

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

Indian Institute of Management, Ahmedabad, India
29 June 2023



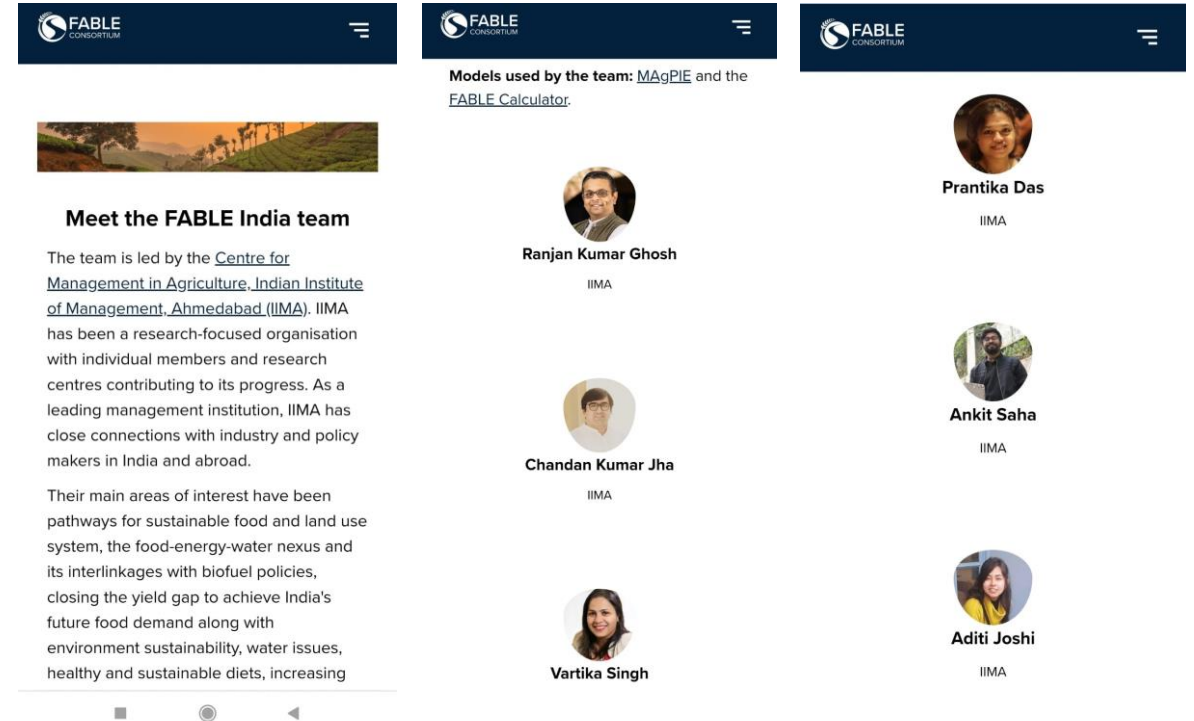
FABLE India

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



The screenshot displays the FABLE India team website. The header features the FABLE Consortium logo and a navigation menu. The main content area is titled "Meet the FABLE India team" and includes a paragraph about the team's leadership by the Centre for Management in Agriculture, Indian Institute of Management, Ahmedabad (IIMA). Below this, there are three columns of team members, each with a circular profile picture, name, and affiliation (IIMA). The first column lists Ranjan Kumar Ghosh, Chandan Kumar Jha, and Vartika Singh. The second column lists Prantika Das, Ankit Saha, and Aditi Joshi. The website also mentions the models used by the team: MAgPIE and the FABLE Calculator.

Meet the FABLE India team

The team is led by the [Centre for Management in Agriculture, Indian Institute of Management, Ahmedabad \(IIMA\)](#). IIMA has been a research-focused organisation with individual members and research centres contributing to its progress. As a leading management institution, IIMA has close connections with industry and policy makers in India and abroad.

Their main areas of interest have been pathways for sustainable food and land use system, the food-energy-water nexus and its interlinkages with biofuel policies, closing the yield gap to achieve India's future food demand along with environment sustainability, water issues, healthy and sustainable diets, increasing

Models used by the team: [MAgPIE](#) and the [FABLE Calculator](#).

Team Members:

- Ranjan Kumar Ghosh** (IIMA)
- Chandan Kumar Jha** (IIMA)
- Vartika Singh**
- Prantika Das** (IIMA)
- Ankit Saha** (IIMA)
- Aditi Joshi** (IIMA)



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., Pérez-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.