Transformation of Agribusiness and Food Value Chains in India: Investment, Models and Challenges

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1. Introduction

Agro processing industries and agribusinesses have been growing at a fast pace in India in the recent years. Agro-industries have been given high priority by the government due to their significant potential for bringing value addition to agricultural output, and enhancing small farmer incomes and rural employment. The priority can be traced to the vision of the father of the nation, Mahatma Gandhi, who as early as 1920's, saw village-based agro-industries as extremely important for India's development and the independence movement, see Table 1. Even today agro-industries are given substantial importance (India, Planning Commission 2008) due to various national priorities including enhancing value-addition to agricultural output, rural employment and incomes, food availability, and alleviating hunger and poverty. The sector, however, faces numerous difficulties including sourcing of quality raw materials, rural market imperfections, supply-chain inefficiencies, financial constraints, and product marketing challenges (Srivastava and Patel, 1989; Goyal, 1994; CII-Mckinsey, 1997; Gandhi, Kumar and Marsh, 2001).

2. Phases of Development

The development of agro-industries has gone through three important phases in India shown in Table 1. The first phase was Mahatma Gandhi's village-based agro-industries approach, founded mainly on a strong social and political ideology (Goyal, 1994). This "*swadeshi*" concept saw a significant role of agro-industries in connecting the rural masses (90 percent of the population at that time) to the mainstream of the Indian economy as well as the independence movement. It also sought to reduce the dependence on imports from Britain. After playing a major role, it later failed mainly because it became a blanket basis for nationalists to favour such industries over modern industry despite less efficient techniques of production, and incompatibility with market demand (Gandhi and Jain 2011).

In the second phase, spanning from India's independence to the early 1980s, the policy was largely dominated by the ideas of Prime Minister Nehru and his central planner Mahanalobis, who argued that India must give high priority to the capital goods sector consisting of large-scale public industries, while the consumer goods sector should be confined to small-scale and agro/rural industries which required less capital and more labour. Regulations and policies were accordingly designed and this was consistent with acute scarcity of capital at that time, and the need to increase employment. However, such small-scale industries, due to their limited scale and inefficient technologies, were unable to meet the mounting demand for quality consumer goods as population grew rapidly and incomes increased, making India a country of shortages, and also one that lacked competitiveness in industry.

Table 1: Phases of Development of Agro-Processing and Agribusiness in India		
Phases	Features	Shortcomings
Pre-Independence: Mahatma Gandhi- *Swadeshi* Phase - upto 1947/1950	• Encourage the use of own rural output • Discourage imports • Generate rural employment and incomes, • Connect and uplift rural masses to mainstream of economy, independence movement • Fight against colonial rule	• Less efficient techniques of production • Incompatibility with market demand • Basis for opposing modern industry
After-Independence: Nehru-Mahanalobis Phase: 1950-1984	• Industrialization strategy • Capital goods reserved for large scale public industries • Consumer goods reserved for agroindustries/ small scale • Logic of acute capital scarcity – agro/ small scale industries need less capital • Agro/ small scale labour intensive, generate more employment	• Limited scale • Inefficient technologies • Inability to meet mounting demand for quality goods of growing population with rising incomes • Supply shortages and lack of competitiveness
Modernization Phase: 1984-onwards (mainly 1991- onwards)	• Economic liberalization • Focus on efficiency – modernization, competitiveness • Attract foreign investment • Focus on quality – use best technology • Focus on meeting consumer demand	• Large scale • Private, capital-intensive • Weak value chain linkages with rural areas and small farmers • Low contribution to rural employment • Weak development linkage - for which agro-industries were given priority

This forced the third phase from the mid 1980s and particularly after economic liberalization in early 1990s, in which the emphasis shifted to modernization, deregulation and opening out to competition. The industry transformed towards better technology, meeting market demand for quality and quantity, efficient management and competitiveness. However, this trend is often seen to lead towards large, private, capital-intensive enterprises often with weak value chain linkages with rural areas and small farmers. The result is a negative outcome for rural employment, and a weakening of the development linkage for which agro-industries have been given high priority in the first place in India.

3. Features of Agro-processing Agribusinesses in India

Data from the Annual Survey of Industries (India Ministry of Planning, 2013*)* shows that 37 percent of all factories in India are agro-industries that contribute 18 percent of

the manufacturing value added and 37 percent of manufacturing industry employment (in addition, substantial employment is generated in agriculture). These figures indicate that agro-industries contribute substantially to both employment and manufacturing GDP, substantiating the national priority given to it in India (Table 2).

Table 2: Some features of the agro-industry sector in India			
Industries	**Percentage share**		
	No. of factories	*Employment*	*Net value added*
Agro-based food industries	19.0	12.5	8.4
Agro-based non-food industries	18.3	24.04	9.4
Total agro-based industries	37.3	36.54	17.8
Other (non-agro) industries	62.7	63.46	82.2
All industries	100.00	100.00	100.00

Source: India Ministry of Planning (2013), Annual Survey of industries 2011-2012

Table 3 shows the structural and financial characteristics of agro-industries in India. It shows that only 16 percent of total industrial fixed capital is invested in agro-industries, but the sector contributes 37 of the industrial employment (Table 3). Agro-industries generate employment for 38 persons per given unit of fixed investment compared to 13 persons for other industries. This does not include the substantial employment generated in production agriculture and the supply chain. Thus with less capital, agro-industries generates substantially more employment. The share of working capital is greater for agro-industries. The share labour wages in total value added is also greater at 35 percent in agro-industries, compared with 24 percent in other industries. These features indicate that these agribusinesses still largely deserve the priority given to them in the national strategy for development and employment.

Table 3: Some structural features of agro-industries vs other industries in India						
Description	Share of fixed capital (percent)	Total persons employed per factory	Fixed capital per factory (Rs. million)	Employment to fixed capital ratio (*per Rs. 222100 000*)	Emolu-ments-wages as a percent of net value added	Percentage of working capital to invested capital
Agro-based food industries	7.8	56.3	31.0	33.6	29.9	52.4
Agro-based non-food industries	8.6	98.8	35.7	40.6	37.6	39.0
Total agro-based industries	16.4	78.6	33.3	38.2	34.9	46.2
Other (non-agro) industries	83.6	71.9	101.3	12.8	23.9	29.4
All industries	100.0	74.2	75.9	17.6	26.0	32.9

Source: India, Ministry of Planning (2013), Annual Survey of industries 2011-2012

CII-McKinsey (1997) indicted that there is tremendous scope and potential for development of food processing industries and agribusiness in India. However, there are numerous constraints to its growth and development. These have been brought out by Boer and Pandey (1997), Gulati *et al.* (1994), Kejriwal (1989) and Srivastava and

Patel (1989), Gandhi and Jain (2012), Gandhi, Kumar and Marsh (2001). These include the following:

- Raw material supply constraints
  - Poor quality, inappropriate varieties, residues
  - Short period of availability - seasonality
  - Small producers, scattered supplies, perishability
  - Competing markets – large market for fresh
- Constraints in processing
  - Old technology – poor efficiency, quality
  - Poor capacity utilization due to seasonality
  - Unsuitable for export or high value markets
- Constraints in Marketing
  - Limited market size/ nascent markets, changing customer preferences
  - High product and brand development costs
  - Long inefficient supply chains, small retail stores
- Financial Constraints
  - Requires more working capital
    - hard to get, higher interest rates
  - High investment requirements for latest technology
- Government Policy
  - Processed/ packaged foods considered luxuries
    - taxed heavily - affects the economics
  - Many special regulations – e.g. MPO
  - Squeeze between input price support and output price control
  - Ad hoc export and import controls

4. Challenges and Models for Agro-Processing Industries and Agribusinesses

The challenges and complexities arising from all these constraints faced by the sector, as well as its peculiarities such as variability, seasonality and perishability, and the need to meet different conflicting goals such as profitability and development, raises the need for innovative approaches and institutional models for the organization of agribusiness activity in India (see Gandhi and Jain 2011, and Gandhi, Kumar and Marsh 2001).

Based on the literature and the experiences in India, a set of key success factors have been identified which appear critical for sustainable success of integrated agribusiness enterprises and the sector in India. These are:

1) Strong procurement system: The produce is generally cheapest at the farm level. The success in reaching large numbers of small farmers and organizing production and procurement from them (direct sourcing) keeping transaction costs low is critical, with further advantages of obtaining the right quality, and achieving economic competitiveness, with high impact on rural incomes and employment.

2) Transforming agricultural technology and practice: The ability to transform farming by bringing adoption of new technology/ practices by the farmers plays a major role in the production of abundant quantity and required quality

of raw material at a reasonable cost, also creating the win-win of raising farmer incomes.

3) Capital resources and investment in the best processing technology and operation: The ability to invest in state-of-the-art processing and handling technology to deliver high quality food/agro products, meeting its high fixed and working capital needs given the characteristics of perishability, variability and seasonality, is very important.

4) Delivering a strong marketing effort: The ability to deliver a strong marketing effort to reach large numbers of consumers with perpetual need, address consumer preferences, create and open nascent markets especially for processed foods and compete with traditional systems, and competitors.

5) Share benefits across the chain: Sharing benefits or profits across the often long food value chain is found critical for sustaining success. Building a strong committed value chain which consistently delivers benefits and performance across all stakeholders including farmers, supply-chain members, investors, consumers and the economy is important. This often requires appropriate representative management, control, ownership and institutional structures.

These features can be used to examine alternative models and approaches. They may seem a tall order. But a number of successful agribusiness models have emerged in India which meet many of these conditions and show their relevance and the way. The models are examined and broadly evaluated below to derive lessons for food value chains and agribusiness development.

4.1 The AMUL Cooperative Model

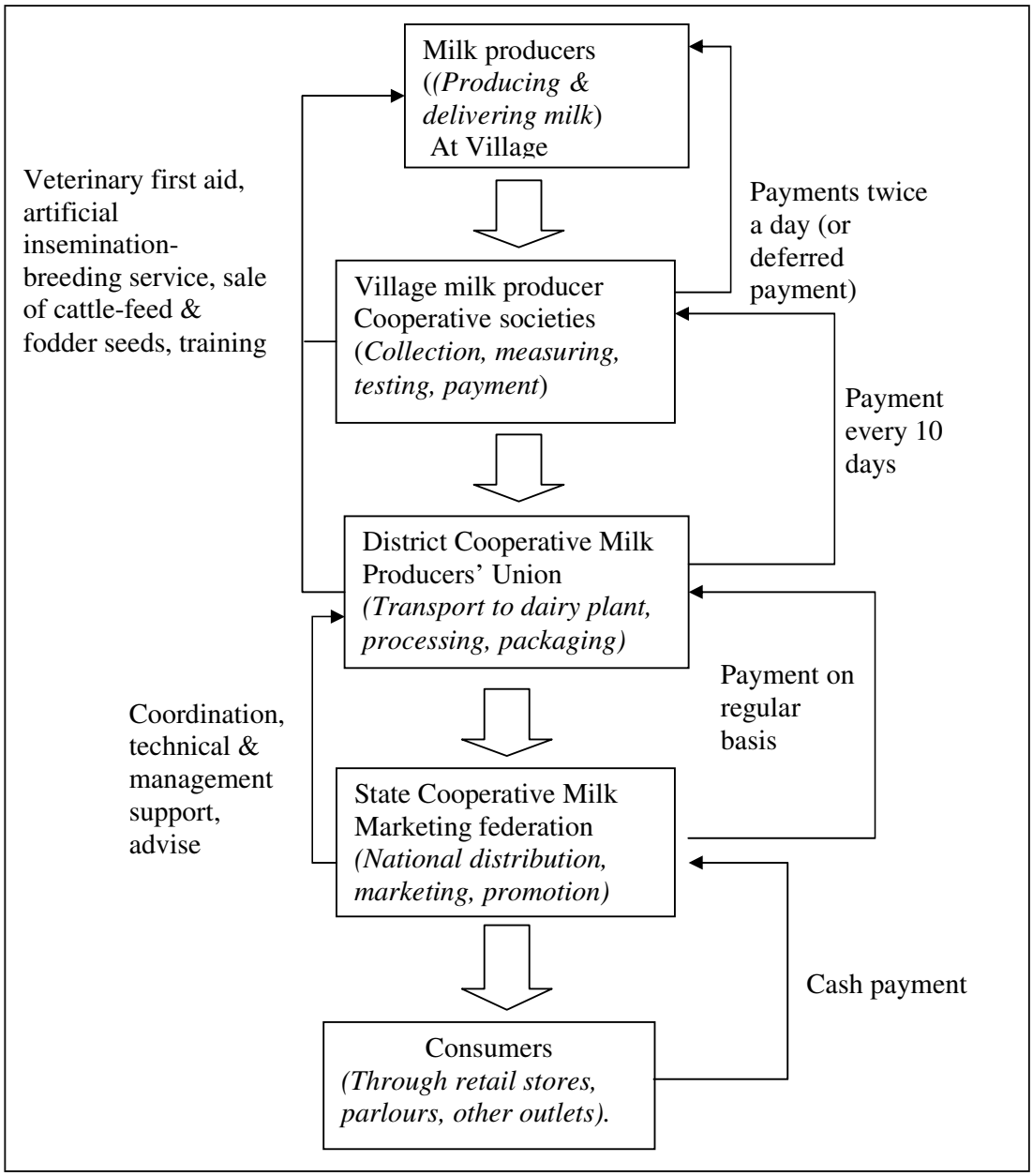
A model which has been very successful in the dairying agribusiness in India is the AMUL cooperative model. This has evolved out of a successful dairy cooperative initiative of 1946 in the Kaira district of Gujarat state. The model and its methods were perfected under the leadership of its enlightened chairman, Tribhuvandas Patel, and its competent professional manager, Dr Varghese Kurien. It has grown enormously over the years, spawning many cooperatives and a state cooperative federation that now markets milk and milk products across the whole country.

In this model, ownership rests with the farmers on a cooperative basis. It typically has a three-tier organizational structure, with primary cooperatives at the village level, cooperative unions at the district level, and a cooperative federation at the state level. The milk is produced by the farmers/ milk producers in the villages and the village cooperatives procure the milk from them. The district union collects the milk from the village cooperatives and transports it to its owned dairy plant and undertakes its processing. The state federation undertakes the marketing of the milk and milk products of all the unions, nationally. The organizations are governed at the top by farmer-elected rotating boards/ managing committees who confine themselves only to periodic strategic and policy decisions. The operational management is entrusted entirely to professional managers/ staff who are largely independent and highly empowered. Apart from the milk business, the cooperative also engages substantially in providing technical services and inputs to the farmers such as veterinary and breeding services, nutritional feeds, and extension services. These enhance cohesion

and commitment in the organization and help its long-term growth and development. The profits are shared as bonus or reinvested in the business. Due to its impact the model is supported by the government and international donors.

The base of the model is the village cooperative society which consists of milk producer members-shareholders, an elected managing committee consisting of 9 to 12 voluntary representatives with an elected chairperson. The managing committee appoints a paid secretary and staff for day-to-day operations. The cooperative society collects milk from the milk producers, and makes payments at district union fixed prices based on transparent measurement of the quantity and quality of milk. It also provides a few services to the members such as veterinary first aid, artificial insemination (AI) breeding service, and sale of nutritious cattle-feed. The village societies are members of the district-level cooperative milk union, represented by their chairpersons. The union is governed by an elected board of directors consisting of 9 to 18 representatives from village society chairpersons and an elected board chairperson. The board appoint a professional managing director and staff. The union collects the milk from village societies, sometimes chills it, and transports it to its own modern dairy processing plant. Here it is pasteurized, stored, packaged or processed into milk products. The union is also proactive in new initiation, training and supervision of the village societies, and a number of important services including veterinary doctor services, AI breeding services, cattle feed supply and vaccination. The district unions are members of the state-level cooperative milk federation represented by their chairpersons. The federation is governed by a board of directors elected from among the union chairpersons, and an elected federation chairperson. The board appoints a professional managing director and staff. Federation undertakes and coordinates the marketing of the milk and milk products of the milk unions. The Amul structure is outlined in Figure 1 below.

Figure 1: Outline of the AMUL model



Source: Based on Sridhar and Ballabh 2006

The state federation, the Gujarat Cooperative Milk Marketing Federation (GCMMF) markets the milk and milk products under the popular brand names 'AMUL' and 'SAGAR' (Kurien, 2003) and has developed a massive network covering over 3500 dealers and 500,000 outlets. There are 47 depots with dry and cold warehouses to carry inventory. The distribution network comprises 300 stock keeping units, 46 sales offices, 3000 distributors, 100,000 retailers with refrigerators, a 18,000-strong cold chain, and 500,000 non-refrigerated retail outlets. Products marketed include fresh milk, UHT milk, beverage milk drinks, infant milk, milk powders, sweetened

condensed milk, butter, cheese, ghee, yogurt/curd, breadspreads, pizza, *mithaee* (ethnic sweets), icecreams, chocolate and confectionery.

AMUL represents a model of an agribusiness enterprise that has ensured a high level of governance and business effectiveness. The model benefits from commitment of the farmers, and cost-efficiency in raw material production as well as procurement which become its major competitive advantage. It also extensively engages with small farmers as well as the landless rural poor who may keep even 1–2 animals, contributing significantly to rural incomes and employment. However, some of its drawbacks include the need for enlightened and committed leadership, and of capable management, which is sometimes difficult to ensure. The board is elected and could become politicized and detract from sound business practices. Further, antiquated laws governing cooperatives often lead to government interference, and inability to use financial markets for raising cheap capital useful for expansion and growth.

4.2 The Nestlé Model

Nestlé is one of the largest private food and beverages companies in the world. The company uses the milk district model for its agribusiness activity in India. Nestlé milk processing factory in the Moga district of Punjab produces milk powder, infant products and condensed milk. In 2008, it covered about 100,000 farmers and had a procurement of 1.25 million litres milk/day. A milk district setup involves negotiating agreements with farmers for twice-daily collection of milk, establishing collection centres and chilling centres at larger community collection points or adapting existing collection infrastructure, arranging transportation from collection centres to the district's factory, and implementing a programme to improve milk quality. Each of the six districts from which Nestlé sources raw milk are referred to as 'Moga Milk Districts'.

In the Nestlé or 'Moga model', the job of sourcing milk from farmers is carried out by a private commission agent appointed by the company. Nestlé operates a network of 1100 agents who receive a commission on the value of the milk supplied to the dairy. Dairy farmers supply milk under contract and the company maintains their records. The company has stringent quality specifications. Nestlé staff members regularly monitor milk quality and performance *vis-à-vis* contractual obligations, and the farmers obtain feedback on milk quality at the collection points. Company technologists determine quality in laboratories with samples being taken in the presence both of the farmers and the company representatives. Nestlé is not obliged to collect milk that does not meet the quality standards specified in the contract. The contract also allows the technologists to penalise the producer with a 30-day ban. If antibiotics are found, the price of milk is reduced by 15 percent. Repetition of any discrepancy is considered a serious breach of contract. Farmers have the right to complain through registers located at each collection point if they believe there is a problem. The system works because it provides an assured market for the farmers at remunerative prices for the milk.

Comparison of the Nestlé model with the AMUL model

In terms of scale and reach, Nestlé's milk procurement pales in comparison with that of AMUL. During 2000-01, AMUL's unions procured an average of 4.58 million kg

of milk per day from over 2 million farmer-members in Gujarat (*Business Line* 2001), see Table 4. Every third litre leaving a milch animal's udders in the state was collected by societies affiliated to AMUL. Nestlé's operations are much smaller and confined to districts around Moga. Nestlé's average procurement of 0.65 million kg per day covers barely 3 percent of Punjab's annual milk output. The average Nestlé farmer supplies about 7.25 kg of milk per day, whereas figure for AMUL is about 2 kg per day, indicating AMUL's reach extends substantially to small/marginal farmers and landless farm labourers who may own only 1–2 milch animals.

With respect to price, Nestlé in 2000-01 paid an average price of Rs 9.84 per kg, lower than the Rs 13–14 per kg that AMUL paid to its farmers. However, adjusting for the fat content, there is little difference between the farm gate prices paid by Nestlé and AMUL. In 2000-01, Nestlé's payments to Moga's farmers for milk as well as development inputs amounts to almost 47 percent of the value of the company's sales of milk products. In comparison, this proportion for AMUL and its unions is over 80 percent. Thus, a much larger share of the consumer rupee reaches the farmers in case of AMUL as compared to Nestlé. It must be noted that Nestlé is a company accountable to its shareholders and investors, while AMUL is an entity owned by and accountable to the farmers (*Business Line* 2001).

Table 4: Comparison between Nestlé and Amul models

Feature	**Nestle**	**Amul**
Milk collection (mill kg/day)	0.65	4.58
No. of farmers covered (mill)	0.1	2.0
Percent of milk production collected	3	33
Avg. milk supply per farmer (kg/day)	7.25	2.0
Avg. price paid (Rs/kg)	9.84	13-14
Percent of consumer rupee reaching the farmer	47	80
Data source: *Business Line* 2001.		

4.3 Heritage Foods Model

The Heritage Group based in Andhra Pradesh was founded in 1992 by Chandra Babu Naidu, a former Chief Minister of Andhra Pradesh. It is a growing private enterprise with three business divisions: dairy, retail and agri, under its flagship company Heritage Foods (India) Limited (HFIL). Heritage's milk products have a market presence in the states of Andhra Pradesh, Karnataka, Kerala, Tamil Nadu and Maharastra, and it has retail stores in the cities of Hyderabad, Bangalore, and Chennai.

The company covers about 200,000 farmers and has the capacity to process 1.5 million litres of milk per day. The annual turnover reached Rs 34.7 million in 2006–2007. Heritage has established a supply chain which procures milk from farmers in rural areas, mainly in Andhra Pradesh and some parts of Karnataka, Maharashtra and Tamil Nadu states. The Heritage model involves harnessing the current milk collection centres as well as rural retail shops to penetrate the rural market. Two-way or reverse logistics are used to transfer and sell goods from the urban markets to rural markets, and through this retail presence also mobilize milk procurement. This enables economies of scale in supply chain costs, serves both the rural customer and

producer, and improves penetration in the rural areas. This also provides opportunities for Heritage to launch its private labels in rural markets. The company's rural retail network has increased to 1515 stores with 13 distribution centres. A typical rural store is about 10 square metres in size and is based on a franchise model to cater to villages with a population of less than 5000. The objective is to deliver popular fast-moving consumer goods (FMCG) products and quality groceries at affordable prices to interior villages across South India, and leveraging for the milk procurement network.

Apart from milk, vegetables and seasonal fruits are also procured through contract farmers and reach pack houses via collection centres strategically located in identified villages. The collection centres undertake washing, sorting, grading and packing and dispatch to retail stores through distribution centres. Other features of the model include: promotion of an annual crop calendar of sourcing that seeks to ensure regular supply and higher income per unit area, technical guidance - agri-advisory services, training of farmers, input supply and credit linkage, package of improved farm practices for better productivity and quality, an assured market at the doorstep, assured timely payments, transparency in operations. The Heritage model provides an example of using the existing marketing points and chains for the purpose of agribusiness rather than building new/dedicated chains. This achieves faster roll-out and reach. It also provides an example of using two-way or reverse logistics for improving the efficiency and economics of the supply chain.

4.4 Suguna Poultry Model

India has a rapidly growing poultry demand and its size is now estimated to be around Rs 12 billion (Business Standard, July 2008). However, the poultry industry is highly fragmented and disorganized. In this disorganized sector, Suguna Poultry has emerged as one of the largest organized players and is believed to now rank among the top ten poultry companies worldwide. The company is based in Coimbatore, Tamil Nadu state, and has operations in 11 states in India, offering a range of poultry products and services. The company pioneered contract farming in the poultry industry in India and sources its products through 12 000 contract farmers across different states. Its fully integrated operations extend from broiler and layer farming to hatcheries, feed mills, processing plants, vaccination and exports. Suguna sells live broiler chicken, eggs and frozen chicken, and has set up a chain of retail outlets providing consumers with fresh, clean and hygienic packed chicken. It has also implemented the Hazard Analysis and Critical Control Points (HACCP) system and has state-of-the-art processing plants.

In Suguna's business model, farmers who own land and have access to resources such as water, electricity and labour can become growers of Suguna's Ross breed of chicks. Suguna takes the responsibility and provides all the other required inputs - day old chicks, feed, medicines as well as supervision to the farmers. Suguna also brings good management practices and technical know-how that lead to higher productivity. The method of growing the chicks is standardized and must conform to the exacting standards laid down by the company; quality control checks are carried out by company staff to ensure the norms are being met. The broilers are procured by Suguna as long as they comply with established quality norms, and the farmer is paid a 'growing' commission or charge. If a farmer does not comply with procedures as laid down, or sells chickens to another party, this is considered a breach of trust and the contract is unlikely to be renewed. Suguna also offers farmers a safety net: it bears

production and market risks, taking responsibility for losses from a change in the market environment. A rise in the feed prices does not affect the farmers because they are supplied with feed directly by Suguna. Similarly, when the bird flu attacks occurred, Suguna absorbed the financial loss suffered by the farmers. Thus, farmers receive assured returns. Regardless of the market prices, the farmers receive the assured growing charge/cost, and incentives.

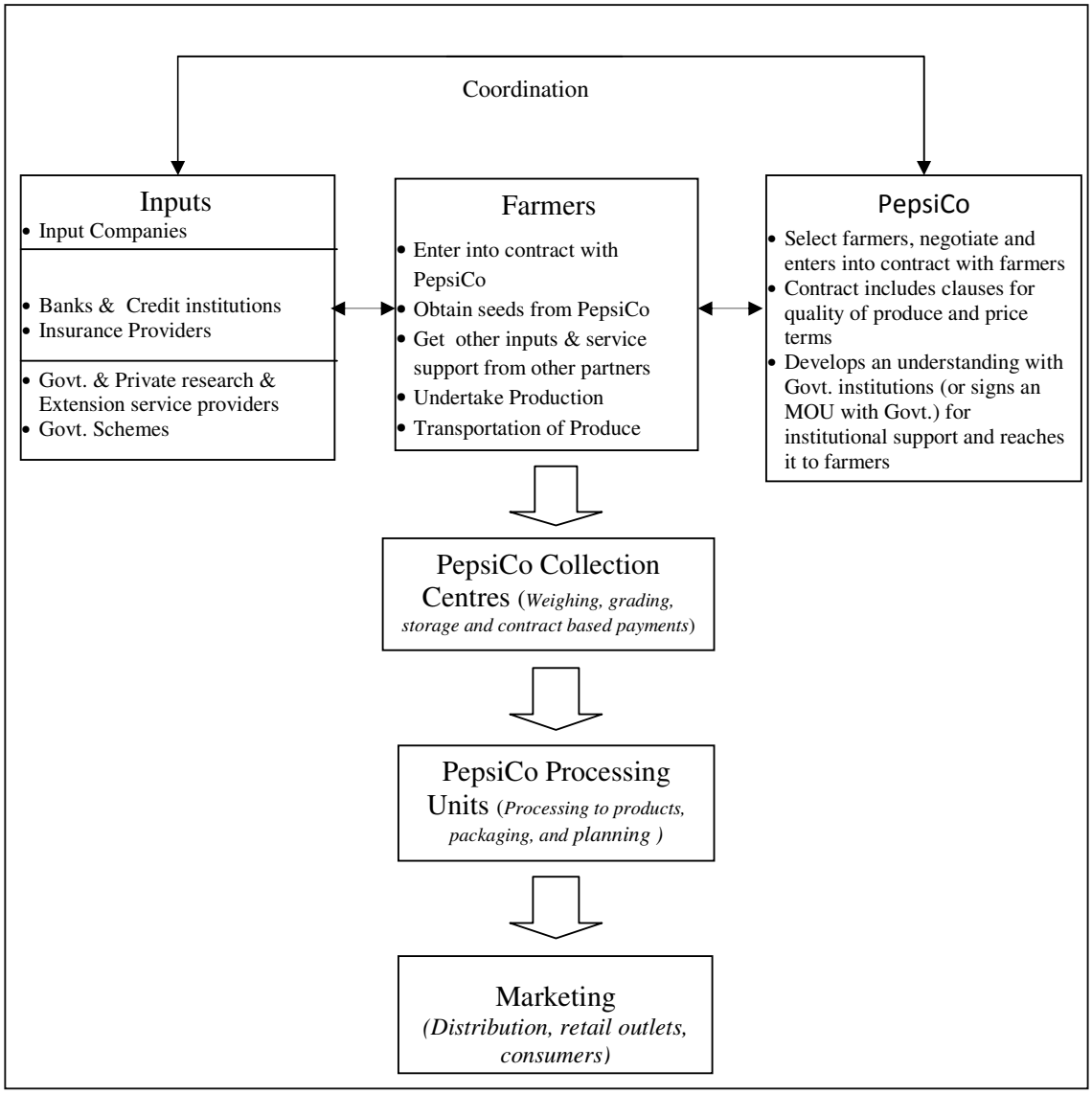
The Suguna model offers fast scalability because the company does not have to buy or lease farms. It keeps costs low, and offers economies of scale including in buying raw materials, feed and medicines. Suguna has benefited large numbers of rural households, improving their lives with its innovative business model. Seeing the impact, other States such as Andhra Pradesh, West Bengal, Punjab and Jharkand invited the company to set up operations in their States. Suguna has proved that every state in India is fit for poultry operations with its presence in 11 states. The model has also attracted visitors from abroad who are keen to learn from Suguna's initiatives and success and adopt the model in other countries.

4.5 PepsiCo Model

PepsiCo has been working with farmers in Punjab since the 1980s, starting with procuring tomatoes and producing tomato pulp. The operation has grown and the model demonstrates effective backward integration by a private company already having strong marketing capabilities and established products and brands. Under this model contracts are made with small farmers for production and procurement of tomatoes but with an emphasis of building a win-win relationship of trust between the company and the farmers. The company brought in experts and promoted the use of appropriate varieties and farm technology, bringing to bear research and know-how available worldwide. Seedlings were provided to the farmers and planting was scheduled and programmed using computers. Tomatoes were procured by the company and it used the best technology in processing and its strong marketing capabilities and networks in selling quality end- products.

More recently, a similar initiative has been launched for potato, see Figure 2 below. The product quality parameters put in place through the chain are driven by the specific needs of processing, and of buyer requirements. Processing requires potatoes with low sugar content (0 percent) and high solids content (between 15 to 20 percent). Because the company is HACCP and ISO certified, stringent quality control is required at all levels in the chain. The requirements are met by ensuring quality compliance at every stage: farming, storing, processing, and packaging (Punjabi, 2008). The company has set up a 27-acre research and demonstration farm in Punjab to conduct trials for new varieties of tomato, potato and other crops.

Figure 2: Tripartite model of PepsiCo India



Source: Based on Punjabi (2008), Singh (2007)

Extensive trials are undertaken before introducing the varieties to farmers, and a package of agronomic practices suitable to the local agro-climatic conditions is developed in collaboration with Central Potato Research Institute (CPRI). This includes specific fertilizer recommendations and spraying schedules. Seed potatoes of the specific varieties are provided by the company. The company ensures that farmers have availability of all the required inputs at the right time. The costs of inputs if provided are deducted during buy back of potatoes. The company had also introduced crop insurance and weather insurance, and PepsiCo created an institutional framework roping in the Central Potato Research Institute (CPRI), agrochemical company Du Pont, Agricultural Insurance Company (AIC), and ICICI Lombard General Insurance company, (Punjabi, 2008).

Teams of agricultural graduates employed by the company work with the farmers to provide technical advise and monitor production. One technical expert deals with approximately 100 farmers. As a result, the use of chemicals and fertilizers is timely and effective (Punjabi, 2008). The agronomists regularly monitor the fields including at planting, spraying, and harvesting. If an outbreak of any disease or pest is seen or expected, farmers are advised for timely spraying. Major problems are attended to in consultation with the company researchers if necessary (Punjabi, 2008). After harvest, the selected procured potatoes are taken to the hi-tech processing plant. There they are washed, peeled and inspected for physical damage and discolouration. Then they are run through rotating slicers, deep fried, mixed with spices and packed. The plant has a well-equipped quality testing lab. The new tomato varieties are said to have brought a yield increase from 16 tonnes to 54 tonnes per hectare (Punjabi, 2008). The introduced high yielding potato varieties have increased farmer yields and incomes and enabled PepsiCo to procure world class chip-grade potatoes. The company has partnered with more than 10,000 farmers working over 10,000 acres of potato across the states of Punjab, Uttar Pradesh, Karnataka, Jharkhand West Bengal, Kashmir and Maharashtra.

This model is more than simple procurement or contract farming and entails substantial company involvement in developing a mutually beneficial partnership between the agribusiness and the farmers. The model can result in very good benefits to small farmers in a limited area, but it requires a long-term view and commitment from the company and a willingness to absorb substantial start-up costs and initial losses (Gandhi, Kumar and Marsh 2001). Singh and Bhagat (2004) conclude that the PepsiCo model is a better model of contract farming as compared to others such as HLL and Nijjer, though there are some operational problems. As the acreage under the crop increases, production increases and the open market prices may fall. The company may then base its contract price on this low open market prices and even fail to honour the contract. Singh and Bhagat (2004) indicate that it is necessary to learn from the experience of HLL that contract farming without building mutual trust might be problematic for the company itself. It should treat farmers as partners and share the benefits and risks with them, thereby creating a long-term sustainable business relationship and a win–win situation for both the farmers and corporates.

4.6 ITC e-Choupal model

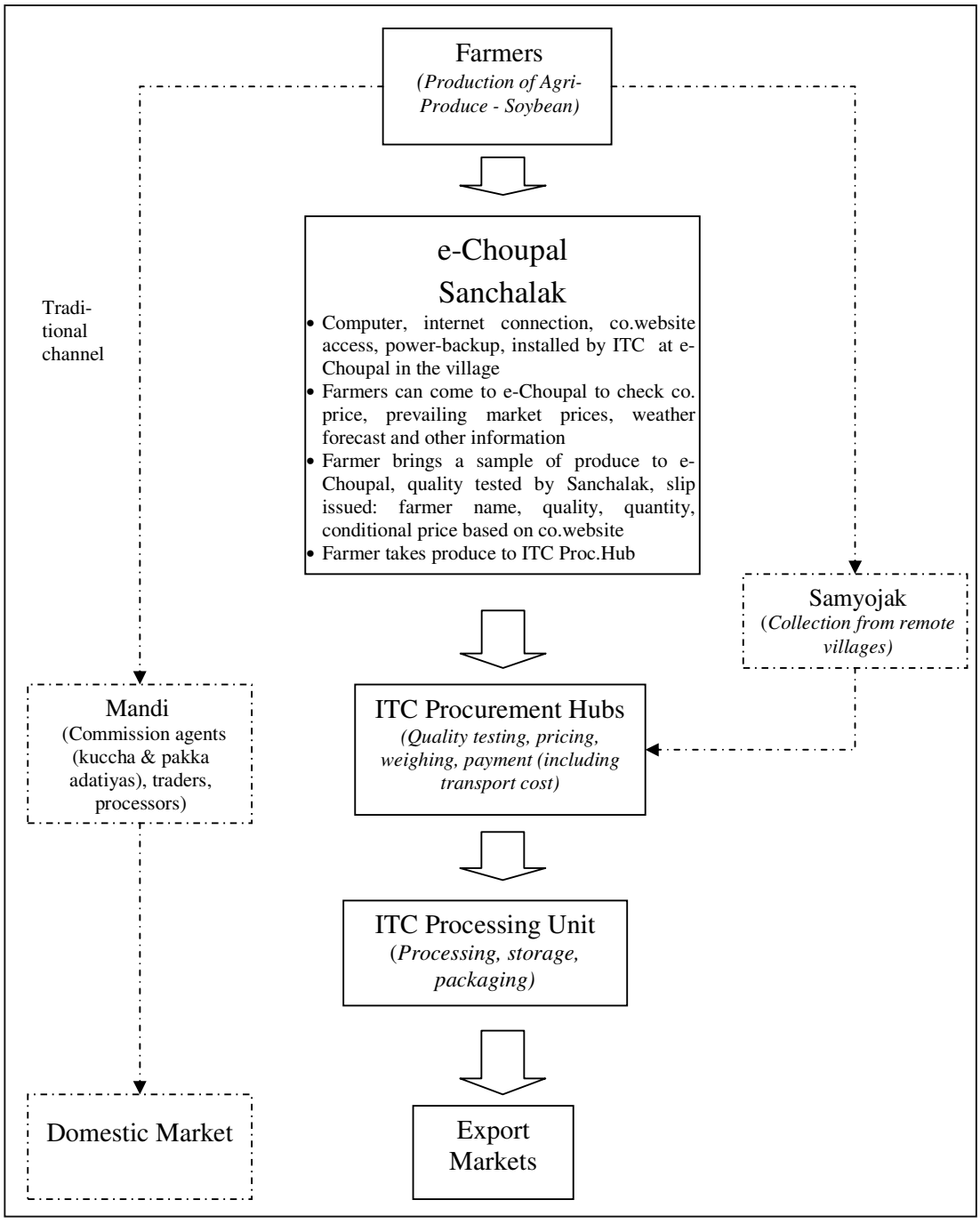
ITC, through its International Business Division (IBD), undertakes procurement, processing and export of agricultural commodities such as soybean, wheat, shrimp and coffee. ITC-IBD has developed a unique IT-enabled procurement, information and marketing model in rural areas, through village centres called *e-choupals.*

The model was launched by ITC in the villages of Madhya Pradesh in the year 2000. ITC opened three soya processing and collection centres and then identified six nearby villages for establishing *e-choupals*. The company identified an educated farmer to head the *e-choupal* in each village. The person is called the *sanchalak* and is trained to operate and coordinate the activities of the *e-choupal*. To establish the *e-choupal,* a personal computer is installed at the house of the *sanchalak,* and the *sanchalak* is given training in using it. The computer is connected to the Internet via telephone as well as satellite and has back-up power. The *sanchalak* helps the farmers in using the system, guiding them to the specially created website of the company and

to see the prevailing prices and other related information on it. To initiate a sale, the farmer brings a sample of the produce to the *e-choupal.* The *sanchalak* inspects the produce and performs quality tests (including foreign matter and moisture content) to assess the quality in the presence of the farmer and explains the if there are any deductions. He then obtains the benchmark price from the computer, makes the appropriate deductions, and conveys a conditional quote to the farmer. If the farmer chooses to sell to ITC, the *sanchalak* gives the farmer a note with his name, village name, particulars about the quality tests, approximate quantity and conditional price. The *sanchalaks* is paid 0.5 percent of the value of soya procured by ITC.

The farmer takes the note from the *sanchalak* and proceeds with his produce to the nearest ITC procurement hub. At the ITC procurement hub, a sample of the farmer's produce is taken and set aside for laboratory tests. A chemist visually inspects the soybean and verifies the assessment of the *sanchalak*. Deductions for the presence of foreign matter such as stones or hay are made based on visual comparison with other produce such as of his neighbour's and the farmer may accept the deductions and the final price. Laboratory testing for oil content is performed after the sale and does not alter the price. The farmer's produce is then weighed on an electronic weighbridge and following which the farmer can collect his payment in full at the payment counter. The farmer is also reimbursed for transporting his crop to the procurement hub. The process is accompanied by appropriate documentation. The farmer is given a copy of inspection reports, agreed rates, and receipts for his records. The system also has *samyojkas* (who were former commission agents) who are responsible for collecting the produce from villages that are located far away from the processing centres and bringing it to the ITC centres. The *samyojka* is paid a 1 percent commission. At the end of the year, farmers can redeem accumulated bonus points through the *e-choupal* for farm inputs, or insurance premiums. The ITC *e-choupal* model is shown in Figure 3.

Figure 3: Outline of the ITC E-Choupal model



Source: Based on Bowonder, Gupta, and Singh 2002

By 2007, the *e-choupal* services reached over four million farmers in about 40,000 villages through over 6500 *e-choupals.* This extended across the states of Madhya Pradesh, Uttar Pradesh, Rajasthan, Maharastra, Karnataka, Andhra Pradesh and Kerala. ITC is extending its business model to other Indian States including West

Bengal, Himachal Pradesh, Punjab and Haryana. Some procurement hubs also have Choupal Saagars which offer goods and services farmers may need including agri-equipment, agri-inputs, personal consumer products, insurance service, pharmacy & health centre, agri-extension clinic, fuel station and food court. Information and services provided by the *e-choupal* web site and e-commerce system include: weather information, information on scientific practices, guidance on how to improve crop quality and yield, access to input supply (fertilizers, pesticides) along with recommendations, and to soil testing service. The model has principally aimed at increasing the efficiency of procurement, resulting in value creation for both the company and the farmer. In addition, the model takes internet penetration to the villages, offering information and global commercial contact. The *e-choupal* allows the farmers daily access to information on prices of many *mandis* which helps them to make better decisions on when and where to sell the produce. Thus, *e-choupal* tries to provide farmers a better price. The incremental income from a more efficient marketing system is estimated to be about US$ 6 per tonne on average, or an increase of about 2.5 percent over the *mandi* system.

Singh and Bhagat (2004) report that many farmers did not agree that they are getting a better price for their produce, and that there are only minor benefits like de-bagging expenses etc. One significant advantage however is correct weight, which is a major worry in traditional *mandi*. Even though there is a potential, the web portal does not have the enough richness to become an information and knowledge dissemination kiosk. The information on best practices, crop production, inputs, fertilizer and seeds, was not of high quality. The main information disseminated is of prices and weather conditions. ITC has not paid enough attention to input trading through its *e-choupals* and proper partnerships with input companies are often not worked out. However, the model offers a quantum change and a huge potential for better service.

5. Comparison of the Different Models

How do the models compare? The comparison can be done on the basis of the key success factors described above, and Table 5 below provides a broad comparison and evaluation of these models (as well as a few other models - for models not described here see Gandhi and Jain 2011). As can be seen, the performance on the key success factors varies substantially across the models. Whereas Amul and ITC e-choupal are strong in reach to small farmers, Suguna and Pepsi are strong in ensuring adoption of the right technology for quality and quantity. Nestle, Pepsi and Amul are strong on investing in modern processing technology as well as at delivering a strong marketing effort to reach a huge food market. Amul and Suguna are strong on bringing commitment and benefits to all stakeholders, and Pepsi is reasonably good.

Table 5: Broad comparison of different models on performance parameters					
Agribusiness Model	**Procurement: Reaching large numbers of small farmers**	**Transforming agriculture: Bringing adoption of new technology by farmers**	**Capital investment in modern processing technology & operations**	**Delivering strong marketing effort**	**Sharing benefits across the value chain, management and control bringing commitment across stakeholders**
AMUL	Strong	Reasonable	Strong	Strong	Strong
Nestlé	Limited	Reasonable	Strong	Strong	Limited
Heritage	Good	Limited	Good	Good	Limited
Suguna	Strong	Strong	Strong	Good	Strong
Pepsi	Reasonable	Strong	Strong	Strong	Reasonable
ITC e-Choupal	Strong	Limited	Strong	Strong	Limited
Other Models					
Nandini	Good	Limited	Limited	Reasonable	Good
Mother Dairy	Limited	Limited	Good	Good	Reasonable
Safal Market	Limited	Limited	Good	Limited	Limited
HPMC	Reasonable	Limited	Good	Poor	Poor
McCain	Reasonable	Strong	Strong	Strong	Limited
Desai Fruits & Vegetables	Reasonable	Good	Good	Strong	Reasonable

6. Concluding Observations

Agro-food processing industries and agribusinesses have been growing quite rapidly in India in the recent years and have been given substantial priority due to their significant potential to contribute to incomes and development. The beginning can be traced to Mahatma Gandhi's emphasis on the need for encouraging of village-based agro-industries to uplift rural masses and connect them to the independence movement and the national economy. The study finds that the sector still contributes significantly to employment in agriculture and industry, and is crucial to value addition and income generation in the rural areas. However, a number of difficulties are faced and the success seems to depend on a set of key success factors built into the agribusiness model design. The key features include reaching large numbers of small farmers and economically procuring quantity, modernization farming through bringing adoption of right technology for quantity and quality, investing in modern processing and meeting the capital requirement, delivering a strong marketing effort,

and sharing benefits across stakeholders through appropriate management, control and institutional structures so as to build a strong value chain.

A number agribusiness models with varying designs which have emerged in India were studied ranging from Amul to Suguna to ITC e-choupal. The comparison shows varying approaches and performance on the different the key factors identified, with strong implications for the success of the models. The AMUL cooperative model seems an excellent farmer-owned design that brings commitment, contribution and substantial benefits to the stakeholders including small farmers. A number of good private agribusiness models have also emerged often from strong industrial and marketing capabilities, which have created strong backward linkages to the farmers, improving technology and efficiency. They need commitment, investment and a strong partnering approach. Even though the success factors remain important, the same approach may not be good for different agribusiness activities and regions, and it is critical that alternative models are experimented with. The models which can effectively address all the five key success factors and which can potentially transform and modernize the whole value chain deserve particular encouragement.

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