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TRACEABILITY IN THE AGRI-FOOD SYSTEM: A TRAVEL JOURNAL FOR WHAT YOU EAT?

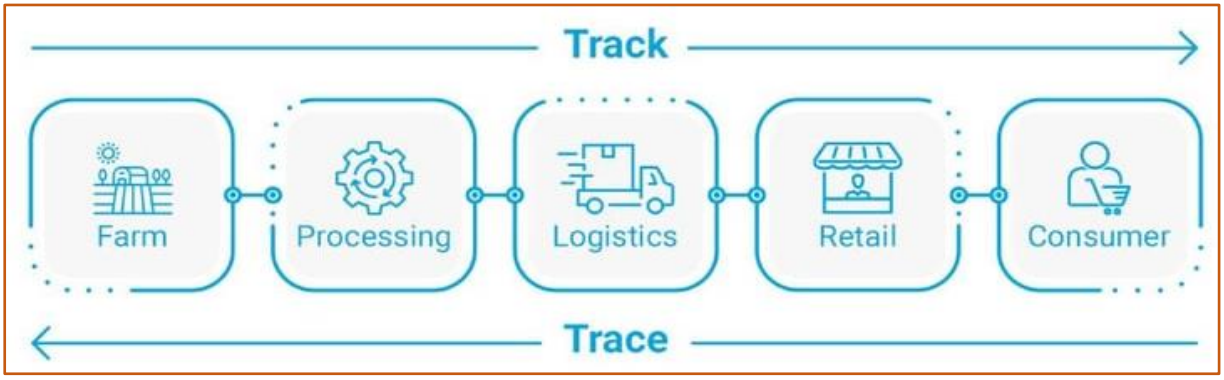
The globalization of supply chains, frequent foodborne disease outbreaks, and the emergence of informed consumers have placed food safety and traceability under a global spotlight, observe Vishal and Kalpana.

CONTEXT

Imagine purchasing a mango from your local market or a bag of rice from the supermarket. Have you ever wondered about their origins? Were they grown ethically? Are they free of harmful pesticides? Traceability in the agri-food chain refers to the ability to track and trace any food product or component through all stages of production, processing, and distribution. Think of it as a comprehensive "birth certificate" and "travel journal" for food.

In simple terms, agricultural traceability is a system that records and monitors the journey of food products from the field to the consumer. It includes every step—from planting seeds and raising livestock to harvesting, processing, packaging, storage, transportation, distribution, and final sale. This system relies on data collection at each stage, creating a transparent and accountable chain.

However, agri-food supply chains are complex, involving numerous actors—from small-scale farmers to distributors, retailers, and consumers. This complexity poses significant challenges to achieving farm-to-table traceability.



Components of food traceability

WHY IS TRACEABILITY SO CRUCIAL?

1. Transparency in What Consumers Eat:

Today's consumers are more aware and concerned about their health than ever. They want to know where their food comes from, how it was produced (organic, sustainable, fair trade, etc.), and whether it's safe and of high quality. Traceability offers this vital information, enabling informed decision-making.

2. Food Safety:

In a world increasingly vulnerable to food safety issues and adulteration, traceability becomes a crucial tool. Globally, an estimated 22% of food is adulterated annually. In India, the rate nearly doubled from 15% in 2012 to 28% in 2019. Traceability helps identify the source of contamination, enables prompt

recalls, and mitigates public health risks. It also assists in verifying product authenticity and preventing fraud and mislabelling.

3. Sustainable and Ethical Sourcing:
Traceability extends beyond safety and quality. It encompasses environmental and social dimensions, enabling businesses and consumers to ensure that products are ethically and sustainably sourced. For instance, it can reveal whether a product is deforestation-free, child-labour-free, or has minimal environmental impact.

4. Market Access and Trade:
Many countries and trading blocs have implemented strict traceability standards to ensure the safety, quality, and ethical compliance of imported food. For example, the EU mandates that imported seafood must be traceable back to the fishing vessel and landing site to combat illegal fishing. Without such traceability, Indian seafood exporters risk losing access to the EU market.

MANDATORY TRACEABILITY SPECIFICATIONS AND ACTS: A GLOBAL PERSPECTIVE

The rising importance of traceability is evident in the growing number of regulations and standards worldwide (see Box 1).

Box 1: Key Traceability Specifications and Acts

Regulation (EC) No. 178/2002:
The foundation of EU food safety regulation, mandating traceability "at all stages of production, processing, and distribution." Businesses must identify from whom they received and to whom they supplied food, ingredients, and food-producing animals.

U.S. Bioterrorism Act (2002) and FSMA (2011):
The Bioterrorism Act and the Food Safety Modernization Act (FSMA) enhance traceability in the U.S. FSMA, in particular, shifts focus from responding to outbreaks to preventing them, emphasizing improved record-keeping and preventive controls.

EU Deforestation Regulation (EUDR):
Effective from June 29, 2023 (with proposed enforcement delay to December 2025), the EUDR aims to reduce the EU's contribution to global deforestation. It mandates due diligence for certain commodities, including cocoa, soy, coffee, palm oil, and wood-based products.

TRACEABILITY IN INDIA: THE CURRENT LANDSCAPE

India has made progress in specific sectors, but significant challenges remain.

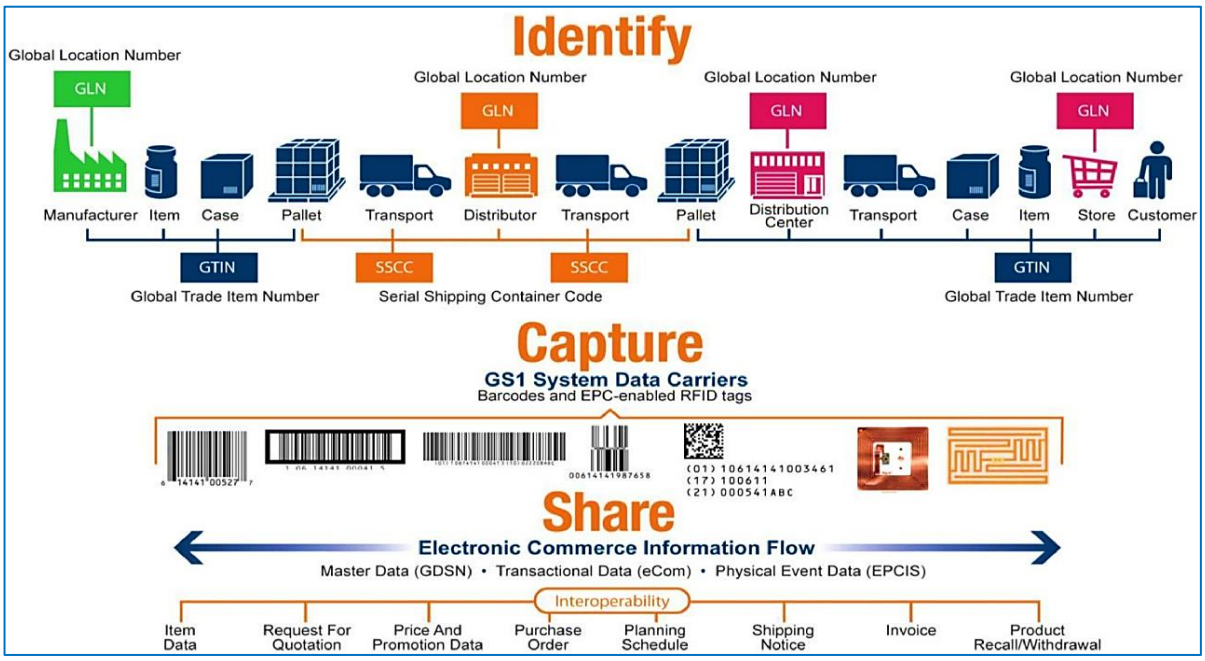
1. APEDA and GS1 India:
The Agricultural and Processed Food Products Export Development Authority (APEDA) collaborates with GS1 India to implement traceability using globally accepted standards like GTIN, GLN, and SSCC. These are applied in products like grapes and other horticultural items.

2. Food Safety and Standards Authority of India (FSSAI):
While comprehensive traceability isn't yet mandatory, FSSAI promotes traceability indirectly. For instance, the Food Safety and Standards Regulations (2011) require food businesses to maintain records. In the Food Fortification initiative, traceability helps ensure nutrients (e.g., iron, vitamin D) are added correctly and safely.

3. National Programme for Organic Production (NPOP):
Supervised by APEDA, NPOP includes traceability through mandatory record-keeping, batch coding, transaction certificates, and rigorous certification processes to maintain organic integrity.

4. Private Sector Contributions:

Private companies like TRST01, TraceX Technologies, SourceTrace, Cropin, Trace Agtech, and AGRIVI are adopting technologies such as blockchain to boost transparency and efficiency in agri-food supply chains.



GS1 standard for traceability

CHALLENGES IN INDIA'S TRACEABILITY ECOSYSTEM

Despite momentum, India faces multiple hurdles:

- **Fragmented Land Holdings:** Small farms and complex supply chains make implementation difficult and costly.
- **Infrastructure Gaps:** Limited internet, electricity, and cold-chain facilities in rural areas hamper digital traceability.
- **Lack of Awareness:** Many farmers and small businesses are unaware of traceability's benefits or lack the skills to implement it.
- **High Costs:** Advanced systems can be prohibitively expensive for smallholders and SMEs. Scalable, cost-effective solutions are needed.
- **Data Privacy Concerns:** Secure data collection and management protocols must be put in place.
- **Absence of a National Framework:** Fragmented initiatives lead to inconsistencies and poor interoperability.

ROLE OF EXTENSION AND ADVISORY SERVICES

Extension services from state Departments of Agriculture, ICAR-KVKs, State Agricultural Universities, agribusinesses, FPOs, NGOs, and Agri-Incubation Centres can play a pivotal role in promoting traceability. Their contributions include:

- **Awareness Generation:** Educating stakeholders about traceability's benefits.
- **Capacity Building:** Training on record-keeping and digital tools.
- **Facilitating Partnerships:** Linking farmers with tech providers.

- **Pilot Projects:** Demonstrating success stories.
- **Ongoing Support:** Troubleshooting and continuous engagement.

For example, KVKs can offer practical training, while state departments can spread awareness about government schemes. NGOs and private advisory services can offer export-specific expertise.

Box 2: Key Global Resources for Learning Traceability
GAP Training Manuals: Provide frameworks for implementing good agricultural practices.
FAO Resources: Extensive guides on food traceability, aquaculture, and sustainability.
BSR.org: Offers sustainability-focused traceability guidance.

CONCLUSION

Traceability is no longer optional—it's essential for India's evolution into a global agricultural leader. Although challenges remain, the path has been charted. Increasing awareness, policy attention, private investment, and tech innovation all signal progress.

Global regulations like the EUDR are not mere challenges—they're opportunities. By investing in traceability, India can meet international demands, gain economic advantages, and foster sustainable agricultural growth.

This transformation requires coordinated action across multiple stakeholders. The government must focus on developing the necessary infrastructure and establishing a national framework to support traceability. The private sector should integrate traceability into its core business practices, ensuring transparency and compliance throughout the supply chain. Farmer Producer Organizations (FPOs) can play a critical role by supporting farmers with training and helping them meet traceability requirements. Technology providers need to offer affordable and scalable solutions tailored to the needs of smallholders. Research institutions should drive innovation and validate technologies that are practical and effective in the Indian context. Consumers, too, have an important role to play by demanding transparency and holding the food system accountable. Finally, extension services must facilitate the flow of knowledge and foster engagement among all stakeholders. Only through such a collaborative and integrated approach can India fully harness the transformative potential of traceability in its agri-food system.

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