

# IMPACT OF CONTRACT FARMING ON THE ECONOMY OF POTATO CONTRACT FARMERS IN HOOGHLY DISTRICT OF WEST BENGAL: A STUDY ON EMPIRICAL LITERATURE

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**Abstract:** Globalization has prompted a huge change in demand and supply of Agri processing industry. Convergence of taste and preferences at consumer level, dominance of big retail chains, and other related changes seek high level of certainty and standardization across the value chain. This leads to higher degree of corporatization of agriculture. Corporate for their own benefits reconfigured value chain and introduced contract farming to minimize the transaction costs in the supply chain. Initially it was introduced in developed countries and gradually travelled across the globe particularly to those developing countries which have institutional voids. In most of the developing countries, contribution of agriculture to GDP has been decreasing but at the same time agriculture caters the livelihood to the maximum number of people. Can contract farming change the situation? In order to answer that, it is important to understand the impact of contract farming on the economy of contract farmers along with the variables responsible for participation in contract farming

**KEY WORDS:** *Literature, Contract farming, productivity, economy, value chain, participation.*

## INTRODUCTION

During last fifty years, we have seen remarkable change in demand side as well as supply side of agri food industry. The developed as well as developing world has experienced the changing demographics and psychographics like changing dietary patterns, economic growth, upward mobility of middle class, high urbanization, rise of double income family, etc. These could well be attributed as catalysts for the rise of processed food across the world. The convergence of taste and preferences for processed food and value added agriculture prompted a metamorphosis of agri business industry's value chain. Production, processing, sales and marketing, i.e every process in the value chain has been experiencing sea change. In the changing scenario, super market has become epicentre of all activities, and this change is called 'super market revolution'. In the new value chain that in some cases spans across the world transnational and global companies started dominating. Convergence in taste and proliferation of super market and processed food came as a challenge for supply chain. It demands consistency of raw materials and other back end activities of the value chain. Therefore, in order to eliminate uncertainties at back end activities companies often go for backward integration to ensure supply of raw materials with certainty and in right quantity and quality. This have been widely been practiced across the globe and in India as well (Barrett et al 2012). In this regard Contract Farming happens to be the most effective way to establish firm-farm linkage.

## OBJECTIVES

The objective of this paper is to study

- ✓ Empirical literature to understand socio demographic variables responsible for participation in contract farming
- ✓ Empirical literature to understand impact of contract farming in the economy of contract farm

## METHODOLOGY

The paper is based on secondary research and secondary data from numerous studies. A large portion of these studies are from developing countries which have got considerable similarity with India in terms of institutional voids. These studies are from different agricultural produce as diverse as rice, poultry, different kind of vegetables, etc. This literature review covers studies pertaining to A) Farmer's Market participation B) motivational factors driving farmers for contract farming C) Impact of contract farming on economy of contract farmers. Research papers were searched using different keywords from contract farming including contract farming, value chain, impact of contract farming on economy, income, productivity, motivation to contract farming, emerging economy, institutional void, etc in science direct, EBSCO, Scopus, etc.

## STATEMENT OF THE PROBLEM

Historically, it has been noticed that agricultural produce in India, has always been subject to high uncertainty. Multiple studies indicated this phenomenon with possible reasons like farmers incurring loss due to shortage of space in cold storage and price crashing just after the harvest, (Jain & Kaul, 1980), (Balkrishnan et al 81) (Singh & Singh, 1982), cartel of the traders, malpractice of Mandi officials, hoarding practices of some powerful wholesalers (Singh & Asokan 2005), Lack of transport (Dahiya and Sharma, 1980), unsupportive infrastructure, logistics and marketing, the complexities of the channels (Singh & Asokan 2005). Given this backdrop, contract farming appeared to be a solution to these woes. There are plenty of evidences which corroborate the claim that contract farming is expanding in India (Planning commission, 2011). Govt of India's policy documents stressed the importance of contract farming to be diffused across the country. Therefore, it is important to explore the impact of contract farming on the economy of contract farmers in general.

Moreover, being a seasonal crop, 90 percent of potatoes are produced in the winter season but their demand spread over the year, prompting cold storing for smooth market supply over the year. Seasonal production coupled with sufficient storage space prompts wide price fluctuation (Dahiya. et. al 1999)

Particularly, small farmers suffer a lot because they are unable to defer selling due to financial compulsions and they are unable to get the cold storage space. This makes them, go for distress selling. During almost end of the first decade of 21st century, Pepsi co started contract farming in few districts of West Bengal for their factory at Howrah. Since then it is more than a decade, and thus it is important to study Contract Farming in West Bengal from close corner.

## MOTIVATION AND PRACTICAL UTILITY OF THE STUDY

This paper is purported to discuss literature covering theoretical and empirical aspects of contract farming. This could be useful for researchers trying to have a holistic picture of contract farming as well as practitioners trying to understand contract farming from different dimensions.

## RESEARCH GAP

There are very few papers which discuss the empirical literature of contract farming focussing on the variables responsible for participation in contract along with contract farming impact's on farmers economy.

## LITERATURE REVIEW

### A: Farmers' Market participation

The literature of this section primarily discusses the variables responsible for farmers' participation in modern supply chain. It also addresses the debate on the inclusiveness of modern supply chain.

Lundy (2012) mentioned that inclusiveness depends on situation. In certain cases it is extremely cumbersome for the firm to let small farmers participate in the value chain but in many other cases, it is perfectly acceptable. Studies done by Birthal, Joshi, and Gulati (2005) on dairy, vegetables, and poultry; Erappa (2008) on gherkin; Nagaraj et al. (2008) on baby corn, chillies, Warning and Key (2002) on peanuts, Simmons et al. (2005) on broiler, Ruben and Saenz (2008) on pepper; and Wang et al. (2009) on horticulture crops in China, Narayanan (2011) for papaya in TN and Miyata et al. (2009) for apple in China, have observed that CFAs favoured small farmers.

However, some studies found that farmers' participation depend on land holding size. These include studies on palm fruit in AP (Dev & Rao, 2005); tomatoes in Punjab (Rangi & Sidhu, 2000, Singh, 2002) and Haryana (Dileep, Grover & Rai, 2002); for multiple crops in Punjab (Kumar, 2006; Singh M. P., 2007; Singh, 2009); seed farming in Indonesia (Simmons et al., 2005) and AP (Swain, 2011), mango and bean crops in Senegal

(Dedehouanou, Swinnen, & Maertens, 2013), several crops in Madagascar (Bellemare, 2012) and United States (US) (MacDonald & Korb, 2006).

Birthal et al. (2008) concluded that in dairy farming probability of big farmers' participation is higher than small farmers'. Similar kind of conclusion has been noticed in the studies of Pandit et al. (2014) for potato in West Bengal, Swain (2012) for gherkin and seed rice in AP; Cai, Leung (2008) in case of rice in Cambodia), Miyata et al. (2009) for green onion in China, etc

But in this context it is important to understand who selects whom. Is it firm's prerogative to select farmers or otherwise? Therefore, it is important to explore the variables which influence farmer's participation in contract farming.

Geographical dimension is one such factor. Contracting firms consider factors like climate, irrigation facility, and distance from processing plant for choosing contracting partners. Therefore, contract farming in rubber happens in Kerala and apple in Himachal Pradesh. Narayanan (2001) mention the suitability of mid elevation region in Tamil Nadu for marigold contract farming because marigold needs cooler temperature for good cultivation

The propensity of higher percentage of farmers in terms of land holding depends on average land holding in that particular state. For example, the average farm holding size in the state of Punjab and Haryana is 3.77 and 2.25 hectares respectively compared to 0.22 and 0.77 hectares in Kerala and West Bengal respectively (GoI, 2010-11). Therefore, there is more probability that medium and large farmers participate in more number in Punjab; on the contrary, West Bengal and Kerala are dominated by small farmers in contract farming. Stringer et al. (2009) notes that firms prefer villages near their processing plant and large farmers, on the basis of the study done in China for vegetables.

Socio economic factors identified by researchers include caste, age, farm experience, household size, education, agriculture asset, access to non-farm income and credit constraint, Proximity to highway or market. Researchers note that there has not been any discriminatory approach towards the backward class people by the contracting firms (Swain (2012) A.P, Narayanan (2011) in Tamil Nadu, Kalamkar (2011) in Maharashtra. The impact of age on participating in contract farming is mixed in nature. Studies which found young farmers to be more prone to contract farming include Narayanan (2011) for cotton in TN, Swain (2012) for gherkin in AP. On the contrary, Birthal et al. (2008) for milk producers in Rajasthan, Nagaraj et al. (2008) for baby corn in Karnataka, Sharma (2017) for potato in Punjab, note that age is positively associated with contract farming participation. Certain studies do not found any difference in age between contract and non contract farmers. These include studies by Narayanan (2011) for papaya, marigold, gherkin and broilers in Tamil Nadu, Swain (2012) for rice seed, Miyata et al. (2009) for green onion and apple in China, and Warning and Key (2002) for peanuts in Senegal.

Birthal et al. (2008) found the relationship between farm experience and contract participation for diary producers in India to be significantly and positively correlated. In contrast, Simmons et al (2005), Ruben and Saenz (2008) found otherwise.

Sharma (2017), Bellemare (2012). Bellemare, Birthal et al. (2008), Cai et al. (2008), Dedehouanou et al. (2013), Miyata et al. (2009), and Narayanan (2011) found household size to be positively influencing farmers' participation in contract farming. Many of the contracted crops demand meticulous supervision. It is easy for a household having many members to provide necessary man hour for that kind of supervision.

Most of the studies take years of formal schooling as a proxy to indicate education of the farmer. Sharma (2017) for Potato and Basmati paddy in Punjab, Narayanan (2011) for papaya and broilers in TN, Swain (2012) for rice seed in AP, Simmons et al. (2005) for broilers in Indonesia, and Cai et al. (2008) for rice in Cambodia found years of schooling to be positively associated with contract farming participation. On the contrary, Narayanan (2011) for marigold in TN, Swain (2012) for rice seed, Miyata et al. (2009) for green onion and apple in China found schooling to be negatively associated with contract farming participation.

Many researchers find agriculture asset a true reflector of farmers' financial position. Some of them found higher agriculture assets as a prerequisite for joining contract farming. These include Erappa (2008), Swain (2011), Arya and Asokan (2011), Escobal, Agreda, & Reardon, (2000), Swain, 2011), Morvaridi (1995) and Nagaraj et al. (2008). On the contrary, Key & Runsten (1999) found firms favouring small farmers because they are more likely to lack productive assets and have limited alternative income and production opportunities, which strengthens the firms' bargaining power.

Access to non-farm income and credit constraint is another important variable. Narayanan (2011), Singh, (2007) and Swain (2012) note that higher non-farm employment and income has negative correlation farmers'

participation in contract farming. Higher non farm income indicates less dependence on credit which encourages farmers to self finance (Hernández, 2009). Therefore, those farmers having access to non-farm income would not need the support of contracting firm to grow crops. Similarly, Ruben & Saenz, (2008) and Simmons et al. (2005) found that those with credit constraints had a higher probability of contract farming participation.

Narayanan (2011) and Randel (2005) for cotton in India and South Africa respectively, Wang, Wang, and Delgado (2014) observed that distance from motorable road impacts farmers decision to participate in contract farming. It is observed that further away farmers are from highway or market, higher is their propensity to join contract farming. Miyata et al. (2009), Cai et al. (2008) found the closer farmer is in proximity with village leader, more likely he would participate in contract farming.

### **B: Motivational factors driving farmers for contract farming**

Masakure and Henson (2005) affirm that opportunity cost, alternative economic opportunity and degree of market perfection drive farmers' motivations to participate in contract farming. Barrett (2012), finds factors such as smallholder risk aversion, social networks, entrepreneurial and technical abilities, trust for the growers become antecedent for farmers' motivation. Many studies observed that farmers' perceive contract farming as high return and low risk mechanism and that perception itself is the source of motivation (Barrett et al., 2012; Deshpande, 2005). Access to credit for credit constraint farmers and timely supply of inputs are the other important factors that drive farmers participate in contract farming (Eaton & Shepherd, 2001; Singh & Asokan, 2005).

### **C. Impact of contract farming on economy of contract farmers**

The response of empirical literature in the context of impact of contract farming is mixed in nature. While a good number of studies found positive impact, there are studies which noticed otherwise. Some of the major work in this regard has been captured in the following table

Table-1

Sl. No.	Author	Geographic area	Agricultural products	Contract farming variables discussed	Effect on income and productivity
1	Glover (1984)	East and south Africa	Sugar, tea, cotton	Market access, payment system, input and service provision	Moderate to strong effect
2	Little and Watts (1994)	Sub-Saharan Africa	Flowers, cocoa, fresh vegetables, rice	Market access, power equation, intra household conflict, etc	Strong positive effect in short run and negative effect in long run
3	Haque (2000)	Punjab, India	Tomato	Market access, payment system, input and service provision	Moderate Positive
4	Dileep et.al. (2002)	Haryana	Tomato	crop insurance, market access, price certainty	Moderate positive effect
5	Singh and Asokan (2005)	Punjab, Karnataka	gherkins, basmati paddy, broiler chicken and safflower	Market access, price, provisions, etc	Positive for gherkin and safflower, negative for Basmati and Broiler and Basmati rice,
6	Dev and Rao (2005)	Andhra Pradesh	oil palm and gherkin	Market access, payment system, input and service provision	Moderate positive impact. Govt Government intervention required to safeguard Small farmers interest

7	Tripathi et al (2005)	Haryana	Potato	price certainty, market uncertainty,	Moderate positive impact
8	Erappa (2008)	Karnataka	Gherkin, sunflower, coconut, areca nut, paddy, ragi	Gross return, price and market uncertainty, etc	Differential impact. High positive for gherkin, lowest for ragi
9	Ramaswami et al. (2006)	Different states in India	Poultry growers	Market access, input and service provision	Mild positive impact. Consistent earning and less fluctuation.
10	Kulkarni (2007)	Maharashtra	Potato	Cost Benefit, provision of extension services, access to inputs and credit	Moderate positive impact
11	Pandey et al (2007)	Various States in India	Potato	Parameters related to development of potato processing sector	positive
12	Kumar P (2007)	Punjab	Different Rabi Crops	Direct contract farming model vs. indirect contract farming model.	Direct contract farming is high positive, indirect contract farming Insignificant. Positive significant For only the big farmers
13	Birthal et al (2008)	Rajasthan	Milk	Costs and benefits, price and market uncertainty, etc	Positive
14	Nagaraj, et al (2008)	Karnataka	green chillies and baby corn	income, employment and access to technology and credit, participation variables	positive
15	Cai et al (2008)	Cambodia	Rice	income, employment and access to technology and credit, participation variables	Positive
16	Sharma (2008)	Punjab	Rice, wheat	Income, productivity and participating variables	Positive
17	Minten et al (2009)	Madagascar.	vegetables	Production and market provision, extension service, income, productivity	Positive
18	Olomola (2010)	Nigeria.	Cotton, Ginger, Rice, soybean and Tobacco.	Production and market provision, extension service, income,	Cotton, Ginger, Rice, soybean positive, cotton indifferent
19	Minot (2011)	Sub-Saharan Africa.	asparagus, baby corn, mange tout, sweet corn, and chillies, tea, coffee, tobacco, sugarcane, cotton	Production and market provision, extension service, income	Positive for all the produces
20	Swain (2011)	Andhra Pradesh	gherkin and rice seed	Income, credit, productivity, payment schedule	Positive. Raised the question of sustainability. Monopsonic behaviour noticed.

21	Wainaina (2012)	Kenya	poultry	Conditions of participating, income, productivity	Positive
22	Ismat (2012)	Bangladesh	poultry	Productivity	positive
23	Pandit, et al (2014)	West Bengal India	Potato	Productivity, price and other extension services	Positive
24	Mwambi et al (2016)	Kenya	avocado	Income, credit, productivity, payment schedule	Indifferent
25	Sharma (2017)	Punjab, India	potato and basmati paddy	determinants of participation, wealth Index, etc	Positive
26	Little and Watts (1994)	Sub-Saharan Africa	Flowers, cocoa, fresh vegetables, rice	Market access, power equation, intra household conflict, etc	Strong positive effect in short run and negative effect in long run

#### Prepared by Authors

In most of the above mentioned studies, primary data was collected using structured questionnaire and interview. Samples were taken from the places where both the Contract farmers and non contract farmers exist. In certain studies (Sharma 17), study areas were selected on the basis of proportionate area under contract farming to the Gross Cropped Area (GCA). Then best and the worse samples were taken. The prevalent cost concepts were used. Benefit-cost ratio on various costs has been calculated. In many studies, the linear production function analysis was adopted. The least square method was used to estimate resource-use efficiency for the crop grown under contract and non-contract farming systems. Before undertaking the regression analysis, zero order matrixes were estimated for both the systems to test the multi collinearity amongst the input variables.

In majority of the research regression analysis was used to establish relationship among different variables. In some studies, Chow test was used to compare productivity of direct and indirect farmers. In few studies Gini coefficient was used to establish inequality of income among contract and non contract farmers.

Data envelopment Analysis (DEA) was used to examine the different types of efficiency between contract and non-contract farmers. In order to get rid of selection bias—a two-step regression method was used, which involves insertion of a correction factor, that is, inverse Mill's ratio.

#### FINDINGS SUMMARIZATION AND CONCLUDING OBSERVATIONS

Literature review of contract farming reveals that there exists abundance of literature pertaining to contract farming. It reveals the socio-economic factors for participation in contract farming. The study also reveals that majority of the variables and their impact could not provide conclusive evidence which explains that participation remained a local phenomenon. Motivation variables lack elements of trust which is a prerequisite for long term relationship. In most of the studies, impact of contract farming on income and productivity remained positive. However, there were some anomalies in form of monopsonic power exercised by the contracting firms, lack of long-term sustainability, etc.

#### SCOPE FOR FURTHER STUDY

Very few studies covered Potato contract farming in West Bengal, though in this part of India, Potato remained a significant crop particularly in Hooghly district. Literature has suggested that participation in contract farming remained local which indicated that the combination of socio demographic factors specific to that particular region should be studied. In most of the studies in the literature, the sample farmers comprised of medium and large land holding particularly in potato. Therefore, it is important to study the impact of contract farming in places where small farmers remained overwhelming majority. Moreover, the element of trust has never been studied in Indian context.

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