

INVESTIGATING THE POSSIBILITIES OF IMPLEMENTATION OF SIX SIGMA IN  
FARMER PRODUCING COMPANIES IN INDIA: A REVIEW

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**Abstract**

This study explores the potential application of Six Sigma tools in Farmer Producing Companies (FPCs) in India. A literature review was conducted to understand FPC successes, challenges, and Six Sigma implementation steps. The review revealed that FPCs empower small and medium farmers by facilitating collaboration, enhancing bargaining power, and increasing output value. They offer various services to promote agriculture and horticulture, supporting crop production, protection, and value addition while reducing the influence of middlemen. This shift to direct marketing has improved farmers' financial status. However, challenges and threats to FPCs were also identified, including intermediaries' influence, political interference, and limited government support and credit facilities. To address these issues and enhance FPC members' productivity, Six Sigma implementation was considered. Surprisingly, few studies investigated Six Sigma's use in agriculture, but the steps for implementation align with agricultural needs. This research paper discusses the implications of applying Six Sigma to improve FPC operations and support the agricultural sector.

**Keywords-** *Farmer Producing Companies, Six Sigma Implementation, agriculture productivity, Literature Review*

**1. Introduction**

In the dynamic landscape of agriculture in India, small and marginal farmers have long been grappling with an array of challenges that impede their growth and prosperity. Their limited scale of operations, combined with factors like inadequate access to resources, fluctuating market dynamics, and vulnerability to external risks, has led to an environment of uncertainty and adversity. The need to address these challenges and uplift the livelihoods of these farmers has given rise to innovative organizational models aimed at integrating them into the agricultural value chain. One notable approach that has gained prominence is the concept of Farmer Producer Companies (FPCs).

The concept of FPCs stems from the recognition that collective action can empower small and marginal farmers, enhance their bargaining power, and provide them with a platform to navigate the complexities of modern agriculture. FPCs bring together farmers, pooling their resources,

knowledge, and efforts to collectively address common challenges and tap into shared opportunities. Through collaboration, these Companies aim to overcome the limitations that individual farmers face and create a more sustainable and inclusive agricultural sector. While the concept of FPCs holds significant promise, their implementation and effectiveness in different contexts warrant careful exploration. This research embarks on a journey to delve into the potential of FPCs as transformative entities for small and marginal farmers. There are successful FPCs in India, however their productivity and efficiency can further be improved by application of scientific quality improvement tools such as Six Sigma. This study is an attempt to understand if the Six Sigma can be implemented in Agriculture sector for its betterment. To attain this objective a literature review about Success stories of FPCs and Six Sigma and its implementation was conducted. Based on findings from Literature Review conclusion is made. Literatures were divided in various parts viz- Introduction to Farmer Producer Companies (FPCs), FPC Success Stories, the origins of Six Sigma Six Sigma Implementing Six Sigma in Indian Organizations, and Challenges in implementation of Six Sigma.

- **Farmer Producer Companies (FPCs)**

A producer company, as defined in Section 581C (1) of the Companies Act of 1956, is a company comprised of at least ten individuals, each of whom is associated with two or more producer institutions. Alternatively, it can consist of a combination of ten or more individuals and producer institutions, all of whom have a shared interest in engaging in the activities of a producer company. The producer company must have its objectives clearly outlined in accordance with Section 581B of the Companies Act of 1956 and must also adhere to the various regulations and requirements specified in the same Act (Goyal, 2021).

Fundamentally, FPCs are designed to unite small farmers for backward linkages involving inputs like seeds, fertilizers, credit, insurance, knowledge, and extension services, as well as forward linkages encompassing collective marketing, processing, and market-oriented agricultural production (Mondal, 2010). The Department of Agriculture and Cooperation introduced a policy document named "Policy and Process Guidelines for Farmer Producer Organizations" in 2013 to stimulate FPC establishment, providing indicative directives for their formation and functioning (Department of Agriculture & Cooperation, 2013). These guidelines propose an FPC organizational structure focused on collaborating with academia, research institutions, extension agencies, civil society groups, and corporations.

## **2. FPC Success Stories**

Small-scale farmers are grappling with threats to their livelihood due to various factors like market instability, competition, and fragmented land holdings. Challenges encompass limited access to credit, technology, and markets. To enhance farmers' income, methods such as raising productivity, cutting cultivation costs, ensuring transparent pricing, integrating agricultural and non-farm sectors, and offering off-season wage employment can be adopted. The formation of Farmer

Producer Companies (FPCs) proves to be a suitable solution. FPCs play a pivotal role in building inclusive and sustainable supply chains, bridging the gap between small farmers and markets. Nonetheless management should proactively identify lucrative market connections. State governments and Agricultural Produce Marketing Committees should adapt legislation to accommodate FPCs. (MP and Mathur, 2018)

The study (Gorai et al, 2022) aimed to assess the operations of Farmer Producer Companies (FPCs) within the context of West Bengal. Through a random sampling approach, data were gathered via personal interviews and focus group discussions from 120 farmer members and 40 FPC facilitators. Notable strengths of FPCs included the leveraging of economies of scale by primary producers, enabling them to negotiate more effectively with input suppliers, banks, and buyers compared to individual farmers. Yet, significant weaknesses encompassed farmers' hesitance to join FPCs, the absence of a strong business orientation and well-defined plan, and limited participation of members in group activities. Threats to FPCs involved the influence of intermediaries, political interference, and high tax rates.

The study (Bikkina et al, 2018) probes FPCs as collective institutions for farmer upliftment. Highlighting Avirat, a pioneering FPC in Gujarat, researchers illuminated how FPCs employed collective action for tangible benefits. While collaboration holds promise, a key hurdle is capital mobilization, crucial for maximizing FPC benefits.

The Sahyadri Farmer Producer Company has swiftly risen to prominence as a leading exporter of grapes from India within a decade. It serves as a remarkable example of successful management and operation in India's agricultural context. The company's leader's ability to conceive an idea, transform it into a viable business, and navigate its challenges is truly inspiring and holds valuable lessons for others. Effective leadership, committed team of workers and loyal farmer-members is essential for aligning toward a common goal in the success of a Farmer Producer Company. A fundamental requirement for ensuring its long-term success is adhering to the democratic principle of 'for the farmers, by the farmers, and of the farmers' (MANAGE 2017).

### **3. Challenges of FPCs**

According to Neti and Govil (2022) Producer collectives have the potential to unite numerous small-scale producers, enhancing their incomes and reducing their vulnerability to risks. This has led policymakers and practitioners to emphasize the promotion of a large number of producer organizations like producer companies. In just the past two years, approximately 8,000 producer companies have been registered, totaling around 16,000, and benefiting roughly 6-8 million producer households as of March 2021. However, while the current policy framework theoretically supports producer companies, there hasn't been a significant improvement in their operational environment in practice. In fact, the Ministry of Corporate Affairs has struck off 45% of producer companies that have been in existence for seven years or more. There are concerns about the excessive emphasis on promoting Farmer Producer Companies (FPCs) at the expense of

establishing structures and mechanisms for sustainable business operations. These areas include capacity building, capitalization, linking with government schemes, developing business expertise, ensuring sound management, and implementing strong internal governance.

#### **4. The origins of Six Sigma**

Bill Smith, an engineer at Motorola, identified that the quality level linked to a Six Sigma measure equates to a failure rate of two components per billion, and he established this as a benchmark. The initiative to attain this ambitious target was formulated within Motorola and labeled as "Six Sigma," encompassing several of the methodical and stringent techniques seen in contemporary Six Sigma initiatives. Coincidentally, the term "Six Sigma" is a registered trademark of Motorola according to federal records. (Raisinghani et al 2005).

#### **5. Implementing Six Sigma to enhance efficiency**

The study (Kaushik and Khanduja 2010) examined the impact of implementing Six Sigma methodology in a technical institute to improve student passing rates. The study reveals that adopting Six Sigma recommendations boosted the institute's sigma level from 2.28 to 4.17, leading to a substantial increase in student pass rates.

The Six Sigma methodology was applied at the Coca-Cola factory for the reduction and optimization of water quantity (Sadraoui, T., Afef, A., & Fayza, J. 2010). At Wipro by applying Six Sigma methodologies, they have achieved benefits such as reduced software defects by 50 percent and rework in software was down from 12 percent to 5 percent, increased productivity by 20 to 30 percent, and 93 percent of projects completed on time and achieved lower field defect rates which were 67 percent lower than the industry average (Sharma, M., Pandla, K., & Gupta, P. 2008)

The Six Sigma DMAIC methodology was even applied in the Indian statistical institute library in Bangalore where the aim was to improve library services and after the implementation sigma level improved from 2.02 to 3.9 (Dutta, B. & Chowdhury, K. 2004)

Effective Flux; Romanian consulting firm implemented Six Sigma in Farm ((Six Sigma in Agricultural Farms: Effective Flux, n.d.). DMAIC methodology was used. The objective of the project was to increase the yield of wheat from farm. After these implementations the yield of wheat grain was 4.72 MT per hectare which was only 3 MT per hectare earlier.

#### **6. Conclusion**

To ensure the effective management of the Farmer Producer Company (FPC), it is imperative to assemble a proficient team with well-defined roles and responsibilities. Identifying viable business activities for the FPC constitutes a crucial phase, encompassing tasks ranging from aggregating input demands, marketing outputs, and establishing storage infrastructure to primary value addition, processing, and crafting a comprehensive business plan. The established success of Six Sigma in various settings has eased researchers' reservations and amplified their curiosity, as

evidenced by the recent upsurge in published articles on the topic. However, very few studies have been seen in the agriculture sector as on date. Thus, there was a need to investigate if Six Sigma can be implemented in Agriculture sector. This study concludes that Six Sigma can be implemented in Agriculture sector. The steps to be followed while implementing Six Sigma can be used in the agriculture sector as well. However, depending on the nature of operations, few steps can be modified.

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