

Chapter 4 - Research Design and Methodology

In the previous chapter, the review of literature based on our research questions was presented. In this chapter, research design and methodology adopted to fulfil the objectives of the thesis (see section 1.6) is presented.

4.1. Research Methods

Both qualitative and quantitative research strategy have been adopted to fulfil the research objectives. To fulfil the objective of understanding the history of CFAs of CGP and white onion in Maharashtra; motivations and problems of participation in CFAs, qualitative data was obtained using the focus-group discussion, structured and semi-structured interviews with various stakeholders such as farmers, company staff, input dealers, banking staff, and key informants like progressive farmers and village headman. The schedules had a combination of open ended and close ended questions (section 4.3.3).

Due to time and cost constraints, longitudinal study design could not be adopted for examination of the economics of contract crop cultivation vis-a-vis non-contract cultivation. The thesis adopts cross sectional research design. Under Cross-sectional design, case studies for selected crops in the selected region was built. Case study method is used for exploratory kind of research and to explain some phenomena in an extensive way over a period (Yin, 2014). Using case study method, the functioning of CFAs, farmers' motivation to join and grow under contract and also the problems faced within the same is explained. One of the limitations of cross sectional design is that data about returns and cultivation aspects is for one reference season only. Thus, based on analysis for one season, it cannot be concluded, whether contract cultivation is better off. However, cross-sectional design in combination with case study provides us a good idea of understanding contract farming in reality and fulfilling our objectives.

4.2. Selection of region and crop for thesis

For building the case study, first the state (region) was selected, followed by crop and company for the thesis. Maharashtra state was selected for the survey due to couple of reasons. Firstly, Maharashtra is one of the leading state in horticulture production and agro-industrial in general (GoI, 2011; GoM, 2010). Given the favourable agro-climatic

conditions for agriculture and flourishing CFAs in Maharashtra, thesis on contract farming shall help provide new insights on research questions. Second reason for selecting Maharashtra state, is that, owing to lack of resources, author of the thesis decided to conduct the entire survey by himself. As the author has the domicile of Maharashtra and with the familiarity of the local language, this makes him able enough to conduct the field survey in Maharashtra.

Thesis was confined for vegetable crops, as the contracts for short duration, i.e. for one cropping season. Therefore, and perennial crops like sugarcane and fruit crops were Moreover, thesis is confined to case study of contract farming Maharashtra. In order to address the research questions companies that were conducting contract farming operations, and having substantial amount of farmers i.e., at least 300 As there does not exist any database for list of contract to rely on primary and secondary sources to create a list of farming is carried out in India and in particular Maharashtra

(See Appendix A: List of firms undertaking contract farming). Secondary sources refer to web, print and electronic media, academic and Government publications. Primary sources confined to key informants in the area of agriculture and agribusinesses in academic, corporates, and Government. Also discussions were held with progressive farmers within selected talukas of Pune district. The list created is given in Appendix A. Based on the criteria of being vegetable crops and for which contract farming is being carried out substantially for more than five years in Maharashtra, white onion contract farming carried out by JISL, and CGP contract farming carried out by Pepsico (I) were selected for the thesis. Moreover, both the commodities viz. onion and CGP, chosen for the survey are the short duration vegetable crops, i.e., can be harvested in 100-120 days and 70-85 days respectively.

In light of the research questions, the thesis builds the case study of the CGP contract farming carried out by Pepsico (I) and white onion contract farming carried out by JISL.

4.3. Data Sources

The thesis fulfils the to address the selected the research questions and objectives through the secondary and primary data

4.3.1. Secondary Data

Since the thesis is based on Maharashtra, it is necessary to understand the socio-economic profile of the study area. Thus, data on agro-climatic conditions, socio-economic indicators of the study area have been collected from the Agricultural Census, 2001 and 2011; Economic Survey of Maharashtra of various years and other sources.

To develop case studies of companies carrying out contract farming the information about the history of the CFAs and other necessary information was obtained from Company's Annual Reports, print, and electronic media, and also from firm staff directly.

4.3.2. Primary Data

Primary data comprises of semi-structured interviews of Company's management, Commission agents in APMCs, banking officials, Government officials, hundekari (traders in case of CGP) and input companies involved in the contract farming. In this study, the farmer is the basic unit of analysis. Farmers' were interviewed using structured schedule through field survey (See Appendix B for schedule). Data about socio-economic characteristics, history of contract farming participation and motivation behind it was obtained. Information on contract cultivation aspects and problems faced by them was also elicited. Details of the sample are mentioned in section 4.4. Moreover, the data collected was supplemented by the information collected by interacting with various stakeholders' viz. farmers, contracting firm officials, input making companies and hundekari (trader) of the selected villages as in other nearby villages of the survey.

4.3.3. Data Collection Tools

Initially, an exploratory (pilot) survey was conducted for both white onion and CGP crop in the districts where its CFAs are being carried out. For study design purpose, vital information about the selected contracted crops was extracted through discussions with farmers, traders, banking and contracted firm officials involved. The companies carrying out contract farming were contacted and information was sought on history of

firms' CFAs. Insight was gained about how the companies carried out the CFAs of particular crops and what were the problems encountered. For sampling design, information was extracted from the internal records of the company on a number of farmers under contract, district wise, taluka wise, and village wise.

A pilot survey was conducted to know the ground realities. Whereby, to check the prevalence of contract farmers (CF) and non-contract farmers (NCF) within the villages. During the pilot survey, to seek new insights on the research questions, the semi-structured interviews were held with CF and NCF. NCF farmers comprised of Attritioned Contract Farmers (ACF) and Never Contracted Farmers (NNCF). ACF are also known as formerly contract farmers (i.e., farmers previously in the contract but had grown reference crop without a contract in reference season). NNCF are those farmers who have never grown reference crop in contract with the reference contracting firm. Also, one focus group discussion comprising of farmer participants was held in a village in Khed Taluka of Pune district. Focus group discussion revolved around the questions about contract features, history, participation, non-participation, disadoption, benefits, and problems of contract farming within the villages. The exploratory survey helped to know about the village size; current cropping pattern in the area as well as before advent of contract farming in the region, history of CFAs in the village and necessary details about the same.

Through consultation with the stakeholders, concepts and variables were identified that influence the farmers' behavior regarding participation of contracting. Different concepts generated using literature review, focus group discussion and semi-structured interviews with stakeholders which addressed the research objectives were transformed in to relevant variables of information. Then each variable was translated to clear questions to obtain answers. The schedule had a combination of open and close ended questions. For e.g., open ended questions were asked related to reasons for participation in CFAs, benefits, and problems, etc. faced in CFAs. Whereas as for examining profitability aspects of contract cultivation and non-contract crop cultivation, close ended questions were used. Finally, all the questions were organized in a coherent manner to elicit data from the respondents. These structured schedules were pre-tested from five CF and NCF respondents each per crop. Based on the feedback and experience, structured schedules were finalized for the final interviews. Final schedules are presented in Appendix B. Final interviews were conducted primarily with any adult person within the

household who is the chief decision maker regarding farming activities as well as actively involved in agricultural production. Participation of respondents for the survey was voluntary, with no direct benefits. They were informed that the conversation would be totally confidential and shall be used exclusively for study purpose.

The survey was carried out in two phases. The survey for onion crop was carried out in 2012 with the reference season of Rabi, 2011-12. CGP survey was carried out in early 2013 with the reference season of Kharif, 2012-13. Data on acreage and contracting status were cross verified with the actual database of companies. Similarly on prices in the open market as mentioned by the farmer was cross verified from nearest wholesale APMC market for the particular produce. Record checks were done wherever possible w.r.t inputs usage and costs, output sold and at what rate. This was done by checking the bills, receipts and other records with the farmer, hundekari, and companies.

4.4. Sample Design

For primary data collection, multi-stage sampling was adopted. Where, stratified simple random sample at the farm stage level of selection was used. As the district and village size concentration of contract, farmers are different. The sampling design of both the crops onion and CGP is presented in the sub-sections below:

4.4.1. Onion

It started contract farming on trial basis since 1997-98, but it was mainly started on a large scale from the year 2001-02 with 473 farmers in *Rabi* season, which reached 1926 farmers in 2011-12 (Table 4.1). It also started for contracting for *kharif* onion since 2007-08 onwards. However, a number of farmers and acreage under contract is very less in *kharif* compared to *Rabi* season. Therefore, *Rabi* season was selected, as the reference season for the survey. The number of farmers contracted for *Rabi* season from 2001-02 to 2011-12 is presented in Table 4.1.

It was observed that in the case of white onion, CF was geographically more spread out. As per the JISL officials, CFAs was spread over eight districts viz. Jalgaon, Dhule, Nandurbar, Nashik, Buldhana, Akola and two districts of Madhya Pradesh. All the villages where CFAs is going on lies between 200 km radius of its processing plant located in Jalgaon.

Table 4.1: Number of JISL's onion CF for Rabi season 2001-02 to 2011-12

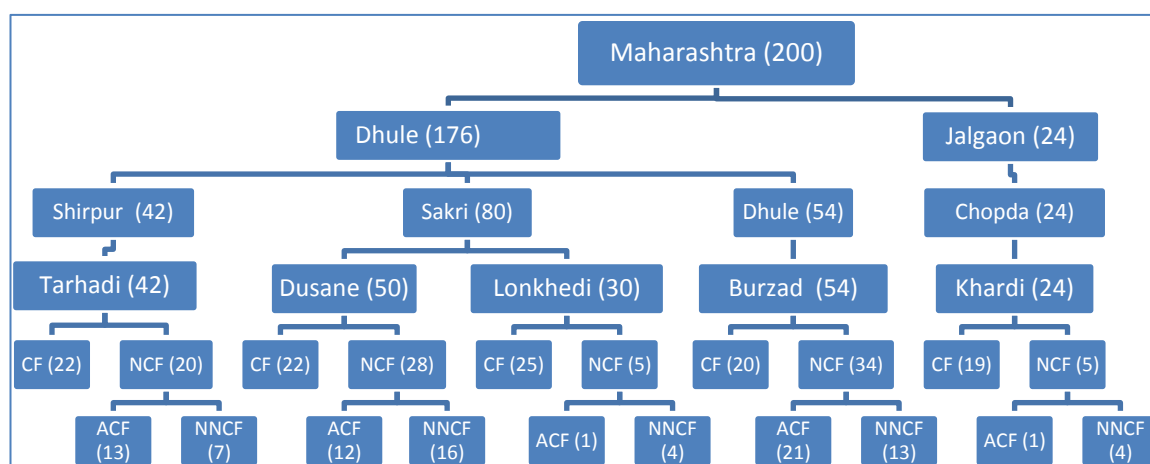
Particular	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
No. of District	4	3	3	6	7	8	8	8	8	8	8
No. of Taluka	10	20	19	22	24	25	26	28	28	25	25
No. of Village	105	105 (0.0)	128 (21.9)	166 (29.7)	198 (19.3)	198 (0.0)	287 (45.0)	340 (18.4)	404 (18.8)	400 (-1.0)	384 (-4.0)
No. of Farmers	473	315 (-33.4)	1028 (226.4)	1288 (25.3)	1267 (-1.6)	1780 (40.5)	1616 (-9.2)	2051 (26.9)	2360 (15.1)	2379 (0.8)	1926 (-19.0)
Total Area (Acres)	437	507 (16.0)	1519 (199.6)	2771 (82.4)	2941 (6.1)	2639 (-10.3)	3470 (31.5)	3562 (2.7)	2613 (-26.6)	2897 (10.8)	3311 (14.3)

Source: Company records

Note: Figures in parenthesis are percentage change over previous year

Initially, owing to the time and labour constraint it was proposed to have a sample of 200 (100 CF and NCF each) for onion and CGP. In the first stage, two districts having a major concentration of CF were selected. As per discussion with JISL, Jalgaon and Dhule combined accounted for around 70% of total CF during Rabi, 2011-12. Thus, these two districts were selected for the survey. It was observed that onion contract crop was well spread out within these two districts, as only seven villages had more than 30 farmers. As survey involved village enumeration for listing of CF and NCF households, to prepare complete sampling frame to facilitate random selection of households for the survey. As some villages consist of more than 500 households and village enumeration takes a considerable amount of time. Thus only those seven villages in these two districts having more than 30 CF were considering for sampling. Of which, two villages belonged to Raver taluka and one in Chopda taluka of Jalgaon district. Within Dhule district, Sakri Taluka had two villages and rest belonged to Shirpur and Dhule Taluka each. It was observed during the pilot survey, the two villages from Raver taluka (Jalgaon district) and also within its neighbouring villages, only JISL 'V12' onion crop variety was grown in Rabi season, and there were hardly any farmers growing table variety onion. One of the objectives of the thesis was to compare the profitability of CF and NCF which, needed a control group. Thus, due to lack of availability of control group, those two villages were dropped, and the rest five villages were selected. Survey focused on the main production zones where the contracting firms procured. The list of villages along with the sample is mentioned in Figure 4.1.

Figure 4.1: Sampling design for onion



Note: Units in parenthesis refer to sample size

Table 4.2: Population and sample of onion households of selected villages

Villages	CF		NCF	
	Population	Sample	Population	Sample
Dusane	32	22	85	28
Lonkhedi	70	25	12	5
Burzad	50	20	62	34
Khardi	36	19	12	5
Tarhadi	61	22	53	20
Total	249	108	224	92

Source: Primary Survey

4.4.2. CGP

CGP cultivation is confined to Kharif season in Maharashtra. PepsiCo (I) had introduced CGP cultivation from 2001-02 in few villages of Ambegaon and Khed Taluka of Pune district as well as in Khatav taluka of Satara district. In the Kharif season (2012-13), PepsiCo (I) had contracted around 1904 farmers. Of which, Pune and Satara districts comprised 43% and 47% of the CF respectively, while the rest 10% belonged to Sangli district (Table 4.3). PepsiCo had started contract farming in 2011-12 in Sangli district. As the proportion of farmers were less in 2012-13 at Sangli district, thus, it was not selected for the survey. Hence, Pune and Satara districts were selected for the survey. In Pune, one village each from Ambegaon and Khed Tehsil, while two villages in Khatav taluka¹⁸ of Satara were selected using PPS (Population Probability to Size) Method. In Satara district, two villages selected (Vanzoli and Mhasurne) through PPS did not have adequate number of NCF growing chip-grade potatoes. Hence, two additional villages

¹⁸ In Satara, CGP cultivation is majorly done in Khatav taluka, hence two villages were selected (Table 4.3).

(Gadewadi and Visapur) nearby within the same taluka having similar agro-climatic conditions were selected. Diagrammatic representation of CGP sampling design is presented in

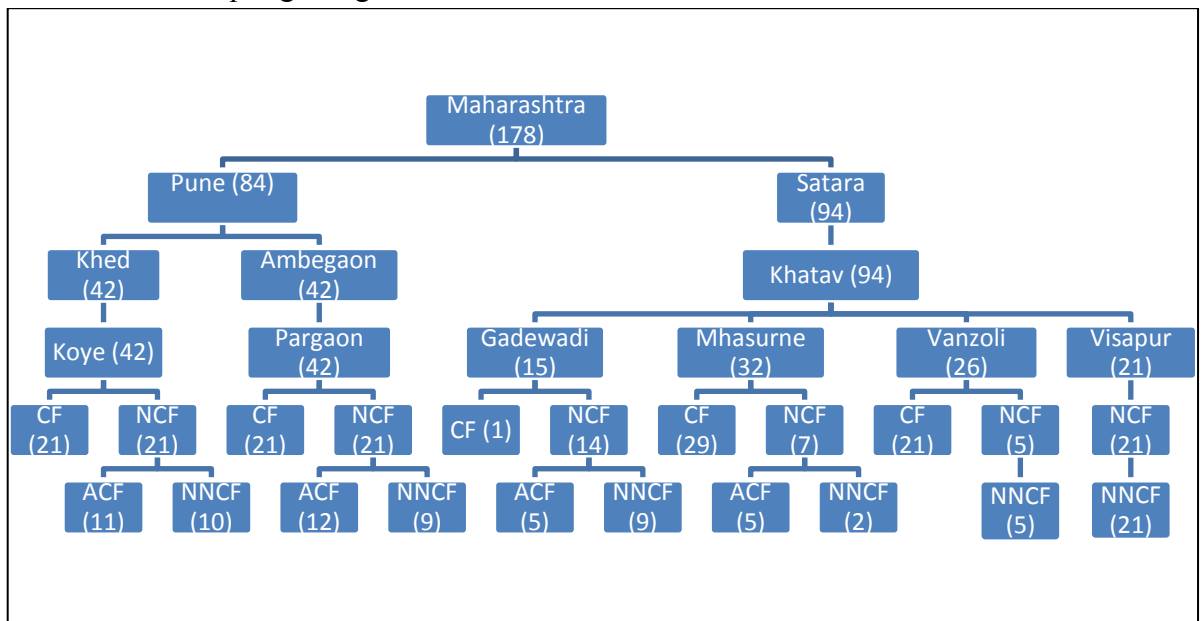
Figure 4.2.

Table 4.3: CGP CF Population district and taluka wise

District	Taluka	No: of CF	% of total
Pune	Ambegaon	412	21.6
	Khed	408	21.4
Satara	Khatav	900	47.3
	Karegaon	4	0.2
Sangli	Kadegaon	170	8.9
	Khanapur	10	0.5
Total		1904	100

Source: Primary survey

Figure 4.2: CGP sampling design



Note: Units in parenthesis refer to sample size

Table 4.4: Population and sample of CGP households of selected villages

District (Province)	Villages	CF		NCF	
		Population	Sample	Population	Sample
Satara	Gadewadi	1	1	28	14
	Visapur	0	0	98	21
	Mhasurme	130	25	14	7
	Vanzoli	98	21	8	5
Pune	Pargaon	114	21	156	21
	Koye	62	21	51	21

Total	405	89	355	89
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Source: Primary Survey

After the villages had been selected for onion and CGP crop survey, census household listing was done for the farming household in the selected villages. The village enumeration involved few basic questions such as the name of the farmer (chief decision maker for carrying out farming activities), whether they grow contract crop CGP/white onion respectively in respective reference season¹⁹. Census house listing would identify three types of farmers:

- a) Household growing contract crop within a contract in the reference season, i.e., CF
- b) Household growing contract crop but not under contract in reference season, i.e., NCF
- c) Household not growing the contracted crop in the reference season

For our study, only the (a) and (b) categories are of importance. Based on census house listing, a list of CF and NCF households for each selected village was prepared. Thus, the village was stratified into CF and NCF. Within each stratum of the village, using systematic, simple random sample method, households were selected for a final interview. For e.g., for CGP in Mhasurne, there were 130 CF (Table 4.3), there was a need to select 25 CF households for the survey. Therefore, a random number was generated from one to five. Suppose that number was 5. Then every fifth household (number 5, 10, 15, and so on as per the list) were selected for the survey.

As each household of respective CF and NCF were numbered. Overall, this selection design generated sample of total 387 farmers, i.e., 108 for CF and 95 for NCF for onion survey, 92 each for CF and NCF for CGP survey. However, after data cleaning²⁰, only 378 respondents were used for the final analysis, which makes a total sample size of 378, i.e., 108 CF and 92 NCF for onion survey and 89 each for CF and NCF for CGP survey. The list of population and sample for onion and CGP survey is presented in

¹⁹ For onion survey, contract crop is “V12” variety whereas, NCF grow any table variety of onion for the reference season, Rabi 2011-12. For CGP survey, contract crop refers to CGP, reference season is Kharif 2012-13.

²⁰ In some cases of CF within CGP survey, it came to know that after after cross-verification that they did not grew CGP under contract. Similarly, in NCF cases, it came to know later that some have mentioned some false responses in relation to production aspects.

Table 4.2 and

Table 4.4.

4.4.3. Limitations of sampling design

One of the limitations of the sample design is that those farmers, who had not grown contract crop in the reference season of that village, were left out of the survey. For e.g., Farmer in Mhasurne, who had grown CGP in 2011-12, but not grew in the Kharif season 2012-13, did not grow CGP. Similarly, the farmer may have grown the onion under contract in Kharif season, but did not grow onion in Rabi season. In onion survey, it was found that many farmers did not grow onion in Rabi season, due to lack of water availability in their fields. Although they did grow onion in Kharif season, but they were excluded from the survey. However, the reason for excluding the farmers who had not grown contract crop in the reference season was that as one of the objectives of the thesis was to examine economic aspects of contract crop vis-à-vis non-contract cultivation. However, through discussions with key informant and stakeholders, an attempt was made to understand their experiences.

Table 4.2 and

Table 4.4 show that disproportionate sampling fraction was used between strata's. The reason being, that one of the objective of the thesis was to examine and compare profitability and economics of contract cultivation vis-à-vis non-contract crop cultivation. Thus, an attempt was made to select the same number of CF and NCF within each village. According to Parten (1950), disproportionate stratified sampling could be used, if the objective of the study is comparing between sub-groups.

4.5. Data analysis method

Data collected from structured schedules was inputted in excel and then exported Statistical Package for Social Science (SPSS) software. For comparing the differences of socio-economics and farm related parameters between CF and NCF, mean and median as central measures of tendency was used. Also to validate statistical significance of differences, non-parametric test Mann-Whitney Test was used, as most of the variables like age, experience, schooling years, landholding, etc. did not follow normal

distribution. Also, profitability analysis was carried out on comparisons of average means of CF and NCF and the differences were tested using independent sample *t*-test.

For understanding the reasons behind farmers joining contract, or leaving or not joining contracts, multiple response analysis options in SPSS was used. To understand the determinants of contract farming participation, logit regression in SPSS was used.

4.6. Concluding remarks

In this chapter, the research and sampling design of the thesis was discussed. Adoption of mixed research method (both qualitative and quantitative research strategy) helped to build a case study of respective crops. Structured schedule at the farm household level was the major data collection instrument. However for building up the case study of both the crops, semi-structured interviews with other stakeholders and focus group discussion was used. In the next chapter, the profile of study area and details of the functioning of onion and CGP contract farming schemes is discussed.