# Food, Agriculture, Environment and Health: Sustainable Transformation Pathways for India

Indian Institute of Management, Ahmedabad, India
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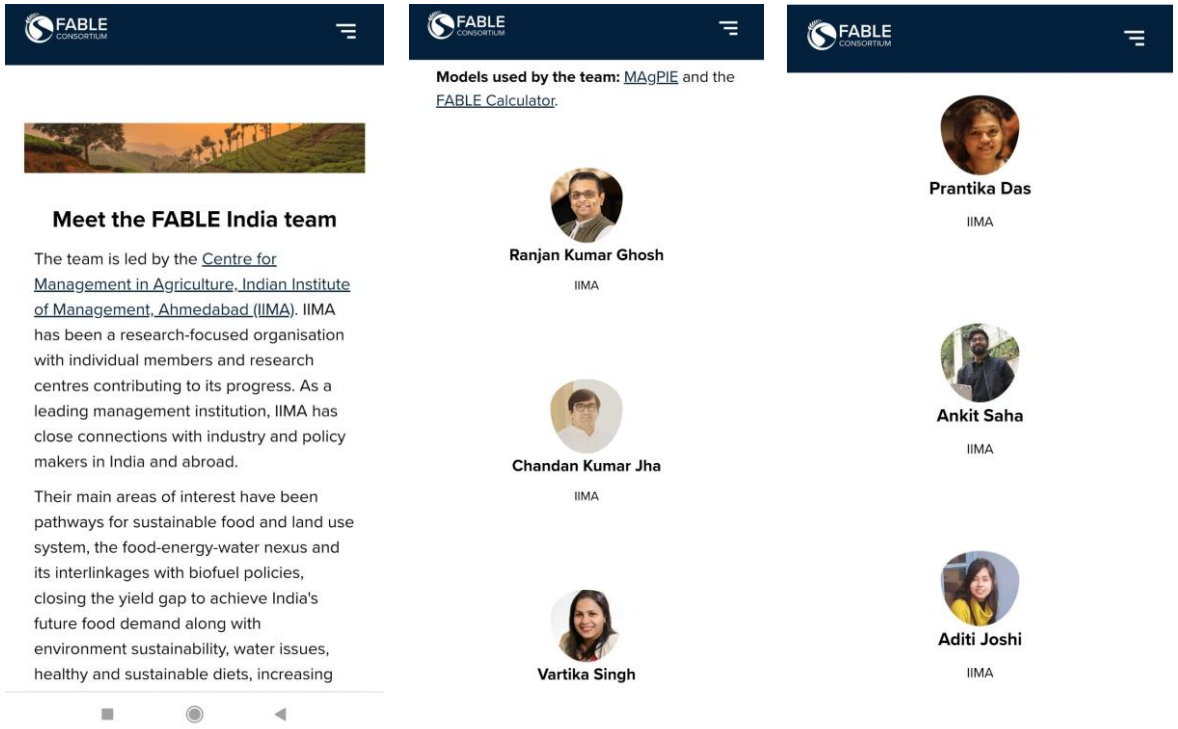
# FABLE India

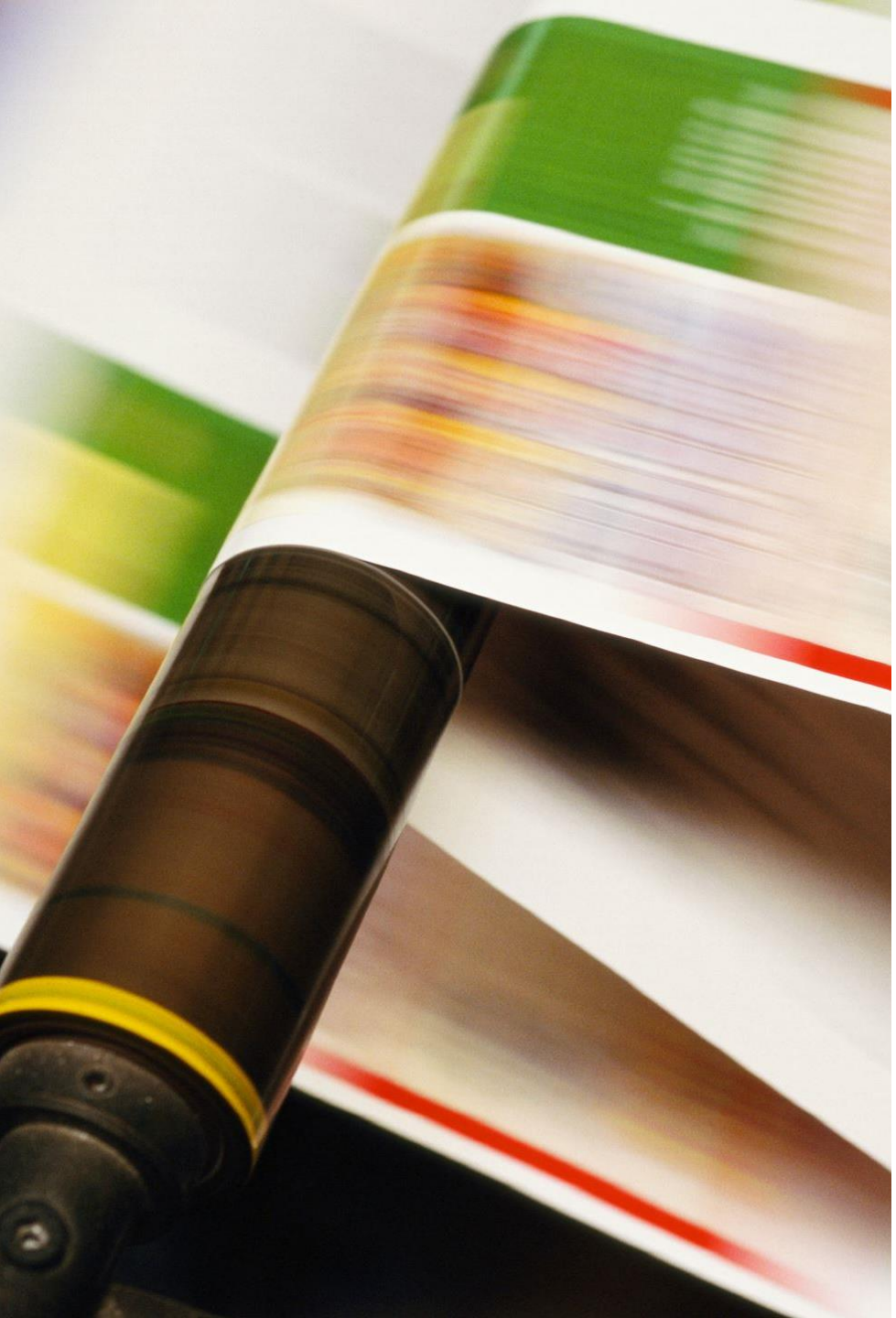
Use of technical tools (land-use PE model MAgPIE, excel-based national and sub-national FABLE Calculator)

Science-based methodology incorporating climate change assessments

Food, land, water, energy nexus

Stakeholder engagement





# Publications


Jha, C.K., Singh, V., Stevanović, M., Dietrich, J.P., Mosnier, A., Weindl, I., Popp, A., Traub, G.S., Ghosh, R.K. and Lotze-Campen, H., 2022. The role of food and land use systems in achieving India's sustainability targets. Environmental Research Letters, 17(7), *p.074022.https://iopscience.iop.org/article/10.1088/1748-9326/ac788a/meta*

Jha, C.K., Ghosh, R.K., Saxena, S., Singh, V., Mosnier, A., Guzman, K.P., Stevanović, M., Popp, A. and Lotze-Campen, H., 2022. Pathway to achieve a sustainable food and land-use transition in India. Sustainability Science, pp.1-12.*https://link.springer.com/article/10.1007/s11625-022-01193-0*

Mosnier, A., Schmidt-Traub, G., Obersteiner, M., Jones, S., Javalera-Rincon, V., DeClerck, F., Thomson, M., Sperling, F., Harrison, P., Peréz-Guzmán, K. and McCord, G.C., 2022. How can diverse national food and land-use priorities be reconciled with global sustainability targets? Lessons from the FABLE initiative. Sustainability Science, *pp.1-11.https://link.springer.com/article/10.1007/s11625-022-01227-7*

# Our approach: Nexus of Agriculture, Food, Environment and Health

# Scenathon 2023

Our scenario design and assumptions

# Multi-sectoral approach

## Three Pathways

- **Current Trends** – Business as Usual.
- **National Commitments** – Pathway to meet national commitments on key indicators.
- **Global Sustainability** – Pathway to meet global sustainability targets.

| Scenario | Current Trend | National Commitments | Global Sustainability |
|---|---|---|---|
| Population | SSP2 | SSP2 | SSP1 |
| GDP | SSP2 | SSP1 | SSP1 |
| Food Demand | FAO2010 | ICMR – NIN | EAT Lancet |
| Food Waste | 5% Reduction | 10% reduction | 20 % reduction |
| Export | Increased by 1.5 times | Increased by 2 times | Increased by 2 times |
| Import | Stable Imports | Reduced Imports | Reduced Imports |
| Livestock Productivity | Same Productivity Growth | High Growth | High Growth |
| Crop Productivity | Same Productivity Growth | High Growth | High Growth |
| Land Expansion | No Expansion | No Expansion | NoDefore2030 |
| Afforestation | Bonn Challenge | Bonn Challenge | Revised Bonn Challenge |
| Harvest Intensity | Medium | High | High |
| Climate Change | RCP 6.0 | RCP 4.5 | RCP 2.6 |
| Protected Area | No Change | Expansion of the Protected areas in future | 30×30 by 2030, |
| Biofuel | Current Blending Rates | NBP Scenario – 20 % By 2030 | Linear Increase After 2030 |
| Agricultural Costs | Maximum | Average | Average |

# Focus on national policy goals

## Drivers

**Population- SSP2**
(India most populated country at the moment)

**GDP- SSP1**
(expected high economic growth scenario)

## Food and Nutrition Security

Healthy Diets- ICMR National Institute of Nutrition, India

Overweight and Obesity – NITI Ayog Reports - National Food Security Act, Integrated Child Development Services (ICDS)

## Climate Mitigation

Demand and Supply side Mitigation Strategies – Third Biennial Update, India's Updated NDC 2022 (Action Year 2021-2023)

Others- National Biofuel Policy 2018 (Blending Targets – 2023)

**Biodiversity – Expand Protected Area, Loss of Natural Habitats halted, Reduce use of Pesticides, Afforestation**

National Biodiversity Action Plan – CBD

Bonn Challenge – 21 Mha additional Afforestation by 2030

**N and P – Limit Uses**

Ideal combination of NPK (reduce nitrogen application)

National Mission For Sustainable Agriculture (NMSA)

Paramparagat Krishi Vikas Yojana (PKVY)

**Water**

Increase water use efficiency and limit water use

Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) - Accelerated Irrigation Benefit Programme (AIBP), Integrated Watershed Management Programme (IWMP) and On Farm Water Management (OFWM)

**Economy**

Self Sufficiency- Several Initiatives under Atma Nirbhar **(Self –reliant)** Bharat

Farmers Income – Doubling Farmers Income (**Ashok Dalwai committee Report**)

Trade- India's Export Policy, Trade restriction due to conflicts.