

## Value Chain Based Extension Services in Indian Agriculture: Retrospect and Prospect

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### ABSTRACT

*Feeding an estimated global population of 10 billion by 2050 and achieving food security along the continuum of availability, accessibility, and acceptability is a daunting challenge. The post-2015 development agenda of the United Nations envisages a hunger free world by 2030 (SDG 2). In the Indian context, it is important to recall that the country has graduated from the 'Ship to Mouth' crisis of food shortages that was witnessed during the 1960s and early 1970s, to the current level of production at around 315 million tons, thanks to the 'green revolution' of late 1970s, that now provides a sense of comfort as far as availability of food is concerned. Agriculture extension remains the most organised extension service in the country, serving as a robust facilitator for diffusion of new knowledge, change in attitudes and acquisition of emerging skill sets at all levels of the farm sector. There is a need, however, to align the existing institutions and their services with a strategic framework that views the entire production system for any given commodity as a 'Value Chain' and reorient the extension services towards identifying opportunities for value enhancement along the crop or livestock value chains to make sure that the farmers' share of value addition is fair and remunerative. This paper draws on the industrial models of value chain based business strategies that have appealed to the imagination of agribusinesses and farming groups such as the soybean industry, corn and cotton growers in developed countries where value chain based approaches have contributed to enhancing returns from farm production. Further, the paper conceptualizes a sectoral value chain for agriculture to potentially guide any restructuring exercise aimed at a tighter alignment of the agriculture extension systems and institutions with a value chain based strategy. Once the restructuring is initiated for service delivery along the sub-sectoral value chain at the apex levels, field structures befitting product value chains will evolve as a logical corollary to the higher level organizational design and extension staffing patterns.*

**Key Words:** Porter's Value Chain; Sector Value Chain; paradigmatic shift; institutional architecture; extension services

### INTRODUCTION

The COVID-19 pandemic, the ongoing war in Ukraine and the rise in extreme climate-related events remind us of the fragility of the global food security situation as the risks associated with both agriculture production systems and supply chains, stare grimly at us. The challenge of feeding an estimated global population of 10 billion by 2050 and achieving food security along the continuum of availability, accessibility, and acceptability has never seemed more daunting even as the time left for fulfilling the post-2015 development agenda of the United Nations is diminishing by the day. Among the 17 Sustainable Development Goals (SDGs) on

the agenda, the second goal envisages ending hunger, achieving food security, improving nutrition, and promoting sustainable agriculture. Progress towards this goal also has a direct or indirect impact on most of the remaining 16 SDGs, as many studies have pointed to. Yet, the role of farmers, particularly small holders, and their centrality to the food and non-food agriculture value chains, remains an area of concern for policy makers and all stakeholders of food and nutrition security.

The phenomenal progress achieved in pushing the frontiers of agriculture production and in building up food security over the last few decades could be compromised if adequate policy

measures are not put in place to ensure remunerative returns to the farm producers. Such interventions aimed at improving the economics of farming in favour of the producers would essentially need to adopt a strategic framework that views the entire production system for any given commodity as a 'Value Chain' and deploy the research, development and extension services to identify opportunities for value enhancement along the crop or livestock value chains to make sure that the farmers' share of value addition is fair and attractive enough for them to stay motivated as farm entrepreneurs and producers. Such a value chain based approach demands a paradigmatic shift across the entire institutional architecture for agriculture development and extension, such that alongside prioritizing production growth for both food grains as well as commercial crops, market based farming systems approaches are embedded in to the package of extension service delivery to help enhance income levels of the farmers.

In the Indian context, it is important to recall that the country has graduated from the 'Ship to Mouth' crisis of food shortages of the 1960s and early 1970s, to the current level of production at around 315 million tons, thanks to the 'green revolution' of late 1970s. But food and nutrition security is not all about mere availability. Equitable access to food and affordability are equally important. Almost every third child below the age of five is malnourished today and despite the various benefits under the public distribution system, the quality of food and its accessibility remain serious sources of concern with almost 25 per cent of the population still earning less than US\$.

2.00 per day and livelihood systems are far too fragile to be called sustainable. Hence, to ensure the competitiveness of Indian agricultural produce with economic viability of farming systems and also that the productivity gains translate in to security of food and nutrition systems for the poorest of the poor who are often the small holder producers themselves, the agriculture extension system needs a complete overhaul while dovetailing its key features with value chain based strategies. A glance

at the very genesis of extension systems may be helpful in this regard. Genesis of Agriculture Extension.

It would be pertinent to revisit how the concept and practice of extension education evolved as a discipline globally, before attempting to manage the much needed paradigmatic change in the Indian context to make it more market driven. Though the word 'Extension' has its roots in the two oldest Universities of England, Oxford and Cambridge, where the idea of 'University Extension' was born to deploy peripatetic lecturers for serving the educational needs of a rapidly rising urban population, the impact of extending the knowledge to agriculture related subjects in rural areas evolved later and was found to be more welcoming. Following the growth of this work in Britain, the land grant colleges in the United States initiated a more formal process of organised extramural lectures on a larger scale for the benefit of farm families (Jones G.E. and Garforth C, 1990). Extension Education, as defined by the legendary J.P. Leagans, is the process of teaching rural people how to live better by learning ways to improve their farm, home and community institutions.

Available evidence of agriculture related advisory services for the peasant communities dates back to times as early as the 1800 B.C., but the emergence and growth of modern extension services, as practiced in most countries of the world, is attributed to the crisis management following the outbreak of potato blight in Ireland between 1845 and 1851. After assuming charge as the British viceroy to Ireland in 1847, Lord Clarendon ordered the appointment of itinerant lecturers who were to travel around the most distressed farming areas to advise small farmers on how to grow nutritious root crops other than potato and bring about overall improvement in the crop husbandry practices. The institution of itinerant farm advisers soon gained popularity in Germany where they were termed as 'wanderlehrer'. When a crisis gripped the vine growers in France due to aphid infestations, a similar system of mobile farm advisers was set up which was later institutionalised as what is

considered to be the first case of wholly state funded agriculture extension in the world. By the end of the 19th. Century, agriculture extension systems and institutions became an integral part of the mandate and operating plans of agriculture departments and colleges across United States, Canada, most countries in Europe and Japan thus establishing the relevance of extension services to agriculture development.

In the Indian context, after the country became independent in 1947, not only were the memories of the disastrous Bengal famine of 1943 fresh in the minds of the people, but the concerns over food security remained acute as the dependence on imports of American wheat continued. However, the introduction of genetically high yielding varieties of seed coupled with increased cropping intensity and input intensive farming contributed to the Green Revolution of the 1970s which helped achieve a quantum jump in food production. The role of agriculture extension in bringing about the green revolution, is widely recognised. Though the extension programme began with a community development approach in early 1950s, with focus on human and community development, it is in the area of agriculture development that the deepest impact has been recorded. Hence, agriculture extension remains the most organised extension service in the country, serving as a robust facilitator for diffusion of new knowledge, change in attitudes and acquisition of emerging skill sets at all levels of the farm sector. Other sectors like health, nutrition, co-operatives and the small and medium enterprises (SMEs) have also deployed extension approaches and techniques, even if it was not to the same extent as the agriculture sector, for realising the goals and objectives of various development programmes.

### **Reconfiguring Agriculture Extension Services: The Value Chain Model**

To embrace the new paradigm of market orientation and competitiveness, bold new approaches to agricultural development that are no less revolutionary than the 'Green Revolution' of the yesteryears are needed. This paper attempts

discussion of the value chain approach based on envisioning any given crop production system as a 'giant enterprise' seeking to integrate forwards and backwards as well as diversify and exploit the fullest economic potential from the crop, on and off the farm 'from seed to plate'. Drawing from the strategic management literature developed by industrial economists and business school academics, the paper dwells on the genesis of the value chain thinking from the industrial economy and its growing influence on agriculture development policies and models. Obviously, the value chain approach calls for convergence and extension of traditional agriculture development models and the product level competitiveness and firm level competitive advantage based strategic thinking that dominates the subject of industrial economics and strategic management.

While the goals and objectives of contemporary Indian agriculture extension agencies such as the Krishi Vigyan Kendras (KVKs) as the front line service providers and on-field services offered by the State and District level extension organs including the Agriculture Technology Management Agencies (ATMA) sound clear and compelling, the strategic framework to guide and achieve the goals, received little or no attention as the policy makers seemed to believe that the articulation of the goals was an end in itself on the assumption that the functional research and extension machinery at the national and state levels possessed all that was needed to realize the stated objectives. This assumption produced results to an extent as the states chased production and productivity targets through enhanced major, medium and micro irrigation projects; seed improvement and input delivery systems; intensive and inclusive credit coverage; setting up marketing and processing facilities for agricultural produce and a host of other development interventions. Much less, the benefits of these measures did not adequately flow back adequately to the farmers, particularly the small holders and marginal farmers.

The lack of a strategic focus on holistic planning and goal setting that should have nurtured



crop specific competitiveness and secured livelihoods for all those associated with the crop value chain, stood exposed as a missing link in the agriculture development system that has evolved over the decades. Recognizing this gap, the country's agriculture research and development wing led by the Indian Council of Agricultural Research (ICAR) launched the National Agricultural Innovation Project (NAIP) in September, 2006. Research on crop based 'Production to Consumption Systems (PCS) through value chain approach constituted one of the four pivots of the NAIP. With this, emphasis on realigning research and development activities with a value chain based approach began, but most product studies supported under the NAIP reflected the understanding and perception of individual researchers and research teams with far too many models and interpretations of 'value chain'. While this could have been seen as a healthy manifestation of the creativity of the researchers, confusion reigned at the policy level on what exactly constituted a value chain approach. It is, therefore, important for academics, research and extension specialists to appreciate the genesis of the concept of value chain in the literature of business management so that agribusiness value chains can potentially be configured in more creative ways to harvest enhanced value in favour of the primary producers

without hurting the interests of any particular value chain partner.

### Porter's Value Chain

The concept of value chain primarily has its genesis in the industrial economy linked strategic management literature of 1980s that evolved in the context of seeking out firm level competitive advantage in a given industry. While strategy consulting groups such as Mc Kinsey had their own version of an industrial firm's business system, Porter, M.E. (1985) posited the argument that competitive advantage cannot be understood by firms in any given industry without considering in great detail, the many discrete activities that a firm performs in designing, producing, marketing, delivering and supporting its product. Therefore, Porter believed that a systematic way of examining all the activities performed by a firm and how the activities interacted was the basis for analyzing the sources of competitive advantage and propounded what has popularly come to be known as Porter's Value chain (Figure 1). The value chain disaggregates a firm into its strategically relevant activities so that one can understand the cost behaviour of the firm as well as identify the current and potential sources of differentiation, which he considered were the principal sources of competitive advantage in an industry.

Figure 1: Porter's Generic Value Chain





As can be seen from the Figure 1, Porter's value chain displays total value formation in a firm with value activities and the margin that they contribute. Value activities are broadly split into two categories- primary activities and support activities. The five primary activities listed in the posterior half of the value chain are those that are associated with the physical creation of the product, its sale and transfer of ownership to the buyer with necessary after sale assistance. The four support activities shown in the upper half of the value chain are the firm wide functions performed to support the primary activities, with the dotted lines reflecting the fact that three support activities namely procurement, technology development and human resource management can be associated with specific primary activities as well as firm wide chain of operations. The fourth support activity described as firm infrastructure, however, supports the entire firm value chain seamlessly and hence cannot be linked to any discrete primary activity. Examples of firm infrastructure include activities such as compliance with regulatory provisions, firm level strategic planning or management information systems.

A wider concept that accompanied Porter's Value Chain which would be of deeper interest for the agriculture sector in general and agriculture extension professionals in particular, is the configuration of a firm's value chain within a larger stream of activities that Porter termed as the Value System. The value system views suppliers' value chains as impacting upstream value through delivery of purchased inputs used in a firm's value chain. Similarly, as the firm's products pass through the value chains of the channel partners (distributors) on their way to the end buyers, downstream channel value is generated in various ways that contribute to the firm's product becoming eventually a part of the buyers' value chain. Hence, it was suggested by Porter that creating and sustaining the competitive advantage depended not merely on understanding a firm's value chain but also on how the firm's value chain was aligned with the overall value system (Porter ME, 1985).

### **Exploring Value System of Agriculture Extension**

To ensure that no point in the value chain across the major agriculture crops/ commodities is allowed to go unexplored and unexploited in terms of economic value, the agriculture extension agencies and professionals need adequate capacity building to bring about a sense of convergence in their understanding of what constitutes value chain based agriculture. While the value chain serves as a conceptual tool to strategize and operationalise secondary processing initiatives, the outcomes in terms of increased returns from farming, employment opportunities, checking migration and above all improving the sagging share of agriculture's share in the country's GDP cannot be exaggerated. As gains from secondary processing become evident, price buoyancy of the primary produce will motivate farmers to strive for higher yields and productivity gains. In the current situation of distress enveloping farmers in most geographical parts of the country and segments of agriculture, the value chain based approach to crop planning, production and processing seems to be the way forward for sustainable growth. As the NAIP envisaged, there is a need for multiple stakeholders to converge and explore the value system across the major crops which undoubtedly involves massive capacity building of all the involved actors, particularly extension staff, to promote a shared understanding of the concept.

Globally, the industrial models of value chain based business strategies have appealed to the imagination of agribusinesses and farming groups such as the soybean industry, corn and cotton growers who have been deeply influenced and motivated to deploy value chain based approaches for enhancing returns from farm production. The results have been quite positive as certain industries like the wineries, tea and coffee processors have realized, which is prompting the farmers to adopt value chain based strategies across all crop and animal husbandry produce. As discussed earlier in this paper, the value chain based approach to planning crop production and secondary processing is very nascent to the Indian context. In fact, many

African and Latin American economies seem far ahead of India on the learning curve. A beginning has been made, thanks to the NAIP as value chain based studies have been carried out on selected arable crops, livestock and fisheries related products.

**Need for Sectoral Restructuring**

To disseminate the concept of value chain based agriculture development widely across all other players in the policy space, a strategy-structure alignment assumes critical importance (Hanumankar, 2008). Any strategic initiative can be only as effective as the robustness of the structure supporting the strategy. A sub-sector linked restructuring of the entire agriculture development linked organizational machinery in the state and

central government could mark a significant baby step towards aligning the institutional structures with the value chain based strategy. **Figure 2** depicts the sectoral value chain for Indian agriculture which can potentially guide any restructuring exercise aimed at achieving the structural fit with a value chain based strategy. Once the restructuring is initiated along the sub-sectoral value chain at the apex levels, field structures befitting product value chains will evolve as a logical corollary to the higher level organizational design and staffing patterns. It must also be reiterated that a well-planned change management programme accompanied by an adequate learning and capacity building component along the lines of the first component of the NAIP will hold the key to the success of the value chain based approach to agriculture development.

*Figure 2  
Sector Value Chain for Agriculture*

<b>Agricultural Inputs Delivery System</b>	<b>Agricultural Production System</b>	<b>Agricultural Value Addition System (Processing and Marketing)</b>	<b>VALUE</b>
Crop Nutrition Plant Protection Quality seeds and planting material Credit Irrigation Agricultural Input Delivery Information System	Crop Yields Soil Conservation Farm Equipment and Mechanisation  Farm Agronomy and management  Animal Husbandry  Sericulture Fisheries Sugar Extension Information System	Storage Commodity  Marketing Agro  Processing Product mechanizing Export promotion Co-operatives/  SHGs Marketing Information System	

## CONCLUSION

Indian agriculture has the potential to escape the pangs of the current distress impacting the rural economy in the country, if a new approach to agriculture development based on crop specific value chain and a commitment to harvest the value system across all agricultural products and product groups could be pursued. Globally, agribusinesses have demonstrated the utility of a value chain based strategy in creating competitive advantage across product lines such as soybean, corn, tea and coffee etc. In the process, agribusiness value chains are inching closer to the industry based generic value chain model advocated by Porter and the pre-cursor business system model popularized by the strategy consulting firm, Mc Kinsey. Even as the learning

curve of other developing countries in Africa and Latin America in recasting their agriculture development programmes around the value chain based strategy could be ahead of India, an earnest beginning was made with a significant component of the NAIP implemented by the ICAR oriented towards production to consumption systems along product based value chains. Indeed, the success of any strategy is predicated on the strength of the supporting organizational structure and an initial restructuring of the entire agriculture development related institutional machinery around the sectoral value chain alongside a mammoth change management and capacity building exercise, could make a huge difference to the future of India's agriculture.

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