



# TRANSFORMING INDIAN AGRICULTURE THROUGH FARMING INNOVATIONS

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## 1. INTRODUCTION

Contract farming has existed for a long time, taking different forms, such as a sharecropping contract that was initially regarded as a feudal form of agriculture because the markets were either absent or underdeveloped (Eswaran and Kotwal, 1985). Initially, contract farming was a common practice in developed countries, driven principally by concerns over food safety and quality (Otsuka et al., 2016; Mishra et al., 2018; Bellemare and Bloem, 2018). Glover (1984) describes contract farming as an institutional arrangement with advantages for plantations and smallholder production. Farmers and buyers commonly use contract farming to make advance agreements on volume, specific requirements, delivery, and price.

Rapid income growth, particularly in Asia, has shifted consumption away from staple grains and toward high-value food commodities such as meat, fish, milk, vegetables, fruits, and processed foods (Minot and Roy, 2006). India too, has been undergoing a transition in dietary preferences away from food grains to high-value food commodities (Birtal et al., 2007; Kumar, 2017). Lower trade barriers and improved communication technologies expand trade linkages connecting small farmers with high-income consumers in industrialized countries. The growth in high-value agriculture, supermarkets, processing, and export-oriented agriculture suggests the growing importance of contract farming (Miyata et al., 2009).

Government policies and regulations, for example, India's Agricultural Produce Marketing Committee (APMC) Act 2003, created opportunities for agribusiness firms to obtain their raw material requirements through contract farming, which otherwise obstructed leasing-in land beyond a limit under the Land Ceilings Act. The Act has drawn several corporate groups, multinational corporations, agricultural input agencies, and other organizations into contract farming (CF). It ensures that intermediaries or mediators do not exploit farmers. The APMC Act allows processors and contractors to procure raw materials directly from the farmers' fields (Mishra et al., 2018; Singh, 2005).

Though the potential benefits of contract farming seem to be enormous, there are apprehensions regarding the participation of smallholders and their exploitation by large processing firms (Abebe et al., 2013; Oya, 2012; Singh, 2002; Key and Runsten, 1999; Little and Watts, 1994). Thus, in developing countries, contract farming remains a much-debated issue. In India, the role of contract farming in agricultural development and agriculture-based livelihoods has been a fertile ground for policy discourse. The debate has intensified with the promulgation of farm reform acts in 2020. However, the ongoing discussions are swayed by perceptions, and the empirical evidence is overshadowed by the rigid positions of the farmers' groups.

In this context, the National Academy of Agricultural Sciences (NAAS) organized a brainstorming session on the 'Role of Contract Farming in Transforming Indian Agriculture' on 10<sup>th</sup> March, 2021. It discussed how contract farming could help commercialize agriculture by linking farmers with modern food retail chains. The session explored the interlinkages among agricultural transformation, value chains, and contract farming. Also, it deliberated on the provisions of the Farmers' Empowerment and Protection Agreement on Price Assurance and Farm Services Act, 2020, which was repealed later. This policy paper is an outcome of the deliberations in the brainstorming session.

### Benefits Of Contract Farming

Contract farming meets agricultural commodities' production, processing, and marketing gaps, which otherwise remain unattended in the traditional farming system. This institutional arrangement benefits all stakeholders on the agricultural value chain, viz., farmers, processing firms, distributors or traders, and consumers. It reduces



inefficiencies in the value chain, limits price difference between farm gate and retail, minimizes wastage of perishable commodities, and ensures food safety for consumers (Roy et al., 2021; Kumar and Tripathi, 2021; Kumar et al., 2019; Kumar et al., 2018a; Kumar et al., 2018b; Kumar et al., 2016a; Kumar et al., 2016b).

A contract farming arrangement between the contracting firm and the farmers often involves provision for credit, inputs, and extension services and thus helps organize production. It also ensures markets for farm produce, particularly for high-value food crops. Contract farming benefits smallholders and agribusiness firms by significantly reducing imperfections in the spot market and reducing costs arising due to uncertainty in supply, quality, and prices. Thus, contract farming offers farmers access to markets, inputs, information, and marketing services (Otsuka et al., 2016; Mishra et al., 2018; Bellemare and Lim, 2018; Kumar et al., 2019; Eaton and Shepherd, 2001). Contract farming can enhance operational efficiency and reduce production costs by providing technologies and capital inflows in the form of inputs (Eaton and Shepherd, 2001).

Usually, the contracting firm purchases the contracted produce of specified quality facilitated by providing farmers with a wide range of managerial, technical and extension services. This helps farmers gain from the cultivation of lucrative non-traditional crops. (Kumar et al. 2016a; Kumar et al. 2016b; Kumar et al., 2018; Glover, 1984; Goldsmith, 1985; Morrissy, 1974; Williams and Karen, 1985; Eaton and Shepherd, 2001). In some cases, the contract producers are observed to earn almost three times more than non-contract producers due to higher yields and assured output prices (Mishra et al., 2018; Kalamkar, 2012; Nagraj et al., 2008; Kumar and Kumar, 2008; Ramaswami et al., 2006; Kumar, 2006; Dev and Rao, 2005; Tripathi et al., 2005; Birthal et al., 2005; Dileep et al., 2002). The key factors that motivate farmers to contract are indirect benefits like knowledge acquisition, intangible benefits like satisfaction associated with the contract for exports, income benefits, and market uncertainty (Masakure and Henson, 2005).

The contracting agribusiness firms require a continuous supply of raw materials of desired quality for processing to fulfil the demand for processed products. While procuring the commodities as raw material from the wholesale markets may not always meet the firm's desired quantity requirements and quality standards, often creating supply uncertainties and jeopardising firm's operations, the procurement of farm produce through contracts is the most convenient alternative for the firm, mainly when non-traditional and high-value commodities are involved (Roy et al., 2021; Kumar and Tripathi, 2021; Kumar et al., 2019; Kumar et al., 2018a; Kumar et al., 2018b; Kumar et al., 2016a; Kumar et al., 2016b). Firms generally prefer to contract with a few large producers due to ease of contract management, cost-effectiveness, and lower supply risks. Therefore, firms often contract with smallholders through farmer-producer organizations or farmer cooperatives; the latter form a link between producers and processing firms (Kumar et al., 2019; Kumar et al., 2016a; Kumar et al., 2016b). Thus, through contracts, firms can overcome land constraint and achieve reliability and consistency in production (Eaton and Shepherd, 2001).

The firms must also meet stringent food safety requirements, particularly in the lucrative overseas markets. These may relate to organic produce, or maximum residual levels (MRL) of chemical pesticides mandated to be present in the products for Europe and the United States markets. Firms need to contract with farmers to procure produce of their desired specification to meet such requirements. The firms often train farmers in good agricultural practices and provide quality seeds, fertilizers and pesticides (Kumar and Tripathi, 2021). Contract farming thus helps maintain the food safety standard. Contract farming benefits consumers by providing safe and reliable food products and reducing the wedge between the farm gate price and consumer price for primary and unprocessed products, and controlling price distortions present in the long, informal value chains that disproportionately benefit a handful of middlemen-cum-traders. This gives better price outcomes to both farmers and consumers. Consumers get food products at relatively low and competitive prices.

## 2. CONCERNS ABOUT CONTRACT FARMING

While most studies underscore the benefits of contract farming, some echoes concern about its limitations and negative externalities. These concerns relate primarily to the weak bargaining power of unorganized small farmers vis-a-vis large private corporations or firms. This imbalance of power may result in less favourable contract terms for producers, thereby reducing the benefits of contract farming for them (Maertens and Velde, 2017). In such circumstances, the smallholders find the contracts biased and do not adhere to contractual provisions (Kalamkar, 2012; Glover and Kusterer, 1990; Grosh, 1994). Hence, the contract agreements protect firms from all unforeseen obligations, while farmers are expected to meet the contractual obligations under all circumstances (Singh, 2002). Contract farming, thus, may become a tool for agribusiness firms to exploit an unequal power relationship with growers. Sometimes, when farmers invest in specific assets or change their cropping patterns to fulfil the contractual requirements, they become overly dependent on their contract crops, further losing their bargaining power vis-a-



vis the firm, which may force them to accept less favourable or exploitative contract terms (Watts, 1994).

While both firms and farmers gain from contracts, the firms benefit more. Thus, contract farming may lower the income of smallholders as contracting firms can exercise greater market power over the farmers (Little and Watts, 1994; Glover and Kusterer, 1990). In contrast, some studies find contract farming more beneficial for large farmers than small farmers.

Some studies also find that contract farming pushes out smallholders from the market, leading to higher inequality and poverty. Therefore, small farmers are less likely to participate in contracts (Guo et al., 2005). Firms prefer to contract with farmers having large landholdings, irrigation facilities, more assets, and cooperative membership (Ton et al., 2018; Michelson, 2013; Balsevich et al., 2005; Hernández et al., 2007; Neven et al., 2009). The firms' choice to contract with large growers restricts smallholders from benefitting directly from the contract arrangements. Thus, contract farming can affect how income is distributed within a rural community, exacerbating existing patterns of economic stratification (Warning and Key, 2002; Korovkin, 1992; Key and Runsten, 1999).

A concern for the contracting firms relates to default by farmers on quantity or quality or both (Glover and Kusterer, 1990). As the price of a contracted commodity rises in the open market against the fixed price under the contract, the farmers are tempted to engage in extra-contractual sales. Farmers are more likely to default if the gap between the contract price and the market price is quite large. Many times, firms also default on procurement. This happens in the case of a good harvest. In such cases, firms may not procure the entire produce or become strict on quality (Singh, 2002). For example, a firm contracted a farmer in Senegal to purchase melons at a fixed price but later duped them into buying melons at a lower price as the market price dropped due to a good harvest (Warning and Key, 2002). In another instance, a firm contracted for gherkin and rice seed in Andhra Pradesh but defaulted on procurement. The firm did not procure gherkin from 63% and rice seed from contract farmers. The company's default rate was higher for small farmers, possibly due to poor bargaining (Swain, 2011). In Cameroon, when farmers tried to organize a cooperative to strengthen their bargaining power, the firm abstained from procurement, wasting farmers' produce (Konings, 1998; Singh, 2002).

There is also a general perception among farmers that contracting firms may deprive them of their land. However, the literature does not mention farmers' losing their land titles upon participation in contract farming. But, questions are often raised about farmers' poor control over their land management under contracts. In a typical contract, the firm supplies all the inputs, and the farmer is just a supplier of land and labour. The political economy view of contract farming considers that contracting leads to processes of "self-exploitation" of farmers, and the companies gain indirect control over land (Singh, 2002). Some also consider contract farming as a mechanism for grabbing land by the contracting firm (Isager, 2021; Vicol, 2017).

Another serious concern of contract farming also relates to the environmental degradation due to the over-exploitation of natural resources (Siddiqui, 1998). Repeated cultivation of a crop under contract without crop rotation can lead to soil infestations (Glover and Kusterer, 1990; Torres, 1997). Higher irrigation intensity and increased use of pesticides and fertilizers in high-value crops vis-à-vis traditional crops also contribute to soil and water degradation.

Some externalities related to contract farming also affect food security and the welfare of smallholders. For example, most contract agreements involve high-value crops or cash crops; an over-reliance on cash crops can also make households vulnerable to food shortages and price fluctuations. Also, the powerful agribusiness corporations may collude with the domestic governments to skew policies and state resources in their favour, away from the interests of the peasants (Watts, 1994).

### 3. EMPIRICAL EVIDENCE ON CONTRACT FARMING

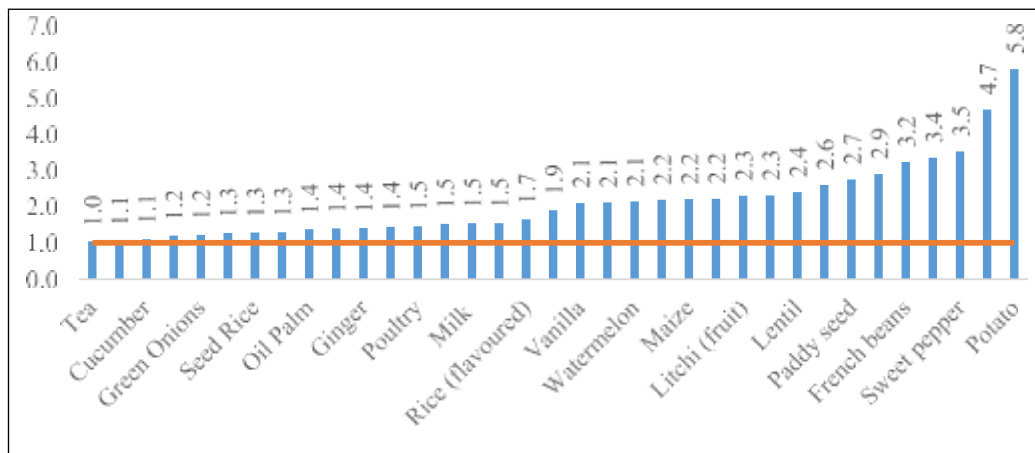
#### Global Evidence

While the debate on the role and impact of contract farming in developing countries remains unsettled (Masakure and Henson, 2005; Winters et al., 2005; Oya, 2012; Prowse, 2012; Otsuka et al., 2016; Mishra et al., 2018; Bellemare and Bloem, 2018), the global evidence underscores the positive effects of contract farming on farmer welfare. Over 92% of the studies report a positive impact of contract farming on productivity and 75% on income. However, some recent studies also highlight a lack of consensus on the role of contract farming in improving farmers' welfare (Wang et al., 2014; Bellemare and Bloem, 2018). To take stock of evidence on the welfare impacts of contract farming, we resorted to the concept of response ratio. A response ratio is a ratio between the mean value of the outcome indicator from an experimental group (here, contract farmers) and its mean value

from a control group (here, thenon-contract farmers). We referred to more than 50 research papers published in reputed journals depicting the impact of contract farming on farm outcomes: yield, production, price, gross income, and net profit. These ratios are closely related measures of proportionate change, often used as measures of the effect magnitude in contract farming. A response ratio with a value greater than one indicates a positive impact. In figures 1 to 4, we include outcome indicators for various countries, except India. Figure 1 depicts the response ratio for various outcome indicators, taken together, for the contracted commodities. The response ratio is the highest for potato (5.8), followed by broiler (4.7), sweet pepper (3.5), tomato (3.4), and French beans (3.2). The high value of response ratio depicts a higher magnitude of benefit for the contract farmers over non-contract farmers. Khan et al. (2019) find a significant positive impact of contract farming in potatoes on price, output value, and income in Pakistan. Similarly, Simmons et al. (2005) report significantly higher net profit for contract broiler producers over the non-contract farmers in Indonesia.

The response ratio is relatively lower for tea (1.0), peanuts and cucumber (1.1), black pepper and green onions (1.2), cashew, rice seed and catfish (1.3), and oil palm and ginger (1.4), meaning lower profits for contract farmers.

**Figure 1: Global impact of contract farming: response ratio for various commodities considering different outcome indicators**

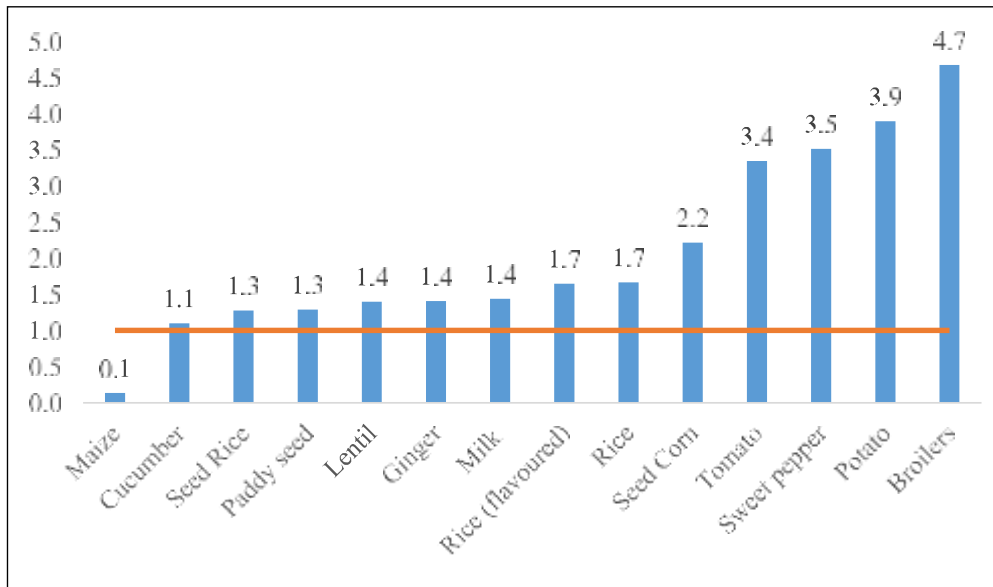


Source: Convener's estimates

We have also attempted to show the impact of contract farming on different parameters of economic welfare. Figure 2 presents the global response ratio for various commodities taking net profit as an outcome indicator. Broiler contracts exhibit the highest response ratio of 4.7 (Simmons et al., 2005). The other items with a high response ratio include potato (3.9), sweet pepper (3.5), and tomato (3.4). Schipmann and Qaim (2011) demonstrate that contract farmers earn 3.5 times higher profit in sweet pepper cultivation than non-contract farmers in Thailand. Moustier et al. (2010) depict 3.2 times higher profit for contract participants in tomato farming in Vietnam over the non- participants.

Commodities with a low response ratio include maize (0.1), cucumber (1.3), paddy seed (1.3), and lentil, ginger, and milk (1.4).

**Figure 2: Global impact of contract farming: response ratio for various commodities taking net profit as outcome indicator**



Source: Convener's estimates

The price realized is another indicator for estimating the impact of contract farming. Figure 3 shows response ratios. The highest response ratio is for potato (2.9), followed by scented (flavoured) rice (1.4), litchi (1.3), honey (1.2), ginger (1.2) and sweet pepper (1.1). It is in the range of 1.0 for paddy seeds, lentil, maize, rice, and cucumber. These response ratios imply that contract farming does not significantly influence producer prices.

**Figure 3: Global impact of contract farming: response ratio for various commodities taking price as outcome indicator**

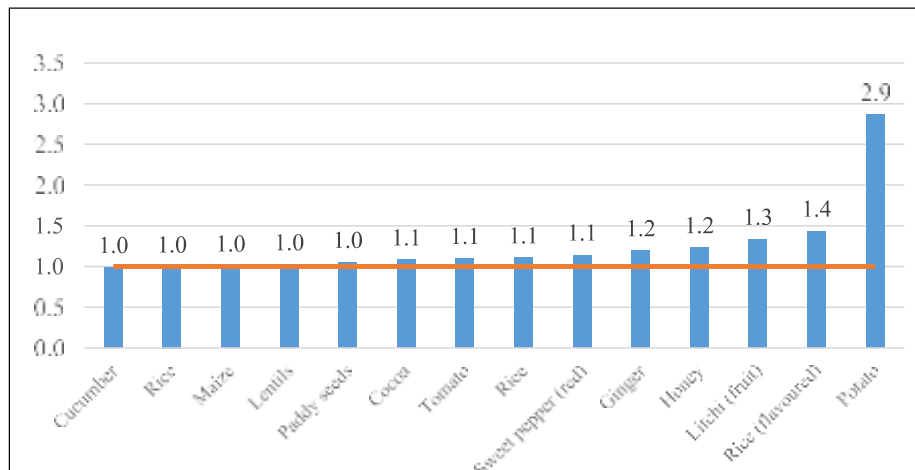
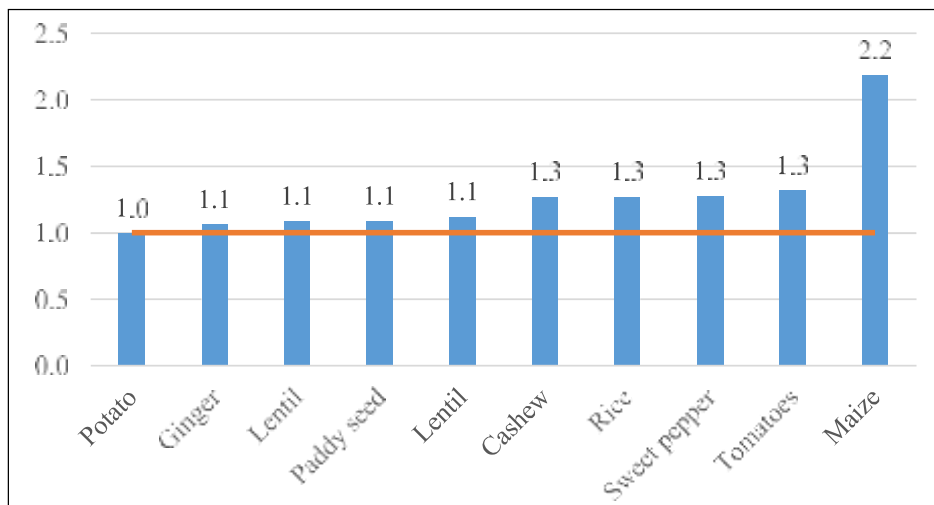


Figure 4 shows response ratios for yields. The response ratio is highest for maize (2.2) and ranges between 1.1 and 1.3 for most other crops.

**Figure 4: Global impact of contract farming: response ratio for various commodities taking yield as outcome indicator**



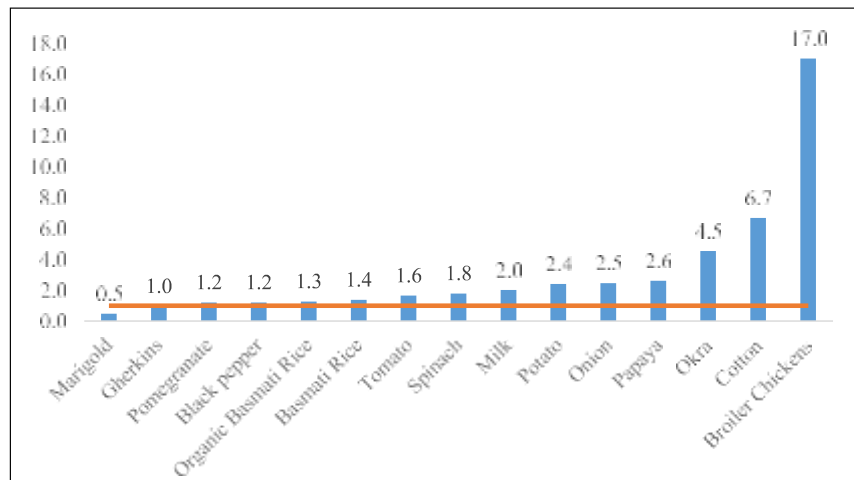
These pieces of evidence underscore the welfare impact of contract farming. Almost all commodities depict a higher value of outcome indicators over non-contract farmers. High-value commodities like broiler chickens and vegetables provide greater economic returns to contract farmers. The production of high-value commodities, in general, needs specialized production techniques, facilities and training. For example, commercial broiler production requires a significant investment in fixed assets such as pucca broiler housing structure for birds. The broiler contract farmers receive quality inputs and follow good production practices under the supervision and guidance of the contracting firm. The contract broiler producers garner better prices for superior produce than the non-contract farmers, who usually miss the facilities and advice typically available to the contract producers (Narayanan, 2014; Roy et al., 2021). Similarly, other high-value commodities, like fresh vegetables, produced under contracts for high-end markets and exports fetch higher prices to farmers (Kumar and Tripathi, 2021). The staple commodities like cereals do not receive similar special treatment from the firm as the high-value produce.

### Evidence From India

Figure 5 shows the response ratio of commodities under contract farming in India. The response ratio ranges from 0.5 for marigolds to 17.0 for broilers. This means broiler farmers benefit more from contracts. Narayanan (2014) shows a 17 times higher net profit from contract farming of broiler chickens over their non-contract counterparts. The response ratio is greater than 2 for milk (2.0), potato (2.4), onion (2.5), papaya (2.6), okra (4.5), and cotton (6.7).

However, in the case of marigolds, non-contract farmers benefit more. The response ratio is below 2 for gherkins, pomegranate, black pepper, organic basmati rice, basmati rice, tomato, and spinach.

**Figure 5: Impact of contract farming in India: response ratio for various commodities covering different outcome indicators**



Source: Convener's estimates

These pieces of evidence reveal that contract farming positively impacts farmers' welfare. Contract farming of high-value commodities like broiler chickens, cotton, fruits, and vegetables contributes more to the welfare.

Further, the literature indicates that small farmers benefit more from contract farming. The response ratio for net profit from milk and vegetable contracts is higher for them. For milk, the response ratio for small farmers is 2.8, much higher than for medium (1.8) and large farmers (1.2). So is in the case of vegetables. However, in the case of broilers, the response ratio for net profit is 1.1 for small and medium farmers and 1.2 for large farmers. Large farmers can perhaps meet the broiler contracts' necessary high fixed investment requirements than the small and medium growers (Birtal et al., 2005). The response ratio for net returns in contract farming of tomato in Haryana was higher for the smallholders (1.8) than the medium farmers (1.3) but was at par with the large farmers (1.8) (Dileep et al., 2002).

In the same way, in Nepal, while the contract farmers of paddy seed earned higher unit profit than their non-contract counterparts, the difference in profit was noticeably more significant for marginal farmers (Kumar et al., 2019). The studies on contract farming of onion, okra and pomegranate in India, and lentil in Nepal, have shown a negative but insignificant impact of farm size on unit profit (Kumar et al., 2018b; Kumar et al., 2016b). However, studies on ginger in Nepal and broiler in Bangladesh suggest a significant positive impact of farm size on unit profit.

The response ratio for the same commodity also varies across regions. For example, the response ratio for net profit for broilers in India (17.0) is much higher than that in Indonesia (4.7); for milk, it is higher in India (2.0) than in Bangladesh (1.4); and for tomato, it is higher in Vietnam (3.2) than in China (1.5). The response ratio also varies by specific features of the commodity. For example, the response ratio for the price for scented rice (1.4) is higher than that for ordinary rice (1.1).

#### 4. POLICY STATUS FOR CONTRACT FARMING IN INDIA

The Government of India attempted to encourage the decontrol of the State APMCs (Agricultural Produce Marketing Committees) and provide a legal framework to facilitate the direct sale and contract farming programmes in the country through the provisions of the Model APMR (Agricultural Produce Marketing Regulation) Act, 2003. The Act provided for compulsory registration of contracting firms, recording contract agreements, resolving disputes, exemption from levy of market fee on contracted produce, and protection of farmers' possession over their land under contract. It also provided the direct sale of farm produce to the contracting firm from farmers' fields without routing it through notified markets under APMCs. In the following years, sixteen states adopted the Model Act and took fruit and vegetables out of APMC regulation. However, Punjab brought out its own Punjab Contract Farming Act 2013. By 2016-17, twenty states amended their APMC Acts following the Model Act 2003 and fourteen notified rules related to contract farming (GoI, 2003).

The Government of India passed three farm laws in the Parliament in 2020 and subsequently enacted these as Acts. The Farmers' Empowerment and Protection Agreement on Price Assurance and Farm Services Act, 2020 aimed to



provide a uniform regulatory law and promote contract farming (GoI, 2020a). The new Act was a simplified version of the Model Contract Farming Act and did away with the complicated system of registration/licence, deposits, and other compliances. The Act provided an assured price, inputs, and services to farmers. It also attempted to empower farmers by engaging them with processors, wholesalers, aggregators, large retailers, and exporters on a level playing field. In case of a higher market price, farmers were entitled to get it over the agreed price. The Act transferred the risk of market unpredictability from farmers to firms and enabled the farmers to access modern technology, better seed, and other inputs (GoI, 2020b).

While farmers were protesting against the farm laws, the Supreme Court of India appointed a committee for their review. Based on its interactions with farmers, the report stated that most farmers (86%) supported farm laws. According to the report, the Acts intended to develop competitive agricultural markets, reduce transaction costs, and increase farmers' share of consumers' rupees. The report recommended not to repeal or suspend the laws in the interest of the majority of the farmers. The report said that the model contract agreement should be formulated and shared on the website with all stakeholders to remove glitches in its provisions and implementation strategy. It stressed expediting communication with farmers to clear their apprehensions.

## 5. Recommendations

The potential of contract farming in fulfilling critical gaps related to information, production, markets, credit and risk is well documented. Some studies also point to exploiting unorganized small farmers by the giant agribusiness firms, owing to their unequal bargaining relationship. The benefits and concerns related to contract farming are often debated in policy-making. This paper uses outcomes of the brainstorming session on contract farming and a response ratio-based analysis of crucial outcome indicators referring to a wide range of global research studies on contract farming to assess the role of contract farming in farmers' welfare worldwide and in India. It also reviews the benefits and concerns associated with the contract farming arrangements. The brainstorming session highlights the critical role of contracts in addressing several key constraints faced by smallholders that limit their productivity and efficiency. Firms benefit from getting an assured supply of raw material in the desired quantity with required quality specifications. Consumers also benefit in terms of receiving safe food at reasonable prices. Most research studies have depicted a positive contribution of contract farming to the welfare of smallholders.

## 6. CONCLUSION

The brainstorming session brings to the fore various concerns associated with contract farming. These relate to the exploitation of smallholders by the contracting firms, primarily due to the weak bargaining position of the unorganized individual smallholders against the large corporations. The firms discriminate against smaller farmers, and favour large and resourceful farmers while contracting. Some studies have highlighted these concerns, and the topic is a fertile ground for debate.

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