



# IMPACT ON SMART FARM DEMONSTRATION PROJECT

Introducing 'Smart farming Solution Model' in Rural Odisha through  
Promoting Greenhouse Farming and Chill Chain Managemrnt among  
Marginal Small Farmers



STORY  
FROM THE  
GROUND

Supported by:  
**Brunel Uniiversity,  
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# Transformative Success in Greenhouse Farming and Chill Chain Management: The Farmer's Journey

## STORY I: Cultivating Success through Greenhouse Farming: Suhasini Pradhan's Journey



Suhasini Pradhan, a forward-thinking farmer aged 43, hails from the rural village of Janisahi under Daspalla block in the agri-heart of Odisha's Nayagarh district. Alongside her husband, Dharanidhar Pradhan, an agri-entrepreneur, her son, Suchitananda Pradhan, and her respected father-in-law, Damodar Pradhan, Suhasini's family is

deeply rooted in the agricultural heritage of their region.

Suhasini's journey began as a diligent cultivator of pulses, specializing in green gram, while also tending to a flourishing half-acre vegetable patch. Despite her unwavering dedication, she grappled with the challenges of conventional farming methods. The scarcity of water resources cast a looming shadow over her efforts, making irrigation a formidable obstacle. Drawing water from a nearby well became an arduous and financially draining task, exacerbated by the well's susceptibility to dry spells during scorching sun waves.

In her quest for prosperity, Suhasini invested nearly 4000 rupees, a substantial portion of which, 2500 rupees, was allocated solely for water facilities. An additional 700 rupees were dedicated to combatting pesky pests. Despite her grueling toil spanning approximately two months, her returns fluctuated between meager profits of 5% and disheartening losses ranging from 10% to 14%, predominantly due to water scarcity.

However, a glimmer of hope dawned upon Suhasini when she encountered the concept of greenhouse farming. A ray of enlightenment emerged through a community awareness initiative spearheaded by Jeevan Rekha Parishad, a grassroots NGO committed to the community's welfare. Through this program, Suhasini was introduced to the revolutionary realm of greenhouse farming and its multifaceted benefits. Embracing this innovation with open arms, Suhasini embarked on a transformative journey.

With unwavering support from the Jeevika Trust, UK, and invaluable guidance from JRP, Suhasini ventured into establishing her very own greenhouse on her farm. The maiden cycle saw her cultivating luscious cauliflowers, an endeavor that bore fruit in ways she had never envisioned before. The results were nothing short of astounding. Armed with a 3000 rupee investment, a mere 1200 rupees were directed towards irrigation, while another 500 rupees combated pests. The yields were remarkable – a diverse range of produce accompanied by



profits scaling an impressive 15% to 18% within a mere 45-day time frame. The prospect of losses, once an all-too-familiar shadow, had now been banished.

Since then, she has followed greenhouse farming as her ultimate measure of farming style. With less use of water and resources she is able to produce even more and better quality of vegetables providing sustainability and being surrounded by an enclosed arena, the presence of insects that previously harmed the crops has reduced and simultaneously the use of chemical insecticides has declined presenting them with a medium of organic farming.



Reflecting on this transformative journey, Suhasini expressed her profound gratitude, "The infusion of modern technology into my farming practices has been nothing short of a blessing. I've attained a level of production that previously seemed unattainable. My profit margins, once languishing around 5%, have soared to an impressive 18%, with losses now relegated to history. I owe my newfound success and enhanced quality of life to the unwavering support and guidance of JRP and Jeevika Trust. "The use of modern technology in farming has been a boon to my lives as currently, I am able to produce in such a big level which was beyond my imagination. My profit margins which earlier was somewhere around 5% has gone up to nearly 18% and I see no signal of loss, which used to be a stagnant part of my farming lives. I am grateful to JRP and Jeevika Trust that they helped and consistently guide me implementing greenhouse farming as I am now gifted with a new and enhanced quality of life."

## STORY 2: Harvesting Hope: The Greenhouse Smart Farming Revolution in Janisahi Village



Dibakar Sahoo, a resilient farmer hailing from Janisahi rural village in Dihagoan gram panchayat under Daspalla block of Nayagarh district of Odisha state, is transforming his life through innovative greenhouse cultivation. His family comprises six members, including his wife, his seven-year-old daughter and two-year-old son, and his father and mother.

Initially tending to an 660-square-foot plot where he cultivated vegetables like eggplants, leafy greens, beans etc. Dibakar faced challenges with high irrigation costs and pest-related crop losses. Approximately 8700 rupees were invested, with a significant portion allocated to

medicines and chemicals, resulting in break-even points or marginal profits ranging from 6% to 8%.

In a fortuitous turn of events during a community meeting organised by Jeevan Rekha Parishad (JRP), a grassroots NGO in his community, Dibakar learned about the potential benefits of greenhouse farming, a modern and efficient approach to organic agriculture. Also he gained insights into greenhouse farming and its advantages. With the support of Jeevika Trust, UK, and JRP's assistance, he successfully established a greenhouse on his farm, initially cultivating 3-5 varieties of leafy greens.

Within the first harvest, Dibakar witnessed remarkable success, growing a substantial amount of leafy greens with reduced investment and at an accelerated pace. Fast forward 3 months, and greenhouse farming has become the cornerstone of his agricultural practices.

Currently investing around 2400 rupees in cultivation, Dibakar allocates no more than 300 rupees for pesticides and fertilizers, and 300 rupees for irrigation over a 45-day period. The result? Profits ranging from 25% to 35%, and remarkably, he hasn't encountered any losses. Even under adverse weather conditions, his lowest profit margin remains at a commendable 6%.

Greenhouse farming has not only improved Dibakar's financial standing but has also allowed him to diversify his crop selection, cultivating a wide variety of vegetables. Embracing modern techniques and using fewer resources, he has elevated both the quality and quantity of his harvests. Moreover, the transition to greenhouse farming has enabled him to adopt organic practices, using minimal fertilizers and contributing to sustainability.

### **STORY 3: From Soil to Success: Ranjita Bhoi's Potato Farming Triumph Through Agri-Tech Integration**



In a remote rural village named Odasara in Daspalla, Odisha, Ranjita Bhoi, 38, faced the common challenges of marginal farmers in securing a stable income. Seeking support from Jeevika Trust, JRP, and Kheyti, she embarked on a journey to maximize her land's potential.

Despite initial doubts and challenges, Ranjita's determination paid off as she navigated the complexities of greenhouse farming with the support and guidance provided by Kheyti and JRP.

In 2024's first harvest cycle, Ranjita reaped the rewards of her hard work, harvesting 70 kilograms of high-quality potatoes. Through strategic networking facilitated by Jeevika Trust and JRP, she sold her produce at Rs. 20 per kilogram, yielding a total revenue of Rs. 1400.



What truly sets Ranjita's success apart is her savvy approach to post-harvest handling. By utilizing solar cold storage, she maximized the value of her produce, selling it at opportune moments for higher returns. Ultimately, Ranjita realized a net profit of Rs. 1000, marking a significant milestone in her journey toward economic empowerment.

Ranjita's story exemplifies the transformative impact of collaboration and resilience in rural communities in the face of climate change. With continued support and dedication, she is poised to expand her agricultural ventures, securing a brighter future for herself and her family while inspiring others along the way.

## **STORY 4: A Green Revolution: Ranjita's Journey to Sustainable Organic Farming**



Meet Ranjita Bhoi, a small scale farmer hailing from the rural village of Odasara, nestled within the Sariganda gram panchayat under the Nayagarh district in Odisha, India. A determined woman, she shoulders the responsibility of a family of five including her husband, a son, mother-in-law and father-in-law. Her husband, Sushanta Bhoi, once a laborer, has now become her farming partner.

Ranjita manages a plot of land spanning 800 square feet. Her farming journey primarily revolves around the cultivation of paddy followed by the cultivation of vegetables, with a special focus on eggplants. The presence of a nearby canal blesses her with access to water for irrigation, but the steep cost of pumping water casts a shadow over this convenience. The lush water-rich environment, though beneficial, also attracts a myriad of crop-damaging insects. This forces Ranjita to allocate a significant portion of her resources towards combating these pests using chemicals and medicines. Her annual investment in cultivation covers around 6,700 rupees. Shockingly, a whopping 4,500 rupees of this is drained by pest management measures, while another 1,000 rupees are spent on irrigation across a 60-day cycle. Despite her earnest efforts, she finds herself barely breaking even, with potential losses peaking at 35% and rare glimpses of profit struggling to surpass 7% to 9%.

The tide turned when Ranjita learned about Greenhouse farming during a community meeting. This innovative approach seemed to offer the promise of higher profits and sustainability. Her introduction to Jeevan Rekha Parishad (JRP), a grassroot NGO operating within her community, became a turning point. JRP, in collaboration with Jeevika Trust, UK, offered her the knowledge and support she needed to embark on greenhouse farming.

Eagerly embracing the new technique, Ranjita erected a greenhouse on her land and shifted her cultivation focus to cauliflower. The results were astonishing. For the first time in a long while, her efforts bore fruit swiftly and profitably. The controlled environment of the greenhouse facilitated a bountiful cauliflower yield with reduced investment and an accelerated growth rate.



Nearly 1.5 years into her greenhouse farming venture, Ranjita's investment strategy has undergone a transformation. She now allocates around 5,500 rupees for cultivation, a substantial drop from her previous expenditure. Pest control costs have dwindled to approximately 1,500 rupees, and just 500 rupees go towards irrigation for the same period. In this time span, her profits have surged, fluctuating between 15% and 25%. Remarkably, Ranjita has not encountered any significant losses; even her lowest profit margin, around 5%, was due to adverse weather conditions in her village.

Greenhouse farming has firmly taken root as Ranjita's primary agricultural pursuit. Embracing a diverse array of vegetables, she leverages modern methodologies to enhance both the quality and quantity of her yields. This shift has enabled her to cultivate organically with minimal fertilizer usage, promoting sustainability.

*In Ranjita's words, "For over a decade, despite my relentless efforts, farming barely sustained me. However, since I adopted greenhouse farming, my profits have seen an astounding transformation. What was once a 5% or 6% profit at best is now my lowest mark. The quality of my vegetables has also witnessed a remarkable improvement. My husband has joined me in this endeavor, and together, we've channeled our hard work into an efficient and rewarding venture."*



## STORY 5: Minatirani's Greenhouse Success Story

Minatirani Bhoi, a marginal and small farmer from the Odasara village in Daspalla block under Nayagarh district of Odisha, India, has seen a remarkable transformation in her farming journey with the adoption of greenhouse farming. Her family, including her husband Chitaranjani Bhoi, who is also a farmer and helps her in farming, two sons - Gyanaranjan Bhoi, a civil engineering diploma holder, and Dushmantha Bhoi, a student in the 2nd grade at a government school, and her father-in-law Nilakantha Bhoi, are proud of her achievements.



Having a small landholding of approximately 300 square feet, Minatirani used to cultivate paddy and then shift to growing vegetables after the harvest, depending on the season. The proximity of her land to a dam provided her with access to irrigation, but she faced challenges during the extreme heatwaves of summer, requiring her to frequently fetch water from the dam, leading to disputes among local communities.

Moreover, being close to a water source also attracted numerous insects and worms, leading to significant losses due to the expense of pesticides and insecticides to protect her crops. Despite investing around 5700 rupees in cultivation, with a substantial portion going into pest control and irrigation over 60-70 days, her profits ranged from just 10% to even losses of up to 40%, making her efforts barely profitable.

However, everything changed when Minatirani learned about greenhouse farming and its potential for promoting sustainable agriculture. She was introduced to Jeevan Rekha Parishad (JRP), a grass-root NGO, which provided her with detailed information about greenhouse farming and its potential benefits, including higher profits. With the support from Jeevika Trust, UK and JRP's assistance, she decided to build a greenhouse and began cultivating coriander leaves and Kosala leaves.

The results were astounding. The quality of her vegetables improved significantly, and the investment required was much lower compared to traditional farming methods. By spending only around 3000 rupees on cultivation, about 1000 rupees on pesticides and fertilizers, and 300 rupees on irrigation for a period of 45 days, she managed to generate profits ranging from 25% to 30%, with no losses encountered so far.

Encouraged by her success, Minatirani expanded her greenhouse cultivation to include various types of vegetables. The greenhouse's controlled environment required less water, and the net surrounding it significantly reduced the influx of insects, leading to reduced use of chemical products during cultivation. As a result, she not only achieved sustainability but also transitioned to organic farming practices. Currently, Minatirani and her husband produce a substantial amount of crops, with the burden of costs significantly lower than before, resulting in a higher profit margin. Reflecting on her journey, Minatirani expressed her satisfaction with the adoption of greenhouse farming and its positive impact on her life.



*"Over the last 5 years, I have been farming in open fields using traditional methods, working hard to improve the quality of my yield, but my profit levels remained limited to 15%-20%. However, since adopting greenhouse farming, I have witnessed a dramatic increase in my production. By utilizing nearly 25% fewer resources, I now generate double the profits in a shorter time while supporting organic farming. This modern technology has truly helped me achieve excellence and turn my dedication into fruitful outcomes." - Minatirani Bhoi*

## STORY 6: CHITARANJAN BHOI- GREENHOUSE CULTIVATOR



My name is Chitaranjan Bhoi. I am a small farmer from the Odasara community present in Daspalla Village. My family consists of four members, my wife- Minatirani Bhoi who is a house maker and sometimes helps me in farming; my two sons- Gyanaranjan Bhoi who completed his diploma in civil engineering, and Dusmanta Bhoi who is studying in the 2nd grade at the government school; and my father Nilakantha Bhoi.

I have a small land of roughly 300 square feet in which I generally cultivated paddy, and post its harvesting cultivated vegetables as per the season. Having the land nearby the dam eased me into the irrigation process. But due to the extreme heatwave brought in summer, I had to bring in water frequently from the dam, which was a big reason for dispute

among the localities. Additionally, being located near a water source, there is a huge insurgence of insects and worms nearby. So, a big chunk of money was always spent on pesticides and insecticides to keep the crops safe from them. However, a significant portion of crops would ultimately get affected. Upon investing a sum of 5700 rupees in the cultivation from which approximately 4000 rupees got invested only in medicines and around 400 rupees for irrigation facilities over a period of 60-70 days, the revenue made ranged till a profit of 10% to even losses made up to 40%. So, even after bearing a huge amount of expenses from every direction, I always ended up with a negligible profit and a lot of times even a loss.

I recently heard about Green House and how it may promote sustainable farming. I was referred to our community NGO-Jeevan Rekha Parishad, where I was thoroughly explained about greenhouse farming and how it can be a great tool to support farming and help in gaining more profit. With the assistance of JRP, I engaged in building a greenhouse and started cultivating in it. At first, I cultivated coriander leaves and Kosala sag. I was amazed by the results it brought in as the quality of vegetables was never this good and the investment made was very less in comparison to previous times. Furthermore, as my cost of cultivation was less, I earned higher profits. Upon my third cycle of cultivation, I invested roughly 3000 rupees in cultivation and not more than 1000 rupees got spent for pesticides and fertilizers, and 300 rupees in the irrigation medium for a time of 45 days and I generated revenue with profits ranging from 25% to 30% and haven't encountered any loss till now.

After that, I started to grow all types of vegetables in the greenhouse. It requires a limited amount of water, and being surrounded by a net the insurgence of insects decreased drastically, resulting in very less use of chemical commodities during cultivation. This not only helped in achieving sustainability but also promoted me in adopting organic farming. Currently, I am able to produce a good level of crops and the burden of cost is substantially low from earlier times following a higher profit margin.



***“Since the last 5 years I have been farming in open fields in the traditional method and haven’t been able to encourage my profit levels more than 15%-20% despite my sincere hard work and every try in engaging a better quality of yield, but after practising plantation under greenhouse methods, I’ve seen a drastic boom in my production. With use of nearly 25% less resources I’ve been able to generate double the amount of profit in lesser time period and support organic farming. Truly this modern technology has helped me gain excellence and channelize my dedication to a fruitful output”, said Bhoi.***

## **STRORY 7: Transformative Impact of Solar Cold Storage Management on Marginal Small Farmer's Success**

### **Background:**



Mr. Bipra Charan Biswal is a passionate and hardworking small farmer based in a rural village named Janisahi in Daspalla block of Odisha, with a focus on cultivating perishable crops such as fruits and vegetables. Despite his dedication, he faced significant challenges in preserving the quality of his produce and maximizing its market value due to the lack of proper storage facilities.

**Intervention:**

Recognizing the need for improved post-harvest management, on 2022, Jeevan Rekha Parishad with the financial support of Care Today Fund - An Initiative of India Today Group, initiated a project named Smart Farming Solutions aimed at providing marginal small farmers like Mr. Bipra Charan with access to modern cold storage facilities. With the support of our funding partner CareToday Fund, JRP established a community-based 5MT solar powered cold storage unit at Janisahi village, equipped with the latest technology to ensure the optimal preservation of agricultural produce.

**Implementation:**

Mr. Bipra Charan actively engaged in training sessions conducted by JRP, where he acquired insights into the best practices of cold storage management. These sessions comprehensively covered aspects such as temperature control, humidity regulation, and efficient storage techniques, all aimed at prolonging the shelf life of his produce. Following the training, he took the initiative to store 50 quintals of mangoes in the facility for one month, demonstrating effective management practices until favorable market rates were achieved.

**Results:**

The positive impact of implementing cold storage management on Mr. Bipra Charan's farm became evident without delay. The enhanced shelf life of his crops empowered him to strategically stagger his sales, ensuring he could secure better prices in the market. Additionally, the reduction in post-harvest losses resulted in increased profits for him and his family.

Benefiting from the first-phase chill-chain store, Mr. Bipra Charan successfully sold his 50 quintals mangoes at a three-fold price value, increasing his total revenue from the previous pricing of Rs.1,50,000/- to an impressive Rs.4,50,000/-. This remarkable improvement allowed him to generate an extra-profit of Rs.3,00,000/-, underscoring the tangible advantages brought about by the availability of chill-chain infrastructure.

**Impact:**

1. Higher Income: With the implementation of cold storage management, Mr. Bipra Charan experienced a significant increase in income by selling his produce at premium prices during off-seasons.
2. Market Access: The improved quality of his crops attracted the attention of larger markets, enabling him to establish connections with retailers and distributors beyond the local level.
3. Community Empowerment: The success of Mr. Bipra Charan became an inspiration for other 1200 marginal small farmers in the community, encouraging them to adopt modern farming practices and explore the benefits of cold storage.





### Conclusion:

This success story vividly demonstrates the transformative power of cold storage management in enhancing the livelihoods of 1200 marginal small farmers across 10 rural villages in Daspalla region. We believe that by continuing to implement such initiatives, we can contribute to the sustainable development of agriculture and empower more small farmers to achieve success in their endeavors.







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