



KHEYTI BACKGROUND

Agriculture in India has always been a key sector, contributing to nearly 18 percent of the GDP, and employing 41.49 percent of the country's workforce; farmers thus make up a very important segment in India. The National Statistics Office (India) notes that 100 Million farmers have extreme income variability and lose money from adverse factors such as rising temperatures, pest diseases, and weeds. According to experts, climate change has about a 4-9 percent impact on agriculture each year, which will ultimately translate to a 1.5 percent loss in GDP. 75 percent of farmers (Centre for the Study of Developing Societies survey) want to quit farming because of this variability. Considering small farmers grow 80 percent of food globally, this is now a part of a global food crisis.

GREENHOUSE-IN-A-BOX (GIB)

Recognizing the need to provide small and marginal farmers with

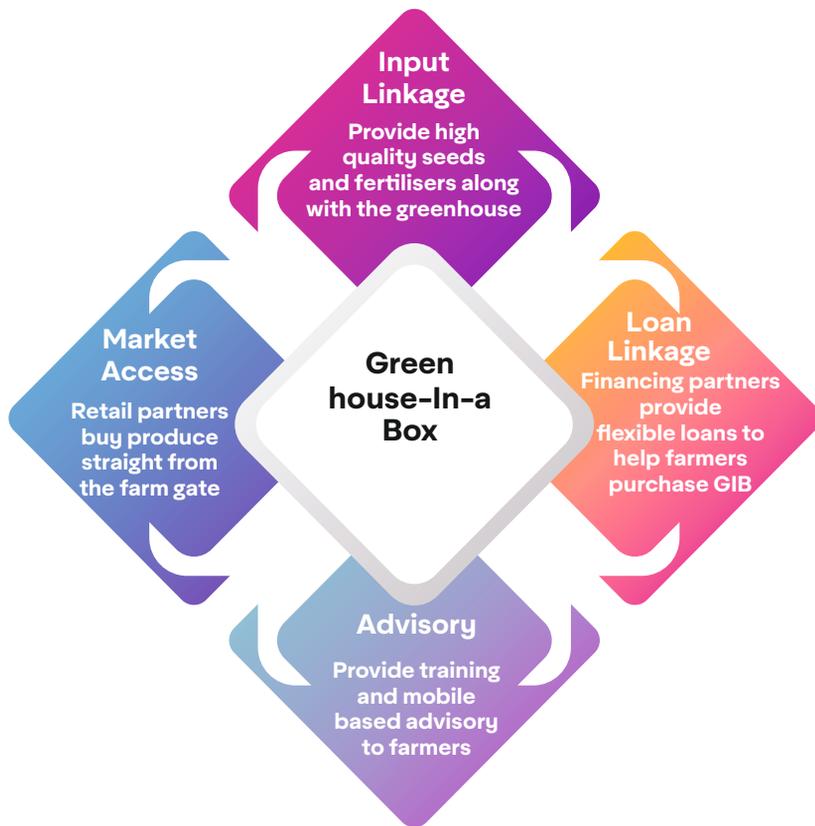


crop security, Kheyti came into being in 2015 with their innovation 'Greenhouse-In-a Box' (GIB). The aim of GIB was to ensure that small and marginal farmers do not lose out on their crop harvests due to external factors such as rise in temperature, diseases, and/or other climatic conditions.

Kheyti used the existing concept of a greenhouse, which till 2015-16 was used by larger farmers, given the high input cost, and transformed it into an innovation which could be used by marginal farmers. The GIB is a low-cost, modular Greenhouse which fits in approximately 2 percent of the farmers' land (the greenhouse fits within 1/10th of an acre). Along with the basic infrastructure of a greenhouse,

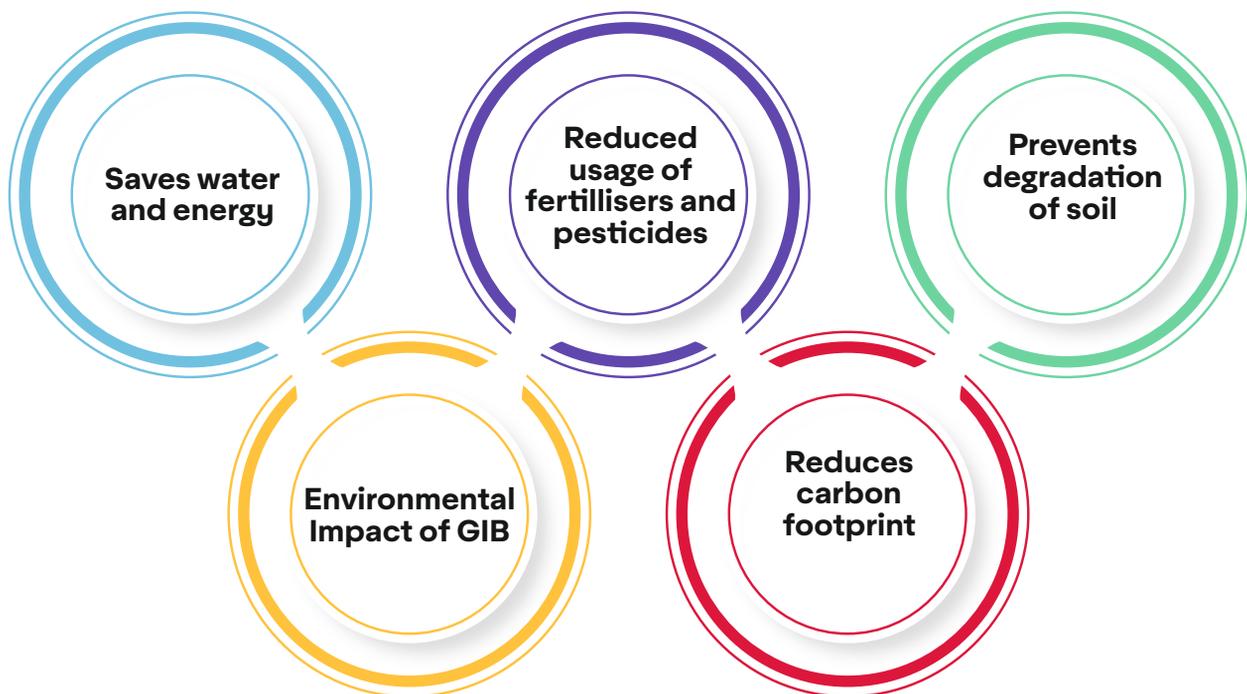
which consists of steel poles, steel cables and an insect net; the innovation is all-inclusive and provides the farmers with complementary services such as financial inputs, agricultural inputs, advisory and market linkages.





The aim of the GIB was to protect the crops of small and marginal farmers from environmental risks. Additionally, the greenhouse can produce three crop seasons in a year, using the same amount of water that a farmer uses to irrigate 2 acres of paddy field in a day. The greenhouse uses 90 percent less water, and farmers have reported a reduced usage of fertilizers and pesticides. Proper fertigation techniques are also in place for the GIB, which prevents pest diseases and the overuse of fertilizers. This has led to a number of changes which have benefitted the farmers and is also good for the environment.

Further, a bulk of the Carbon dioxide emissions come from the use of fertilizers in the field which also give rise to emissions of the potent GHG nitrous oxide (N₂O). By limiting the amount of fertilizer used, there is also a lesser amount of urea which comes into contact with water. Consequently the total amount of Carbon dioxide that is released in the air reduces with the use of a greenhouse. Kheyti is thus ensuring that the correct climate action is taken, and that farmers do not lose out to crop failure due to climatic changes.



Although any crop can be grown within the greenhouse, Kheyti has specifically chosen 7 crops which are to be grown, which include cucumber, eggplant, green bell pepper, tomato, beetroot, French beans, and cabbage. Additionally, some farmers also choose to grow potato, onion, and carrot.

Initially, Kheyti faced resistance from farmers as the greenhouse was an unknown concept to them. However, over time the organization has seen the emergence of farmers who have started approaching them for greenhouses program. These farmers have often watched their videos online and wish to reap the benefits of the greenhouse. Farmers who are eligible for the Greenhouse are known as 'Kheyti Eligible Farmers'.

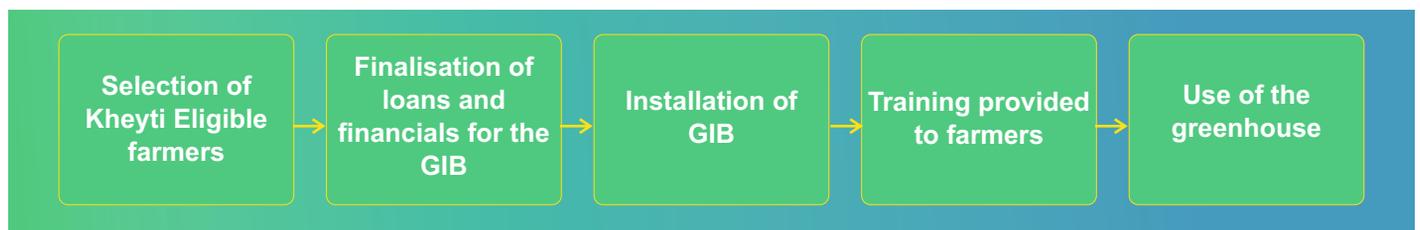
Eligibility Criteria:

There are a few criteria which need to be fulfilled by the farmer in order to be eligible to receive the benefits of the program.

- The farmer must be a small or marginal farmer i.e., they must own more than 5 acres of land.
- The farmer must have access to enough water to irrigate the crops i.e., 1000 liters a day.
- The farmer must possess a smart phone for online trainings and communication with Kheyti's call center for grievance redressal and support.
- The farmer should not have any other source of income. Further, the farmer or one family member is available at the farm at all times.

How it Works

Kheyti started off by identifying farmers who meet their criteria, and who believe that they will benefit from GIB. Once the finances and funding of the greenhouse is sorted, the installation of the GIB begins. Kheyti's innovation aims to provide farmers with not only the structure but also with trainings on how to use it and the benefits of it. Once the greenhouse has been installed, farmers undergo a series of trainings which are conducted on site as well as online. As part of the product, Kheyti also provides farmers with a 'season starter kit' which includes seeds, fertilizers, and pesticides specially designed for each crop and each season. Further, they also provide an insurance to farmers against loss of crops due to unforeseeable circumstances which is free for the first year, and costs Rs. 25 per month subsequently.



Reach And Impact

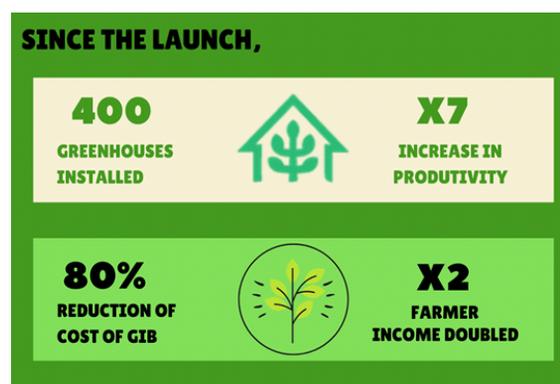
Kheyti was awarded MA funding in 2018, for a period of three years. The funding was categorized as Stage 1 which implied that Kheyti's innovation was going through trials in order to finalize the concept. Their goal was to provide 300 farmers access to the greenhouse to protect their incomes from climate risk.

Kheyti managed to reach their goal, and even went beyond it with the MA funding. On joining, they were on the fourth version of their greenhouse and with the grant they managed to conduct research and design to reach a seventh version of the greenhouse known as Greenhouse-lite. Since the beginning, Kheyti has managed to cut the cost of the greenhouse from their initial model by 80 percent to make it more affordable for the small farmers. The funding also helped Kheyti conduct crop trials and product viability. With the help of MA, they were able to expand their reach by nearly 8 times.

The GIB is currently being used by 400 farmers in Telangana and a pilot programme has begun in Varanasi, Uttar Pradesh. A total of 1500 farmers have enrolled in the GIB programme till date. The MA funding helped Kheyti grow from 150 farmers to the 400 farmers.

Due to GIB, the farmers have reported an increase in their yield by 7 times, and a doubling of their income which can be attributed to the increased yield, the market linkages provided through Kheyti to sell the produce, as well as decreased expense on pesticides and fertilizers. With this increased income, Kheyti has observed that farmers used the additional money to send their children to school, save for unforeseen situations as well as used it to invest in agricultural inputs. The beneficiaries are also more open to taking risks in terms of the type and number of crops that they grow as there is an increased sense of security. These factors have led to an enhanced quality of life for the farmers.

IMPACT



Alignment with the Sustainable Development Goals (SDGs)

Kheyti's values are also closely aligned with the SDG indicators in a number of ways, and they are thus working towards the achievement of these goals. By providing farmers with a secure source of income, Kheyti is working towards reducing the rate of poverty within small and marginal farmers. In smaller land holdings, farmers often lose out all their income if their crops are damaged or do not do well for external reasons. Thus, providing farmers with the safety of crop yield, Kheyti is preventing them from slipping into poverty. By working solely with small and marginal farmers, the organization is also attempting to reduce inequalities by ensuring that these farmers can sell to the market and do not lose out to farmers with larger land holdings. In addition to this, Kheyti ensures that farmers do not need to give up their agricultural occupation and is striving to provide them with decent work and economic growth within their own sector.



Although most of the GIBs and the loans for these are given to the males, who are also the heads of their households, Kheyti has observed that most of the work done in the greenhouses is by women. They try to work towards gender equality by providing greenhouse training to women as well, so that they will be able to run the greenhouse and have more decision making abilities in relation to their family's agricultural occupation.

Success Stories

The success stories of Kheyti have encouraged more and more farmers to invest in GIBs. They have seen a substantial change in their income and a subsequent change in their standard of living. Farmers have actively tried to teach themselves to use smartphones so that they would be a Kheyti Eligible farmer.

Hemalatha and Lachireddy were exposed to the greenhouse when they visited another farmer who had invested in Kheyti's programme. By successfully attending all trainings and meetings, and keeping the Kheyti team up to date with any challenges they faced- these farmers managed to reap a record harvest of 5 tons of cucumbers! They made a profit of \$639 in four months. With this additional income, the farmers managed to pay off their daughter's college. The success of the greenhouse has motivated the farmers to continue to invest in the greenhouse, in hope to reap even more produce in the future.



- Yield: 5,026 Kgs
- Crop: European Cucumber
- Crop Tenure: 4 Months
- Revenue: **& 1,525**
- Revenue: \$ 639¹
- Profit/month: \$ 160

Janaiah Bital is a 60 year old farmer, who wishes to make farming an aspiration for the next generation. Despite most of the farmers in his area moving out to other occupations, janaiah wanted to continue to work in this sector and did so with the help of kheyti's innovation he was inspired by the greenhouse when he was exposed to it during one of the field visits conducted by organization. he taught himself how to use a smartphone so that he would be eligible for the gib janaiah achieved a 6.2 ton harvest of cucumbers, and made \$785 (\$238 per month) as a result!



Partnerships And Funding

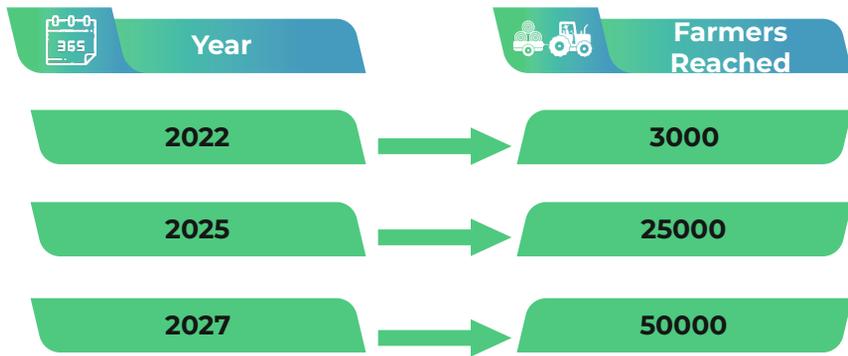
In August 2020, Kheyti secured a debt funding from Acumen Fund, and is currently working on renewing and cultivating their existing partners. They have brought together over 100 organizations to work with them in the past 5 years. They have also received funding from various partners such as Mulago, Jasmine Social Investments, DRK Foundation, Autodesk Foundation, and, Hampshire foundation. Overall, Kheyti has raised more than 2 million dollars of funding from various organisations and philanthropists. Through MA, Kheyti also managed to forge partnerships with various organizations including Bank of Baroda in order to facilitate loans for the eligible farmers willing to buy the greenhouse. Due to the work done with the MA funding, Kheyti also won the Design Impact Award and an award of 80 lakhs.

Partnership	Funding Amount (In USD)
Acumen Fund	500,000 (debt)
Mulago	450,000 (grant)
Jasmine Social Investments	200,000 (grant)
DRK Foundation	200,000 (grant)
Hampshire Foundation	200,000 (grant)
Autodesk Foundation	200,000 (grant)
Design Impact Award	100,000 (grant)
Total	18,50,000

After vast research and trials conducted by Kheyti, the manufacture of these greenhouses is done by Mahindra Top, and they partner with various organizations which help provide the season starter kit, insurance, and other key aspects of the Kheyti programme. Some of their partners are Dalberg Design, Arugatech, and Stree Nidhi. Kheyti also collaborates with companies for farmer linkages. These companies include BigBasket, Polimeraas, and Ratnadeepamongst others. Kheyti has also partnered with banks such as Bank of Baroda. Currently, Kheyti's main focus is to renew these partnerships and expand with them to different states within India.

Way forward

In terms of scalability, Kheyti is still finalizing their proof of concept. They have conducted various trials and are using different partners to see which works best. Kheyti hopes to have 3000 farmers enrolled in the programme by the end of the next financial year. Following that, the dream is to reach 25,000 farmers in 3 years, and 50,000 farmers in 5 years. Further, upon perfection of the greenhouse, the organization may also branch into similar products which work on improving open field cultivation for small and marginal farmers.



Kheyti's work impacts every individual in the country. Not only are they working towards providing a better quality of life for the small and marginal farmers, they are also working to ensure that food security persists and crops are not lost due to climatic conditions. Food security, farmer income, and crop productivity go hand in hand, and Kheyti is working towards a better future for everyone involved. Small and marginal farmers produce around 60 percent of the total food grain production. Thus, by ensuring that these farmers are more resilient to climatic conditions, Kheyti is ensuring food security for the country, while at the same time trying to enhance the standard of living for these small and marginal farmers.

