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Spring The Success Story of an Organic Farmer from Khargone District of Madhya Pradesh

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Abstract:

In the recent declaration of COP28 UAE on Sustainable Agriculture, Resilient Food Systems and Climate Action, it was again highlighted that the world should be more focused on the conservation, protection and restoration of land and natural ecosystems. Sustainable and healthy agriculture can play a major role in solving the problem of global hunger and effective management of natural resources. In the current paper, the story of an Organic farmer Mr. Rameshwar Bariya, who is from a very small village – Awalya, dist- Khargone, Madhya Pradesh has been highlighted. Farmers like Rameshwar Bariya can be the game changer to promote the adoption of sustainable farming practices to farmers. It discusses the journey of a farmer from conventional to sustainable farming and his own experiences of adopting different organic farming practices. The paper also highlights the agriculture landscape impact of Narmada Landscape restoration Project, a unique project funded by United States Agency of International Development (USAID) and NTPC Ltd. and jointly implemented by Global Green Growth Institute (GGGI) & Indian Institute of Forest management (IIFM) at Khargone district of Madhya Pradesh, India.

Keywords:

Organic Farming, Sustainable Landscape Management, Sustainable Farming, Drip Irrigation, Adoption and Success, NLRP, Success Story

Introduction:

In the beautiful village of Awalya, Block – Mahehswar, District - Khargone in Madhya Pradesh, lives a remarkable farmer Shri Rameshwar Bariya. With a heritage rooted in agriculture, he cultivates 1.0 acre of his farming land, harvesting a diverse array of crops such as cotton, wheat, and maize as main crops while pulse crop such as red gram,and an assortment of vibrant floricultural crops such as merigold are grown as border crops. Departing from conventional farming practices, Rameshwar Bariya joined the organic movement initiated by

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Narmada Landscape Restoration Project and stated practicing organic methods in 2022, abandoning chemical fertilizers and pesticides in favor of natural techniques.

The village – Awalya is situated at the lapel of Vindhya mountains and has a scenic beauty of Nature at its best. There are around 200 households in the village, divided into different faliyas. Rameshwar Bariya's house and his farming land is in the pahadi faliya of the village, geographically located at 22°19'40.78"N latitude and 75°41'8.04"E longitude. Sandy loam and clay loam are the major soil types found in the village. Rameshwar Bariya's farmland has sandy loam soil and has some slope as it is at the bottom of the mountain. The major source of irrigation is the well and surface water drawn from streams. The water in the stream flows all year round as it is fed by the overflow from the "Narmada Water Supply line" which supplies water from the Narmada River to Indore city.

He also integrated animal husbandry and integrated farming approaches into his practice, nurturing four cows, two buffaloes and four goats whose dung and urine metamorphose into Sanjiwak, a potent organic fertilizer. Rameshwar Bariya's farm exudes a harmonious blend of agriculture, agro-forestry, and dairy, ensuring a sustainable interdependence among enterprises. He ardently believes that this symbiosis not only enhances crop yield but also generates substantial income.

Through his continuous learning and interactions with the project team and fellow farmers, Rameshwar Bariya has refined his craft. His proficiency in organic farming has gained him recognition as a progressive farmer, drawing numerous visitors including visitors from foreign seeking his expertise and insights into innovative agricultural techniques. He graciously shares his wealth of knowledge with peers, project stakeholders and agricultural authorities, enriching the farming community with his expertise. He set a great example of transformation from conventional to organic farming, even when he is not very literate and wasn't aware much about organic farming practices.

The Narmada Landscape Restoration team has been instrumental in strengthening Rameshwar Bariya's efforts by providing technical support, fostering the integration of water-saving technologies such as drip irrigation, crop diversification and introducing improved organic crop varieties. His farm has become a learning hub, attracting farmers eager to learn and adopt his refined organic farming practices.

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Technologies adopted:

The farmer has adopted integrated farming practices over his conventional methods. When he joined the NLRP Organic Initiative, he got the soil health analysis done for his farmland for the very first time, the cost of which was covered from the project. He adopted crop diversification, sowing of improved and organic varieties of wheat, cotton, maize and pigeon pea, integrated nutrient and pest management practices, drip irrigation technique, mulching of palash leaves and becoming the part of farmer's group such as farmer interest group (FIG) and also motivated his wife to join woman's self-help group (SHG) of his village.

Improved crop varieties:

"As you sow, so shall you reap". All these years he has been sowing traditionally saved seeds of wheat and pigeon pea, and the yields have been very average from his farmlands. He learned about the other organic varieties of different crops and started sowing Bansi variety of wheat and desi variety of pigeon pea. With support from the project team, he was connected with the organic cotton firm in the area and received non-GMO cotton seeds for his land. He also started crop rotations in the fields from Rabi 2022 season.

Integrated Nutrient & Pest Management practices:

Nutrient supply for the crops is one of the costliest forms of input in the conventional cropping system. Mr. Rameshwar Bariya has been involved in the different training program organized by the project and learned how to effectively manage the soil health and supply proper nutrient to crops. In the soil health analysis, it was found that the soil is mostly deficient in organic carbon and nitrogen. He decided to manage these with low-cost inputs and started practicing mulching, crop rotation and crop diversification. Simultaneously he adopted organic practices such as use of seed treatment materials like rhizobium in pigeon pea and gram, azotobacter and PSB in wheat and maize. To improve the number of microorganisms in soil he prepared and applied Sanjiwak and Decomposer with irrigation and spray. Apart from the liquid organic fertilizers he also prepared FYM (with decomposer) applied approximately 15 ton to his 1 hectare of farmland.

Sanjiwak:

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It is a liquid manure prepared by mixing 30 liters of cow urine, 300 KG cow dung, 5 kg jaggery and 1-2 KG besan in 1000 liters of water. To prepare the mixture, he constructed a proper cemented pit with financial support from Narmada Landscape Restoration Project. Once mixing of all the five components, the pit was kept covered for the next 7 days, farmer only required to shake the mixture with help from wooden stalk twice in a day. Once the Sanjiwak is prepared it can be used in the field within the next 10-15 days. This liquid manure not only triggers the soil microorganism activities that lead to rapid decomposition of the organic materials and supply nutrients to plants but also helps to maintain the soil structures and increase the water holding capacity of the soil.

For effective management of different pests in the crops, he applied a similar formula of integration of cultural, mechanical, and organic inputs. He started sowing border and trap crops to reduce the occurrence of pests. To monitor the pest population, he installed 15-20 pheromone traps in his cotton fields and also installed 20-25 yellow sticky traps. With support from his wife and other members of his family he prepared and used different organic inputs such as Panch-Patti dawai, Char-Chatni dawai, Neem leaf extracts and fermented milk. After application of all such inputs, he found panch-patti kadha to be very useful to avoid pest attack in his field. He sprayed the liquid every 10-12 days interval in cotton in kharif and gram in rabi.

Panch-Patti Kadha:

The liquid organic pesticide can be simply prepared using the leaves of any five pest repellent plants and water. Almost half-half KG of leaves of five easily available plants (in which the pest does not attack) like Neem (*Azadirachta indica*), Dhatura (*Datura stramonium*), Besram (*Ipomea carnea*), Custurd apple (*Annona squamosa*), and Akanv (*Calotropis gigantea*) are collected and cut into small pieces. The leaves are mixed in a container with around 12-15 liters of clear water and 5 liters of cow urine. The mixture is then boiled for half an hour or until the water reduces to half the quantity, so that the leaf extracts can easily dissolve in the water.

The boiled extract will then left for some time to get into normal temperature, once the temperature will normal the extract should be squeeze from the mixture using a cotton cloth or thin sieve. The mixture can be used as 500 ml per 15 liters of water to spray in crops. This will work as an excellent repellent for harmful insects and pests.

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Precision Farming:

The effective management of water availability in the soil is the key to getting optimum produce from the crops. Rameshwar Bariya understands the importance of irrigation in crops at their critical stages and applied water accordingly. He switched from his traditional furrow irrigation to drip irrigation techniques and experienced great response in terms of yield of crops like cotton and gram. He was financially not able to purchase the drip irrigation system for his farmland but to motivate other farmers of the village and to adopt organic and precision farming practices, he decided to install the drip irrigation system in his farmland. He received all the technical and some financial support from Narmada Landscape Restoration Project to learn and implement this technique. Using drip irrigation system, he saved almost 60-80 % of water and also experienced reduction in pests and diseases in the crops resulting in better yield.

Diversified livelihood opportunities:

Mr. Rameshwar Bariya believes that his success in organic farming will lead to widespread awareness among other farmers of the area and they will also start practicing organic farming practices in their farmland. Farmers of the area were afraid that if they adopt organic farming practices, they may face reduction in the yield of crops, however Rameshwar Bariya did not experience the same. Rameshwar Bariya has enough numbers of animals in his cattle shed and he was selling surplus milk to other farmers. The Narmada Landscape Restoration Project team has identified a scope for selling the cow urine and Mr. Bariya agreed to collect and sell it to other farmers to help them to prepare organic inputs. Cow urine is required in most organic inputs and if a farmer does not have cows, he may fail to produce the organic inputs.

Cow Urine Collection Tank:

For effective collection of cows urine, he constructed a concrete floor with specific shallow drainage channels in his cattle sheds. These drainage channels collect the urines in a urine collection tank constructed downside of shed. He received technical and financial support from the Narmada Landscape Restoration Project for the same. With the help of the collection tank, he is able to collect 10-15 liters of cow urine every day and is selling it at the rate of 5 Rs. per liter to other farmers. Through this small initiative, he is able to generate some additional income and start supporting other farmers for preparation of their organic inputs.

Bamboo plantation:

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There is a stream flowing just beside Rameshwar Bariya's field. The stream flows throughout the year because of the overflow water received from Narmada Water Supply Line. He observed that the stream is eroding the stream banks year after year and becoming a challenge for his farmland. He decided to plant some bamboo samplings alongside of the stream to reduce the soil erosion and also generate additional income in future. In the year 2022 he planted 100 samplings of Bamboo along with the stream. The bamboo plants are now in very good condition and by showing the same to other farmers he is motivating them to plant the bamboo in the entire stretch of stream.

Capacity building:

Rameshwar Bariya joined the NLRP initiative in July 2022 and started adopting the organic practices from Kharif 2022 season. He was first involved in the Farmer Interest Groups' (FIG's) meeting in his village and expressed his deep enthusiasm to learn more about sustainable agriculture practices. He started discussing the farming activities with the Village Resource Person of the project and participates in every monthly meeting of FIG. FIG meetings are organized once a month in each project village by the agriculture experts from NLRP.

Apart from the FIG monthly meetings, individual discussions with agriculture experts & village resource person, he participated in following capacity building event organized by Narmada Landscape Restoration Project –

- Training on "Preparation of Organic Input – by Sandeep Tambe" organized at village – Navrangpura on 24th February 2023.
- One day extensive training on "Organic farming practices" organized at village – Veklya on 6th May 2023.
- Exposer visits and training at bioRe Organic cotton facility Kasrawad on 20th May 2023.
- On-field practical training on installation and operation of Drip Irrigation system organized on 30th May 2023 at village - Navrangpura.

Apart from attending the training and capacity building event organized by NLRP project, he also frequently visited the fields of other organic farmer of the area and discuss with them regarding their experience and learning from adopting different sustainable agriculture practices.

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Figure 1: Farmer (Rameshwar Bariya) harvesting Cotton from the organic field.

Figure 2: Farmer inspecting the cotton field before harvesting

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Figure 3: Delegates from United States Agency for International Development (USAID), Indian Institute of Forest Management (IIFM, Bhopal) and Global Green Growth Institute (GGGI) visited the organic cotton field and discussing about his experience.

Figure 4: Farmer receiving the training for Organic farming practices conducted by the Narmada Landscape Restoration Project team.

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Results

Framing was not a new concept for Rameshwar Bariya. He has been doing conventional farming for more than 20 years. In conventional farming his major problem was the highly increasing cost of cultivation, which is more than 50% of the total cost (Seufert et al., 2012) and significant decline in soil productivity. Before the year 2022, he was hardly getting 30 – 50 k annual income from his one-acre farmland and the livelihood of his family was mostly depending on Forest NTFP like tendu-patta and labor works. Even his earnings from other sources were consistently spent on buying inputs for agriculture.

On major achievement was the drastic reduction in the cost of cultivation from his initial year. He was able to reduce his cost of cultivation by more than 50 - 60 % by preparing and adopting organic inputs. He stops purchasing external inputs such as fertilizers and pesticides.

Here is an overall cost – benefit analysis for Kharif 2022, Rabi 2022 and Kharif 2023 season' crops -

Season	**Crop + Intercrop**	**Area (acre)**	**Total Cost of Cultivation (INR)**	**Gross Income (Yield + Straw) (INR)**	**Net Income (INR)**	**Agronomic Benefit-Cost (B:C) Ratio[1]**
Kharif 2022	Cotton	1.5	65900	74800	10900	1.13
Rabi 2022-23	Wheat	1.5	33990	83250	49260	2.45
Kharif 2023	Cotton (Main) + Merigold & Pigeon pea (Border)	1.5	35800	79500	43700	2.22

**Data based on the farmer dairy maintained by the farmer.*

Rameshar Bariya not only reduced his cost of cultivation but also succeed in increasing the income through crop diversification and adjustments in the sowing and harvesting that helped him to reduce the risk of drought and also to get some good market price of his crop produces.

[1] *The agronomic benefit-cost ratio is calculated with the gross benefit divided by the total cost of cultivation.*

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By adopting advanced techniques such as Drip irrigation, he was able to save his time and water. He spends that saved times in learning more about sustainable farming and also for other livelihood activities like dairy and poultry. Geeting less water from the stream ensures its continuing flow towards downside and also increases the groundwater recharge by having more availability of water in the stream.

Organic Certification:

From the Rabi 2023 season, he has been enrolled in the APEDA organic certification program and he will be able to buy his organic produces at a much higher price from this season. The NLRP project team has supported him to establish market linkage with organic buyers or his produces. He also got the membership of an already established Farmer Producer Organization of the area, through which he can sell his organic produce to buyers of the nearby area or to cities like Indore.

Feedback from the Farmer

Mr. Rameshwar Bariya proudly says that by adopting sustainable agricultural practices he was able to generate more income from his farmland and without leaving any harm to the environment and ecosystem. He is very happy to produce healthy food for his family and also has no diffidence to sell his produce in an open market. He believes that the soil health of his farm will also increase in the next few years. He aims that every farmer should adopt integrated ways of organic farming and should be enthusiastic to learn and adopt new technologies in agriculture. Integrations can lead farming to become an environment friendly business and a good source of income for farmers. He is actively engaged in the promotion of such practices to other farmers of the village and area by sharing his journey and own experiences.

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