



# Smart protein landscape in India

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# The Good Food Institute India

**Accelerating the shift to a secure, sustainable, and just food system through three key areas of work:**



## **Science & Technology**

Analyzing, advancing, and funding the foundational science of alternative proteins



## **Corporate Engagement**

Consulting with the world's biggest food companies to help them capitalize on opportunities in the alternative protein market



## **Innovation**

Providing mission-critical support to entrepreneurs and early-stage startups at all points along supply chain



## **Policy**

Advocating for evidence-based regulation of plant-based and cultivated meat and accelerating government investment in alternative protein R&D

International affiliates act as a force multiplier, bringing the expertise of our departments to the rest of the world.

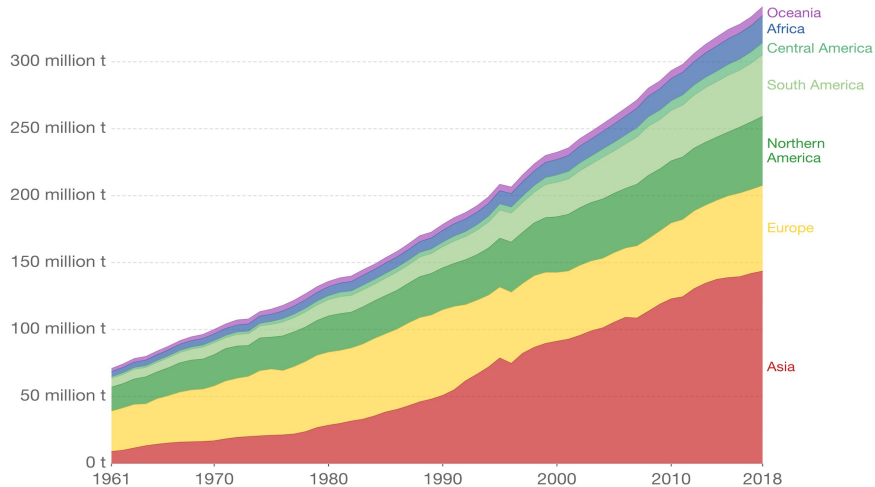


UNITED STATES  
BRAZIL  
EUROPE

ISRAEL  
INDIA  
ASIA PACIFIC

# Global meat demand to rise 200% by 2050: Driven by emerging economies such as India, with major implications for local ecosystems & climate pledges

Global meat production, 1961 to 2018

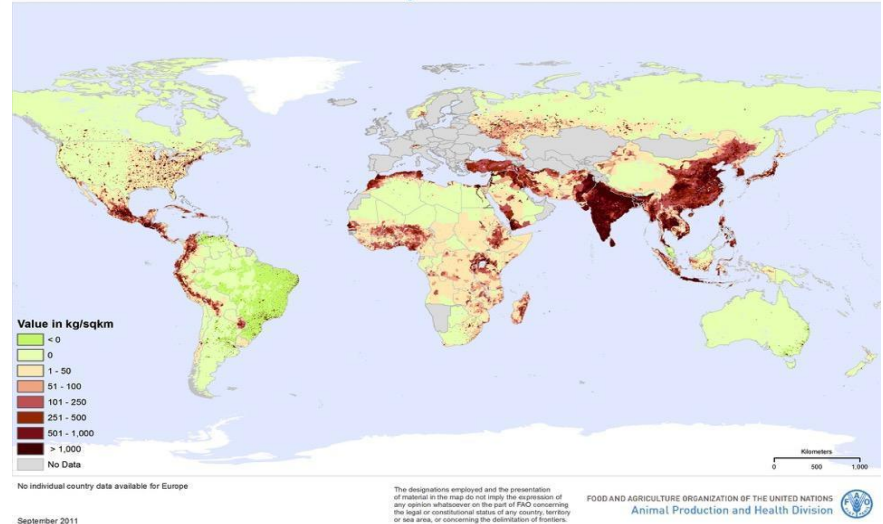


Source: UN Food and Agriculture Organization (FAO)

OurWorldInData.org/meat-production • CC BY

Our World  
in Data

Growth in Demand for Poultry Meat 2000 - 2030



# Feeding growing demand: Implications for the Global South

## Climate change and environmental degradation



Industrial animal agriculture is responsible for **14.5% of greenhouse gas emissions**—a higher share than the transport sector

Developing countries are disproportionately affected by the impacts of climate change; India is currently the [fifth most vulnerable](#) country to climate change.

Source: United Nations, [Livestock's Long Shadow](#) (report)

## Global food insecurity and nutritional deficits



Cycling crops calories through animals is equivalent to **87-97% food waste** in production (i.e. energy and protein feed-to-food conversion efficiencies)

Diverting massive quantities of crops away from direct human consumption and toward animal feed drives up prices, exacerbating food security

Sources: World Resources Institute (calorie formula)

## Threats to public health and food safety



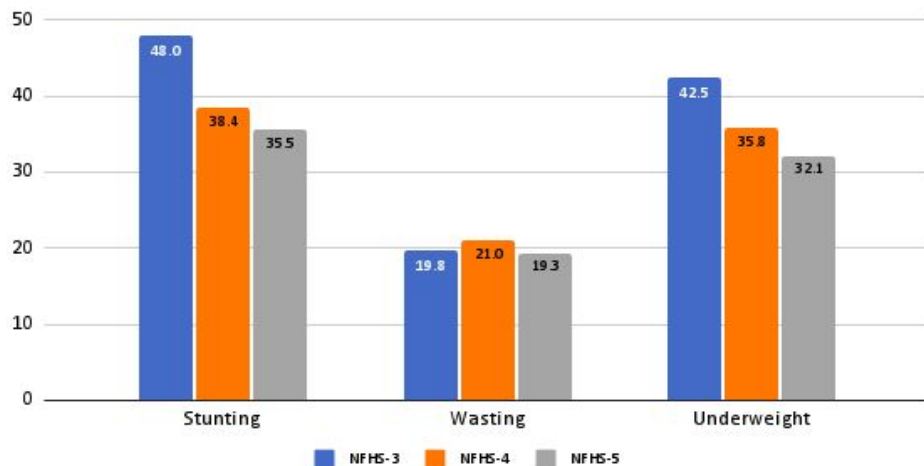
Medical experts expect **10 million annual deaths** from antimicrobial resistance (AMR) in 2050, an emerging trend from use in animal farming

Global burden of food safety related incidences is borne by those living in low- and middle-income countries, accounting for 75% of deaths

Sources: United Nations, IAGC (AMR)

# An urgent need for protein diversification..

Figure 1: Trends in Child Malnutrition Indicators



*The available data suggests that diets in India are heavily cereal based, with very little diversity and inadequate consumption of nutritious foods such as pulses, vegetables, fruits, milk, eggs, and meat (NFHS 2019-20)*

# What is '*smart*' protein?

Smart protein (also called 'alternative protein' globally) is a potentially transformative **sunrise sector encompassing plant-based, fermentation-derived, and cultivated proteins**, and their underlying technologies and ingredients. Smart proteins offer promise to **diversify existing protein supply to be highly secure and sustainable**, while giving consumers and producers a **simple switch, not a sacrifice**.

# Plant-based foods



**Plant-based meat, eggs, and dairy are produced directly from plants.**

Like animal products, they are composed of protein, fat, vitamins, minerals, and water. Next-gen plant-based options look, taste, and cook like conventional meat, and offer complex carbs and fiber.

# In India the plant based meat, eggs, dairy industry is rapidly expanding (non comprehensive!)

## Plant-based meat

## Plant-based dairy

## Plant-based eggs



## Ingredient suppliers



# Value chain partners

## Ingredient suppliers



## Equipment suppliers



## Co-manufacturing & pilot facilities



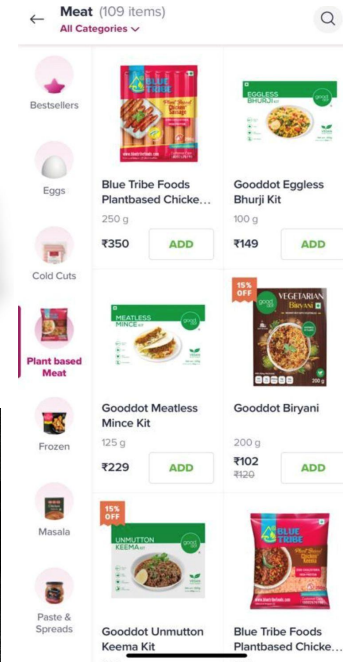
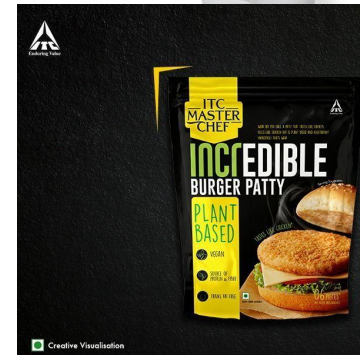
## Research institutions



## Distributors



# Category awareness and distribution of plant-based proteins: potential to transcend the early adopter and reach the true mass market

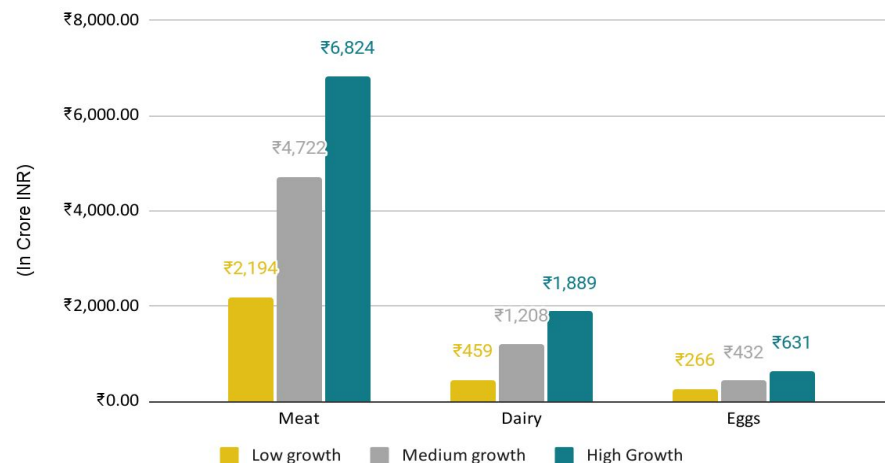


# The Indian economic opportunity: smart protein could be worth >USD 4 Billion by 2030 with the right intervention, with a path to 10x further growth by 2040

Domestic market size of plant-based meat, eggs and dairy in India



Export potential of plant-based meat, dairy and eggs in India



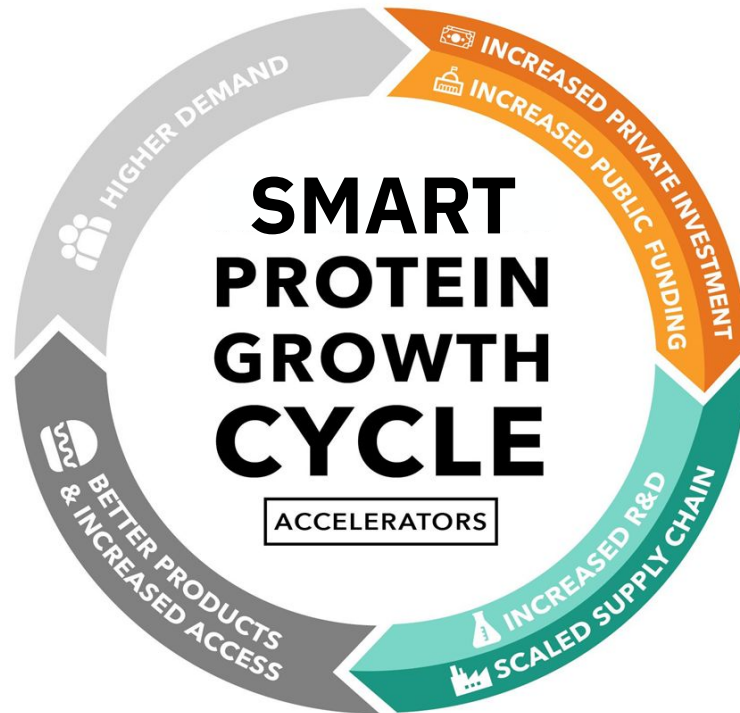
# Key challenges facing the Indian ecosystem



- Most major ingredients such as protein isolates, concentrates, TVP's are imported. Duties are high - upto 60%. This leads to cost basis being already much higher for plant-based as compared to animal-based counterparts and higher costs will hinder repeat purchase and category growth.
- Knowledge gaps exist at all stages of the value chain before end product formulation especially in protein processing. Technical and process as well as scale up, design, knowledge of offtake markets.
- Indian crop raw material quality has batch to batch variability, not same protein content and its actually much cheaper to import raw materials than to source from India due to Minimum support price regulations for key pulses and soybean.

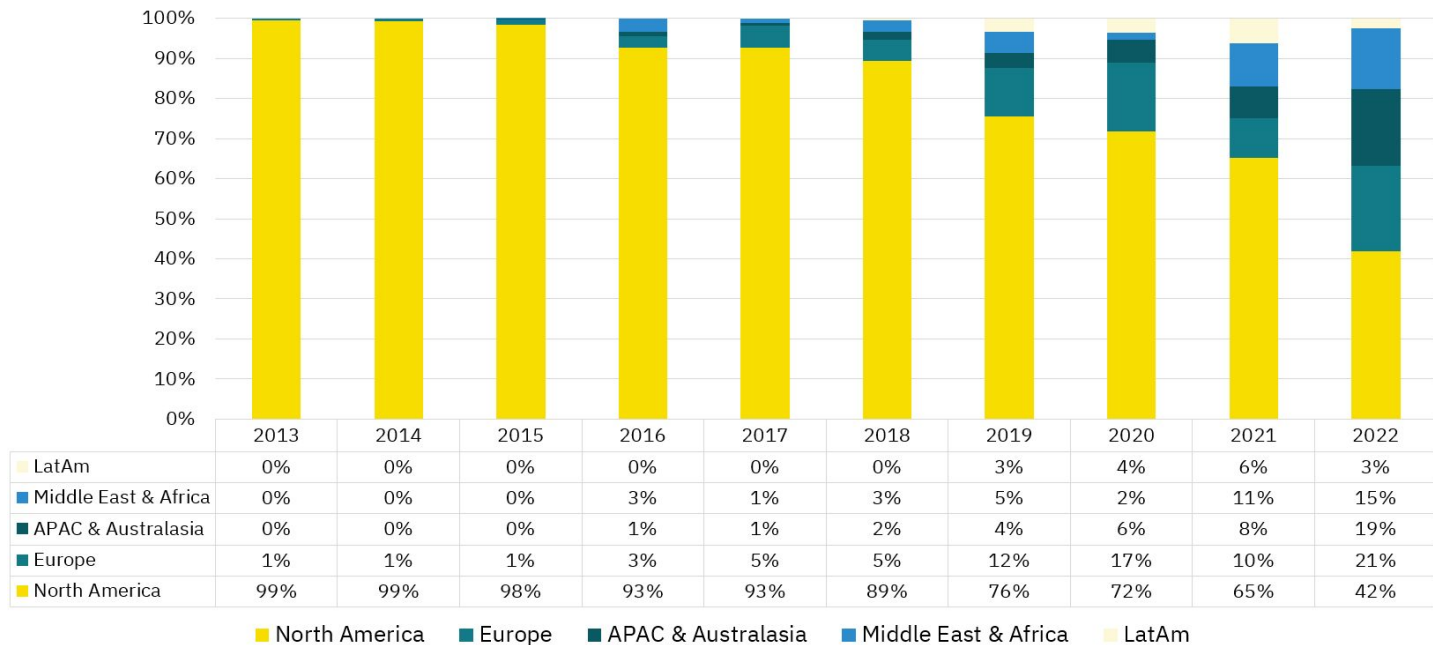
# Key drivers of the smart protein industry: the market will not solve these challenges on its own, without scientific and policy support

- To speed up the flywheel in India, we need to catalyze:
  - **Public, private, and philanthropic investment**
  - **Research and technological commercialisation**
    - **Talent development and incubation**
    - **Agricultural integration and value addition**
  - **Startup, manufacturer, and supplier scaling**
- All with a focus on **lower costs, improved nutrition and quality, and greater access**



# Investment distribution by region

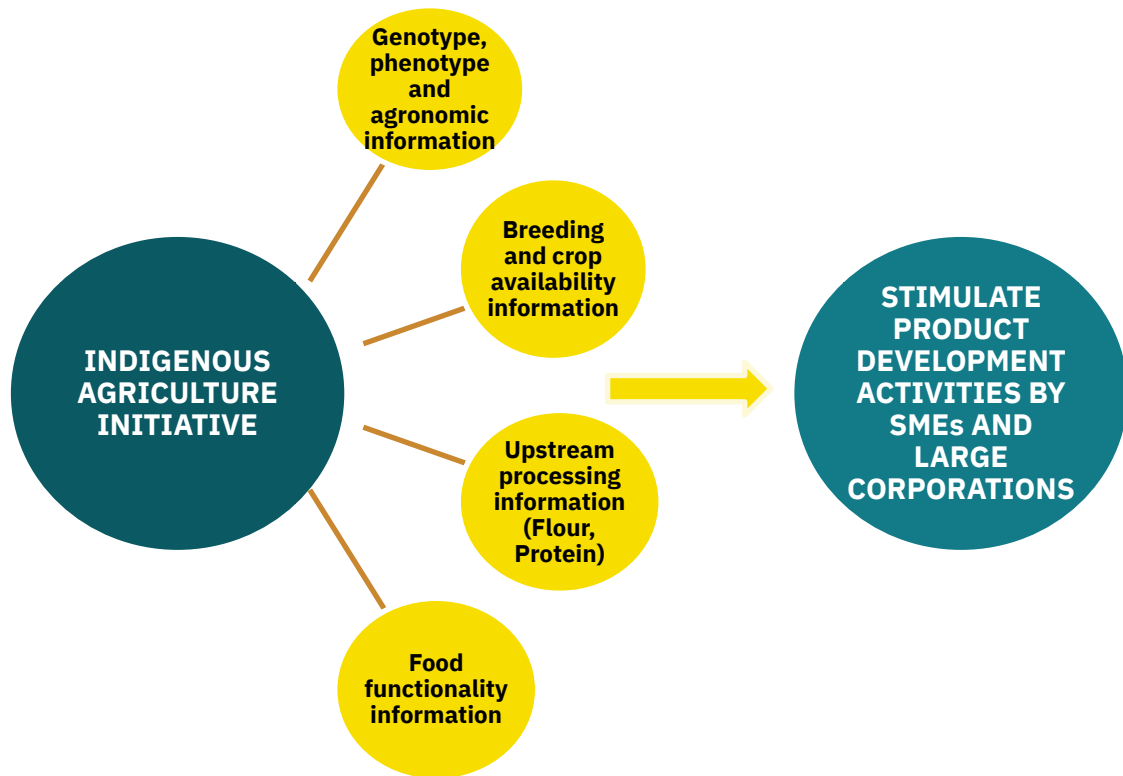
Alternative protein investment geographical distribution, 2013-2022



# Agriculture integration & value creation

Creating **robust R&D and value chains for crops to be viable raw materials** for plant-based foods, thereby diversifying the global inputs for the sector:

1. Working with other agricultural research and academic institutions like **ICAR-IIMR & CGIAR-ICRISAT** to improve the functionality of crops that serve as raw materials to smart protein products and other sustainable by-products (value creation)
2. GFI India's **Strategic Analysis** on building self-sustaining end-to-end **value chain for high-value seaweed ingredients**



# Industry & Infrastructure Development

**Private sector collaboration:**  
Smart Protein Industry Forum aligning key players across the industry including FICCI, CII, ABLE, and others, ready to work with government on major indicators and pillars of National Mission

**Regulatory path to market:**  
Building capacity to assess smart protein foods and technologies, particularly where novel foods assessment is required, with clarity and a fair path to market

**MoFPI, FSSAI, APEDA, Private industry (Smart Protein Industry Forum, FICCI, CII, ABLE, IPGA)**

**Ease of doing business:**  
Easing trade, taxation, and other barriers to scaling with critical support at the early stages of a sunrise sector

**Enabling scale:** Extending incentives for infrastructure investment, export manufacturing, value chain development, and procurement for food security programs



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