

Rural Supply Chain Networks: The Future

The author, N Viswanadham, Executive Director of Centre for Global Logistics and Manufacturing Strategies (GLAMS) at the ISB, and a Clinical Professor in Operations, explains that the future belongs to the rural supply chain networks, and India has the opportunity to become a leading global food supplier.

Rural supply chains are the next big issue for researchers and businesses in India and China. The reasons are simple: the urban areas are congested with deteriorating quality of life and saturated markets. Nearly 60 per cent of India's population live in rural areas, and forecasts indicate that these numbers will remain the same, even in 2050. There would be 800 million people living in Indian rural areas in the 2040-'50s, providing the scale and the markets for commodity supply chains to thrive. Thus, there is a need for transforming rural India into a group of sophisticated vibrant activity centres. Innovations in every layer – products, processes, business models, and service models – are fundamental for this transformation process to happen. Businesses need to be reinvented with high technology tools that can provide employment and services for millions of rural dwellers at an affordable cost. In this article, we provide an integrated framework, and also a glimpse of those technologies and models that might work in rural scenarios.

Introduction

What is 'global,' 'urban,' and 'rural?' The difference between urban centres and rural areas may seem so obvious. The criteria used include population size and density, and availability of services such as communication, education, healthcare and

finance. Different population thresholds are used for different countries: for African nations, it is 5,000 inhabitants, while for Latin American and European nations, it is 2,000 or 2,500, or even less. A large proportion of settlements classified as 'rural' in China and India would fall within the 'urban' category, if these population thresholds are adopted. Investments in services and infrastructure tend to concentrate on urban areas. MNCs choose cities with good logistics and IT, educational and financial infrastructure, and power and water facilities for FDI. As a consequence, investments for betterment of rural areas are generally done by governments. Thus, rural supply chains dealing with agro-products, handicrafts, toys, textiles and apparels emanate from villages and small towns with not so sophisticated infrastructure and lifestyles. The rural areas host the tail-end of very important food and apparel supply chain networks, whether they are rural, urban or global. Global supply chains cross countries and can originate either in urban or rural areas, depending on the product. For example, American and European retailers source fruits, vegetables, meat, leather and apparel products from rural areas in low-cost countries.

Also, supply chains migrate from local to global, urban to rural, and vice-versa. The first wave of supermarket revolution occurred extremely fast in urban areas,



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with high sales growth rates. The second wave starts with diffusion into second-tier areas and the third wave starts when super markets move in to rural areas. Rural retailing is portrayed as the next sunrise segment in retailing space.

Strategies and development initiatives have been implemented all across the world to alleviate rural areas from these afflictions by formulating revenue generating programmes. For example, in the US, agricultural prospects of different regions have been identified and a cluster mechanism has been adopted. In South Africa, policy measures have been taken to alleviate the Negro community by providing agricultural lands on grant basis. In Thailand and Japan, the concept of “One Village One Product” has evolved, which improved the prosperity of rural communities in these countries. The model of Grameen Banks in Bangladesh gave birth to the concept of “Micro-credit.” In India, there were several public and private sector initiatives in the areas of agriculture, aquaculture, and also for supplying farm inputs to the farmers. For example, the *Bharat Nirman* project, with an allocation of Rs. 1.76 trillion aims to build roads, provide electricity to 100,000 villages, extend irrigation to 10 million hectares, or 24.7 million acres, and build 6 million houses by 2009. Across the country, companies like HLL, Godrej Aadhara, DCM Hariyali Kisaan Bazaar, Triveni Khushhali, ITC Sagar Choupal and Tata Kisan Sansar are helping farmers earn a better livelihood.

The Indian rural areas host two kinds of supply chains: food products and apparel; and furniture, leather items and toys. In agri-business sector, the food processing industry is small and factories are located nearer to demand centres, i.e., in big cities or their outskirts. Integrating the agri-business and SME sectors into the global value chain is high priority item for India for the following reasons:

- India has 12.4 million SMEs, contributes 7 per cent of GDP, 35 per cent of exports, over 29.5 million employed.
- In India, 51 per cent is cultivable land. India is ranked in the top-five list in many agricultural produce like vegetables, fruits, milk, animal husbandry, etc. But the revenue generated from these resources does not match its optimal potential. With growing importance for processed foods, the food processing industry in India still remains at 1.6 per cent, while in countries like Thailand and Brazil, it is 65-75 per cent. The wastage that goes into the agri-produce is almost 30 per cent.
- Retail in India is another vibrant story that is least saturated with global markets. Currently there are 12 million retail outlets employing 21 million (7 per cent of total work force) people, and these provide no entry barriers for big players. Organised retail segment in India is small now, but has tremendous market size in urban and rural areas.

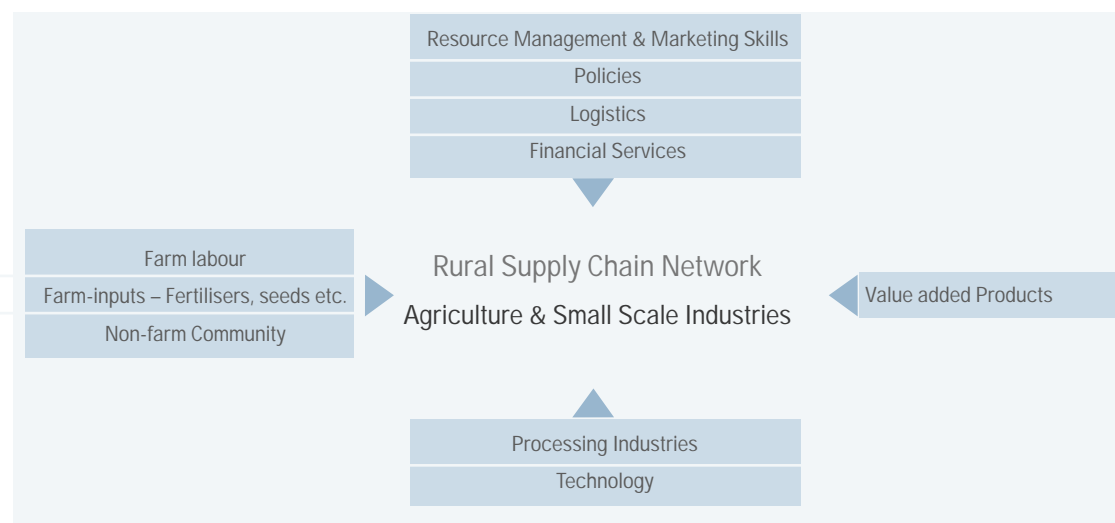
Thus, the priority in India today is to

develop its local rural and urban supply chains and integrate them into the global value stream.

The Rural Supply Chain Network

Figure 1 presents an Input-Output representation of a rural supply chain. An integrated rural supply chain network (IRSN) (see Figure 2) is a group of independent companies, often located in different regions, forming a strategic alliance with the common goal of designing, manufacturing, and delivering right-quality products and services to customer groups, faster than others. They compete with similar cooperating networks. The IRSN is an integration of three different well-designed sub-networks for handling transfer of goods, information and funds: a logistics network, an information technology network and a financial network. The logistics network provides a streamlined material flow among all partners, cutting down lead time and cost of moving raw materials, sub-assemblies, and finished goods to their destinations. An extranet – a secure and reliable communications network linking all companies of the enterprise – provides information integration enabling efficient logistics and effective decision-making. There is also a secure financial network that connects financing, insurance and credit-rating agencies, and all other stakeholders and financial institutions. Thus, we see that the eco-system that enables an agile rural supply chain has players from farming,

Figure 1: Input-Output Representation of Rural Supply Chain Network



“We need to reinvent rural supply chain networks using high technologies, keeping in mind the inefficiencies and constraints imposed by the infrastructure and economic environment.”



Rural Supply Chain – Flow of Goods

manufacturing, retailing, financing and finally from the customers. This is an ideal rural supply-demand-financial chain and the current state of the Indian rural chains is far from it.

Currently in India, there are attempts to connect stakeholder’s information networks through messaging, wireless phones, Internet kiosks, etc., but these attempts are for supply of information rather than for efficient control of the supply chain or for supply-demand matching. The logistics network is the one that is often blamed for bad roads, lack of cold chain, manual handling, slow transport such as bullock-carts or tractors. Rural financial networks exist with the support of organisations such as the World Bank. The aim of rural supply chain in India is to reach the ideal described above, using Internet and other technologies, to create agility in networks.

The rural supply chain stakeholders and researchers can learn from the well-developed industrial goods supply chains. The idea is to transform the way agriculture works and create a business orientation among farming community.

Reinventing the Rural Supply Chain

We need to reinvent rural supply chain networks using high technologies, keeping in mind the inefficiencies and constraints imposed by the infrastructure and

economic environment. To do this, we have identified two value-delivery processes in the food supply chain for re-engineering: the production and sale of commodities by farmers, and rural retail network. First, we present a decomposition of rural food supply chain into its component value-delivery processes.

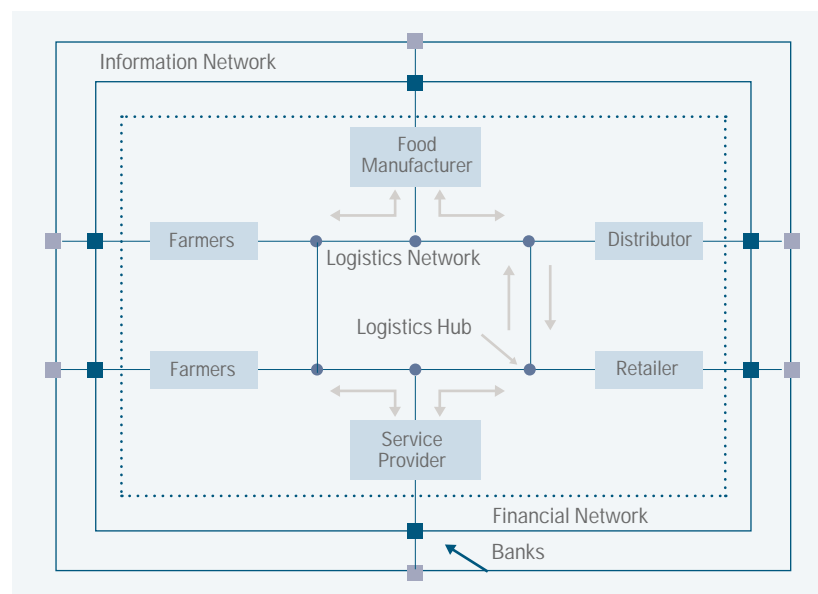
Value Delivery Processes in the IRSN:

Operationally, the IRSN has four core value-delivery processes. It is important that all four processes are managed to work in harmony for the entire supply chain to be competitive. The core business processes in a rural production organisation are as follows:

- Procurement (procurement of farm-inputs, procurement of fresh produce)
- Production of basic agriculture products (farming and non-farming)
- Processing (processing of fresh produce – grains, fruits, vegetables)
- Retailing (rural and urban retailing)

The support processes assisting the above core business processes can be identified as follows: technology, transportation including cold-chain, mobile communications technology, knowledge processes – pre-harvesting and post-harvesting techniques, handling, packaging, and processing techniques, resource management and marketing, and finally financial services.

Figure 2 : Integrated Rural Supply Chain Network



Production of Basic Agriculture Products (Farming): A New Model

The ISB Kisanbandhu (IKB) model has been developed by the faculty of Centre for Global Logistics and Manufacturing Strategies (GLAMS). A proof of concept experiment and also a total supply chain design study are currently underway at the Centre. The primary function of IKB is to enable farmers to sell their produce at a fair price. It consists of a cyber intermediary (information and business exchange), a commodity exchange, and logistics provider, quality grading teams, finance and insurance agencies. The cyber intermediary maintains an updated database of registered farmers, logistics providers, brokers, retailers, mandi managers, food manufacturers and exporters. It also has real-time market information, commodity exchanges information trading different goods, and other marketing information useful to the farmer. The IKB is a sophisticated exchange, with natural language processing capabilities, and farmer can deal directly using his cell phone and transact in his native language. The farmer can get feedback on processing of the transaction on TV channel at prescribed timings. The IKB can also be used for procurement of inputs for farming.

Rural Retailing

In India, rural retailing can get support from omnipresent post office. The rural retail group places an order with the call centre via post office, which communicates the order to the State Distribution Centre (SDC). The SDC will pass on the details of the order to the district/local distributor located near the village. Depending upon the type of order, goods can be delivered. All consumer durables can be delivered by post office mobile vans. Perishable and FMCG goods can be delivered by road transport to the post office, who can distribute it to the village retail group. The payment for goods will be handled by post office. Thus, IT enabling the post office, which is both a delivery channel, as well as bank, will provide much needed supply chain visibility in rural supply chain networks, in general, and retail networks, in particular.

Small Scale Industries in Rural Areas

There are several garment manufacturing and export centres – Ludhiana, Tiruppur, Bangalore, Mumbai, Chennai, Jaipur and Delhi – exporting to USA, UAE, UK, Germany, France and other EU countries. Major competitors are China, Bangladesh, Indonesia, Sri Lanka, Pakistan and other Southeast Asian countries.

There is a huge opportunity – both in exports and domestic markets – for textile SMEs in Punjab, provided there is attention to supply chain aspects like knowledge and information, services like logistics and finance, and resource management. The Orchestrator model (figure 3) is a widely popular model, based on the supply chain practice of several MNCs, with a strong hold in the businesses of export sourcing, distribution and retailing. In the above model, groups of SMEs, with competencies in several production activities, necessary for manufacture of garments, fabrics, etc., partner and coordinate with the product cycle. The supply and demand sides are bridged by an orchestrator, who will pool the customer requirements and monitor production activity, ensuring that there is appropriate matching between market needs and supply.

Conclusions

The future belongs to rural supply chains. With more than four billion people living in rural areas, there is a tremendous need to focus attention on issues of product designs, production, marketing and retail of food, and other electric and communication items in rural areas at affordable prices. India has a huge opportunity to become a leading global food supplier, as well as global garment suppliers, if correct strategies are put in place and encouraged.

Figure 3: Orchestrator Business Model

