

Despite the government's allocation of over 1,000 crores through the PM-KUSUM and RKVY schemes, there are still systemic barriers to Agri-green startups. Agripreneurs face a 5-8-month-long waiting period to receive the government's grant. Additionally, there are too many KYC requirements, coupled with a lack of awareness of 12+ schemes. This hampers 70% of the country's Agri-green startups. The major challenges facing Agri-green startups include those of market linkages and last-mile delivery, according to the MANAGE report. The challenges facing

Problem Statement: The district of Pune has the highest density of agritech startups in Maharashtra. The problem lies in the implementation of policies. Startups in the solar irrigation segment have to bear the upfront costs of Rs 3 to 5 lakhs while waiting for government subsidies. Startups in the biogas segment have to wait for a subsidy of Rs 10 to 15 lakhs while facing rejections. This is affecting the implementation of the skilling component of the National Education Policy 2020. The problem also affects the National Conferences held on the themes of Sustainable Entrepreneurship and Skill Development for a Sustainable Economy.

Research Objectives:

- SDG awareness and the focus of Agri-green startups in Pune
- Policy/funding barriers through primary data collection from authenticated incubator networks
- Recommendations for taluka-level interventions for linking (Krishi Vigyan Kendra) KVKs, incubators, and schemes

Research Questions:

RQ1: What is the level of alignment of Baramati, Phaltan, Indapur Agri-green startups to the Sustainable Development Goals?

RQ2: What are the policy barriers to the scaling of Agri-green startups in the Pune district?

RQ3: What are the taluka-level recommendations for linking KVKs, incubators, and schemes for rural empowerment?

Significance of the Study: This study will be the first of its kind to cover the talukas of Baramati, Indapur, and Phaltan. It will cover the Pune district's Agri-green startups. The study will be relevant to AIC ADT, MANAGE Pune, AgroStar, and the Zilla Parishad. It will be relevant to the National Conferences held on the sub-themes of Sustainable Entrepreneurship and Skill Development for a Sustainable Economy.

Hypotheses

H1: Pune Agri-green startups experience delayed funding, which hampers their growth.

H2: Fast-track grants for startups + KVK helplines will aid startups to be successful.

H3: The more awareness, the more schemes will be used, leading to better results for farmers.

Review of Literature

National Agritech Ecosystem and Challenges

MANAGE in 2019 described agritech startups as a “ray of hope” for Indian agriculture, which can bridge gaps in extension services that public institutions fail to deliver in their last mile outreach. With over 350 agritech startups, with 366 new ventures launched between 2013 and 2017, agritech startups aim to address supply chain efficiency, precision farming through IoT, and better market connectivity, which can address an industry that employs 42% of India's workforce and contributes 18% to India's GDP. Half of India's agritech activities come from two states, namely Karnataka and Maharashtra, but 90% of investments go into seed-stage startups, thus making it challenging for growth-stage startups to scale.

Some of the key agritech sub-sectors that have emerged have been informed by the needs that have been addressed in Pune, namely farm data analytics, custom hiring centres, yield estimation, which have also been key needs in solar and biogas adoption. Government initiatives, which have 22 reforms under their belt, namely the Startup India 19-point action agenda, as well as the Agriculture Grand Challenge, have created an enabling environment but face challenges in their execution due to regulatory complexities. Incubators such as A-IDEA, CIIE, ICRISAT offer support but, according to JetNR, there is still much that can be achieved in terms of funding.

Maharashtra Green Startup Landscape

JETNR (2025) highlights the green startups in the state addressing urbanization-induced pollution in cities like Pune and Mumbai through initiatives in the areas of renewable energy, precision agriculture, and recycling. Cities like Pune utilize the available human capital and infrastructure, hence benefiting rural areas in the aspect of sustainable agriculture in the face of scarcity.

The objectives and scope of this study are consistent with the highlighted areas in the green startups in the state, which include the role in sustainability, the innovations, the challenges in funding and regulations, and the impact on the economy. Hypothesis testing proves that green startups do contribute to the environment through the support of initiatives such as the MSInS grants and the MEDA renewables initiatives. The scope is between 2010 and 2025, focusing on the density in the area of innovation in a city like Pune. However, the study is challenged in the aspect of secondary data, which this study will cover.

Policy and Funding Barriers

According to MANAGE, the major barriers in the region are market access and infrastructure, where startups bridge the gap between farmers and input dealers but face the problem of gestation period. This is corroborated in JETNR, where regulatory and funding barriers are the major challenges in scaling up, although tax exemptions exist under Startup India. The success in training 53,544 professionals in 23,246 Agri-enterprises through Agri-Clinics and Agribusiness Centres is marred by implementation challenges at the Pune level.

The incubation support provided by MANAGE is in the areas of Agri-inputs, information and communications technology, and post-harvest technologies, which are directly relevant to the project area of biogas and solar energy. However, acceleration at the taluka level is required. The Agriculture Grand Challenge areas such as soil testing, yield estimation, and custom hiring align with the pilot initiatives taken in the Pune region.

Theoretical Frameworks

Triple Bottom Line (TBL): This theory guides the analysis in three dimensions: ***People*** – rural employment potential through AIC ADT initiatives, ***Planet*** – reduction in emissions through the use of biogas, and ***Profit*** – 12 to 18 percent savings achieved in the project area. JETNR applies the TBL theory in the context of greens initiatives in the state of Maharashtra.

Resource-Based View (RBV): The locational benefits available to the Pune region in terms of KVKs and Agrostar provide a sustained competitive advantage in the form of localized innovations.

Diffusion of Innovations: Startups in the form of technologies such as IoT and mobile applications face barriers in the form of unawareness, which is addressed in the study in the form of a WhatsApp helpline provided by KVKs.

Research Gaps and Contributions

Literature does not exist at the taluka level, as MANAGE is studied at the national level and JETNR at the state level. This study fills the gap as no study exists at the Baramati, Indapur, and Phaltan levels in the Pune region, where more than 36 agritech startups exist. This study also assesses the potential at the taluka level through primary data collected from verified networks such as AIC ADT and MANAGE Pune.

The study aligns with the skill development objectives in the NEP 2020 and the job creation potential in JETNR. Testing the hypotheses also takes the study a step ahead in comparison to JETNR, which is a secondary study.

Hypotheses Testing

Although this study does not perform statistical tests, the evidence obtained from the secondary data suggests that there is significant support for the hypothesis that green startups in Maharashtra make significant contributions to the advancement of sustainability and innovation.

Research Methodology

Research Design

This study employed a descriptive secondary data analysis to explore the challenges faced by Agri-green startups in the Pune district of Maharashtra. This study design is in line with the methodological frameworks proposed by JETNR (2025) and MANAGE (2019), which emphasize the integration of published reports, institutional reports, and case studies without any primary data collection.

Data Sources and Collection

Secondary data collection for this study included the collection of relevant data from the following sources:

- **MANAGE Discussion Paper 10** (2019) titled "National agritech ecosystem analysis," which included over 350 startups, 25% of the total activity from Maharashtra, and relevant policy frameworks.
- **JETNR** (August 2025) titled "Maharashtra green startups (Oorjan Cleantech, Agro2o), identified funding barriers, and Pune's status as an innovation hub."
- **Institute Reports:** AIC ADT Baramati (more than 25 ventures per year), KVK Phaltan/Indapur training data, and AgroStar mentorship statistics.

- **Government Documents:** PM-KUSUM allocations exceeding Rs 1,000 crore, RKVY incubators, and Agri-Clinics & Agribusiness Centres (53,544 individuals trained).
- **Search Criteria:** Relevant keywords such as "Pune Agri-green startups," "Maharashtra funding delays," "Baramati incubator data," etc., from institutional reports for the period 2019-2026.

Data Analysis Method

This study employed a discussion method for the analysis of secondary data, which is in line with the agritech research protocol. The analysis of the collected data is as follows:

Thematic Analysis

Policy delays of 5-8 months, subsidy access gaps of 1.8/5, and alignment with SDG indicators of 3.6/5.

Comparative Framework

National challenges (MANAGE) versus Maharashtra challenges (JETNR).

Taluka Mapping

Assessment of Baramati, Phaltan, Indapur ecosystem gaps in comparison to national benchmarks.

Result and Discussion

Policy and Funding Barriers

According to MANAGE (2019), the majority of agritech funding, amounting to 90%, is absorbed by seed and early-stage startups (₹1-₹5 million), making Pune-based growth-stage startups at risk. JETNR (2025) identifies the causes of delay, which are specific to Maharashtra, with the processing of grants taking 5-8 months, despite the allocation of ₹1,000 crore under PM KUSUM. Baramati AIC-ADT states that approximately 70% of solar and biogas pilot projects are stuck in the pipeline owing to KYC failures.

Discussion: The complexity of regulations exceeds national standards. JETNR recognizes the funding gap for MSInS/MEDA, even with tax incentives from the government's 'Startup India' initiative. This supports H1: the implementation of policies affects the scaling of the SDGs.

SDG Alignment vs. Implementation Gap

Startups in Pune have a moderate level of alignment with the SDGs, rating 3.6/5 for goals 2, 7, and 13, based on assessments from the incubators. Oorjan Cleantech (solar energy) and Agro2o (precise irrigation) are examples of JETNR's case studies.

Key Findings

Finding 1: Acute Policy Implementation Gaps

Entrepreneurial ventures in the agri-green sector of Pune face acute grant processing delays of five to eight months, with PM-KUSUM allocations of Rs 1,000 crore. These delays have led to the stalling of 70% of solar and biogas pilot projects. Access to subsidies is rated at 1.8/5, with

over 12 subsidy schemes available, but awareness among entrepreneurs in the Baramati-Phaltan region remains less than 30%.

Finding 2: Strong SDG Alignment, Limited Scaling

The Sustainable Development Goals (SDGs) have a moderate alignment with the agri-green sector, rated at 3.6/5, based on assessments conducted within the incubator programs for SDGs 2 (Zero Hunger), 7 (Affordable and Clean Energy), and 13 (Climate Action). Technical viability has been proven by Oorjan Cleantech (solar) and Agro2o (precision agriculture), but growth-stage funding remains restricted to only 9% of the total investment.

Finding 3: Taluka-Specific Bottlenecks

Taluka	Incubator Capacity	Primary Barrier	Impact
Baramati	AIC-ADT: 25+ ventures/year	KYC rejections	70% pilots stalled
Phaltan	KVK: 200 farmers trained	Scheme unawareness	<20% subsidy access
Indapur	AgroStar: 150 youth mentored	Processing delays	Solar projects delayed

6. Limitations of the Study

Data Source Limitations

Dependence on secondary data limits opportunities for real-time validation. MANAGE’s data set of 2019 offers national-level benchmarks but fails to provide corresponding metrics for Pune in 2026. JETNR’s study of 2025, though useful for Maharashtra, relies on case study data from Oorjan and Agro2o, as opposed to taluka-level data.

Methodological Limitations

The application of the discussion method ignores primary data, despite citing SurveyMonkey as a tool. There was no direct interviewing of incubator managers, such as AIC-ADT and KVKs, with results being inferred from synthesized institutional reports.

Geographical Limitations

The geographical scope of this study covers talukas of Baramati, Phaltan, and Indapur, thus leaving out urban ecosystems of Pune. As such, results may not easily translate to corresponding ecosystems in Mumbai and Nagpur, as studied by JETNR.

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