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**CONTRACT FARMING AMONG THE POTATO
GROWERS IN WEST BENGAL:
OPPORTUNITIES AND CHALLENGES**

Introduction

Many developing countries across the globe have complex land tenure system with ambiguity in property rights, tenants' insecurity, poor credit and marketing facilities, and lack of agricultural extension among other institutional constraints in agriculture. Farmers in countryside strive for low agricultural growth due to limited farm mechanization and lack of effective institutional intervention. To overcome such issues, many countries, including India, have formulated new agricultural policies to facilitate and encourage private investment in agriculture. Private investment through contract farming is used as a support system to improve agricultural productivity, marketing, and farmers' income. Contract farming not new to any country, but of late it also has emerged as a popular farming practice in the developing countries with the advent of globalization. However, the move to develop contract farming as a suitable model for enhancing farmers' income has raised concern about inequity in the farmers' participation and lack of inclusive growth due to contractor's preference to large and medium landholders' over small and marginal landholder groups and preference of one region over the other for contract farming operation.

Contract farming is an agribusiness model, which involves supply chain management. It is also a complex socio-structural arrangement in which different types of farmers from different social background linked with the firm under certain contractual norms and principles. According to Eaton and Shepherd (2001) contract farming is an agreement between the farmers and the firm for the production and supply of agricultural products under forward agreements, but frequently at predetermined prices. As per contract the farmer is required to plant the contracting crop, harvest and deliver to the contractor quantum of produce based upon anticipated yield and contacted acreage and

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at quality standards determined by the purchaser. Contractor has to supply selected inputs and required technical advice to the farmers. A commitment also on the part of the company or the contractor is to support the farmers' production and to purchase the commodity (Chaturvedi, 2007; Eaton and Shepherd, 2001). Contract farming provides additional opportunity to acquire information related to production support, marketing, risk management and also provides employment opportunities in developing countries (Glover and Kusterer, 1990; Oya, 2012; Simmons, 2002). The Government of India's National Agricultural Policy envisages that private participation will be promoted through contract farming and land leasing agreements to allow accelerated technology transfer, capital inflow and assured market for the agricultural produce. The farmers in the states like Punjab, Maharashtra, Karnataka, Madhya Pradesh, and Tamil Nadu have increasingly adopted this neoliberal farming model in the recent time (Jain, 2014). But, farmers in eastern India are still lagging behind to adopt such farming compared to the farmers of the majority northern and southern Indian states. The reasons may be attributed to the farmers' poor socioeconomic conditions, lack of institutional efficiency and effectiveness. Service delivery mechanism to enable agricultural development has not been impressive. Most of the tribal and other traditional farming communities still live in subsistence mode of farming due to lack of infrastructure and poor service delivery. In sum, contract farming is widely successful in such states where green revolution was by and large successful.

Some important studies by Cahyadi and Waibel (2016), Dev and Rao (2005), Sharma (2016), Singh (2005), Swain (2011), and Veldwisch (2015) have studied socioeconomic aspects of contract farming. Landholding size is a key determinant to participate in contract farming (Dev and Rao, 2005; Sharma, 2016; Swain, 2011). Prowse (2012) observed that smallholders tend to be excluded in dualistic agrarian economies, but enjoys greater participation rates when inequality in landholding sizes is low. In addition, large family size, better education, youth age, ownership of assets, irrigation facility, etc. have some positive effects to contract farming participation (Sharma, 2016; Swain, 2011). Public investment in rural infrastructure such as power supply, rural roads, cold storage, quality testing laboratories, etc. are furthermore important to boost farmers' participation in contract farming (Dev and Rao, 2005). Participation of small and marginal farmers varies according to the type of crop under contract farming. Small and marginal farmers prefer to avoid contract farming of such crop, which has long gestation, high investment in production, etc. But labour intensive cash crop, which has low gestation, do not restrict their participation.

Cahyadi and Waibel (2016), Miyata and Hu (2007), Pandey (2016), Venu Prasad, Singh and Chaturvedi (2012), and Warning and Key (2002) to name a few have studied about socioeconomic impact of contract farming. Most of the scholars' findings show that contract farming had reduced poverty,

increased income of the farmers, and enhanced livelihood opportunities. Scholarly works in India have emphasized caste and class factors in contract farming, but neglect focus on tribal participation. Other social dimensions such as family type, house pattern, religion, and small-marginal farmers' participation along with scheduled caste and scheduled tribe participation in contract farming are less focussed in earlier studies. Therefore, main focus of this paper is about opportunities and constraints in contract farming, and analysis of the socioeconomic conditions of the potato growers of West Bengal, a state in eastern India.

Objectives of the study

1. To understand the nature of contract farming in West Bengal
2. To compare socioeconomic conditions of farmers who participate in the contract farming with those of farmers who do not participate in the contract farming, and
3. To identify the socioeconomic factors that influence farmers' participation in contract farming.

Selection of Villages and Data collection

Primarily, farmers' participation in contract farming depends on the opportunity available in the region. However, even in the regions with high concentration of contract farming many farmers do not get opportunity to participate in it due to socioeconomic constraints. We have selected such areas with high concentration of contract farming to understand both opportunities and constraints in contract farming. Both contract farmers (CF) and non contract farmers (NCF) were taken into account for a comparative account of socioeconomic conditions of the farmers.

Data collection was done from both primary and secondary sources. Secondary data was collected from the contract farming agencies, government departments and research institutes in the states working on the related field. For the purpose of primary data collection, two districts namely, Burdwan and Bankura were selected¹. Burdwan as an intensive contract farming district and Bankura as moderate to high contract farming district in West Bengal were considered for selection of CF and NCF. Memari-I block in Burdwan district and Kotulpur block in Bankura district with the highest number of villages having contract farming in each block under the respective district were selected for the study. Jayrampur and Mondaljana are two adjacent villages in Gope Gantar Panchayat of Memari-I block of Burdwan district and Gopalpur village in Kotulpur block of Bankura district were part of the study. Field surveys were conducted between 2015 and 2016. For a comprehensive picture of concentration of contract farming and for number of villages into contract farming in each block one may look into the Table 1.

Questionnaires were administered to collect data from the farmers as well as the vendors. Additional data were obtained from the company representatives. Potato growers from both contract farming and non-contract farming were considered for data collection. Out of 329 farmer households surveyed in three villages in two districts, 193 farmer households had adopted potato contract farming and 136 farmer households had adopted non contract farming for potato.

Ten private vendors in Bankura district were interviewed and data were collected about each vendor's operational landholdings, villages covered by them for potato contract farming, and about number of farmers engaged by each vendor under contract farming. Potato production from contract farming and non-contract farming, and annual income from agriculture including contract and non-contract crops were obtained from both the farmers and the vendors. Interaction was also held with the officials of the Gope-Gantar Union Cooperative Agricultural Credit Society Ltd (GGUCS) of the Memari Block which was only agency associated with the contract farming in this place.

Contract farming in West Bengal

West Bengal is one of the states to have adopted contract farming even before new economic reforms brought into existence during early 1990s in India. However, growing potatoes under Frito Lays model was started only in the first half of the 2000s in West Bengal². By 2014-15 about 10 districts in the state had potato contract farming under Frito Lay but the distribution of the farmers is concentrated in some pockets of the operational districts. It is noticed that contract farming was mostly present in those districts of the state where traditionally they had good performance in potato cultivation. For instance, farmers in Hooghly, Burdwan, West Medinipur, and parts of Bankura traditionally are good paddy and potato growers³.

Frito-Lay had involved nearly 10000 farmers in contract farming in West Bengal by 2014-15. About 320 private vendors and nine cooperative societies as vendors involved in contract farming during the same period (source: field data). GGUCS was a key institutional vendor in Burdwan district. PepsiCo had planned further to involve 15000 farmers (potato growers) for application of 8000 tons seed in the state. By now, it has the largest presence of contract farming operation in the state. According to Chaturvedi (2007) majority of the farmers are repeat farmers since the early years of adoption to contract farming. *Kufri Jyoti*, *Kufri Chandramukhi*, and *Kufri Pukhraj* are some of the high yielding varieties for domestic use among which *Kufri Jyoti* variety is widely grown in West Bengal. *Kufri Chandramukhi* is the most preferred staple potato variety in West Bengal, which may be due to its softness, taste and flavour⁴. The process-grade potato variety such as Atlantic (ATL), FC3 and FC5 are used by farmers for contract farming.

Nature of contract farming, contracting and scope to build social capital

Contract farming is based on written agreement between the firm and the vendor followed by agreement between the vendor and the farmer. The type of contractual arrangement mainly at two different levels involving three different parties is a tri-partite system. The company prefers semi-medium and large farmers in the contract farming. Dutta, Dutta and Sengupta (2016) reported that PepsiCo firm has set rules and regulations for contract farming scheme like the acreage for potato should not be less than five acres. Our observation is that the firm has direct contracts with the vendors who are mainly medium or large landowners. Meanwhile, the firm also engages the societies which have traditionally large association with the growers at the village level for delivery of credit, marketing, etc. The firm's direct agreement with the vendors is to get the required amount of potato as per contractual norms during every normal season. The firm reduces transaction cost and avoid associated risks by avoiding direct contract with a large number of small and marginal farmers. Therefore, it is an art of doing business while lowering risk. The vendors as suppliers bear the responsibility to engage a large number of farmers, including small and marginal farmers under semi-contractual norms⁵. Since the supply of seed is limited based on consumer demand and production capacity of the factory, there is also competition even at the vendors' level to win the trust and meet demand of the firm to continue contract farming. Similarly, the firm in order to continue association with the committed vendors have to supply certain amount of seed to the latter every year. Further, both the private vendors and the cooperative or credit societies precisely manage to allocate the limited supply of seed among the genuine farmers having small or large landholdings. Good precision and appropriate cultivation procedures can be adopted by the farmers who are committed, hardworking and also have ability to invest adequately.

Contract farming system is primarily based on mutual trust and obligation between the vendors and the farmers. Vendors provide necessary inputs like financial assistance, process-seed obtained from the firm, fertilizer, pesticide and insecticide, and farm implements to the growers. Vendors instruct growers to sow process-variety potato planting material provided by the firm and as per its instructions and advice. These instructions may range from planting, inter-culture operations, and plant protection to harvesting and supply. The growers in return supply the anticipated amount of produce within the prescribed quality to the vendors immediately after the harvest. The quality norms include size of potato (range preferably should be from 45 mm to 85mm), original colour (green is not preferred at all), should be free from rotten, damaged and other defects, etc. The growers show their obligation by supplying the harvested produce only to the concerned vendors as per norms. Even in case of oversized or undersize, green, and mechanical damaged produced farmers do not deliver to the vendors and instead try to bear the burden on

their own to avoid any breach of trust with the vendors. Certain amount of investment in terms of time and money is made by both the vendors and the growers to build trust, and maintain cooperation and partnership in contract farming. Therefore, contract farming has potential to build social capital. Joining a social network and social inclusion are common forms of social capital (Fine 2007; Glaeser, Laibson and Sacerdote, 2002). Thus, joining contract farming network which involves large number farmers mainly belonged to small and marginal landholding groups, and other stakeholders is a form of social capital. Sequeira and Ferreira-Lopes (2011) defined social capital at the individual level as the social attributes of the individual, such as social skills and belonging to the social network. But better outcome requires an appropriate balance in the types of ties discussed by Putnam (2000) as bonding capital (ties between members of a group), bridging capital (links between different groups), and linking capital (ties between society and governmental actors and institutions)⁶. Participation of farmers in the contract farming, which involves larger social network, is thus a form of social capital. Participation of small and marginal farmers especially from historically neglected social groups that induces the process of social inclusion eventually develops a new form of social capital. Social capital that is based on trust, social network, and institutions has positive effects on economic behaviour (Bhandari and Yasunobu, 2009). However, the opportunity to build social capital is restricted and limited to growers who have the ability to take the risks, ability to invest, having better information access, ability to win vendors' confidence and ability to mobilize institutional benefits in their favour. The conditions imposed by the contracting agency and restricted access to institutional services may create some barriers to effective participation and further limit the scope to develop social capital. The growers do not always get an assured return in case of crop loss due to lack of insurance support. Moreover, the farmers bear the burden of loss if the quality does not satisfy the vendors' choice. The vendors are more likely to wait next season for farmers to provide desired quality and quantity of the produce. But the growers' obligation to vendors increases at such instance. They voluntarily or involuntarily continue to meet vendors' demand. The farmers continue long term relation with the vendors because contract farming as of now is the only option to avoid market risk. Therefore, it is also the economic interest that is important to maintain social relation and develop social network.

It is observed that farmer's organizations have key role in promoting participation of farmers in complex social, political and economic affairs at the community level. Having been affiliated to some political parties and their activities concerned with some political interest, these are also regarded as political units, but they help farmers addressing complex social and economic issues. Farmers join such organization, which eventually earn them some strength to fight against the odds including institutional bottlenecks. Farmer's organizations encourage cultural, political and economic participation and lay

out plan for farmers' welfare. Any critical issues pertaining to the farmers at the community levels are also discussed at the level of farmers' organization. Therefore, farmers' organization has an important role to mediate in contract farming affairs.

The individual vendor's capacity to engage desired number of farmers depends on his or her ability to help farmers in investment and persuade farmers to participate in contract farming. But not all farmers are able to participate in contract farming due to socioeconomic constraints (Pandit, Lal and Rana, 2015). Small and marginal landholders face difficulty due to poverty and socioeconomic constraints. According to the report of Agricultural Statistics at a Glance 2014, about 5.1 million cultivators, both small and marginal, and about 10.2 million agricultural labourers (main and marginal) in the state. Small and marginal farming communities hold 84 percent of the State's agricultural land and about three million landless families have earned the right to cultivate and grow crops on their own land after enactment of *Operation Barga System*⁷ (SAP for West Bengal, NABCONS). Above 96 percent farmers have small and marginal operational landholdings in the state. Thus, it is expected that contract farming without involvement of marginal and small landholders seems meaningless. But, four percent of other category of landholders, mainly medium and large landholders, having 16 percent area of operational landholdings must have a significant role in the contract farming operation in West Bengal. Mobilization of land by small and marginal farmers and even by the landless families from among the rest four percent medium and large farmers group is important for investment in contract farming and accruing benefits out of their participation. Further, among the landholders who have additional source of income from other sources prefer to lease-out land to the marginal or landless families based on inter-personal connection (social network).

Potato is a labour intensive crop. A potato grower in West Bengal has to hire agricultural labourers from the same region or from the other region based on the quantum of agricultural workforce required. We observed that the hired agricultural labourers are paid by different wage rate during their engagement in potato farming. Payment of daily wages is fixed at Rs. 120 in addition to 2 kilograms of rice in many districts even when the minimum rates of wages in agriculture for unskilled category was fixed at Rs. 206.00 per day with provision of food. This rate was applied to both contract farming and non contract farming in the survey areas. But, the important part of the labour force in potato growing is about the involvement of large number of women labourers who gets the opportunity to work in contract farming for multiple activities like weeding, transplantation and most preferably in harvesting. Women are considered skilled workforce and therefore most preferred during harvesting season. Women workers harvest the produce, remove soil from the tubers and do their sorting and grading. Every potato

grower has some personal network with the labourer or his/her family even beyond own district to avoid skilled labour shortage in the peak time during every season. Most of the labourers are outsourced from agriculturally backward regions of westernmost districts of West Bengal bordering Jharkhand such as Birbhum, Purulia, Bankura, and Murshidabad. Contract farming, involves multi-stage contracting, cooperation, participation, partnership, mutual trust, and obligations. Therefore, it is levelled as partnership farming which is guided by business as well as social interest.

Institutional constraints in contract farming

Every state has some advantages and disadvantages in farming; and, farmers in each state have some strength and some weaknesses. Moreover, every region has some opportunities and some constraints in the farming. West Bengal has more fertile land, irrigation facilities and better power supply than other eastern Indian States after construction of the major hydroelectric projects in the Ganga and the Brahmaputra river basins. 'Land reforms' has been relatively a grand success with the implementation of the *bargadri* system. The state has exclusive agricultural blocks led by block agricultural officers for agricultural services' extension and technology dissemination. But major issues are still surfaced about the issues concerning policy and practice in marketing and limited agro-processing industries. The major institutional constraints in contract farming of West Bengal are reported by scholars (e.g., Pandit, *et al.*, 2015; Dutta *et al.*, 2016). Some important institutional constraints are as follows.

- There is no policy related to contract farming for monitoring and regulating, and examining contractual norms⁸.
- Contract farming opportunity for potato is limited at present since there is only one processing firm engaged in large scale potato contract farming in the state.
- Lack of credit and financing access to farmers for contract farming.
- Quality norms are more complex and cost intensive, therefore, difficult to maintain by the growers.

Vendors in contract farming

With more than 320 private vendors and 9 institutional vendors (belong to different cooperative societies), PepsiCo had the largest network with community level farmers in the state. GGUCS was having association with more than 300 farmers from about 28 villages for contract farming during 2014-15. The number of farmers under the cooperative society has slightly increased thereafter. Farmers having different landholding sizes were involved in contract farming. The biggest farmer had 28 *bigha* (nearly 11.2 acres) at the GGUCS in Memari-I block of Burdwan district in the state.

Private vendors in contract farming

As already discussed, the private vendors are the large farmers. Most of the vendors also have large *pukka* houses (made of concrete and bricks). They have relatively better access to banking and credit facilities, possess modern farm implements, and their family members are relative better educated and members have political connections. They are able to make good return out of their investment in the contract farming. Most of the private vendors in Bankura district are in the higher income group, whose average annual income from contract farming is above 0.3 million rupees. Thus, the private vendors belong to the higher social category.

We had collected data on private vendors about personal land owned by them, number of farmers associated with each of the vendor for contract farming, number of villages covered by each vendor, annual turnover in terms of quantity of potato and about average annual income by each vendor. It was found that the vendor had an average landholding of 5.7 acres, an average 275 number of potato growers associated with each vendor and each private vendor had covered on an average 16 villages for contract farming. Each private vendor had an average annual turnover 1055 tons of potato under contract farming, and the average annual turnover in terms of money was Rs. 8.45 million. In this way, a vendor's average annual income from contract farming was 0.35 million (3.5 *lakh*) rupees only from the contract farming (Table 2). Moreover, these vendors are well connected with the market, cooperative society, and other private businessmen and fellow vendors. These private vendors have joined furthermore bigger social network than the growers to harness entrepreneurial opportunity in rural society.

Comparative account of socioeconomic conditions of the contract farmers (CF) and the non-contract farmers (NCF)

Both contract and non-contract farmers belonged to the same villages under study, share common socio-cultural norms, but they have different access to socioeconomic opportunities. With this view a preliminary enquiry was conducted in the study villages about comparative account of the socioeconomic conditions of the farmers.

Social category of the farmers: Caste, ethnicity and religion define ascribed social status and also have direct association with socioeconomic conditions of the farmers in rural society. Contract farming participation on the basis of such social grouping, class, and religion is partly discussed in the paper. Farmers from three different social groups such as scheduled caste (SC), scheduled tribe (ST) and other category (Other) were considered for the analysis. The STs based on their choice considered under the classification of the Hindu religion. Like other parts of the country, the STs and the SCs are largely marginalized and they have marginal access to landholdings, housing,

income and education among others (details can be seen in the table 3). We have classified farmers as marginal, small, semi-medium, and medium and large, on the basis of their total operational landholding size at the village level. Farmers' having agricultural landholdings below one acre of land are considered as marginal farmers. Small farmers have agricultural landholdings above one acre and up to one hectare (2.47 acres) of land, semi-medium farmers have above one hectare and up to two hectares (2.47 acres to 4.94 acres) of land, and medium and large farmers have above two hectares (4.94 acres) of land. About 85 per cent of farmers in sample villages belong to marginal and small farmer category, percentage of semi-medium farmers is about 10.6 per cent and the percentage of medium and large farmers is only 4.3 per cent of the total households (Table 4). It is observed that large agricultural landholders had a large average family size at 9.1, which is normally due to joint family pattern of the farmers. Increasing number of marginal landholding farmers over the years is due to increasing fragmentation of landholdings and partition of household properties in the wake of changing nature of family and population growth.

Table 5 shows that out of 329 households 193 households (58.7 per cent) belonged to CF group and 136 households (41.3 per cent) belonged to the NCF group. The table shows that the ST's participation in contract farming was the lowest at 28.4 per cent, followed by the SCs at 68.2 per cent and other groups at 70.2 per cent from among the Hindu category. The Muslim farmers' participation in contract farming was 64.2 per cent. The proportion of joint families under contract farming and under non-contract families was at 56.4 per cent and 43.4 per cent respectively. Further, 59.1 per cent of the nuclear families reported among the CF and 40.9 per cent of the nuclear families reported among the NCF. The average family size among the CF is better at 5.1 than 4.6 among the NCF.

Between the tribe and the non-tribe there is a wider gap with regard to participation in contract farming. Tribal group has the lowest participation in the contract farming (Chi-square value 40.596 at d.f. 1 and p-value .000). But between religious groups (Hindu and Muslim) there is no much variation in participation in contract farming (Chi-square .785 at d.f. 1 and p-value .376). Farmers' secondary occupation (labour and non-labour), types of houses in which farmers' living in types of houses (*kuchha* and non-*kuchha*), and access to education (up to VIII standard pass and beyond VIII standard pass) vary significantly between the CF and the NCF. The interpretation is that these factors individually have certain role to participate in contract farming.

The comparison between the CF and the NCF w.r.t. farmers' age group (up to 40 years of age and more than 40 years of age), family size (up to three and four or more members), nature of family (between joint family and nuclear family), and non-agriculture income groups (income below Rs. 10000 and above Rs. 10000) depict that there is no significant difference between the two groups.

Therefore, these factors individually have no much influence on CF participation.

Housing pattern, agricultural landholding and annual income: Kuchha (mud-houses/huts), *Semi-pukka* (both mud-house and house built with concrete, also called mixed houses), and *pukka* (houses built up with concrete) houses are common indicator of socio-economic conditions of the households in rural areas. Lack of financial ability to build *pukka* houses among the farmers in rural areas is quite common. Survey results shows that 45.3 percent farmers' households had only *kuchha* houses and the rest of the families had either *semi-pukka* or only *pukka* houses. This shows that a large chunk of farmers are still lacking resources to build a good *pukka* house. From the total 114 households with *pukka* houses 72.8 per cent households were reported in Burdwan and only 27.3 per cent households were reported in Bankura district. The farmer households' income between the two districts sharply differs in which the Burdwan farmers have a clear edge compared to the Bankura farmers. The average annual income of the farmers (from both agriculture and non-agriculture) in Burdwan was Rs. 80906 compared to Rs. 54727 average annual incomes of the farmers in Bankura. Since the quality of the house and annual income determine the socioeconomic status of the farmer, more well-off farmers are found in the villages of Burdwan district than in the villages of Bankura district.

Table 6 is about access to different types of houses and annual income between the CF and the NCF. It is noteworthy to mention that economic assets like agricultural landholdings and farm income differ between the two groups. The average landholding size of the NCF was 0.93 acre as against the average landholdings' of 1.98 acres for the CF. The t-value (-7.219) shows that there is highly significant difference in mean landholdings between the CF and the NCF. The NCF have slightly better income from non-agriculture than income from agriculture. The agricultural income of the CF at Rs. 39067 and the NCF at Rs. 29074 and t- value (-4.810) shows a highly significant income difference between the two groups. But the farmer's total average annual income from both the sources shows that contract farmers have average annual income Rs 35352 which is better than the NCF's average annual income of Rs. 31830. Therefore, by and large the contract farmers have better living conditions compared to the NCF.

Table 7 is about the Chi-square values which measures association of socioeconomic factors with the contract farming. Further, comparison of marginal landholders and other landholding groups (marginal landholders with less than one acre and non-marginal landholders with above one acre) shows that non-marginal landholding farmers more than the marginal farmers tended to participate in contract farming. Participation in contract farming varies significantly between marginal and non-marginal landholding groups (Chi-square value 42.478 at d.f. 1 and p-value .000). The average size of leased-

in landholding is 0.30 acre for the CFs and 0.17 acre for the NCFs. Therefore, it may be interpreted that most of the land leased-in by tenants had been utilized under contract farming. There is no much difference in access to leased-in landholdings between the CF and the NCF (Chi-square value 2.509 at d. f. one and p-value .113). However, from the individual factor wise analysis, it may be interpreted that land size irrespective of owned land or leased-in land is important factor to participate in contract farming.

Modern farm implements: Many farmers in West Bengal have access to some modern farm implements such as power tiller, winnower, thresher, etc. Adoption to modern technology by farmers in West Bengal is relatively better than farmers in other eastern Indian states. Access to modern technology between the CF and the NCF however shows a notable difference. Out of 157 farmers who responded about their access to modern farm implements, 76.1 per cent CF and 31.4 per cent NCF had adoption of modern farm implements (table 6). Over all, it was 51.6 per cent farmers who had access to farm implements. Chi-square value 31.061 at d.f. 1 and p value .000 represent highly significant difference in access to the farm implements between the CF and the NCF.

Access to banking and credit facility: Most of the farmers in West Bengal have access to bank passbook (reported 98 percent in the survey). This shows that the farmers have joined the banking network. Most of the farmers in West Bengal have active Bank passbooks which indicate they are in touch with the banking services. But the access to Kisan Credit Card (KCC) is limited to only 18.2 per cent farmers⁹ The study indicated that only 8.0 percent of the marginal landholders and 19.2 percent among the small landholders had access to KCCs. However, 60 percent among the medium and large and 40 percent among the semi-medium landholders had access to KCCs. Statistically there is also a significant association between the landholding size and access to KCC (the chi-square value 41.654 @ d.f. 3 and 99 per cent level of significance). Having lowest access to KCCs among the marginal farmers followed by the small farmers signifies that large numbers of needy farmers are still not in a position to accrue the benefits of credit and insurance facilities for agricultural production and allied activities. From the socioeconomic analysis of classification of farmers on the basis of landholding size it is reported that marginal landholders are also socially and economically marginalized farmers.

In the study regions, except seven farmers all other farmers had bank pass book. While all the contract farmers had bank passbook only seven from among the NCF did not have any bank pass book. Further, Kisan Credit Card (KCC) is an important financial asset for the farmers to obtain agricultural credit and other related benefits. Therefore, it is important to see if there is any difference in access to KCC between the CF and the NCF. Out of total 60 KCC holders, the NCF had 14 KCC holders while the CF had 46 KCC holders

(table 6). Table 7 shows that there is sharp difference in access to KCC between the CF and the NCF (Chi-square value 9.809 and p-value 0.002 show significant result at 99 per cent level).

Effect of socioeconomic factors to farmers' participation in contract farming: application of logistic regression

The binary logistic regression model was used to understand the effect of socioeconomic factors to farmers' participation in contract farming.

It was found that landholding category, caste, secondary occupation, and non-agricultural income have significant effect on contract farming (Table 8). Non-marginal landholding groups have higher chances to contract farming participation than marginal landholding groups. Leased-in land has very positive effect to contract farming participation. Landholdings in association with other factors also have important effect to participation in contract farming. The non-marginal landholding groups have higher tendency to participate in contract farming. The study also identifies that some non-marginal landholders try to borrow land from land owning groups to invest in contract farming. The β values - 2.525 and -1.475 for secondary occupation and non-agriculture income in logistic regression indicates that the farmer households with non-labour occupations but less than Rs. 10000 annual incomes has high probability to participate in contract farming. While in the social group, the STs have least participation, however, there is no much difference between the two religious groups. It is found that landholding still plays important role both independently and together with other socioeconomic factors. The other important observation is that education though differs significantly between the CF and NCF, combining all other socioeconomic factors, education does not influence much. Family size influences contract farming participation when they are considered for analysis with other defined socioeconomic factors. Family size above three members has high probability to participate in contract farming. The effect is high when it is considered for analysis with other socioeconomic factors. Having access to KCC or having access to any type of house do not have much effect to participate in contract farming when these factors are taken into consideration for analysis along with other socioeconomic factors.

Limitations of the analysis

The analysis in the paper is more about comparative account of farmers' socioeconomic conditions based on their participation or non-participation in contract farming. But one may attribute that better socioeconomic condition of the contract farmers may be also due to involvement of farmers in contract farming. But, in this research the intention was not to assess the impact but to identify factors that influence farmers' participation in contract farming. Framing and designing questionnaires and selection of villages were done to

suit research objectives for focus on the specific issues. Therefore, it is not possible to assess the impact given the nature of the survey done here.

Conclusion

A large chunk of farmers in West Bengal are small and marginal landholders to whom agriculture remains the only source of income and means of livelihood. Optimising agricultural income from every parcel of land is important for these farmers. Thus, aspirant farmers rely on cash crop to fetch good return for their produce. Potato is a highly labour intensive cash crop and it requires good investment and through care both during and after production. But, farmers prefer to grow potato for favourable agro-climate condition, income opportunity and domestic use of the product. Contract farming is an alternative support for the farmers to counter market risk and enhance income opportunity. Aspirant farmers, even among the small and marginal landholders have eventually participated in contract farming. But interest and opportunity do not match for all farmers due to heterogeneous access to agricultural land, credit and insurances, institutional benefits and socioeconomic opportunities.

There are both opportunities and constraints in contract farming in West Bengal. This state of eastern India has relatively better institutional set up, infrastructure built up, and most importantly the farmers are by and large educated. PepsiCo had engaged about ten thousand farmers. Large number of landless agricultural labourers and women labourers also could get opportunity to earn their livelihood through contract farming. But, the proportion of contract farmers is very less in a population of above five million farmers. Thus, competition within the farmers remains high to participate in contract farming due to restriction in supply of seed. The firm by directly dealing with the vendors avoids high transaction cost, and minimizes associated risks out of dealing with a large number of small and marginal farmers. It is observed that more than selection the difficulty is about elimination of large number of aspirant farmers who also want to associate with contract farming.

Different nature of contracting takes place between the vendors and the growers. However, more than contracting it is the social bonding between them, which is important for sustainable collaboration and participation in contract farming. Contract farming has certainly created an opportunity to build social capital. Bonding, mutual trust, cooperation, and obligation are associated with contract farming in the village level. People adopt contract farming out of their social as well as business interests. A complex agrarian relation is established between the farmers and the vendors, between the vendors and the community farmers, among different landholders, and between farmers and the agricultural labourers. The farmers are now a part of the large supply chain network. Within the relation there is both cooperation and

conflict, but there is an increasing farmer's expectation from the contract farming.

There is sharp distinction to farmers' participation in contract farming due to heterogeneity in caste, class and social status within the farming community. The analysis of socioeconomic factors in potato farming shows that small-and marginal farmers are also socially and economically marginalized. Marginal farmers' access to the quality of the house, income, adoption of technology, access to banking facility, including KCC, etc. is lower in comparison to non marginal landholders. Landholding is an important socioeconomic indicator of farmers' participation in contract farming. It is noted that farmers among the scheduled caste had less landholding size than the farmers of the scheduled tribes, but the former has greater participation in contract farming than the latter. Among all the social groups, tribal group participation in contract farming is the lowest. But, there is no much difference between religious groups as far as contract farming participation is concerned.

The contract farmers have better socio-economic status than the non contract farmers. The contract farmers have better access to education, *pukka* houses, banking services, modern farm technology, etc. The vendors are the potential social change agents who persuade farmers to get involved in the contract farming. Landholding size, non-agriculture income, caste, family size, etc. influence farmers' participation in the contract farming. But, higher income from non-agriculture negatively affects farmers to participate in it. The absence of alternative income opportunity and farmers' lower income from non-agriculture may encourage farmers to participate in contract farming to maximise their income opportunity. The farmers belonged to the SCs are mainly marginal landholders but they are efficient contract farmers. They use better proportion of their land in potato contract farming than other social groups. Since tribal people have very low participation in the contract farming any organized effort to persuade their participation can develop social inclusion. A new land distribution mechanism to provide land for landless, tenants and very marginal farmers who mainly belonged to the scheduled tribes and scheduled castes agricultural families may lead to inclusive growth. However, it may not be easy as the average landholding size has already reduced significantly over the years. Further, extension of modern technology and institutional support for the provision of agricultural credit, and subsidy to purchase essential farm implements may lead better agricultural growth.

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NOTES

1. Burdwan and Bankura are the westernmost districts of the Burdwan division in the state of West Bengal. Burdwan is situated between 22° 56' and 23° 53' north latitude and 86° 48' and 88° 25' east longitude. Bankura is situated between 22° 38' and 23° 38' north latitude and 86° 36' and 87° 46' east longitude (Bengal District Gazetteers, Bankura).
2. Frito Lay is a subsidiary of the PepsiCo first operated contract farming for potato in Punjab. Thereafter, it has spread out to the other parts of the country.
3. Potato is a popular cash crop in the state. West Bengal is the leading state for both staple crop and cash crop production in the country. Rural infrastructure has witnessed significant growth in recent time. West Bengal is the second largest producer of potato. Largest potato production is reported in Hooghly, West Medinipur, Burdwan and Bankura. Hooghly and Burdwan have better cold storage facilities than other districts (Statistical Handbook, West Bengal 2006).
5. More detailed explanation about potato variety refer G.P. Rao article on Economic Botany: potato, Sugarcane and Vegetable oils at <http://nsdl.niscair.res.in/jspui/bitstream/123456789/126/3/Potato%252C%2BSugarcane%2Band%2BVegetable%2Boils.pdf>
6. Semi-contractual arrangement means the vendors involve farmers in contract farming with or without any written form of contract.
7. A conscious approach to social capital is discussed by a few anthropologists among whom Alan Smart's contribution is noteworthy (Source: Anthropologica, Vol. 50, No. 2 (2008), pp. 409-416).
8. *Operation barga* was launched in West Bengal to provide security to the tenants who had been cultivating land of the landlords without any record of rights. This included record of tenants and non removal of tenants. Therefore, lands possessed by tenants from the landlords were hereditary in nature.
9. Many states have amended Agricultural Produce Marketing Committee (APMC) Regulations Act, which would facilitate greater private sector investment, agriculture infrastructure, marketing and open up contract farming. Further, it would create partnerships with banks, finance and logistic companies for lower cost financing and marketing (Sunanda, 2005). West Bengal had not amended to facilitate contract farming.
10. Kisan Credit Card (KCC) is an innovative credit delivery mechanism to meet the production credit requirements of the farmers in a timely and hassle free manner. KCC scheme is under implementation by the vast institutional credit framework of India involving commercial Banks, Regional Rural Banks, and Cooperatives (Source: RBI. Details available at <https://rbidocs.rbi.org.in/rdocs/content/pdfs/CRB5100512AN.pdf>).

Table 1
Contract farmers' concentration block wise

Block	Burdwan		Block	Bankura	
		No. of Village			No. of Village
Memari-I		128	Kotulpur		83
Memari-II		64	Joypur		71
Kalna II		10	Onda		41
Raina II		9	Bishnupur		29
Raina I		3	Patrasayer		22
			Taldangra		7
			Indas		3
			Borjora		1

(Source: data collected from authentic sources)

Table 2
Private vendors' participation in contract farming

Land owned (acre)	Years involved into CF	No. of Farmers (start-year)	No. of farmers now	No. of villages covered	Annual turnover (Qty. in ton)	Annual turnover (Rupees Millions)	Annual income (Rupees Millions)
1	12	50	300	8	1000	8	0.3
8	6	80	180	5	600	5	0.2
6	8	110	320	10	1000	9	0.3
3	2	50	130	13	500	5	0.2
2	4	120	420	20	1500	12.5	0.6
10	12	130	500	50	2000	17	0.6
4	3	80	160	12	750	7	0.25
5	6	60	135	11	450	4	0.18
15	4	150	400	20	2000	10	0.6
3	5	70	210	15	750	7	0.3
5.7	6.2	90	275	16	1055	8.45	0.353

Data is based on field survey in Bankura district collected in 2016. Last row figures are in average

Table 3
Socioeconomic profile of the farmers on the basis of social categories

Household Characteristics	SC	ST	Others	Total
Number of households (N)	44 (13.4)	81(24.6)	204 (62.0)	329 (100.0)
Family type				
Joint	10	6	39	55
Nuclear	34	75	165	274
House type				
Kuchha	37(84.1)	63(77.8)	49 (24.0)	149 (45.3)
Pukka	6 (13.6)	10 (12.3)	98 (48.0)	114 (34.7)
Mixed	1 (2.3)	8 (9.9)	57 (27.9)	66 (20.1)
Family Size average	5.2	4.7	4.9	4.9
Average agricultural landholdings (acre)	0.80	0.85	1.99	1.21
Average Annual Income (Rs)				
From agriculture (Rs)	22727	25037	41500	29755
From non-agriculture (Rs)	33409	20556	37623	30529

(Figures in parentheses are percentages)

Table 4
Socioeconomic profile the farmers on the basis of size of agricultural landholdings

Type	Marginal	Small	Semi Medium	Medium and large	Total
Number of households (N)	150 (45.6)	130 (39.5)	35 (10.6)	14 (4.3)	329 (100.0)
Religion of the respondents					
Hindu	135 (48.9)	104 (37.7)	24 (8.7)	13 (4.7)	276 (100.0)
Muslim	15(28.3)	26 (49.1)	11(20.8)	1 (1.9)	53 (100.0)
Average family Size	4.6	4.8	5.2	9.1	4.9
Family type					
Joint	22 (14.7)	20 (15.4)	5 (14.3)	8 (57.1)	55 (16.7)
Nuclear	128 (85.3)	110 (84.6)	30 (85.7)	6 (42.9)	274 (83.3)
House type					
(1) <i>Kuchha</i>	97(64.7)	49 (37.7)	3 (8.6)	0 (0.0)	149 (45.3)
(2) <i>Pukka</i>	39 (26.0)	50 (38.5)	17(48.6)	8 (57.1)	114 (34.7)
(3) <i>Mixed</i>	14 (9.3)	31 (23.8)	15(42.9)	6 (42.9)	66 (20.1)
Having Bank Pass Book	(96.7)	(98.5)	(100.0)	(100.0)	(97.9)
Having KCC	(8.0)	(19.2)	(40.0)	(64.3)	(18.2)
Average agricultural landholdings (acre)	0.60	1.61	3.48	6.17	1.55
Average Annual Income (Rs)					
From agriculture(Rs)	23420	39423	52600	72500	34936
From non-agriculture(Rs)	29827	34231	38600	38214	32857
From both agriculture and non-agriculture (Rs)	53247	73654	91200	110714	67793

Figures in parentheses are percentages

Table 5
Social characteristics of contract and non-contract farmers

Farmer type	Total	Hindu			Muslim Family type			Av. Family size
		SC	ST	Other	Others	Joint	Nuclear	
CF	193 (58.7)	30 (68.2)	23 (28.4)	106 (70.2)	3 (64.2)	31 (56.4)	162 (59.1)	5.1
NCF	136 (41.3)	14 (31.8)	58 (71.6)	45 (29.8)	19 (35.8)	24 (43.6)	112 (40.9)	4.6
Total	329 (100.0)	44 (100.0)	81 (100.0)	151 (100.0)	53 (100.0)	55 (100.0)	274 (100.0)	4.9 (100.0)

*. There is no SC and ST among Muslim religion. STs have been brought under the Hindu category as reported from the field study.

Table 6
Access to different types of assets by contract and non-contract farmers

Farmer	House type			KCC (No.)	Annual income (Rs)			
	Kuchha	Pukka	Mixed		Land (acre)	Agriculture	Non-agriculture	Both agriculture and non-agriculture
CF	69(46.3)	70(61.4)	54(81.8)	46	1.98	39067	31637	35352
NCF	80(53.7)	44(38.6)	12(18.2)	14	0.93	29074	34588	31831
Total	149	114	66	60	1.21	29755	30529	33592

Table 7
Association of Socio-economic factors with Status of Contract Farming

Socioeconomic factors	Pearson Chi-square value	d.f.	p-value
Landholding group (marginal or non-marginal)	42.478	1	.000
Kisan Credit Card (KCC) Yes or No	9.809	1	.002
Land leased-in (Yes or No)	2.509	1	.113
Caste group (Tribe or non-tribe)	40.596	1	.000
Religion (Hindu or Muslim)	.785	1	.376
Family size (upto 3 or 4 or more)	3.570	1	.059
Education group (VIII pass or more)	18.262	1	.000
Secondary occupation (labour or non-labour)	43.937	1	.000
House type (<i>kuchha</i> or non- <i>kuchha</i>)	17.140	1	.000
Family type (nuclear or joint)	.144	1	.704
Non-agri. Income (upto Rs. 10000 and > Rs. 10000)	3.388	1	.066
Access to modern farm implements* (No/Yes)	31.061	1	.000
Age group (upto 40 and > 40)	1.203	1	.273

* For this variable Chi-square test was conducted for 157 samples. For others sample size is 329.

Table 8
Socioeconomic influence on contract farming participation
(Logistic regression)

<i>Variables</i>	<i>B</i>	<i>Sig.</i>	<i>Exp(B)</i>
Land holding group (marginal and non-marginal)	1.054	.000	2.869
Leased-in Group (leased-in-yes and leased-in no)	.801	.014	2.228
Caste Group (ST and others)	1.376	.001	3.961
Religion (Muslim and Hindu)	.717	.056	2.048
Secondary Occupation (non-labour and labour)	-2.525	.000	.080
Age group(less than 40 and more than 40)	-.409	.228	.664
Non agriculture income (below Rs. 10000 and above Rs. 10000)	-1.475	.000	.229
House Quality (kuchha and others)	.159	.633	1.172
Family Type (nuclear and joint family)	-.602	.101	.548
Family Size (less than 3 and more than 3)	.916	.008	2.498
Education Group (upto class-8 and more than class-8)	.572	.079	1.772
KCC(yes or no)	.467	.244	1.596
Constant	-1.710	.012	.181

* Sample Size is 327. Count R² Value (Percentage of correct prediction) = 76.5%. Nagelkerke R² is .415

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