

Workstream 5 - Insights from India

SCALING REGENERATIVE AGRICULTURE: SEASON 2024 OUTCOMES



Foreword



Sustainable
Markets
Initiative

The **Sustainable Markets Initiative's (SMI) Agribusiness Transition Hub** was launched in 2020 with the aim of accelerating the **adoption of regenerative agriculture practices** within the industry, while ensuring positive partnerships with the world's farmers.

One of the targeted regions was **India**, for which the **Workstream 5** was formed, focusing on **basmati rice**. Specifically, the initiative is centred in **Punjab, Haryana, Uttar Pradesh and Madhya Pradesh**, in which basmati rice is planted in **over 160k hectares**, around 6% of the total area available.

Workstream 5 is formed by several **influential companies** within the agrifood value chain with high expertise on basmati rice systems.

Partners



2023

During 2023, Workstream 5 discussed what the **implementation of solutions** to help **scale up regenerative agriculture for basmati rice systems** should look like.

In that same year, the **first pilots were created and deployed**, in order to **gather proof of value and insights**, while **additional partners** were onboarded on the initiative, before defining a scale up model for the following seasons.

2024

For 2024 season, Workstream 5 has focused on the **definition and execution** of a **scale up plan**, leveraging **pilot learnings**, and including additional value angles are to **overcome the main barriers** of regenerative agriculture transition. So far, solutions implemented have directly reached **2.5k farmers**, impacting on **12k hectares of basmati rice**, in which parameters such as **yield, profitability, soil health and water usage** have been improved, with an overall positive impact in **farmer livelihoods**.

The aim of this report is to share the **outcomes of this season**, which will be leveraged in future seasons to improve the adoption rate.

Regenerative agriculture



Sustainable
Markets
Initiative

Regenerative agriculture is a **holistic, context-specific approach to farming systems** that work in harmony with the environment while **improving productivity and economic viability**. It is key to tackle the **environmental impact** of and on the **agrifood supply chains**, helping to strengthen their **future resilience** and improve **food security**^{1,2}.

However, it needs to **scale three times faster** to address the threat presented by climate change and biodiversity loss and achieve a **resilient and sustainable food supply**³. Because of this, the Agribusiness Transition Hub focuses its work on **scaling up regenerative agriculture** within the industry.

WHAT ARE THE BARRIERS OF ADOPTION OF REGENERATIVE AGRICULTURE?

To **accelerate the adoption** of regenerative agriculture practices in **India**, the barriers of adoption were studied. Our work showed that there are **three main reasons** why regenerative agriculture is not scaling:



KNOWLEDGE

There is a **knowledge gap** when it comes to the implementation of regenerative agriculture



ECONOMIC CASE

The short-term economic case for the average farmer is **not compelling enough**



VALUE CHAIN

Value chain **drivers are not well aligned** to encourage regenerative agriculture adoption

RESTRICTED

Regenerative agriculture



Sustainable
Markets
Initiative

Given the **transcendence and potential** that regenerative agriculture has, Workstream 5 has focused on **implementing solutions to overcome the barriers** faced by farmers when adopting regenerative agriculture

WHAT SOLUTIONS IS THE WORKING GROUP IMPLEMENTING TO OVERCOME THESE BARRIERS?

THEORETICAL & PRACTICAL CAPACITY BUILDING



Perform **trainings** on regenerative agriculture practices for farmers, combined with **on-site demonstration of technologies** to **enhance their productivity and profitability**

CO-BENEFITS VALORIZATION



Unlock **new revenue streams** by educating farmers on the obtention of regenerative agriculture co-benefits, providing **methodologies and technologies** that enable their **monetization**

MULTISTAKEHOLDER FORUMS



Engage **value chain stakeholders** and **policy makers** to jointly **increase awareness** on regenerative agriculture, and to establish a **proper ecosystem** that enables and accelerates adoption

WHAT POSITIVE IMPACT HAVE THESE SOLUTIONS GENERATED?



Increase in profitability, driven by higher productivity and access to high value markets



Enhancement of soil health, with a decrease in erosion and **improvements in biodiversity**



Improvement in water quality, and reduction in its **usage**



Reduction of carbon emissions, with an increase in **capture and storing**

WHAT HAS BEEN THE REACH OF THESE SOLUTIONS FOR 2024?



~2.5k farmers



~12k hectares

Season 2024 outcomes



Sustainable
Markets
Initiative



WATER

Up to **18%**
improvement in **water productivity**



SOIL HEALTH

+200
soil samples performed in farms



CARBON

~1.400
MT of CO₂e emissions reduced



PROFITABILITY

Up to **9%**
boost in **yields**

20%
farmers' revenue increase for selling in
export markets

Season 2024 outcomes



Sustainable
Markets
Initiative



Water

Basmati rice systems are **highly water-intensive**, requiring on average 2,500 litres of water to produce 1 kg⁴. Because of this, improving **water management and reducing consumption** is key to sustainably enhance these systems. The implementation of technologies such as **alternate wetting and drying (AWD) pipes** enables the reduction of water consumption in irrigated fields⁵.

ACTIVITIES

During this season, efforts have been put in **educating farmers** on the importance of making an **efficient use of water** while at the same time **showcasing different technologies** that could be used to do so.

- > Most of the farmers have received **trainings and support** on the **implementation of AWD devices**.
- > Around **200 farmers** have participated in a pilot on **IoT sensors implementation** in their fields, which allow to properly alternate **flooding and non-flooding on fields** by providing real time data.

RESULTS

When implementing **IoT sensors**, farmers have perceived the following improvements:



55% of farmers have reduced their **water consumption by ~6%**



20% of farmers have enhanced their **water productivity by ~18%**



45% of farmers have boosted their **yields by ~10%**

FINDINGS

- > **Yields** have improved along with **water productivity**, demonstrating that an **efficient water usage** does not imply a decrease in **crop productivity**. Nonetheless, there is still room for improvement in specific regions, and efforts will be put to **furtherly decrease water consumption**

RESTRICTED

Season 2024 outcomes



Sustainable
Markets
Initiative



Soil Health

Soil health has key benefits for both **ecosystems** and **agricultural productivity**, as it increases **carbon sequestration**, reduces **GHG emissions**, enhances **water quality**, increases **nutrient availability**, provides **pollinator habitat**, and boosts **crop yields**, thus improving **farmer livelihoods**⁶.

ACTIVITIES

At the start of the season, **soil sampling** was performed on **+200 farms** to obtain a **baseline on soil health indicators**:



Around **60% of farms** have a **Soil Health Index** higher than **66%**



Organic carbon was **low in 12%** of fields



Nearly **50% of farms** have some type of **macronutrient imbalance**



Above **30% of farms** have **deficiencies on micronutrients**

Given this baseline, throughout the season **trainings** and **personalized advisory** on how to correct identified imbalances and deficiencies (e.g., macro and micronutrients) have been **offered to farmers** with the objective of helping them **improve their performance on soil health indicators**, which enhances the **production of basmati rice and subsequent crops**.

FINDINGS

- > The **objective** for upcoming seasons is to **improve Soil Health Index of all enrolled farmers**; however, and acknowledging that **soil health outcomes require several seasons** to be fully materialized, the Workstream plans not only to keep analysing the soil of the **+200 farms**, but also **add 300 more** to the sample.

RESTRICTED

Season 2024 outcomes



Sustainable
Markets
Initiative



Carbon

The transition to regenerative agriculture enables **reductions in GHG emissions** as well as **carbon sequestration in fields**, mainly thanks to the introduction of **sustainable cultivation practices**. By enrolling in **carbon programs**, farmers can **monetize these reductions in GHG emissions**, obtaining **additional revenue streams**.

ACTIVITIES

During this season, efforts have been put in **educating farmers** on the **obtention of carbon credits** by providing them with the **methodology, technologies and support** to enrol in **carbon farming programs**.

- > **Carbon farming programs** have covered **+900 hectares**

RESULTS

Farmers that have been enrolled in **carbon farming programs** have perceived the following **improvements**:



~1.400 emissions reduced (in MT of CO₂e)



+6M litres of **water** saved



Up to **~5%** increase in **yields**



13\$ per hectare in additional revenues

FINDINGS

- > During the following seasons, we aim to **increase the number of farmers enrolled** in carbon programs to furtherly **reduce farming GHG emissions**.
- > Moreover, we will also continue **studying the additional benefits** from these programs, such as the reduction in **water consumption** and the **increase in yields**.

Season 2024 outcomes



Sustainable
Markets
Initiative



Profitability

Overall, farmers have increased their **profitability**, due to the **effects** derived from the **solutions implemented**:



PRODUCTIVITY

- > Up to **9% increase in yields**



AGRICULTURAL INPUTS

- > **Reduction in costs** due to improved practices and input optimization



NEW REVENUE STREAMS

- > Access to **high-value export markets**
- > Access to **carbon farming programs**

Workstream partners are **committed to purchasing production** from farmers joining the initiative, which is later **sold in high-value export markets**:



~23k

tons of basmati rice
purchased by SMI partners
in 2024 season



20%

farmers' revenue increase
for selling in export markets



RESTRICTED

What is next?



Sustainable
Markets
Initiative



2025 season

During 2025 season, the Workstream aims to **increase its impact on the ground** by both expanding the offering to farmers and delivering solutions in a larger number of hectares, with the objective of reaching...

 **~16k** hectares of basmati rice

To do so, the focus will be put on:

DEPLOYING ADDITIONAL SOLUTIONS

- > **Identifying complementary offerings** that add the biggest value to farmers, such as improving the affordability and adoption of farm mechanization.

ENGAGING ADDITIONAL PARTNERS

- > **Including new partners** that are willing to deliver an impact on the ground and are aligned with the initiative's ambition.

DATA GATHERING

- > **Capturing data** from solutions deployed, to quantify the outcomes of the taskforce, identify improvement opportunities for upcoming season and mitigate risks.

References & Acknowledgements



Sustainable
Markets
Initiative

REFERENCES

1. Sustainable Markets Initiative's Agribusiness Task Force, "Scaling Regenerative Farming: Levers For Implementation", accessed December 2024
https://a.storyblok.com/f/109506/x/1eb7531ee2/smi_agritaskforce_2023-final.pdf
2. Food and Agriculture Organization of the United Nations (FAO), Family Farming Knowledge Platform – Regenerative Agriculture, accessed December 2024
<https://www.fao.org/family-farming/detail/en/c/1512632/>

Chesapeake Bay Foundation, "Regenerative Agriculture", accessed January 2025
<https://www.cbf.org/issues/agriculture/regenerative-agriculture.html>
3. Sustainable Markets Initiative's Agribusiness Task Force, "Scaling Regenerative Farming: An Action Plan", accessed December 2024
<https://a.storyblok.com/f/109506/x/7b102e6831/agribusiness-task-force-white-paper.pdf>
4. Kaur, D. (Diljeet); Singh, A. (Angrej); Kumar Sindhu, V. (Vinay), 2024, "Growth and productivity of direct-seeded *basmati* rice (*Oryza sativa* L.) as influenced by sowing dates and irrigation schedules in north-western India", accessed December 2024
<https://www.sciencedirect.com/science/article/pii/S0378377424003299>
5. Food and Agriculture Organization of the United Nations (FAO), "Rice farming: saving water through Alternate Wetting and Drying (AWD) method, Indonesia", accessed January 2025
<https://openknowledge.fao.org/server/api/core/bitstreams/de4695f2-a313-4ef0-b84b-1fb5d088033d/content>
6. Soil Health Institute, Strategy, accessed January 2025
<https://soilhealthinstitute.org/our-strategy/>

ACKNOWLEDGEMENTS

This report is the output of contributions from members of the Sustainable Markets Initiative's Agribusiness Task Force and other external organisations, specially thanking the following contributors for their support in producing this report:

Project Leads

Kai Wirtz and Sourabh K. Verma, Bayer CropScience

Key Contributors

Anuj Sharma, Yara

Irfan, Deepak, Manwendra Bayer CropScience

Malavika Gopinath, Olam

Vikram Mehla, LT Foods

The Sustainable Markets Initiative's Agribusiness Task Force would also like to thank NTT Data for their support in the production of this report.

Workstream 5 - Insights from India

SCALING REGENERATIVE AGRICULTURE: SEASON 2024 OUTCOMES

