Smallholder attrition in contract farming schemes in India: extent, causes, and concerns

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This paper maps the extent and causes of farmer exit from contract farming arrangements in southern India using survey data for five schemes: cotton, gherkins, papaya, marigold, and broiler chickens. The paper finds that farmer attrition is quite widespread and that poorer farmers from marginalized social groups are more likely to exit these arrangements. While this is an important policy concern, the study also distinguishes between voluntary exit, where the farmer opts out, versus involuntary exit, where the contracting firm drops the farmer as a supplier because of constraints in delivering quality produce, or the firm's interaction with the farmer forces the farmer out. The paper also highlights the episodic nature of farmer participation, wherein farmers leverage opportunities to contract occasionally as part of a dynamic portfolio of alternatives. The paper emphasizes that while involuntary exclusion is of serious concern, voluntary exit and episodic participation are perhaps less important issues from a policy perspective.

Keywords: smallholder, contract farming, India, inclusive supply chains, sustainability

THE ABILITY OF MODERN supply chains to involve poor smallholders has been a predominant concern in the context of poverty alleviation and rural development (Eaton and Shepherd, 2001; da Silva 2005; Swinnen, 2007; Minot, 2008; Barrett et al., 2012). In recent times, a rich academic literature has evolved around this question. Somewhat less studied is the equally important question of whether participation of smallholders, when this does happen, is sustained over time. On the one hand, if a smallholder's participation is not sustained, the associated gains from such participation, when they exist, are lost to the farmer, who might then be rendered vulnerable to relapsing into a state of poverty. To the extent that farmer exit from these supply chains emerges on account of the inability of the smallholder to meet quality requirements or make specific investments to be part of these supply chains, smallholder exit is cause for concern. If, however, smallholders voluntarily exit these systems on account of more remunerative alternatives or in favour of

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options that might be more appropriate for the specific, idiosyncratic circumstance of the household, then this is less cause for concern. This paper argues that while sustainable participation is desirable, it is essential to texture our understanding of the dynamics of farmer participation in modern supply chains in a way that is useful to policymaking, in particular, to make careful distinctions on the cause of exit.

This paper discusses these issues in the context of five contract farming arrangements in southern India. Using a combination of firm level data for two commodities – cotton and gherkins – as well as a primary survey, conducted between 2007 and 2010 of over 822 farmers across five contracting schemes in southern India, including papaya, marigold, gherkins, broiler chickens, and cotton, the study examines the dynamics of smallholder participation to highlight the extent and causes of farmer exit from these systems. The focus of this paper is twofold. First, using specific data on the reasons for exit, the study distinguishes between voluntary exit, where the farmer opts out, versus involuntary exit, where the contracting firm drops the farmer as a supplier, the farmer faces insurmountable difficulties in meeting the demands of the buyer or the firm's interaction with the farmer forces the farmer out (for example, when the firm reneges on the contract). The two types of exit imply very different things for policy concerns. The second focus is on the episodic nature of farmer participation in contracting arrangements, wherein a spell of non-participation is sandwiched between spells of contracting. Using insights from the field survey, the paper illustrates how smallholders often leverage the opportunity to contract occasionally as part of a dynamic portfolio of alternatives.

Following this introduction, the paper discusses the fluidity in contract farming arrangements in developing countries documented so far, making a case for factoring dynamic aspects in the study of welfare implications of contract farming. The next section discusses the extent and causes of farmer attrition or exit from contract farming schemes using data from southern India. This is followed by a discussion of farmer exit from the farmer's perspective, using survey data through structured interviews. This section also elaborates on two specific cases of contracting, for cotton and gherkins, where the former collapsed and the latter endured, conveying the firm's perspective of the challenges faced in sustaining operations. The penultimate section focusses on the idea of episodic participation, illustrating the manner in which farmers periodically enter and exit these arrangements voluntarily (and to varying degrees) based on their exigencies. The paper concludes with some reflections on the circumstances when smallholder exit should or should not be a serious concern and the policy implications in these scenarios.

The fluidity of contract farming schemes in developing countries

The dynamics of farmer participation and temporal change in contract farming practice have been issues of relative neglect despite widespread recognition of their importance. As Minot (1986, 2008) points out, the failure of contract farming schemes in developing countries is high, but poorly documented. Questions of sustainability and survival rates are important from the perspective of public policy,

which is typically charged with the role of enabling smallholder participation, especially if inclusive supply chains are an important policy vehicle for enhancing small farmer prosperity. The survival of these supply chains aside, there is also the question of change in the composition of contract suppliers that might undermine the welfare of the small farmer in the long run if the firm decides to exclude them eventually. It is clear, and recognized as such in the literature, that firms might alter their portfolio of farmers based on experience and learning. Over time, those farmers who were contracting may be dropped and others who were not, included. The evolution of a firm's portfolio of suppliers is only just beginning to get serious attention. An early example is from Runsten and Key (1996), who found that multinational tomato processors in Mexico first contracted with large growers but then eventually involved also the small growers because side selling was a problem with their larger growers. An exporter in Thailand that started producing its own horticultural products on company land later shifted to smallholder contract production (Minot and Ngigi, 2004). Herath and Weersink (2009) note that the Sri Lankan tea sector has changed from being dominated by vertically integrated plantations to one where processors source from small, independent growers. Minot and Ngigi (2004) describe the evolution of several contract farming schemes in Kenya, including one (Del Monte pineapple) that gave up on contract production and others that have shifted from large-scale to small-scale production. The reverse, that is, movement from small- to large-scale suppliers could happen as well, a trend that perhaps does point to the problem of sustained smallholder participation. For example, the Xiaobaiyang chain in Beijing is known to have shifted from 1000 to 300 processed food suppliers in two years as it centralized its procurement system reflecting consolidation rather than a shift of scale (Hu et al., 2004). Dolan et al. (1999) show a consolidation in the export sector in Kenya with a sharp reduction in the proportion sourced from small farmers. In the case of processing, Farina et al. (2005) find a similar trend for dairies in Argentina and Brazil. Similarly, leading Russian chains focus only on a handful of foreign and domestic suppliers for dairy products (Dries and Reardon, 2005). In Senegal, green bean exporters switched from small-scale contract production to large-scale production (Swinnen and Maertens, 2008).

These shifts have several origins. Some changes emerge from contextual issues, especially exogenous changes downstream that have implications for firm strategies for procurement, driving firms to alter their sources (Dolan and Humphrey, 2000; Mannon, 2005). Sometimes it can prompt firms to abandon sourcing from the particular community altogether. Fold and Gough (2008), for example, report how changing consumer preferences in the European Union (EU) affected contract pineapple production in Ghana. Ashraf et al. (2009) document a breakdown of a DrumNet contracting scheme in Kenya. They point out that in the case of DrumNet, the exporter stopped buying from DrumNet because farmers could not meet new EU production requirements. Farmers sold to other middlemen and defaulted on their loans from DrumNet. In a different case, degradation of soil quality consequent to recommended nutrient and pest management led to the firm abandoning contracting altogether in Mexico (Glover and Kusterer, 1990; Mannon, 2005). Whatever the reason, these strategic shifts undermine the ability of smallholders to participate in a

sustained manner. Even in the absence of such serious shifts within a system, farmers could exit because of their inability to deliver the necessary quality of produce; these quality standards could force resource-constrained farmers to exit these arrangements. While a firm's procurement decision or smallholder constraints can drive changes in the dynamics of participation, an under-documented phenomenon is the voluntary exit of farmers from these arrangements. For example, Glover and Ghee Lim (1992), describing the emergence of contract farming in South-east Asia, observe that the success of contract farming schemes in Thailand turned out to be the very cause of failure. Farmers who became wealthier started investing in more lucrative avenues such as real estate and exited contract farming altogether. Similarly, an agribusiness executive in India said 'we want to get out of contract farming, the farmers get better at it and want to pursue other options and then don't return. It becomes difficult for us'. These suggest that the sustainability of contract farming schemes as a whole cannot be taken for granted but also that it is important to rigorously document the mortality or survival of schemes as well as the cause of farmer exit to understand the shared features of enduring supply chains.

Extent and causes of farmer attrition from contracting schemes in southern India

This section maps the extent of farmer attrition in the southern Indian state of Tamil Nadu, using survey data based on five sample firms involved in contract farming in five different commodity sectors: cotton, gherkins, marigold, papaya, and broiler chickens.

The five commodities chosen for study have very different histories in the region, yet share a recent past in terms of their roles in shaping the trajectory of contemporary agriculture. Three of the crops, gherkins, papaya, and marigold, were introduced into the area recently, in the early 1990s, while cotton and broiler have long occupied a prominent place in the agrifood system of the region. Gherkins are a non-traditional export crop with no domestic market. The crop is procured from farmers and processed at small-scale plants, by washing, rinsing, and preserving in brine, acetic acid or vinegar. These are either bottled and labelled for international clients or shipped out in barrels for bottling. Cotton is a traditional cash crop in parts of the study area, with established local markets and networks. Recent years have seen mills integrating along the garment chain, and extending backward to contract with farmers for good quality, long staple cotton for milling. Papaya was introduced in the region in the 1990s for extracting papain, which has wide-ranging industrial uses. The variety is appropriate, but not ideal, for table consumption, and the fruit is a by-product that is used to make candied fruit or for pureeing. Marigold contracting was initiated by firms for oleoresin extraction for export, mainly as colouring agent for poultry feed. Marigold has a thriving local market, however, for fresh cut flowers that are used for a number of occasions, religious and otherwise. The broiler industry in the study region is almost completely vertically coordinated, a process that began in the mid-1990s. Day-old chicks are provided by the firm and bought back by the

contracting firm. The firm acts as an aggregrator-intermediary, but also has its own brand of chicken in various processed forms. These contract commodities have significantly different attributes, contributing to diversity in contract farming arrangements. At the same time, they all symbolize new aspects of agricultural development in the region, represented by strong links downstream not only to industry but beyond, to regional, national, and global markets (Narayanan, 2012b).

The data used come from a survey of 822 farmers covering these five commodity sectors, conducted between 2007 and 2010, representing farmers with different contracting status. The list of contracting farmers for the year of the survey was obtained from the subject contracting firm for each of the commodities studied. Based on this list, a stratified sampling process was followed that ensured different types of farmers were selected. In the villages sampled, a census of all households identified four key types of farmers: those currently contracting (henceforth, contract farmers); those who were growing the contract crop either for the open market or contracting for firms other than the subject firm (other contract farmers); those who had given up contracting with the subject firm and do not grow them any more (attrition farmers); and those who had never contracted (never contract farmers). The attrition farmers are those who have given up the contract crop altogether. The sample respondents were randomly selected from each type. The survey was conducted in two phases: gherkins and cotton constitute Phase 1 and marigold, broiler, papaya, and a follow-up of the same gherkins firm constitute Phase 2.

Extent of attrition

The house-listing process (or census) mapped the participation of households in the sampled hamlets comprehensively. While these are not presented in detail here, it was clear that there was no contract village that was sampled that did not have at least a few attrition farmers. Overall in the sample villages, the house-listing process reveals that farmer attrition is fairly commonplace, although it varies across sectors (Table 1). For broiler, for every seven growers currently contracting, there is one grower who contracted with the subject firm and has exited. The ratio is nine for papaya, three for marigold, and one for gherkins, indicating that exit is perhaps more common for marigold. In gherkins, which are exotic to the region, the ratio is the reverse, where for every 10 farmers who are currently contracting with the subject firm, there are 15 who no longer contract with the subject firm. While this is possibly an overestimate of those who have exited permanently, it gives some sense of the extent of attrition. As expected, there seems to be a negative correlation between the initial fixed investments required for contract participation and farmer exit, with broiler that requires sunk costs in construction of poultry sheds, feeders, and drinkers seeing the least churning. In the case of papaya, which is a tree crop and will yield latex for three to five years, the sunk costs perhaps keep attrition low. Field crops such as gherkins and marigold see a relatively greater proportion of attrition farmers. Table 1 provides the total numbers from the house-listing process by different categories of farmers.

Table 1 Pattern of participation in the sample villages

Commodity	*Contract farmers*	*Attrition farmers*	*Other contract farmers*	*Never contract farmers*
Broiler	68	10	87	2567
Gherkins	76	117	275	819
Marigold	790	280	0	1042
Papaya	61	7	0	1696

Note: Data from Phase 1 not presented owing to some data gaps
Source: Compiled from house-listing data, author's survey (2007–10)

Who exits? The correlates of farmer attrition

If farmer attrition is as widespread as the house-listing process suggests, is there something systematic about who exits and who sustains participation in these arrangements? To find out, we conduct a regression analysis using an econometric model that associates the probability of a contract farmer exiting a contracting arrangement with the sample firm and a number of explanatory variables. A positive and statistically significant association suggests that a larger value of the explanatory variable increases the likelihood of a contract farmer exiting and a statistically significant negative association indicates that a lower value of the explanatory variable increases the likelihood of farmer attrition from the contracting scheme. A regression analysis of the correlates of farmer exit shows that there appears to be no systematic bias in attrition and the smallest land-size class was as likely perhaps to exit as the farmers with larger landholdings (Table 2). This can be interpreted as a case where smallholders do not face systematic and shared constraints to sustained involvement. At the same time, it is the case that contracting firms, especially for cotton, marigold, and gherkins, generally contract with smallholders and the average landholding size was quite small. So the fact that smallholder exit is not a systematic pattern might only reflect that the initial selection of farmers itself was in favour of smallholders. That said, a dummy variable for survey investigators' assessment of whether the farmer seemed to be among the poorest 40 per cent of the villagers, suggests that poor farmers are more likely to exit, suggesting perhaps a particular set of wealth constraints that prevent poorer farmers from continued inclusion in these arrangements. Farmers who were relatively better educated show a low propensity to attrition whereas those belonging to historically disadvantaged marginal groups appear to have a higher probability of exit from contracting arrangements.

More interestingly, however, conditional on social group and poverty, those who perceived the net benefits from contracting to be negative relative to the next best alternative they had, also were more likely to exit the contracting arrangement. So too were those who are more risk averse. Risk aversion was measured through an experiment where the farmer was offered a sure prospect of winning an amount versus an alternative where the farmer would win an amount linked to a coin toss, greater than the sure amount if heads and lower if tails, but which on average would be exactly equal to the sure amount. Ambiguity aversion was not however a significant correlate. Farmers were regarded ambiguity averse if they did not choose

an option where the odds of winning are not known over an option where the odds were revealed (even though the odds were kept the same across the two alternatives).

While it is difficult to ascertain the elements of the particular experience of the farmer with the contracting firm that forms the basis of their perception, it is suggestive of farmers evaluating their contracting experience against other alternatives available to them.

The sunk costs do not seem to be significant drivers of non-exit, though it could well be the case that the commodity dummies pick up this effect. Regression analysis of this sort is useful to elicit patterns but often masks the precise *causes* of farmer exit from systems and indeed whether the firm in fact dropped the farmer as a supplier. The two types of exit ought to have very different implications for public policy to the extent that the latter might be voluntary and the former might be involuntary.

The causes of exit

The farmer survey attempted to understand the causes of exit in some detail, asking those who ceased to contract with the subject firm after prior experience why they did so, leaving the question open-ended. The responses were then organized into 19 specific reasons. The data indicate, expectedly, that there exists a fairly wide variety of reasons for farmer attrition (Table 2). Some involve the firm terminating the relationship, when they drop villages or when they drop farmers from their portfolio (ranked 8 and 14 out of the 19 reasons). This is often a consequence of the firm altering their scale of operations in response to either sluggish downstream demand or on account of a geographic shift in the areas of procurement. This is documented in other works as well and indeed the most commonly recorded reason for farmer exit from contract arrangements (Glover and Kusterer, 1990; Dolan and Humphrey, 2000; Mannon, 2005).

While farmers might not be candid in admitting that they were dropped by the firm, several did confess that they are unable to deliver contract commodity of the quality that the firm requires. This is notable for broiler and gherkins, where this inability led to higher rejection rates and in the extreme leading to the firm dropping the farmer-supplier altogether. Ashraf et al. (2009), Fold and Gough (2008), and Harou and Walker (2010) record similar problems, on a large scale, with compliance. Bachke (2010) observes that without handholding by cooperatives in Mozambique, as many as 64 per cent of farmers in a contract farming arrangement dropped out of the system. These are also barriers and constraints that farmers might face that prevent them from participating in potentially profitable supply chains. This includes credit constraints as well. Several other reasons explicitly point a finger at the firm as a cause for exit (including poor technical support, poor quality of inputs, delayed payments, etc.) together constituting an average of over 12 per cent of the responses. This dissatisfaction with firms has not been explored in the literature so far.

Interestingly, however, alongside these situations reflecting involuntary exit, there is strong evidence of farmers experiencing disconnect between realized outcomes and expectations. Other than for broiler, a considerable proportion of attrition farmers state that the profits were not as high as anticipated, and that this

Table 2 Who exits?
Dependent variable (1 = farmer no longer contracts with the subject firm and does not grow the crop; 0 = continues to contract with subject firm)

Variable	*Coefficient*	*Robust standard errors*	*t-statistic*
Land owned (acres)	–0.06	0.06	–1.13
Poor (1 = bottom 40%)	1.10	0.63	1.76 *
Rainfed farm (1 = rainfed)	–0.49	0.57	–0.85
Land fertility (1 = better than village average)	–1.61	1.38	–1.17
Family size	–0.10	0.17	–0.6
Age (years)	0.36	0.18	2.02 **
Age-squared	0.00	0.00	–1.85 *
Education level of farmer			
Illiterate (=1)	–1.80	0.96	–1.87 *
Below secondary school (=1)	–1.27	0.84	–1.51
Secondary completed (=1)	–2.34	1.03	–2.27 **
Education level of the most educated family member			
Illiterate (=1)	–0.68	0.92	–0.75
Below secondary school (=1)	–0.59	0.80	–0.74
Secondary completed (=1)	–0.66	0.74	–0.88
Scheduled caste/tribe (=1)	13.36	1.83	7.29 ***
Most backward caste (=1)	15.01	1.41	10.66 ***
Proportion of household food needs sourced from the market (%)	–0.02	0.02	–1.24
Distance to the nearest surfaced road (km)	0.06	0.04	1.39
Gherkins (=1)	2.54	1.20	2.11 **
Marigold or cotton (=1)	6.31	1.35	4.68 ***
Length of the contracting relationship (years)	–0.04	0.07	–0.62
Sunk cost (Rs.)	0.00	0.00	1.29
Risk score	0.01	0.00	4.71 ***
Risk score interacted with ratio covariance of contract price and market price	–0.40	1.92	–0.21
Debt (Rs. thousand)	0.06	0.80	0.07
Cropping diversity (number of crops per acre)	–0.14	0.26	–0.52
Ambiguity aversion (1 = ambiguity averse)	0.16	0.48	0.33
Risk aversion (1 = risk averse)	1.53	0.48	3.21 ***
Lottery price (Rs.)	–0.01	0.02	–0.65
Constant	–19.44	4.62	–4.21 ***
Proportion classified correctly	85.71%		
Log pseudo-likelihood	–71.36		
Number of observations	238		
Pseudo R2	0.35		
Wald chi-squared (28)	321.04 ***		

Notes: * Significant at 10%, ** Significant at 5%, *** Significant at 1%
Excludes observations that have never contracted or those contracting with a non-subject firm.
Risk score refers to a psychometric measure of different benefits and risks associated with contracting and the next best alternative, weighted by the frequency and importance of the relevant benefit or risk. It is interpreted as a catch-all measure of the net incremental risk associated with contracting. The risk aversion measure takes the value 1 if in an experiment during the survey, the farmer chooses the safer option. Essentially, this means when a farmer is offered a bet with a 100% chance of winning and another where there is a 50% chance of winning more than the sure amount and a 50% chance of winning less than the sure amount, although the average is equal to the sure amount, the farmer chooses the former bet over the latter. Lottery price is the maximum amount a farmer is willing to pay for a fair bet and the variable ambiguity aversion takes the value 1 if the farmer, in a game played, chooses the option where the chances are known over the option with unknown probability of winning. For details on the experiments, see Narayanan (2012a).

was a reason for exit (Table 3). Other reasons for exit include excessive demands on family labour, limited availability of hired labour at low wages, and yield losses. Personal circumstances representing idiosyncratic reasons for farmer attrition also figure among the reasons, while rain- and pest-related yield loss is also significant. Perceptions of detrimental impacts on soil quality and health appear serious enough to drive some farmers to exit contracting. Triggers for farmer attrition from contracting schemes encompass both those that fall within the ambit of traditional policy concerns, such as provision of credit support for smallholders, skill building and so on or establishing oversight on firm practices, and those that are outside the realm of policymaking involving farmers' assessment of alternatives available to him or her. In the latter case, public policy has little role or rationale in keeping farmers in the fold. Existing scholarship on farmer exit focuses overwhelmingly on involuntary exit and few studies have examined the phenomenon of voluntary exit.

Table 3 Self-reported causes of farmer exit

Reason for attrition	*Percentage of attrition farmers citing the reason*					*Average (weighted by total number of responses)*
	Gherkins (Phase 1)	*Gherkins (Phase 2)*	*Marigold*	*Broiler*	*Cotton*	
Not as profitable as anticipated	18	17	11	0	44	**20**
Labour costs too high	20	9	25	0	10	**16**
Too much labour required	21	14	21	0	7	**16**
Low price for output	3	0	23	0	2	**7**
Improper payment by the firm	0	3	4	53	2	**6**
Soil quality deterioration	5	17	4	0	0	**5**
Rain-related yield loss	5	3	0	0	15	**5**
Firm stopped contracting in the village	6	0	0	0	15	**5**
Pest problem	2	14	0	0	2	**3**
Farmer unable to maintain quality standards	5	0	0	20	0	**3**
Poor quality of inputs	3	0	2	20	0	**3**
Health issues	0	9	4	0	0	**3**
Inadequate/poor technical support from firm	6	0	2	0	0	**2**
Firm refused me a contract	5	3	0	0	0	**2**
Personal reasons	3	6	0	0	0	**2**
High cost of cultivation relative to other crops	0	0	5	0	2	**2**
Water problem	0	6	0	0	0	**1**
No advance or credit available	0	0	2	0	0	**1**
Delay in input delivery	0	0	0	7	0	**1**
Number of responses	**66**	**35**	**57**	**15**	**41**	

Note: No papaya attrition farmer was interviewed. Hence, papaya is not included in the table. The reasons are in descending order of average percentage of responses in the last column.

Voluntary and involuntary exit: a tale of two schemes

This distinction between voluntary and involuntary exit is quite important in defining where policy interventions can make a difference and where they cannot. This section discusses the example of two schemes in southern India, for cotton and gherkins, illustrating the nature of farmer attrition for two different firms and their contexts.

Both firms contracted with relatively small farmers, with an average landholding size of approximately 2.5 acres. Figure 1 presents trends in the procurement patterns for two firms. The cotton firm started contracting with a lot of promise in 2004–05. In what came to be known as a tripartite model for contract farming, the Government of Tamil Nadu brought together three cotton mills (one of which was chosen as the subject firm) and the government marketing organization called Cotton Corporation of India for contracting with the farmer. The Integrated Cotton Cultivation Programme and the Tamil Nadu Agricultural University (TNAU) were to provide research and development support, with the Commissioner of Agriculture providing extension support and training to the farmers. Commercial banks would step in to provide credit facilities to the identified farmers, with insurance and dispute settlement, if any, looked after by the Central Institute of Cotton Research (CICR). In 2007–08, the firm began to procure summer cotton from Salem district, and this is reflected in the increase in the number of blocks, villages, and hamlets that year (Figure 1). Despite this expansion in procurement area, the contract acreage and the number of farmer-suppliers did not increase substantially, indicating possible farmer attrition in the Coimbatore region. By the time of the survey in 2007–08, the cotton firm was procuring from 77 farmers in a handful of villages in the study region and it was apparent that it would not survive. By 2008–09, the firm had abandoned contracting in conventional cotton. An executive associated with the programme declared 'Contract farming in conventional cotton is an absolute flop everywhere' (Coimbatore, Tamil Nadu, 2008). The firm was planning then to commence contract farming operations in organic cotton. As a newspaper reported 'the mill sector has lost its initial enthusiasm for the concept' (Revathy, 2010). Most of the spinning mills that embarked on contract farming operations in 2003–04 had abandoned contracting by 2008–09, save as corporate social responsibility (CSR) initiatives. As a company executive stated, 'we find that 200 farmers or so is reasonable for us as a CSR initiative, but it doesn't make sense otherwise. We need 10,000 bales, we get 150–200 bales from contracting and scaling up is not possible' (Tiruppur district, Tamil Nadu, 2008).

Many explanatory factors were at work. Against a strong traditional market for cotton, it was difficult to ensure that the farmer did not divert the harvest to the open market. Even when a premium was fixed, because payments to farmers were not instantaneous and poor quality was penalized, this made it less attractive for the farmer. From the firm's perspective, the cost of transacting was often higher than importing raw material internationally where trade credit of six months was available to the spinning mills. A final blow came from the interlinking of credit. In 2008–09 farmer debts were waived through a national policy. Contract farmers who had already delivered produce faithfully to the mill had automatically repaid the

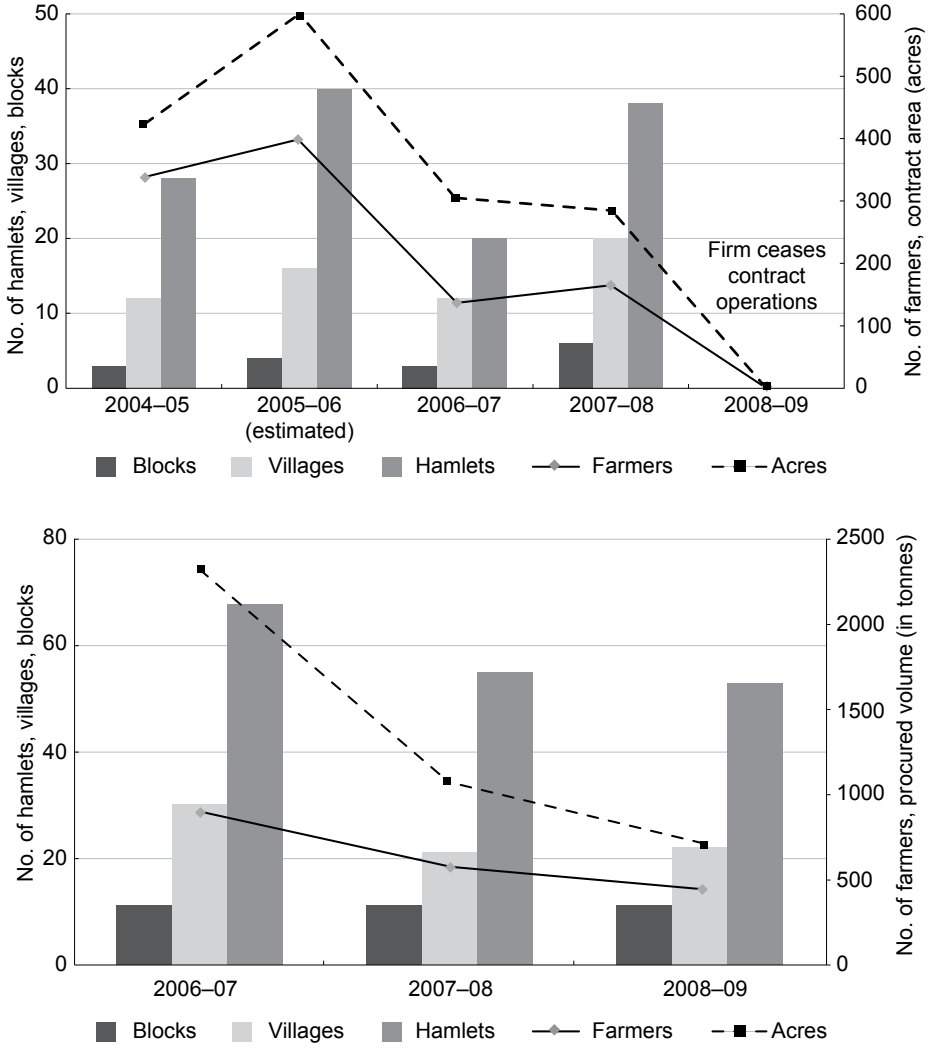

Figure 1 A tale of two schemes: (top) cotton and (bottom) gherkin contracting in the study area

loan, while those who side-sold had their loans waived by the banks. This vitiated the relationship between those farmers who honoured the contract and the mill. Combined, the mill could not sustain the operations.

The experience of the gherkins firm is a contrast. It started commercial operations in 1999. By 2008, the firm had expanded to contract from over 5,000 farmers spread over more than 3,000 acres and has stabilized at that scale, though depending on the economic conditions in the importing countries, this fluctuates a little from year to year. It is interesting that while the numbers of contract hamlets, villages,

and blocks, and even contract farmers in the study area have not declined dramatically, the volume procured from the study region has seen a comparatively marked decline, indicating decreasing volumes procured per farmer (Figure 1). Interviews with executives of the firm indicate the firm's strategic shift to new geographies for procurement. At the time of the survey, the gherkin processor was sourcing a majority of gherkins from outside the study area, moving to the east and south of the study region. This was partly on account of the stiff competition from other gherkin processors located in and around Dindigul town. The other reason, according to an executive with the firm, is declining yields from the 'old areas' (Dindigul, Tamil Nadu, 2008). It reflects, too, the effects of the economic downturn in importing countries, that saw fewer international orders, so that the firm reduced total procurement nationwide in 2007–08 and 2008–09. Interestingly, whenever their procurement needs fall, the gherkins firm, as a policy, tries to ensure that rather than dropping farmers they contract less acreage on average from each of them, so that they do not lose the trust or loyalty (of supply base) represented by the farmer. This implies a considered strategy at managing fluctuations and stemming attrition. Farmer attrition in this instance has been mostly voluntary, though the firm does shift geographies of procurement once in a few years, forcing farmers in older areas out of the system.

These two contracting schemes illustrate how firms do or do not manage farmer attrition and delicately balance their often challenging contexts downstream with those upstream.

Episodic participation in contract farming arrangements

Attrition aside, another under-documented phenomenon is the issue of episodic participation. Almost universally, even when firms are willing to offer contracts every season, farmers who contract prefer to contract only for a subset of the seasons, opting not to contract the rest of the year. Importantly, a contract commodity has a very specific place in the farmer's annual cropping pattern and portfolio, wherein there are a set of competing cash crops that farmers move in and out of over the year. Over the longer term, too, farmers' participation in contracting is often episodic, where a spell of not contracting can be sandwiched between two periods where the farmer is contracting for the commodity. Forty-six per cent of contract farmers reported that they had breaks in their contracting history, ranging from 8 per cent for broiler contract growers to 73 per cent for marigold contract farmers (see Table 4). The figure is as low as 8 per cent for broiler and as high as 73 per cent for marigold farmers. The former reflects both the level of fixed investments required and the fact that broiler farmers have begun contracting only recently. In the case of papaya, breaks from contracting indicate spells when no latex was extracted.

Figure 2 presents the duration of breaks in the contracting history of sample farmers. This is plotted against land owned, to map the prevalence across classes of farmers, and the rug plot shows the density of observations according to land ownership. It is clear that a number of gherkin and marigold contract farmers have

had breaks in their contracting history. In the case of gherkins, there is a fair spread across time. For marigold, on the other hand, most spells are clustered around 2004 to 2008, several ending in 2008. For broiler and papaya, such breaks appear less common, and seem to be of shorter duration, typically less than a year. It is apparent that the phenomenon of episodic participation is not confined to a particular landholding size category.

The reason for episodes of not contracting could be on account of the firm's withdrawal or the farmer opting out. The farmer survey mapped the reasons for breaks in contract (Table 4). In many instances, the episodic nature of farmer participation is governed by the ebb and flow of the international orders downstream that the processing firms get, implying that there are years when the pool of contract farmers shrinks. About 28 per cent of those with breaks declared that the firm had not offered them contracts. In particular, the pattern for marigold, which saw breaks clustered between the years 2004 and 2008, marks the time when the firm had few export orders and had scaled down operations considerably. In many other instances, the individual farmer often opts out of the contract crop, either willingly, responding to potentially high profits for a competing crop, or involuntarily, when personal circumstances of the farmer, for example, illness of family members, pose particular constraints on contract

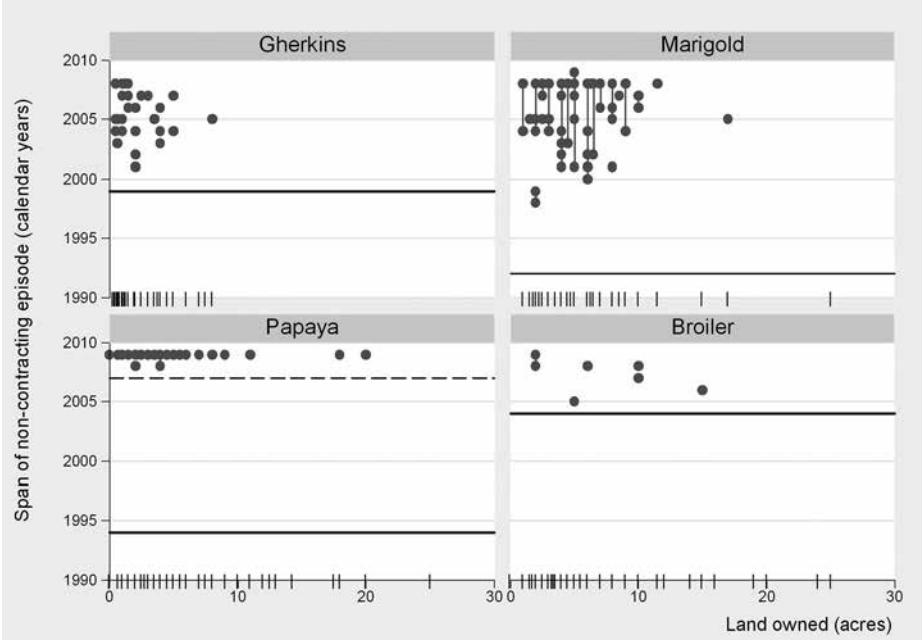

Figure 2 Episodes of non-participation by contract farming scheme
Note: The horizontal lines denote the year the firm commenced contract farming operations. Rugplot denotes the distribution of sample observations according to land owned. The scatter indicates episodes of not contracting and a line represents a span of period of non-participation.

cultivation. In the context of gherkins during the year of the survey, many farmers mentioned that they had switched to tomato that year since they expected prices of tomatoes to be extremely high. In the case of marigold, the competing crop was turmeric. Farmers also mentioned that owing to perceived decline in soil quality with repeated growing of gherkins, some farmers often chose to stay away from gherkins for a few seasons before growing them again. Instances of episodic participation render the notion of inclusiveness fuzzy and as such should not be cause for policy concern as long as one can ascertain that farmers have *continued capacity* to participate. Suffice to say that episodes of non-participation should not be misconstrued as exclusion, just as voluntary attrition is not.

Table 4 Episodic participation

Percentage of farmers contracting with any firm reporting episode of non-participation		
Commodity	*Percentage of total respondents*	*Number of respondents*
Phase 1		
Gherkins	49	98
Cotton	55	58
Phase 2		
Gherkins	44	77
Marigold	73	59
Papaya	43	72
Broiler	8	71
Reasons for the break in contracting for those with episode of non-participation		
Reason	*Percentage of total responses*	*Number of responses*
Firm did not offer contracts	28	34
Water constraints	18	22
Pest issues	16	20
Losses with contract crop the previous year	11	14
Low contract price	9	11
Wind and weather issues	4	5
Contracted with another firm	3	4
Grew for the spot market	2	3
Health issues	2	3
Went away from the village	2	3
Death in the family	2	2
Labour shortage	2	2

Note: Farmers were allowed multiple options to capture all the relevant reasons for the break.

Concluding remarks

This study made a case that analysis of contract participation at a given point in time, while useful in its own right, cannot by itself provide a credible basis for policy-making for contract farming. An understanding of dynamic outcomes is essential, if only to help stave off potential catastrophic risks for the intended beneficiaries or equip them appropriately. It demonstrated using the example of five contracting schemes that not only is attrition quite pervasive across schemes, it is also the case that poorer farmers appear to have a greater propensity to exit these arrangements. While this should be cause for concern it is also important to have a more textured understanding of the causes of leaving. Often, farmers exit the scheme voluntarily to pursue more rewarding opportunities or choose to participate in episodes, where contracting is an element of a dynamic portfolio of alternatives. In framing policies to promote and support sustained smallholder participation in modern supply chains it is important to make clear distinctions on the precise nature of farmer attrition. Without such an understanding, policies could lead to severely misplaced emphasis.

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