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## AGRI-FOOD SUPPLY CHAIN (AFSC) NETWORK-OPERATIONAL STRATEGIES

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### Abstract

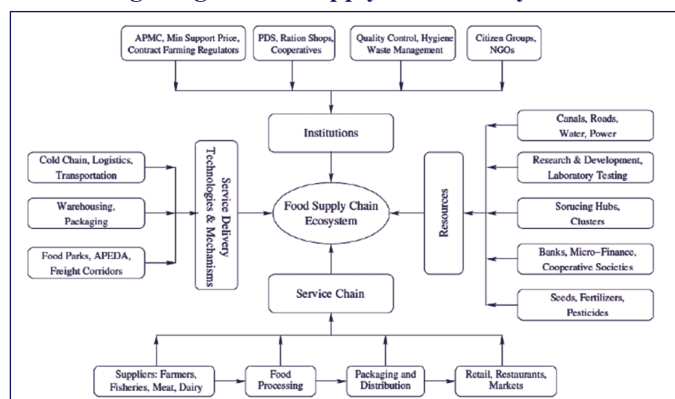
*In the era of globalization, cross-border trade opportunities, interdependence of national economies, production of highly value-added and customized products, accessibility of goods, services and technology across all industries including the agri-food sector stands escalated. Hence, efficient Agri-Food Supply Chain Network (AFSCN) has become imperative. Individual Suppliers, Producers and Marketers in the supply chain co-ordinate their value creating activities with one another, create greater value than they could by operating independently. AFSCs create synergies in any of the one way:*

- (i) *Expand traditional market beyond their original boundaries (increased sales volume)*
- (ii) *Reduce the delivered cost of products (Increased gross margin)*
- (iii) *Target specific market segments with specific products (Increased consumer perception of delivered value)*

### 1. INTRODUCTION

Today's information-driven, integrated supply chains are enabling organizations to reduce inventory and costs, add product value, extend resources, accelerate time to market, and retain customers. The real measure of success is how well activities coordinate across the supply chain to create value for consumers, while increasing the profitability of every link in the supply chain. Supply chain management is the integrated process of producing value for the end user or ultimate consumer. To minimize the complexity of supplier selection and collaboration (time, cost and risk associated with quality), innovative supply chain management solutions connecting growers to customers while maintaining transparency at all level has become the necessity. Agri-Food Supply Chain (AFSC) is a network of activities involving production, processing, distribution and consumption and highly dependent on the partners (actors), supporting services and infrastructure. It is an essential component of the global value system of organizations and people engaged in the movement of products and services. From production, food products flow via a series of actors or activities in processing, distribution, retailing and consumption. Actors or activities can interact with each other at any stage of the chain.

**Fig. 1 Agri-Food Supply Chain Ecosystem**

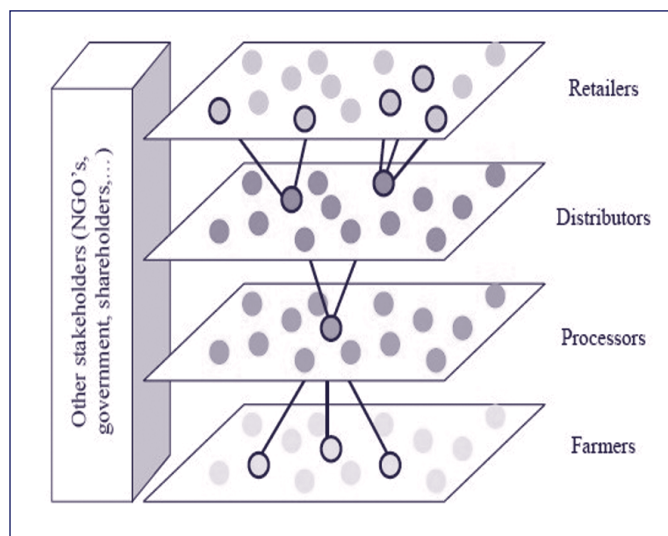


### 2. ACTORS IN AGRI-FOOD SUPPLY CHAIN NETWORK AND THEIR CHARACTERISTICS

The major actors of AFSCN are listed below:

- Producers
- Processors and Manufacturers:
- Distributors and Trade
- Retailers and Food Service
- Consumers
- Infrastructure and Services and Other Necessary Components

Agri-food supply chains are two types such as Agri-food chain for fresh agricultural products (fresh vegetables, flowers, fruits etc) and Agri-food chain for processed food products (portioned meats, snacks, juices, desserts, canned food products etc.). Participants in both are farmers/producers, traders, processors, retailers etc. Inadequate action of one participant may impact the quality leading to customer dissatisfaction.



*Schematic diagram of a supply chain from the perspective of the processor (bold flows) within the total FSCN (based on Lazzarini et al. 2001)*

3. AFSCN COMMON PROBLEMS

Production	Supply Chain	Processing	Marketing
<ul style="list-style-type: none"> <li>• Poor extension</li> <li>• Quality inputs</li> <li>• Low productivity</li> <li>• Deficient and inefficient production management</li> <li>• Non demand linked production</li> <li>• Improper Post-Harvest management resulting in poor quality</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of storage</li> <li>• Poor transportation</li> <li>• High wastages</li> <li>• Multiple intermediaries</li> <li>• Fresh produce transported to Mandis in open baskets or gunny bags stacked one on top of the other</li> <li>• Cold chain absent or broken, produce deteriorates rapidly</li> <li>• Food safety is major concern: Hygiene and pesticide MRL not monitored</li> </ul>	<ul style="list-style-type: none"> <li>• Low Processing</li> <li>• Lack of Quality</li> <li>• Poor Returns</li> <li>• Low Capacity Utilization</li> </ul>	<ul style="list-style-type: none"> <li>• Poor Infrastructure</li> <li>• Lack of Grading</li> <li>• No Linkages</li> <li>• Non- Transparency in prices</li> <li>• Long delays from producer to retailer</li> </ul>
<p>* Each segment working in an isolated manner resulting in multiple losses across the value chain</p>			

4. NOTABLE CASES OF AFSCN IN INDIA

The companies who have been following the AFSCN are as follows:

- PepsiCo
- Fritolay
- Mahindra Shubhlabh
- ITC e-Chaupal.
- SAFAL
- The Milk Supply Chain NDDDB (Anand) Model
- SAUGUNA Poultry (Vertical Integration)
- Fish and Egg Supply Chain Network (Andhra Pradesh to Assam)

5. CHALLENGES FACED BY AFSCN

The challenges faced by AFSCN are manifold. The major challenges are that the most urban companies tend to see farmers as 'buyer' rather than a supplier, a huge gap in the marketing structures in the forward and reverse chains. Most organized logistics players avoid the F&V segment owing to risks and complexities such as highly fragmented growers. Lack of good roads to connect the farms to nearest collection points, lack of standardization, and high volatility in pricing and quality are to be considered. Availability of uninterrupted power supply to cold storages/Cold rooms still remains one of the major tasks.

6. IMPACT OF THE OUTBREAK OF THE PANDEMIC

The impact of COVID on AFSCN is as follows:

- Critically affected economic & technological structure of organizations and disrupted the lives globally.

- The AFSCs (linking the operations of food production with 'farm to fork' or 'farm to plate'), the agri-farming, food processing and the allied food sectors were not exception.
- Caused vast uncertainties in demand and disrupted the agri-food sector throwing a big challenge to keep AFSCs safe and secure.
- Stressed the agricultural processes deprived of labour, affected the manufacturing & hoarding of food items (causing bullwhip effects as well as the fragility of supply chains contributing to the overall economy in unforeseen ways.
- Transportation restrictions further resulted in an increased level of food wastage due to delays in food supply chains, particularly perishables.

7. WAY AHEAD MULTI-PRONGED STRATEGIES

i. Business Process Must Lead:

- Rapid configuration approach using dynamic modeling and component repositories
- Based on Business Process Management (BPM) and Service Oriented Architecture (SOA)
- Alignment of and interdependency between all integration types and levels.

ii. Business itself to lead and out rightly be responsible:

- Human and organizational change
- Commitment and vision at both 'CEO-level' and 'workers level'

iii. Sector Specific Models with enough room for modifications:

- Based on cross-industry models/standards (e.g., OpenGIS,

ebXML, XBRL)

- Standards organizations.
- AFSCN needs to be process-driven on shared integrated information network. It will not only integrate the product flow in the pipeline but also develop into a seamless two way dynamic chain of attributes flow and product improvement specs.

## 8. DISRUPTED AFSCN -KEY STRATEGIES

- **Develop Supply Chain Flexibility** - Companies need to incorporate readiness and speed with the supply chain by making smaller scale supply chains; limited, decentralized, deft 'little working models', with adaptable supplier agreements and associations with assembling nearer to the point of procurement. Need to investigate techniques to 'purchase where they make, and make where they sell.'
- **Smart Procurement/E-Commerce:** To enable organizations comprehend sourcing requirements, advance machine learning can be utilized depending on past purchases, pricing, agro and modern patterns, among others.
- **Supply chain automation and analytics:** By using end-to-end data management techniques that take the form of an information warehouse of sorts' manufacturers can capture transactions linked to the supply chain more accurately, consistency, and with minimum repetition. This would help organizations to gain market insights, assess supplier

performance, help in supply chain diagnostics & risk management.

- **Risk management of suppliers:** Risk management at entire level of suppliers can help in deciding on cost structures, trend performance data, and enhance supply chain visibility into the extended value chain. Would also assist in avoiding abrupt supply chain disruptions and dealing with lack of information.
- **Supply chain simulation:** By developing new supply chain strategies based on changes in the business/operating model, firms can approve and distinguish the best cost-efficient network to accomplish the necessary service level across the value chain.

## 9. KEY FOCUS AREAS

- Unorganized sector holds the key
- Need a Holistic Approach
- Standardization
- Demand Driven Approach
- Bottoms up Approach
- Incremental Value Addition
- Voice as the killer application in ICT
- Inclusion of more educated and fresh blood into Agri-Business
- Effectiveness will push Agriculture Development.

*N.B: This article is based on the talk given by the author in one the webinar organised by IIIE Odisha Chapter*