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Current Status of Select Indian Agricultural Markets: Primary Survey

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Domestic Agricultural Markets: Case Studies[1]

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1. Introduction

More than three-fifths of India's population draws their livelihood from agriculture that adds just one-fifth to its GDP. There should be obvious serious concerns about efficient functioning of this sector both in terms of its output / productivity and its marketing. While output and productivity are supply side factors, markets provide an intermediate link between producers and final demand by consumers. Efficiently functioning markets add to welfare of producers as well as consumers. Interventions in domestic agricultural markets can affect the efficient allocation of resources negatively thus making domestic agricultural sector less competitive in international markets. This effect can get further magnified through interventions in the border trade policies. Efficient agricultural markets can be potent tools for poverty reduction. "Improved agricultural market systems are important for poverty reduction first because agricultural growth can play a critical and unique role in pro-poor growth; second because improved coordination and exchange are critical for agricultural growth; and third because improved coordination and exchange are also critical for the processes by which pro-poor agricultural growth contributes to wider growth" (Dorward and Kydd 2005).

In India, farmers' produce is generally disposed off in the village, rural/primary market or secondary agricultural market. The number of regulated (secondary) agricultural markets stood at 7,521 as of March 2005 as compared to just 286 in 1950. There are also about 27,294 rural periodical markets, about 15 per cent of which function under the ambit of regulation. Regulated markets are managed by Agricultural Produce Market Committees or APMCs, though in some states they may be given different names such as Agricultural Market Committees (AMCs) in Andhra Pradesh, Regulated Market Committees (RMCs) in West Bengal and so on. Once a particular area is declared as a "market area" it falls under the

[1] This is a complete Report on Case Studies of Indian agricultural markets.

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jurisdiction of an Agricultural Produce Market Committee. Under the APMC Acts[3], only State Governments have been permitted to set up markets. The states and Union Territories that did not enact their APMC Acts are Kerala, Manipur, Meghalaya, Nagaland, Sikkim, A&N Islands, Dadra & Nagar Haveli, Daman, Diu and Lakshdweep (Acharya 2003).

In order to prevent speculative activities by private operators, food grain markets in India have faced several interventions including storage and movement controls through policies such as Essential Commodities Act and *zoning* that prohibited private trade in foodgrains across broad zones (Jha & Srinivasan, 2004). Such restrictions and also harassment by officials, corruption and bribery, have resulted in slow movement of grains from surplus to deficit regions, increase in price variation across regions and added to cost of marketing/trading, making domestic prices internationally uncompetitive. Moreover, zoning resulted in farmers in surplus areas getting a lower price than their counterparts in deficit areas. In fact the movement restrictions on foodgrains were meant to bring down prices to MSP levels in surplus states in order to facilitate foodgrains' procurement. This has also led to shifting to other crops with no such restrictions as happened with a shift from wheat to mustard in the north-western states (Sharma, 1997).

There had been restrictions on the inter-state sale of agricultural commodities in many states. A number of states (e.g. Uttar Pradesh, West Bengal, Assam, Orissa etc.) have used entry permit, which must accompany the sale invoice without which goods are not allowed to enter the consuming state. Obtaining entry permit is a major source of harassment for the dealers wishing to import goods into the consuming state. There is a practice followed by many states of collecting tax on the entry of commercial vehicle into their jurisdiction. This is an impediment to inter state trade. This causes significant losses to the traders due to delays, payment of entry tax and, possibly bribes (NCAER, 2003). Other market interventions include restrictions on private marketing, investment scale in food processing industries, land ownership and ceilings and lack of clear guidelines on contract farming.

Regulatory barriers have constrained investments in development of storage and processing, hampered the development of effective market institutions, and lowered the capacity of

[3] Before its revision in 2004.

agricultural producers to be internationally competitive. India, for example, is the world's largest producer of fruit and vegetables but inadequate post-harvest storage and transportation cause losses of around 30-40 per cent, only 7 per cent value addition takes place, and only about 2 per cent of production is processed commercially (Government of India, 2001). As a result a broad consensus has emerged about the need for reforms in agricultural market policies and quite significant reforms have been implemented in recent years, as part of the ongoing policy reform process in India.

In a liberalised trade regime for both domestic and foreign trade, prices stabilise across the states and there are welfare gains to producers, consumers and wholesale traders at the national level. Deregulating domestic trade results in steep decline in government costs of procurement and storage of cereals. Decentralised procurement at market prices for safety net programme can be used in a cost effective manner. Efficient markets encourage efficient allocation of land resources across crops. Better and hindrance-free transportation infrastructure reduces transaction costs of private traders and hence adds to welfare gains (Jha and Srinivasan 2003).

While it is important to liberalise all the various factors that affect the entire chain of agricultural marketing mentioned above so as to make their operations relatively efficient, we shall focus our attention to the first stage in which farmers sell their produce to the buyers. To grasp the changes taking place in agriculture market structure at grassroots level; to identify the existing market structure and infrastructure at the village level; and to see the pattern of marketing prevalent at the farm level, micro level investigations were undertaken with village and household as the units of inquiry.

The details of sampling design and methodology are discussed in Section 2. The section is divided into eight sub-sections. Sections 2.1 to 2.7 provide details on choice of reference crops and selection of states, districts, villages and farm households surveyed with respect to the chosen reference crops. Section 2.8 puts forth the details of the questionnaires for households, traders and market officials. In Section 3 we discuss the results of the field survey in details. This section is divided into nine subsections. The first five sub sections

present the structure of output, viz., characteristics of operational holdings, cropping pattern, productivity and input usage. The following four sub sections present details of the market structure, conduct and performance for the selected reference crops. Section 4 presents the marketing problems faced by the households, traders and market functionaries. The qualitative observations are also presented in this section. Finally, Section 5 presents concluding remarks on the production and marketing structure for the selected states and reference crops.

2. Case Studies

Detailed case studies for some selected reference crops were undertaken to gauge the performance of regional agricultural markets. Existing secondary information and the review of studies in the market literature helped us in identifying market characteristics for different crops across various states. The selection of reference crops was based on their significance in the agricultural economy, and the existence of government interventions and State Trading Enterprises. Based on various criteria as discussed below the following four crops were selected as reference crops for the purpose of field survey of this study:

- Paddy / Rice
- Cotton
- Groundnut
- Tur (arhar)/Red-gram

2.1 Choice of Reference Crops

The present study focuses on selected agricultural crops we call them as reference crops. Selection of the reference crops was based on their significance in Indian agriculture sector, presence of domestic interventions and their priority on the policy reform agenda. We have attempted to cover all the major crop groups, like cereals, pulses, oilseeds and cash crops. One important crop from each crop-group was selected as a reference crop.

Among the cereals, there are two major grains namely wheat and rice, which form the staple diet in India. There are five other coarse grains which substitute (or supplement) the consumption of these two superior cereals especially in the case of poor. These coarse grains

are jowar, bajra, maize, barley and ragi. Among cereals, paddy dominated in production with its overwhelming share of 45 per cent. As paddy was also the most important crop grown by maximum number of states, it was the obvious choice among cereals. In the case of pulses gram was the largest crop with 38 percent share followed by urad and arhar (tur) with a share of 25 and 20 percent, respectively. The remaining 17 percent share was contributed by other *rabi*/*kharif* pulses namely, moong and masur. Since our survey period coincided with the *kharif* period, therefore, arhar (tur) was selected from pulses as it was *kharif* pulse with the highest share. Among oilseeds, groundnut is the leading oilseed crop, with a share of around 31 percent in total oilseeds production. Groundnut is followed by soyabean and rape-seed-mustard with a share of 30 and 24 percent, respectively. The remaining oilseeds account for 15 per cent share of the total oilseeds production. As groundnut has the highest share and is also the leading *kharif* oilseed crop, it was selected as one of our reference crops. Cotton was selected as the fourth reference crop since cotton is one of the most important among cash crops. Others include sugarcane, jute and fruits & vegetable crops.

Our field exercise endeavoured to analyse the presence and extent of government interventions in the domestic markets. For this it was essential to study the behaviour of all the three major agents (farmers, traders and government representatives) that operated in the markets.[4] It was therefore most appropriate to conduct the survey during a time-period when all the agents would be interacting in the markets. Agents in the markets come face to face with farmers during the marketing season giving an opportunity to witness the trading procedures in agricultural markets. The survey activity for this project was planned for the period October-December 2005 **(Table 1.1)**. During this period, the *kharif* crop farmers were expected to market their produce. This is the most appropriate time to get the first hand feel of the marketing problems faced by the farmers and the traders in agricultural markets. Therefore, the crops short-listed for reference in the survey were *kharif*-specific although we have also collected information for all the crops grown by the farmers during the reference period for this study. While the reference period for farmers was from July 2004 to June 2005, the traders and officials were surveyed for the reference period of October 2004 to September 2005 to capture their post harvest operations, which start with the beginning of the harvest.

[4] The term "agents" here refers to the three types of participants that interact in the agricultural markets. These include the government regulators namely, the APMC officials; the traders, who conduct their sale/ purchase; and the Farmer, who sells the agricultural produce in the market.

Selection of our reference crops is also justified from the point of view of different kinds of interventions that have been in place in our selected crops. Paddy has significant interventions by the Food Corporation of India (FCI) and also by the state governments in some cases. Domestic interventions in the paddy sector have been most pervasive via the FCI that is largely involved in procurement and marketing of paddy/rice. In addition, there is intervention at the consumers' end also in the form of cheap supply of rice to the below poverty population through the PDS system. Tur (Arhar) is a major pulse crop and is a cheap source of protein for the poor in India who cannot afford dairy-based or meat based protein products. A large proportion of vegetarian population in India draws its protein requirements from pulses. Interventions in tur markets are generally conducted by the National Agricultural Co-operative Marketing Federation of India (NAFED). The NAFED intervenes in the tur market for procurement under the price support scheme when the market price falls below the MSP. The edible oils sector is highly protected through import tariffs. Groundnut market is also intervened by NAFED under the price support scheme. Lastly, in the case of fibre crop (cotton), there has been prevalence of various state interventions. The Maharashtra State Co-operative Cotton Growers Marketing Federation (MAHACOT) had long been a monopsony cotton procurement agency in Maharashtra till 2002-03. In addition NAFED and Cotton Corporation of India (CCI) are the government agencies for cotton procurement under the price support scheme. The cotton cash crop is also important for the Indian economy given its forward linkages with the textile and wearing apparel sectors.

2.2 Sampling Design for Primary Survey

Agriculture is a state subject and is primarily administered by the state governments. It is expected that the policies and market characteristics would differ across states. Further, different agro-climatic conditions coupled with varying consumption patterns of agricultural commodities across various states also have their influence on policy regimes in different states. Under the constraints of time and budget, a total number of 675 cultivating households were selected for detailed primary survey from six selected states. The detailed methodology followed in selecting the states, districts, villages and households is given below.

2.3 Selection of States

Crop selection influenced selection of the states for surveying the markets. Each reference crop is grown in different parts of the country. In respect of each selected crop, the states were short-listed for conducting primary survey based on their contribution in the all-India production of the specific crop. A high producing state would record a higher market surplus in that crop[5]. This in turn would mean that we have a wider scope to witness and record the existing market interventions.

Among the four focus crops, the greatest thrust was put on studying state interventions in the paddy sector. Being a staple foodgrain, interventions in the paddy sector have been predominant to insure adequate buffer stocks for maintaining food security, price stabilisation for the consumers and price support to the farmers. The top five paddy producing states include West Bengal, Punjab, Uttar Pradesh, Andhra Pradesh and Tamil Nadu in that order **(Table 1.2)**. While the state of Punjab contributes nearly 9 per cent to total paddy production, private trade in the state is absent as entire marketed surplus is purchased by government agencies rather than by traders in the markets[6]. It was therefore decided not to include Punjab in our sample. However, the remaining top four paddy producing states were selected for the survey. The fifth state, Maharashtra, was purposively included in the survey. Though it is not among states with high paddy production, it is a rice deficit state. Its rice production is less than consumption. Together these five states represented more than one-third of the total paddy production and two-fifths of the area under paddy cultivation. With a major thrust on interventions in paddy markets, as many as 300 farmers were selected for survey across these five states.

For tur (arhar), the top two producing states of Maharashtra and Uttar Pradesh accounted for nearly half of the total production and more than 40 per cent of the total area under the crop. A total of 100 farmers were surveyed from these two states to gather information on marketing of tur. The top two groundnut producing states are Gujarat and Tamil Nadu. Together they accounted for 47 per cent of the all-India output and 43 per cent of the total area under the crop. Tamil Nadu has the highest productivity of groundnut but it has only 9

[5] Data on market surplus at the dis-aggregate level is hardly available. Therefore production is taken as proxy to market surplus for selection of states and districts for the purpose of primary survey.
[6] Except basmati paddy, which is sold through private agents alone.

per cent of the all India area under groundnut cultivation. On the other hand, Andhra Pradesh is a large producer and has about 25 per cent of the all-India area under groundnut, although its share in production is less than Tamil Nadu because of its low productivity. Though subjective, it was decided to take Gujarat and Andhra Pradesh, as groundnut growing states, in our sample.

Cotton is grown in more than 14 states in India but there are three major cotton-growing states namely Maharashtra, Gujarat and Andhra Pradesh. These three states together contribute more than 60 per cent of the All-India production and nearly 70 per cent of the area under cotton cultivation. Therefore, our sample selection for cotton was restricted to the above mentioned three states. Although, in all the three states government interventions in some or the other form were there these interventions in Maharashtra had been quite pervasive till 2002-03. To study all these aspects in detail, a total number of 175 cotton farmers were surveyed across these three states.

Thus a total number of 675 farmers were selected for the detailed primary survey for the agriculture year 2004-05 (July-June).

2.4 Selection of Districts within States

Six states were finally chosen for the four reference crops for the purpose of primary survey. After having pinned down the states for detailed survey, it was proposed that at least two districts for each reference crop should be selected in each state. We focused our selection on the highest production districts for the reasons as mentioned in the case of selection of a state (maximum market surplus is expected from the highest production district). The second district selected was generally the second highest producing district of the reference crop. However, the highest production criterion was not followed in a strict manner and was relaxed in many cases for reasons that have been documented below.

The southern state of Andhra Pradesh and the western state of Maharashtra turned out to be the two most represented states in terms of crops and districts selected. During the year 2002-03, Anantapur and Kurnool were the top two groundnut producing districts in Andhra Pradesh. The two districts were also adjoining to each other. Thus, these two were selected

for surveying the farmers of the groundnut crop. With regard to cotton, the top producing districts were Adilabad and Guntur. The Adilabad market is a famous cotton market in Asia. Moreover, Adilabad shares border with the Yavatmal cotton producing district in the state of Maharashtra. The selection of Adilabad and Yavatmal was prompted by the likelihood of recording any sale of cotton from Yavatmal into Adilabad or vice versa and recording any restrictions on inter-state movement of cotton between Adilabad and Yavatmal. In addition, another district, namely Kurnool, was selected for surveying cotton farmers. The Kurnool district was already selected for groundnut and this fact is important since it could help in recording any disparities in market characteristics for the two crops in the same district.

For paddy, West Godavari and East Godavari were the top producing rice districts in Andhra Pradesh. However, both these are adjacent coastal districts and do not share borders with any other states. Therefore there was not much scope for recording movements to other districts or another state. Krishna and Nellore districts ranked third and fourth, respectively, in paddy production in Andhra Pradesh. While Nellore was selected, Krishna was replaced with the fifth ranking district of Guntur.[7] The selection of Krishna district would have based the survey in a new district as compared to the ones selected for other crops. Its replacement with the Guntur district for paddy granted an opportunity of selecting the same district for two reference crops namely paddy and cotton. This selection presented a chance to study the same district market for two crops to observe any differences in marketing procedures. In the western state of Gujarat, groundnut and cotton were the two reference crops for our survey. Groundnut in the state is primarily grown in the three districts Junagadh, Amreli and Bhavnagar. Of theses, Amreli and Bhavnagar districts were selected for surveying the groundnut farmers. Since Amreli and Bhavnagar districts share a common border, the selection sought to document any inter district movement restrictions.

Bhavnagar and Surendernangar were the districts that record the highest cotton production in Gujarat while Amreli ranks fifth in cotton production. Since Bhavnagar and Amreli districts had already been selected to be surveyed for groundnut, the same were also short-listed for cotton. This enabled the survey team to survey the same markets for different reference crops.

[7] Nellore was important as it shared borders with Tamil Nadu and gave us the opportunity to observe any movement restrictions between the two states.

The western state of Maharashtra was another primary focus area in our survey as it was selected for three of the four reference crops. Districts of this state were selected to be surveyed for paddy, cotton and tur (arhar). Within Maharashtra, the Maharashtra State Agricultural Marketing Board (MSAMB) has seven divisional offices.[8] Amravati and Nasik are the two top cotton producing divisions. While Jalgaon district records the highest cotton output in Amravati division, the Yavatmal district produced maximum cotton in Nasik division. It may be appropriate to repeat here that the selection of Yavatmal district was also important to evaluate the presence of cross border transactions between the farmers / traders of Yavatmal (in Maharashtra) and Adilabad (in Andhra Pradesh) since both markets share a common border.

Tur (arhar) output is the highest in Yavatmal, Amaravati and Wardha districts. Short-listing of Yavatmal was obvious as it helped implement the field exercise in a district already selected for another crop, cotton. Between Amravati and Wardha, Wardha district was selected randomly as a second district for the tur (arhar) crop in Maharashtra. In the case of paddy, Raigarh is the top producing district in Maharashtra and was selected for surveying the paddy farmers. The second district selected was Thane, adjoining the Raigarh district.

Tamil Nadu in south India was selected to be surveyed for paddy markets. Paddy in this state is grown round the year in all three growing seasons[9]. During 2002-03, maximum paddy was produced in Thanjavur, Caddallore and Thiruvallur districts. Paddy output in the later two districts was nearly the same. But since Thiruvallur was near the border with Andhra Pradesh, it was selected in order to observe any movement restrictions. In the case of Uttar Pradesh, its districts are divided into 17 divisions. Due to a very large number of districts, the proportions of crop output from each district are small.[10] Therefore, the primary selection criteria based on the highest producing district was not very relevant in this state. In addition, the districts producing the reference crops, paddy and tur (arhar), were spatially located far apart from one another. While many districts were growing paddy, not as many were producing the tur (arhar) crop. We therefore selected two districts that were located close to each other and were also involved in producing both crops to be able to study any crop specific issues in the

[8] The seven divisions are Pune, Nasik, Aurangabad, Latur, Amravati, Ratnagiri, Nagpur divisions
[9] The three paddy growing seasons in Tamil Nadu are: I: April-July, II: August-November, III: December-March

markets. The districts of Pratapgargh and Jaunpur were thus surveyed for paddy and tur (arhar). In the rice producing state of West Bengal, the highest output, in 1999-2000, came from the districts namely, Burdwan, Midnapore (W) and Birbhum. Of these, the two adjoining districts of Burdwan and Birbhum were selected for the survey.

Table 1.3 presents the districts selected for field survey in each of these states with reference to the relevant crops. Information on the rank of the district in total state production of the reference crop and its share in the state production has also been documented.

2.5 Selection of Markets within Districts Chosen for Survey

Selection of markets is a vital stage in the survey methodology as all the three market agents interact at this place.[11] Short-listing of the most significant market among all others in the district was quite obvious given the presumption that market arrivals, and therefore all transactions take place in the market. However, due to lack of detailed information about existing markets in the selected states, we may not have selected the most important market in each district but each selected market was definitely significant one.

Every district headquarter has one or more APMC markets under its jurisdiction, each of which had varying crop arrivals in terms of volume or quantum. One market was selected in each district to be surveyed. Since there is a market within each district's headquarter which generally has the same name as the district, it was decided to select the district headquarter markets for our survey. Such a purposive choice is based on the expectation of significant arrivals into the district headquarter markets.

In Andhra Pradesh, the districts Adilabad, Anantapur, Guntur, Kurnool and Nellore have been selected for three crops. It is noteworthy that despite Anantapur and Nellore being quoted as significant markets, based on crop arrivals, physical market yards were non functional in Anantapur and Nellore. In Kurnool, though the APMC market existed at the district headquarter at Kurnool, yet the market was not significant in terms of market arrivals.

[10] Even the largest paddy producing district of Maharalganj had a share of only 5 per cent in the total paddy output of the states during 2002-03; and the largest tur (arhar) producing district of Pratapgarh had a share of only 7 per cent in total tur/arhar produced in the states.
[11] Markets place is referred to as "*mandi*" in India.

Based on discussions with the officials in Department of Marketing, Government of Andhra Pradesh, and information in "Important Markets", Government of India (2000), Adoni was selected as the APMC market in the Kurnool district **(Table 1.4)**.

In Gujarat each of the selected districts, Amreli and Bhavnagar, had markets in the headquarters with the same name as that of the district. In addition, it was noted that Amreli and Bhavnagar were significant markets for both cotton and groundnut. Maharashtra had the maximum number of agricultural markets. District Raigarh (selected for paddy), did not have a market headquarter with the same name. Instead the APMC market Alibag was selected, as it was significant for paddy in the district. However, only a small office existed and a market yard was absent. While official information on area of market yard is not available but the statistics on quantities and values of arrivals indicate the significance of Alibag market. In the Thane district, the Kalyan APMC market was selected as suggested by the APMC officials and information available from Maharashtra State Agriculture Marketing Board (MSAMB). In the remaining three districts of Jalgaon, Yavatmal[12] and Wardha, the headquarters had their names identical to the district names.

In Tamil Nadu, Thiruvallur and Thanjavur districts were selected for survey. In each of these districts, there existed an APMC market in headquarter named after the district name, which was therefore selected as the market to be surveyed. The Pratapgargh district in Uttar Pradesh had the same name for the district-headquarter where the agricultural market existed. In Jaunpur, however, though the APMC market named as Jaunpur existed, the Shahganj APMC was considered instead since it is a major market for tur (arhar).

In West Bengal, two districts namely, Burdwan and Birbhum were selected for paddy. While Burdwan had market headquarter named as Burdwan, the market headquarter of Birbhum was named Suri and was selected for survey. Strikingly, though the APMC markets were mentioned to be significant (Government of India (2000)), and were also mentioned on the AGMARKNET website, in practice the APMC market yards were non-existent. Therefore, alternate markets were picked up to interview the APMC officials. In Birbhum district, the agricultural market named Purandarpur (in the Purandarpur Tehsil of Suri revenue circle) was

selected for surveying the APMC official. In Burdwan district, the market named Haldi (in Bagarwan Tehsil of Burdwan revenue circle) was selected. The discussions with the officials of the Directorate of Marketing and the West Bengal State Marketing Board confirmed that very few regulated market yards (RMCs)[13] existed in these districts and traders are not under any compulsion to necessarily trade in the market yard only. The licensed traders were mainly trading in the rural markets/ villages.

Thus, in the 6 states across the country, 18 markets were selected for survey for the four reference crops of India's *kharif* season. Further, in each of these districts, one APMC market was singled out. The market yards were the sites for surveying traders (10 in each market) and the APMC officials (one in each market). In the cases where the market space was not functional or non-existent, as in the case of Anantapur, Nellore, Alibag, Birbhum and Burdwan, the traders operate in the vicinity of the selected markets and were surveyed outside the market yards.

2.6 Selection of Villages for Farmers' Survey

While the APMC officials and the traders were surveyed in the market yards,[14] the farmers were surveyed in the villages. A decision was made to include farmers that may be close to the selected market (*mandi*) but may prefer to sell their produce in another market. Such farmers could narrate the reasons for their preference to sell in the market closer to their farm or in an alternate market. In the following discussion we use the word farmer as synonymous to farm household.

Farmers were selected from villages located in the periphery of each of the above selected regulated markets. Villages around each market were selected from three distance ranges: 0-10 kilometres (km), 11-20 km and above 20 km. Selection of villages, based on distance, was intended to assess the likely willingness of a distant farmer to sell in the same market or opt for an alternate market located closer to his/her farm.

[9] Markets place is referred to as "*mandi*" in India.
[13] In West Bengal APMCs are called Regulated Market Committees (RMC)
[14] Except in West Bengal where the traders were surveyed in the rural markets/ villages

Within each district there exist different administrative structures by the name of Tehsil, Taluk, Revenue Circle and Community Development Block.[15] The survey methodology involved random selection of four villages in each of the three distance ranges based on the markets selected. In exceptional cases, different revenue circles were selected for different distance ranges. The identification of villages in each distance range was based on information available in the District Census Handbook, 1981 and 1991. One out of the four selected villages per distance range was finally shortlisted for each crop in each district. In the case where a district was selected for two reference crops, two separate villages, one for each crop, were selected in each distance range.[16] The villages were selected based on dominance of respective selected crops in the village cropping patterns.

Table 1.5 shows the villages selected in each district for respective reference crops. In all 70 villages were selected.

2.7 Selection of Farm Households

A detailed listing of farm households, based on the reference crop grown, area owned and marketed-surplus, was prepared. Each village was listed with focus on one reference crop though information was recorded for other crops grown/marketed as well. Sample farm households were selected such that all categories of land holdings got represented. The land holding classes have been divided into five broad categories: (i) Marginal (0.1-2.5 acres), (ii) Small (2.51-5.0 acres), (iii) Semi-medium (5.1-10.0 acres), (iv) Medium (10.1-25.0 acres) and (v) Large (above 25.0 acres). At least two households were selected under each category subject to the condition that they must be selling some proportion in the market. In case of non-availability of required number of farm households in a particular farm size-class, the selection was made from another class.

If farmers were trading in more than one market, an effort was made to include about 20 per cent farmers that traded in a market other than that selected for the survey. Also, four more

[15] Revenue block refers to the administrative structure in a district which could be a Revenue circle, C.D Block, Tehsil or Taluk

[16] Kurnool in Andhra Pradesh for groundnut and cotton, Yavatmal in Maharashtra for cotton and tur (arhar), Pratapgargh and Shaganj in Uttar Pradesh for paddy and tur (arhar); Amreli and Bhavnagar in Guajrat for groundnut and cotton

buffer/ spare households in each village were selected which were surveyed only if any of the identified households refused to respond. The survey of farm households covered maximum number of paddy farmers. Its obvious significance is due to the fact that it is a staple food crop and also subject to interventions during procurement, distribution and price setting. The number of farm households selected for the survey was 300 for paddy, 175 for cotton, 100 for groundnut and 100 for tur (arhar) **(Table 1.6)**. In each of the selected regulated market as presented in **Table 1.4**, 10 traders and one market official were surveyed.

2.8 Questionnaires

The survey encompassed each of the three agents of the Indian agricultural markets, namely the farm household, the trader and the government official overseeing the regulated market. The exercise intended to identify the restrictions on farmers and traders, the ways in which the government exercises its control over the marketing and distribution process, and scope for improvements by alterations in the existing regulations/procedures of transactions. Detailed questionnaires were prepared to investigate the farm households in the village, traders operating in and government officials overseeing the regulated market. This enabled us to analyse in-depth, the structure, conduct and performance of regulated markets in India.

The templates for Questionnaires were pre-tested in September 2005 through personal field visits. The Questionnaire for the farm households was designed to collect information on land holding and cropping patterns, cost of cultivation, channels and methods of selling marketed surplus and marketing constraints. The traders' Questionnaire was designed to survey their trading practices and the impact of government facilitation, regulations and procurement practices on the regulated markets. Information was also collected about their views on the possibility of creating alternative market channels like private markets and contract farming, which may be beneficial to traders / farmers at large. In addition, information on obstacles to movement (of the farmer's produce) or trading (of the trader's goods) was also recorded. A separate Questionnaire was prepared for the market officials. It aimed at understanding their role as the market facilitators between farmers and traders. The NCAER researchers visited various markets / districts being surveyed by the networking institutes. Some major observations from these field visits are discussed in Annex-1.

Table 1.1: Crop Seasons in India

	Crop season	
	Kharif	***Rabi***
Season	May-Mid October	Mid October-Mid April
Sowing period	May-July	October-December
Harvesting period	September-October/ November	February-April/ May
Source: Bulletin on Food Statistics, 1998-2000		

Table 1.2: State-wise Production and Area for Four Reference Crops

	Paddy				**Tur (Arhar)**				**Groundnut**				**Cotton**			
	Shares in All India (per cent)															
State	**Production**		**Area**		**Production**		**Area**		**Production**		**Area**		**Production**		**Area**	
Andhra Pradesh	7.19	(4)	6.83	(6)	6.79	(6)	12.72	(3)	18.81	(3)	24.71	(2)	12.47	(3)	10.43	(3)
Assam	3.74	(7)	6.31	(7)												
Bihar	4.98	(6)	8.91	(5)	4.52	(7)	2.66	(8)								
Chattisgarh	2.55	(9)	9.04	(4)												
Gujarat	0.60	(16)	1.19	(15)	9.05	(4)	9.17	(5)	25.00	(1)	34.12	(1)	19.22	(2)	21.25	(2)
Haryana	2.47	(10)	2.26	(14)									11.90	(5)	6.78	(5)
Jharkhand	2.17	(12)	3.77	(10)	3.17	(8)	1.48	(9)								
Karnataka	2.24	(11)	2.86	(13)	10.86	(3)	15.09	(2)	12.61	(4)	14.12	(3)	4.23	(7)	5.08	(7)
Kerala	0.70	(15)	0.77	(16)												
Madhya Pradesh	0.90	(14)	3.60	(12)	7.69	(5)	7.99	(6)	2.75	(7)	3.19	(7)	4.35	(6)	7.17	(4)
Maharashtra	1.85	(13)	3.77	(10)	35.29	(1)	31.36	(1)	10.09	(5)	7.06	(5)	29.75	(1)	36.51	(1)
Orissa	3.24	(8)	10.60	(3)	3.17	(8)	3.55	(7)	1.15	(8)	1.04	(9)				
Punjab	8.88	(2)	6.28	(8)									12.36	(4)	5.87	(6)
Rajasthan									3.90	(6)	4.03	(6)	2.86	(8)	5.08	(7)
Tamil Nadu	5.71	(5)	4.22	(9)	1.36	(10)	1.48	(9)	22.48	(2)	9.24	(4)	1.72	(9)	1.17	(9)
Uttar Pradesh	8.11	(3)	10.97	(2)	13.57	(2)	9.76	(4)	1.15	(8)	1.18	(8)				
West Bengal	14.39	(1)	14.50	(1)												
Source: Agriculture Statistics at a Glance, 2004 Note: Figures within brackets represent all India ranks.																

Table 1.3: Districts Selected in each State

Reference crop \ State	Andhra Pradesh	Gujarat	Maharashtra	Tamil Nadu	Uttar Pradesh	West Bengal
Cotton	Guntur (2, 15.8)	Bhavnagar (1, 17.2)	Jalgaon (1, 18.8)			
	Adilabad (1, 17.2)	Amreli (5, 8.3)	Yavatmal (3, 11.4)			
	Kurnool (9, 4.6)					
Groundnut	Anantapur (1, 33.9)	Amreli (2, 20.5)				
	Kurnool (2, 15.0)	Bhavnagar (3, 19.3)				
Paddy	Nellore (4, 9.2)		Raigarh (1, 15.0)	Thanjavur (1, 8.9)	Pratapgarh (14, 2.5)	Burdwan (1, 13.5)
	Guntur (5, 8.9)		Thane (6, 8.6)	Thiruvallur (3, 7.8)	Janupur (24, 1.9)	Birbhum (4, 7.6)
Tur (Arhar)			Yavatmal (1, 16.6)		Pratapgarh (1, 6.5)	
			Wardha (3, 10.3)		Janupur (6, 3.9)	

Figures in brackets indicate district's production rank in the state and district's share in state's total production.
Ranks and shares have been based on statistics for 2002-03, except for cotton in Maharashtra for which the year 2001-02 and paddy in West Bengal for which the year 1999-2000 have been used.

Table 1.4: Names of Markets Selected for Survey

Reference crop/ State	Andhra Pradesh	Gujarat	Maharashtra	Tamil Nadu	Uttar Pradesh	West Bengal
Cotton	Adilabad	Bhavnagar	Jalgaon			
	Guntur	Amreli	Yavatmal			
	Adoni					
Groundnut	Anantapur	Amreli				
	Adoni	Bhavnagar				
Paddy	Nellore		Alibag	Thanjavur	Pratapgarh	Burdwan*
	Guntur		Kalyan	Thiruvallur	Shahganj	Suri*
Tur/ Arhar			Yavatmal		Pratapgarh	
			Wardha		Shahganj	

* please see preceding paragraph

Table 1.5: Details of Selected Villages

District	Main Crops	APMC/ AMC/ Market Town	Taluk/ Tehsil/ CD Block	Revenue Circle/ MPP/ Police Station	Name of Sample Villages (reference crop)	Number of Sample Farmers	Distance from market town (km)
Andhra Pradesh							
Anantapur	Groundnut	Anantapur	Anantapur	Anantapur	Somanadoddi	9	0-10
				Raptadu	Raptadu	8	11-20
				Garladinne	Kanampalle	8	Above 20
Guntur	Paddy, Cotton	Guntur	Guntur	Guntur	Gorantla (C), Pothur (P)	9,10	0-10
				Pedakakani	Koppuravuru (C), Nambur (P)	8,10	11-20
				Pedanandipadu	Katrapadu (C), Pusulur, (P)	8,10	Above 20
Kurnool	Groundnut, Cotton	Adoni	Adoni	Adoni	Kapati (G), Arekal (C)	9,9	0-10
				Pedda Kadubur	Rangapuram (C)	8	11-20
				Alur	Kurukunda (G)	8	
				Holagunda	Gajjehalli (C)	8	Above 20
				Alur	Arikera (G)	8	
Nellore	Paddy	Nellore	Nellore	Nellore	Pedda Cherukur	10	0-10
				Muthukur	Pidatapolur	10	11-20
				Venkatachalam	Kasumuru	10	Above 20
Adilabad	Cotton	Adilabad	Adilabad	Adilabad	Yapalguda	9	0-10
				Tamsi	Nipani	8	11-20
				Jainad	Dollara	8	Above 20
Gujarat							
Amreli	Cotton, Ground-nut	Amreli	Amreli		Mangvapal (C,G)	9,9	0-10
					Rangpur (C,G)	8,8	11-20
					Keriyachad (C,G)	8,8	Above 20
Bhavnagar	Cotton, Ground-nut	Bhavnagar	Palitana		Gheti (C,G)	9,9	0-10
			Gogha		Sanodar (C,G)	8,8	Above 20
			Talaja		Rajpara (C,G)	8,8	Above 20
Maharashtra							
Jalgaon	Cotton	Jalgaon	Jalgaon	Nashirabad	Dhanwad	9	0-10
				Asoda	Vadnagari	8	11-20
				Mhasawad	Mhasawad	8	Above 20
Raigarh	Paddy	Alibag	Alibag	Zirad	Gothi	10	0-10
				Zirad	Dhokawade	10	11-20
				Poynad	Shahavaj	10	Above 20

Thane	Paddy	Kalyan	Kalyan	Kalyan	Nandap	10	0-10
				Upper Kalyan	Khoni	10	11-20
				Nadgaon	Raye	10	Above 20
Wardha	Tur/Arhar	Wardha	Wardha	Wardha	Ganeshpur	9	0-10
				Sevagram	Nandora	8	11-20
				Waifad	Degaon	8	Above 20
Yavatmal	Cotton, Tur/Arhar	Yavatmal	Yavatmal	Yavatmal	Takali (C), Kita (T)	9,9	0-10
				Hiwari	Harjuna (C), Echori (T)	8,8	11-20
				Yelabara	Vithalwadi (C), Ramnagar (T)	8,8	Above 20
Tamil Nadu							
District	**Main Crops**	**APMC/ AMC/ Market Town**	**Taluk/ Tehsil/ CD Block**	**Revenue Circle/ MPP/ Police Station**	**Name of Sample Villages (reference crop)**	**Number of Sample Farmers**	**Distance from market town (km)**
Thanjavur	Paddy	Thanjavur			Velliyur	10	11-20
					Palacepalayam	10	Above 20
					Kudalur	10	0-10
					Rayanthur	10	11-20
					Avarampatti	10	Above 20
Uttar Pradesh							
Jaunpur	Paddy, Tur/Arhar	Shahganj	Shahganj		Dipaipur (P), Kuriyari (T)	10,9	0-10
					Mizapur (P), Barauna (T)	10,8	11-20
					Basauli (P), Dakaha (T)	10,8	Above 20
Pratapgarh	Paddy, Tur/Arhar	Pratapgarh	Pratapgarh		Arjunpur (P), Dharauli (T)	10,9	0-10
					Bansi (P), Adharpur (T)	10,8	11-20
					Konpa (P), Chhatarpur (T)	10,8	Above 20
West Bengal							
Burdwan	Paddy	Burdwan	Burdwan		Nababhat, Kamnara	10	0-10
					Jiara	10	11-20
					Samanti	10	Above 20
Birbhum	Paddy	Suri	Police Station Suri		Haripur (Suri-II)	10	0-10
					Sekampur (Suri-II)	10	11-20
					Talibpur (Suri-II)	10	Above 20

C: Cotton, G: Groundnut, P: Paddy, T: Tur/Arhar
APMC: Agriculture Market Produce Committee, AMC: Agriculture Market Committee, MPP: Mandal Praja Parishad, CD Block: Community Development Block

Table 1.6: Crop-wise Distribution of Farm Households in Each State

Reference crop/ State	Andhra Pradesh	Gujarat	Maharashtra	Tamil Nadu	Uttar Pradesh	West Bengal	Total
Cotton	75	50	50				175
Groundnut	50	50					100
Paddy	60		60	60	60	60	300
Tur/ Arhar			50		50		100
All Crops	185	100	160	60	110	60	**675**

3. Data Analysis of Primary Survey

3.1 Distribution of Land Holdings

It is essential to iterate in the beginning that our analysis of primary survey would be focused around five operational holdings, namely marginal, small, semi-medium, medium and large farmers[17]. **Table 2.1** provides details on distribution of operational holdings, their operated area and average family size. The farm households falling under the categories of marginal to semi-medium (up to 10.0 acres) formed the majority in our sample across all the states under study. The large farm households did not appear in the sampling distribution of Uttar Pradesh and West Bengal. However, it seems that the distribution of operational holdings by farm size was skewed across the states. While the proportion of marginal and small holdings ranged between 43 and 49 percent in all states except Uttar pradesh where its proportion was 77 percent, these farmers possessed about 62 percent area in Uttar Pradesh and 14 to 20 percent area in all other states. In the case of medium and large farmers (above 10.0 acres), they constituted less than 23-30 percent holdings and occupied more than 55 to 65 percent of the total operated area except in Uttar Pradesh and West Bengal. In these two states, the numbers of farmers selected were very small and therefore not comparable. Further, the data reveals that farm size and family size were by and large positively related across the states. This may be due to less sub-division of land holdings of the relatively large families. The average family size was highest, 9.05 in Uttar Pradesh followed by West Bengal 7.02, and Tamil Nadu 6.07. It was lowest in Andhra Pradesh where the average size was 5.29.

Though the distribution of landholdings was not uniform across the states, the analysis by types of land is more revealing. **Table 2.2** presents the land holding pattern by farm size categories. The average size of net operated area of the sampled households was highest in

Tamil Nadu (10.0 acres) followed by Gujarat and Maharashtra (9.3 acres, each). The net operated area was very low in West Bengal (6.1 acres) and Uttar Pradesh (4.3 acres) possibly because of under representation of the large size holdings. Large size holdings were rare in West Bengal and therefore were not represented in our sample. However, in Uttar Pradesh, although large holdings are very much prevalent, they were conspicuously missing from our sample. Non-cultivable land comprised permanent fallow and land not cultivated during the crop season. On an average, the net operated area was less than owned area in Andhra Pradesh, Gujarat and Maharashtra because of high non-cultivable land. Net operated area was more than owned area in Tamil Nadu, largely on account of higher leased-in to leased-out land. Lastly, the operated and owned areas were almost equal in Uttar Pradesh and West Bengal because of small amount of non-cultivable or net leased-in land.

Comparing the structure of tenancy across various farm size categories, it may be observed from the table that in all the states except Tamil Nadu, leasing-in land by large farmers was less than that of small and marginal farmers. Therefore, switching-in was in favour of smaller holdings. In Tamil Nadu, however, in consonance with the trend observed in Punjab and Haryana (Kumar, 2005, 2007), the net leasing-in land was more by large farmers than that by the small and marginal farmers, the term used as 'reverse tenancy' (Singh, 2004) in the literature[18]. The latter phenomenon was happening in agriculturally advanced states because of economies of scale on large holdings and reverse tenancy was also playing a role for consolidation of holdings in these states. Comparing the cropping intensity across various states, multiple cropping was highest in Uttar Pradesh, followed by Tamil Nadu and West Bengal. Cropping intensity was almost one in Maharashtra, Andhra Pradesh and Gujarat possibly because of lack of irrigation facilities in these states. Across farm size, cropping intensity was comparatively higher for smaller size holdings, except the case of Tamil Nadu where large farmers had higher cropping intensity than all other categories. This further lends support to the above-observed phenomenon of reverse tenancy in the case of Tamil Nadu. In the latter state, large farmers leased-in higher land to fully utilize the indivisible capital resources (as in agriculturally advanced states large farmers make higher investment in capital resources).

[17] The classification of size of each holding is already given in Section 2.7.

[18] It will be seen in the later part of the discussion that out of the six selected states, agriculture in Tamil Nadu was more comparable to that of Punjab and Haryana in terms of productivity and profitability.

3.2 Area under Irrigation

The percentage of area irrigated and source of irrigation for the selected households across the six states is displayed in **Table 2.3.** The percentage area irrigated provides an explanation for varying degree of cropping intensity across various states. The three states namely, Uttar Pradesh, Tamil Nadu and West Bengal that observed high cropping intensity (around two crops per annum) had around 70 percent operated area irrigated. On the other hand, rest of the three states, namely Andhra Pradesh, Gujarat and Maharashtra had almost single crop grown during the year because of lack of irrigation as these three states observed only 41, 30 and 11 percent of the operated area irrigated, respectively. Among various sources of irrigation, ground water was the principal source in Gujarat, Maharashtra, Andhra Pradesh and Tamil Nadu while surface water irrigated the major area in Uttar Pradesh and West Bengal through canals. In Gujarat, bore well was the only source of irrigation that provided artificial water for around 30 percent of the total operated area. In Andhra Pradesh, 30 percent of the operated area was irrigated through bore well and around 15 percent operated area was irrigated by canals. In Tamil Nadu, bore well provided irrigation facilities to more than half of the operated area. Another one fifth of the area operated was irrigated by the electric tube-wells. Canals irrigated only 2 percent of the operated area among the selected households in the state. As against these trends, around half of the operated area in Uttar Pradesh and two-third in West Bengal (for the selected households) was irrigated by canals in these two states. In Uttar Pradesh additional one third of the operated land was irrigated by the groundwater lifted through diesel (or electric) tube wells. Tanks were not found significant in any of the states, indicating their falling significance in the modern times whereas they were major source of irrigation in southern India in the seventies and early eighties.

3.3 Cropping Pattern

In consonance with the main objectives of this study to throw light on issues related to marketing, we opted for four reference crops, one each as principal crop in each of the selected state. Besides the reference crop, the sampled households also cultivated range of other crops during the year. For obtaining information on revenue and expenditure aspects of each cultivating family, we collected information on all the crops sown by the selected households during the reference year. Therefore, despite the debate being centric to the reference crops, we will also present analysis of the annual revenue and cost and the net profitability of the cultivating households for giving a complete picture of the status of

agriculture in each of the selected states. In this section, we present the cropping pattern being observed by the cultivators in our reference states.

Paddy was the most predominant crop among the four reference crops as was also discussed in the previous section. Paddy was sown in multiple seasons during the year especially in West Bengal and Tamil Nadu among our selected states. This is also evident from its share in total cropped area, as paddy occupied about 99 per cent of gross cropped area (GCA) in West Bengal and 68 per cent in Tamil Nadu **(Table 2.4)**. Its share in Uttar Pradesh and Andhra Pradesh was 32 and 25 percent, respectively. A small amount was also grown in Maharashtra around 19 percent, as was mentioned earlier that Maharashtra was a deficit state in rice. Among other reference crops, groundnut occupied 57 percent of gross cropped area in Gujarat and 24 percent in Andhra Pradesh. Cotton was the most important crop in Gujarat, Maharashtra and Andhra Pradesh with a share ranging between 37 to 43 percent each in these three states. The fourth reference crop, namely tur (arhar) was relatively minor crop with a share of 11 percent in Maharashtra and 7 percent in Uttar Pradesh. Tur was a pulse crop and as was the case with all other pulse crops, it was a low priority crop sown mostly on the rainfed land that was generally not available for cultivation for other priority crops, due to reasons like lack of irrigation, etc.

In the case of other crops (non-reference crops), wheat and green fodder were the most important crops in Uttar Pradesh with a share of 33 and 27 percent, respectively in the gross cropped area. In Tamil Nadu and Maharashtra, other (*rabi* and *kharif*) pulses occupied around 27 and 17 percent share, respectively in the gross cropped area. The minor crops like sorghum (jowar) and maize also found place in the cropping pattern of Andhra Pradesh and Maharashtra. Other pulses and oilseeds also occupied small area in Andhra Pradesh. Though groundnut was a reference crop in Andhra Pradesh and Gujarat, it was also sown in minor quantity in Tamil Nadu, Uttar Pradesh and Maharashtra. The analysis of cropping pattern broadly suggests lack of crop diversification among the selected farm households. Further, the high value crops like fruits and vegetables did not attract much interest among the farmers.

3.4 Value of Output (Farm Productivity)

For better understanding of the marketing issues of individual households and to measure their marketing efficiency, it is essential to know about their cropping pattern, pattern of input

usage, acreage productivity and overall profitability from the farming business. In most of the subsistence crops marketing happens only after the fulfilment of home requirement of the cultivators. Therefore, farmers' production capacity and consumption requirements are paramount for understanding their marketing issues. In this section we present a comparison of gross output and farm productivity in value terms for the aggregate of all crops.

The gross value of output from all the crops measured per household, per acre, per crop and per capita is presented in **Table 2.5**. The gross value of output per household shows a consistent pattern across the states. The gross value of output per household increased with the farm size thus displaying a positive association between the two. Value of household output was highest in Tamil Nadu, around Rs one and a half lakh, followed by Gujarat, West Bengal and Andhra Pradesh, around Rs one lakh, each and Uttar Pradesh and Maharashtra, around Rs seventy thousand, each. However, household output conceals much more than what it reveals. The household output is a skewed measurement, as it does not take into account the differences in land area operated by the households. Therefore, the better comparison should be in terms of value of output per acre also known as productivity in economic jargon.

The land productivity was highest in Uttar Pradesh (Rs. 18 thousand) followed by West Bengal (Rs. 17 thousand) and Tamil Nadu (Rs. 13 thousand). The productivity was relatively lower in Gujarat (Rs 12 thousand) and Andhra Pradesh (Rs 11 thousand) and it was the minimum in Maharashtra (only Rs. 7 thousand). As expected, the productivity proved to be a direct function of irrigation as states with high irrigation, viz., Uttar Pradesh, Tamil Nadu and West Bengal recorded quite high productivity while states like Andhra Pradesh, Gujarat and Maharashtra, where irrigation levels were very low observed lower productivity. Across various farm size categories, no clear trend was visible. However, looking carefully and comparing land productivity between large holdings and small (and marginal) ones, it is observed from the data displayed in the table that except Tamil Nadu, in all other states, value of productivity was higher for marginal and small farmers as compared to large farmers. This trend supports the age-old perception of 'inverse farm size productivity' relationship, whereby small holdings are considered to be more efficient compared to large holdings[19].

[19] On farm size productivity relationship two different opinions are given in the literature. The first opinion given by Sen (1964), Khusro (1964), Bhardwaj (1974) and Rao (1965) argued that as the size of holdings

Tamil Nadu, however presented trends that coincide more with the trends displayed by the agriculture in Punjab and Haryana rather than the backward states of Eastern and Central parts of India (see for example Kumar 2005, 2007; Kumar and Sarkar, 2005).

The average value of output per acre of gross cropped area (representing the crop productivity against the land productivity presented above) also had somewhat similar trends. However, crop productivity was not as diverse across farm size as was the case of land productivity. The range of crop productivity across various states was also less compared to land productivity because the former was net of cropping intensity whereas the latter included the differences that cropped up because of the differences in cropping intensity as well. The average value of crop productivity was highest in Gujarat (Rs. 12 thousand) and it was lowest in Maharashtra (Rs. 7 thousand) The crop productivity was maximum in Gujarat probably because of dominance of cash crops, like cotton and groundnut in the cropping pattern in that state. Value of output per capita, which is largely dependent on value of output and family size, was highest in Tamil Nadu followed by Andhra Pradesh and Gujarat and the lowest two states were Maharashtra and Uttar Pradesh.

3.5 Input Use Pattern

The productivity or value of output presents only the revenue side of the farming operations. In order to see the returns from the farming business, it is essential to take note of operational and other fixed costs incurred by the farmers. Cost structure as reflected by the share of various inputs in the total cost of cultivation is determined by the level of technology and use of modern inputs. Traditional agriculture was being carried out by conventional practices and use of traditional inputs such as human labour, manure, home grown seeds and rainfall water. However, modern agriculture is more dependent on machine labour, improved seeds, chemical fertilizers and higher use of controlled water for irrigation among others. The variation in use of these inputs in different states exhibits the differences in adoption of technology thereby, a glance at the total cost of cultivation may reflect the extent of technology diffusion across different states. In this section, we examine the cost structure, revenue and gross returns from the farming business for the sampled households in our six selected states.

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increase, productivity declines. The inverse relationship between farm size and productivity has been questioned by the second group of economists like Rudra (1968) and others. For details see Kumar (1991).

As mentioned above the total cost of cultivation can be divided into two parts, namely operational cost, and fixed cost. Operational cost can further be divided into material cost and labour cost. Material cost comprises of all material inputs, e.g., seed, manure, fertilizer, pesticides, payment for hired tractor or maintenance charges for own tractor including the fuel cost and pump set/tube well charges. The labour cost can be divided into family labour and hired labour. Similarly fixed cost has four components, namely rent for leased-in land, imputed value of own land, depreciation and interest on working capital[20]. The fixed cost has to be borne by the farmer irrespective of crops grown or output produced whereas operational cost is linked with the output produced. The statistics related to cost, revenue and gross returns are presented in **Table 2.6** (separately for each state).

It is evident from the Table that material cost accounted for around 38 to 64 percent of total cost of production and it was highest in Uttar Pradesh and lowest in Gujarat. Similarly labour cost varied between 33 and 58 percent and across the selected states it was in the following descending order, Gujarat, West Bengal, Maharashtra, Tamil Nadu, Andhra Pradesh and Uttar Pradesh. In other words, agriculture was more mechanized in Uttar Pradesh, Tamil Nadu and Andhra Pradesh as compared to Gujarat, Maharashtra and West Bengal. The range of fixed cost lied between 2 to 15 percent of total cost of production. Looking at various components of material cost, plant protection chemicals (including fertilizer, pesticide and manure) was the largest and most important component of material cost in all the six selected states. This single item constituted around one fourth share in the total cost of production. Seedling and tractor charges were the other most important components of material cost. Irrigation was least important component of material cost, except the case of Uttar Pradesh. It was seen in sub-section 2.2 that diesel and electric tube-well were the rare sources of irrigation among our selected states except Uttar Pradesh and some parts of Tamil Nadu. In most of the states, bore well and canals were used for irrigation. The cost of irrigation was much higher in the former than in the latter source of irrigation. Moreover, In Gujarat and Maharashtra very small area was irrigated and most of the farmers were dependent on rainfall for their cultivation. In the case of labour use, Gujarat and Uttar Pradesh depended more on

[20] In our fixed cost estimates, because of lack of information we ignored the imputed value of own land. Therefore our fixed cost estimates account for only rent for leasing-in, depreciation and interest on working capital.

family labour whereas, hired labour was used in much higher proportion in Andhra Pradesh, Tamil Nadu, West Bengal and Maharashtra.

There was a wide variation in material and labour costs across different farm size holdings. Family labour was higher for small farmers compared to large farmers in almost all the states without any exception. Hired labour was tilted towards large farmers in most of the states. The total labour cost per acre was by and large higher for small and marginal farmers as compared to large farmers, with the exception of Tamil Nadu where large farmers had higher labour cost on account of much higher hired labour per acre. The same holds true for the material cost. Total material cost per acre was higher for small and marginal farmers compared to large farmers, except Tamil Nadu where material cost for large farmers was almost double to that of small and marginal farmers. Thus, total cost per acre was higher for marginal and small farmers compared to large farmers in all the states, except Tamil Nadu. The higher material and labour cost per acre for small and marginal holdings indicate their higher input intensity on the operated land on account of working on a smaller piece of land as compared to large farmers. This also provides an explanation for our earlier assertion of why the large holdings were less efficient compared to small and marginal holdings in our selected states. However, in the case of Tamil Nadu, higher labour and material usage per acre by the large farmers, compared to small and marginal ones provides an elucidation of seemingly direct relationship between farm size and productivity in that state.

The gross value addition, which is the difference between the value of output and total material cost, presents some interesting results. The value addition was highest in West Bengal, around Rs. 11 thousand, followed by Uttar Pradesh Rs. 9 thousand, Gujarat Rs. 8 thousand, Andhra Pradesh Rs. 7 thousand, Tamil Nadu Rs. 5 thousand, and Maharashtra Rs. 4.5 thousand. Among farm size categories, value added was higher for marginal and small farmers in Andhra Pradesh, Maharashtra and West Bengal, while in other states there was no clear trend across farm size. Farm business income (FBI) is the estimate of net returns to the cultivators that is calculated by subtracting total cost of production from the gross value of output. It is the carryout income of the farmer from farming business after bearing all paid out expenses and depreciation on capital assets. A glance at the farm business income data reveals that net returns from farming business were even negative among some of the farm

categories on account of rising paid out cost. This indicates the fact that in many cases, agriculture does not fetch enough returns and if farmers have also to bear the cost of land[21], a majority of them would discard agriculture and go in alternate occupations. Across the states, FBI was highest in Uttar Pradesh, followed by West Bengal, Andhra Pradesh, Maharashtra, Gujarat and Tamil Nadu. The average value of per acre farm income was observed to be around Rs. 2 to 4 thousand only. It is however, paradoxical to observe that Tamil Nadu, that had very high land productivity among our six selected states, observed negative farming income for semi-medium and large holdings possibly because of much higher cost of production due to high material cost and that of hired labour. In summary, the statistics presented on farm business income indicates that farmers, especially that of small and marginal categories are operating only on account of their family labour. The total earnings from farming in their case are only what have been termed as imputed value of family labour. Large farmers, on the other hand, not having the advantage of family labour were able to subsist on farming only on account of higher operated area. On an average, output-input ratio lied between less than one to less than two.

3.6 Market Structure, Conduct and Performance

The structure of agriculture produce marketing in India consists of a mix of public and private sectors. Barring direct intervention by the government in some commodities, marketing in most others is dominated by the private sector. According to Acharya (1994), the quantity of agricultural produce handled by government agencies has not been more than 10 percent of the total value of marketed surplus. Another 10 percent of the marketed surplus is handled by the cooperatives. Thus, rest of the 80 percent marketed surplus comes in the ambit of private trade. Private trade in agriculture is regulated under the provisions of 'Agricultural Produce Markets Act' passed by various State Governments and regulated markets created under this act. These regulated markets generally provided adequate infrastructure in terms of marketing yards and succeeded in reducing many illegal exactions earlier charged by the traders (Kumar, 2007). Owing to a widening of the production base of the agricultural sector, the market orientation of the farm sector has considerably increased. The overall impact of the working of these institutions on agricultural marketing has decidedly been positive and has helped to increase its competitiveness and efficiency (Acharya and Chaudhri, 2001; Kumar, 2007). With the changing perception and growing need of free trade at the

[21] The imputed value of owned land is not included in the cost of production in the present case.

international as well as domestic front, the market legislation is once again under preview. The 'Model Market Act 2003' has been passed by the Union Government and changes are also being made in the legislation by the state governments in line with the Model Act whereby emphasis is on bringing farmers in direct contact with the consumers and reducing the intermediaries in the process of marketing.

However, these institutional reforms have not been successful in terms of coverage over the whole of India. Market imperfections continue to operate in most of the areas where an agricultural breakthrough has not taken place. In the backward areas, number of the regulated markets are limited and further markets continue to be dominated by the trader-cum-moneylender nexus. In the agriculturally advanced regions, the market infrastructure is fairly developed resulting into efficient marketing. In the agriculturally underdeveloped parts of India, it is highly inadequate and consequently, the marketing system continues to be non-competitive and dominated by monopsonistic interests (Kumar and Sarkar, 2005).

In the background of market structure discussed above, we make an attempt in this section to study the marketing behaviour of the selected household in six selected states. The next two sections present marketed surplus by farm size at the aggregate and crop-wise, respectively. In the third section, we try to comprehend the marketing channels followed by the farmers and review the success of the regulated marketing system. The fourth section compares prices obtained by farmers for the major crops and to observe whether there is any price discrimination prevalent across various farm sizes, a gross price index is calculated for all crops.

3.7 Marketed Surplus

We define marketed surplus in the present case as the quantity of output the farmer actually sells irrespective of his needs for home consumption and other requirements. In technical terms this is known as 'marketed surplus'. This term is different from 'marketable surplus' which is defined as the residual left with the producer after meeting his requirements for family consumption, farm needs and payment-in-kind to casual and permanent labour, the landlord, artisans and others (Moore et.al., 1973). In the case of latter, there is a need to ascertain whether the farm household has produced output in excess of all his compulsory retention. A certain amount of value judgment is involved in the measurement of marketable surplus. The

marketable surplus may be termed as an *ex-ante* concept referring to the surplus planned to be marketed and marketed surplus can be an *ex-post* concept referring to the actual amount marketed during a certain period. We therefore prefer marketed surplus in the present analysis.

Table 2.7 presents per household and per acre value of net output produced and marketed for all the crops (aggregate) in the six selected states. Value of net output excludes the value of by-product and the value of fodder crops as both are generally used for feeding own livestock and not meant for the market. However, net output also includes the previous year's stock (if any) held by the household. The trends in output and marketed surplus per household clearly establish a direct relationship with the farm size. However, the same was not true in the case of output and marketed surplus per acre. Marketed surplus per acre was higher for smaller size holdings in Andhra Pradesh, Gujarat, Uttar Pradesh and West Bengal, while it was higher for the larger size holdings in Maharashtra and Tamil Nadu. Marketed surplus as a percentage of output, by and large, increased with the increase in farm size thus having a direct relationship with the farm size. The percentage of output marketed widely differed across our selected states. It was as high as 95 percent in Andhra Pradesh and Gujarat, about 75 percent in Tamil Nadu, around 50 to 60 percent in West Bengal, Maharashtra and Uttar Pradesh. Nonetheless, the proportion of output marketed at the aggregate does not reflect the true nature of commercialization of agriculture in the selected states. It was mentioned elsewhere that sample selection for this study was guided by the choice of our reference crops. As cropping pattern in Andhra Pradesh and Gujarat was dominated by the commercial crops, viz., cotton and groundnut, their proportion of output marketed was therefore very high. On the other hand, cropping pattern in Uttar Pradesh, West Bengal and Tamil Naud was dominated by the subsistence crops like rice, wheat, and pulses without any significant inclusion of commercial crops and thereby the aggregate output marketed was unduly low in these states. Given this reality, crop specific analysis of marketed surplus might give us a better picture on the level of commercialization in the reference states.

Comparing the contribution by large versus small farmers in the marketed surplus, **Table 2.8** emphasizes the higher share of large farmers in the aggregate marketed surplus in all the six states. It can be seen from the Table that the first three categories of farmers together constituted around 77 percent of holdings (who occupied around 45 percent of area) while contributed only 23 percent of marketed surplus in Andhra Pradesh. Large and medium farmers, on the other hand, occupied 23 percent holdings with 55 percent operated area and

contributed around 77 percent share in the total marketed surplus. Similar was the situation in other states. In Gujarat, holdings up to 10 acres occupied around 35 percent of area and shared only 23 percent of marketed surplus while large farmer (above 25 acres) held 28 percent of area and contributed 48 percent of marketed surplus. In Maharashtra, medium and large farmers (above 10 acres) operated around 65 percent of total area and contributed above 87 percent of marketed surplus leaving only 13 percent share in marketed surplus by the smaller size holdings with a share in operated area above 35 percent. In Uttar Pradesh medium farmers held only 3 percent area and contributed 35 percent share in marketed surplus while in West Bengal medium farmers held 20 percent land area and contributed 46 percent share in marketed surplus. Thus, from the fact that there was a direct relationship between farm size and percentage of output marketed and large holdings had higher share in the total surplus, one can conclude that subsistence concerns were prime for smaller holdings while large farmers contributed much higher proportion of output in the market.

The net output produced and marketed per household and per acre of reference crops in physical terms (quintals) is presented in **Table 2.9.** The productivity of paddy was highest in West Bengal (25.0 quintals) followed by Andhra Pradesh (18.5 quintals) and Tamil Nadu (17.1 quintals) while it was lowest in Maharashtra (11.2 quintals). Comparing marketed surplus across the paddy growing states, It is seen from the results that percentage of marketed surplus of paddy was in the following descending order, Andhra Pradesh (87 percent), Uttar Pradesh (73 percent), Tamil Nadu (71 percent), West Bengal (48 percent) and Maharashtra (26 percent). The distribution of marketed surplus of paddy across these five states is more realistic, indicating that Uttar Pradesh and Tamil Nadu were much higher commercialized compared to West Bengal where subsistence concerns dominated (with predominance of small holdings) and Maharashtra that was a deficit state in rice. Across various farm size holdings, the proportion of output marketed increased with the increase in farm size in almost all the paddy growing states. Tur (a pulse crop) was mainly grown in Uttar Pradesh and Maharashtra. Productivity of tur was higher in Maharashtra compared to Uttar Pradesh across almost all size of holdings. Tur was also a subsistence crop although its market proportion was higher than that of paddy as seen above. On an average, 83 percent output of tur in Maharashtra and 72 percent in Uttar Pradesh was marketed. Across various size class holdings, percentage of output marketed had a direct relationship with farm size.

As was mentioned above, groundnut and cotton both are commercial crops. Cotton was grown in Andhra Pradesh, Gujarat and Maharashtra while groundnut is grown in the former two states. Almost whole of the production of cotton was sold in the market while groundnut was marketed above 90 percent by all size of holdings. Such a high percentage of surplus of these two crops, substantiate our earlier argument that these two crops overvalued the aggregate marketed surplus for Gujarat and Andhra Pradesh. Being commercial crops, almost whole of the production of these two crops was meant for the market without any significant differences across farm size classes as is seen from the table. On the productivity front, average groundnut production per acre was almost double in Gujarat as compared to Andhra Pradesh. Among farm categories, large farmers in Andhra Pradesh and small farmers in Gujarat were relatively more efficient in productivity compared to other farmers. Cotton productivity was 6-7 quintals per acre in Andhra Pradesh and Gujarat, while it was around 4 quintals in Maharashtra. Across the various farm size classes, there was no particular trend in productivity in the case of cotton. Thus, out of the four reference crops, paddy turned out to be highly subsistence crop while tur was also a subsistent crop but it was more commercialized than that of paddy. Groundnut and cotton, on the other hand being commercial crops were fully marketed by all size of holdings.

3.8 Marketing Channels

Marketing channels through which farmers sell their produce in the market is an important indicator of market efficiency. Although, marketing of agricultural produce in India is regulated and farmers are directed to sell their produce through regulated *mandis* under the 'Agricultural Produce Markets Act'. However, as was pointed out earlier, regulated *mandis* are operating successfully only in a few states, mostly in agriculturally advanced regions. Moreover, the recent 'Model Act' passed by various states have liquidated the condition of selling or buying through only the regulated markets even in those states where regulated markets are functioning very successfully. **Tables 2.10 and 2.11** provide details on value of output marketed by the farmers through various channels and buyers for the aggregate marketed surplus by the households. The place of (market for) sale utilized by our sample households at the aggregate included sale within the village, sale in the primary rural markets and sale in the wholesale markets (*mandis*). In Andhra Pradesh, farmers sold on average about 73.0 percent of marketed surplus within the village and 26.0 per cent in the wholesale market (regulated *mandi*). Among the farm size groups, only large farmers preferred to sell considerably large volumes in wholesale market. This might be to reap the benefit of

economies of scale for the transportation facilities that these farmers generally owned. All other households including the medium farmers sold more than three fourth of their produce within the village.

Majority of sample farmers in Gujarat and Maharashtra cultivated cash crops like groundnut and cotton, that were sold in wholesale market (*mandi).* About 99 percent output in Gujarat and 75 percent in Maharashtra was sold in the regulated wholesale market. A small proportion, 8 per cent by marginal farmers and 10 percent by small farmers were sold within the village or rural market in these two states. The farmers also sold some of their produce through other channels that were informal in nature. The reasons for sale through informal channels might be credit tie-ups with moneylenders/landlords and obligations to sell through petty traders etc. This channel accounted for 23 percent of total produce sold in Maharashtra by the selected farmers. Most farmers in Uttar Pradesh preferred to sell either through village markets (64 percent) or through wholesale markets (32 percent). Among farm groups, marginal farmers sold 92 per cent of their produce in the village market. Marginal and small farmers also preferred to sell small proportion of their produce in the primary rural market. However, the semi-medium and medium farmers sold more than half of their marketed surplus through wholesale markets. Sale within the village emerged to be the most preferred channel among all category of farmers in Tamil Nadu and West Bengal. However, there was a difference in the medium of sale through village channel also in these two states. Whereas in West Bengal, sale within village was though the millers, sale within village in the case of Tamil Nadu was on behalf of the commission agents of the wholesale markets. Data displayed in **Table 2.11** throws more light on these facts.

The identified major buyers of farmers' produce were village consumers, village shopkeepers, landlord/money lenders, village millers, itinerant merchants, *kutcha* and *pucca arhatiya* (commission agents in the regulated *mandi*), government agency and others. In many of the cases, more than one buyer operated on a single place or channel of sale. For example, the first five kinds of buyers (mentioned above) carried out their activities within the village itself. Similarly, Katcha and *pucca arhatiya* both operated in the regulated *mandi* at the same time for different sellers. The major buyers identified in Andhra Pradesh were itinerant merchant/landlord, village miller and *kutcha*/*pucca arhatiya*. Except the *arhatiya,* all

others mostly operated within the village where production was taking place, as that was also the most convenient and economical mode of sale for the farmers[22]. Across various farm size holdings, large farmers sold high proportion of their produce to *kutcha*/*pucca arhatiya*s. Both the *kutcha* and *pucca arhatiya*s are commission agents who act as intermediaries between farmers and traders in the wholesale (regulated) market. Small and medium farmers preferred the other informal means like itinerant merchants, village millers and landlords, who ultimately sell either in the primary rural markets or wholesale markets. There appears to be a nexus of credit and agriculture markets in the informal sector that bound the small and marginal farmers to these landlords and itinerant merchants.

In Gujarat, Maharashtra and Tamil Nadu, it seems wholesale *mandis* worked quite efficiently whereby commission agents including the government agency handled majority of the produce. The sale through informal buyers discussed above was almost nil except small amount sold to the village millers by the marginal and small holders in Maharashtra. However, sale pattern in regulated markets was different in these three states. Whereas, in Gujarat and Maharashtra, sale was realized in the regulated *mandi* and transportation cost from the farm to the market was borne by the farmers. In Tamil Nadu, the activity of sale took place within the village while transportation cost from the farm gate to the *mandi* place was borne by the *kutcha*/*pucca arhatiya*. The agricultural produce in Uttar Pradesh was shared evenly by the formal and informal marketing agencies. Regulated *mandis* through *kutcha*/*pucca arhatiya*s shared about one third of the produce sold. Another one third was handled by the village millers, while rest of the one third was taken care off by the informal buyers namely, landlords, itinerant merchants and village consumers. The direct sale by the farmers to the government agency was conspicuously absent, whereas FCI makes significant procurement of both paddy and wheat from Uttar Pradesh. Across various size classes, around 60 percent of output of medium (large) farmers was sold through regulated *mandis* whereas only 5 to 25 percent of output was sold through this channel by the marginal and small farmers. The local informal buyers like landlord/money lenders dominated the agriculture marketing in West Bengal. About 57.0 per cent of total produce was sold to landlords, while sale through regulated market was less than 40 percent. Unlike all other states, in West Bengal, sale though regulated *mandis* (*kutcha*/*pucca arhatiya*s) was much

[22] Which particular mode was more efficient in terms of net price obtained by the farmers is discussed in the

higher by the small and marginal farmers as compared to medium and large farmers. It is clear from the above discussion that farmers generally sold their produce through intermediaries and direct sale from producer to consumer was completely absent except a small amount in Uttar Pradesh and West Bengal. Informal buyers like landlords, itinerant merchants and village millers played a dominant role in Andhra Pradesh, Uttar Pradesh and West Bengal. On the other hand, large proportion of agriculture produce was sold through commission agents in the regulated *mandis* in Gujarat, Maharashtra and Tamil Nadu.

3.9 Marketing Cost

Marketing costs are the expenses incurred in bringing the produce from the farm gate to the market. These costs generally include handling, packing and loading charges at the farm place, storage and transportation charges and charges for unloading, cleaning and weighment at the market place including the personal expenses incurred by the farmers during their stay in the market to sell their produce. In the present analysis, handling and packing at the farm gate are done by the producers themselves and therefore these items do not count in the marketing cost. The components of marketing cost for the four reference crops are provided in **Table 2.12.** It is rather ironical to observe that farmers who were selling through regulated markets were paying higher per quintal marketing cost compared to those who were selling through informal channels mostly within the village. The marketing cost of paddy was higher in Maharashtra and Andhra Pradesh where the product was sold through regulated *mandis* while it was almost nil in the other three states, viz., Tamil Nadu, Uttar Pradesh and West Bengal. In Tamil Nadu, paddy was sold to the commission agents of regulated *mandis* but the deal was done at the farm-gate and the carrying and other costs were borne by the commission agents. In the case of Uttar Pradesh and West Bengal, paddy was sold mostly within the village to the intermediaries. Transportation cost and loading charges were the main components of marketing cost while market fee and *mandi* commission was borne by the buyers in the case of paddy. Storing of paddy for later sale does not seem to be a widespread practice among the sample farm households. Due to improper infrastructure farmers in West Bengal had to bear some spoilage cost.

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next section.

Marketing cost of Tur was higher than paddy on account of higher transportation and loading charges. The farmers of Maharashtra incurred higher average marketing cost (Rs. 12.5 per quintal) than that of Uttar Pradesh (Rs. 9.12 per quintal). The *mandi* commission and market fee for tur was also borne by the buyer. Groundnut and cotton were both sold mostly through regulated markets. In both these crops nominal amount was paid in terms of market fee by the farmers, as these two crops were commercial crops. The total marketing cost for these two crops was little higher than paddy but comparable with that of tur. Transportation cost was slightly higher in Gujarat for both the crops possibly because of more spread fields in that state. The loading charges were more or less comparable across all the three states for both the crops. On an average, marketing cost for groundnut was Rs. 7.5 per quintal in Gujrat, that was slightly higher than Rs. 4 per quintal in Andhra Pradesh. In the case of cotton, average marketing cost was Rs. 8 per quintal in Andhra Pradesh, followed by slightly less than Rs, 8 per quintal in Gujarat and Rs. 6 per quintal in Maharashtra. Across various farm sizes, no definite trend emerged for the marketing cost of all the four crops across the six selected states.

Marketing cost also indicates the efficiency of the marketing channels. The channel that involves lower marketing cost is considered to be more efficient. **Table 2.10** displayed the channels through which farmers sold their produce. The figures in parentheses display the marketing cost per quintal for each channel. On an average, market cost was higher in the rural markets, followed by wholesale *mandis* and other informal channels in the descending order. The marketing cost was lowest for sale within the village. This was the pattern of marketing cost in Andhra Pradesh, Gujarat and Maharashtra. In rest of the three states produce was sold either through wholesale *mandis* or through informal channels within the village. Out of these two, market cost was higher in the regulated *mandis* while marketing cost for produce sold in the village was almost zero. However, the actual efficiency of a channel might be reflected not only through lower marketing cost but also through competitive prices to the sellers. In the proceeding section, we try to locate efficiency of various channels by the net price received by the farmers.

3.10 Prices Received by the Farmers

The market structure and conduct can best be judged from the pricing efficiency of crops produced and sold by the farmers in the market. A fair deal in the determination of these prices

depends upon the availability of market infrastructure and marketing services. Important among these services are - availability of well furnished markets with efficient functionaries; standardized weights and measures; adequate transport and communication facilities; proper storage facilities and well connected market information system. In the previous section we have seen that farmers in Tamil Nadu, Maharashtra and Gujarat were mostly selling their produce through the regulated *mandis*. In West Bengal, Uttar Pradesh and Andhra Pradesh other informal channels were being used by the farmers for disposing off their produce. The last two columns of **Table 2.12** present the gross and net price received by the farmers for the four reference crops. The net price is the price received by the farmers, net of market expenses.

Comparing net price received by the farmers across various states, it is seen from the data that net price for paddy varied between Rs 483 and 587. It was in the ascending order of Tamil Nadu, West Bengal, Maharashtra, Uttar Pradesh and Andhra Pradesh. Across various farm size categories, paddy price tend to increase with the farm size in Andhra Pradesh and Maharashtra, it had seemingly inverse relation with farm size in Tamil Nadu while net price remained almost stagnant over farm size in West Bengal and Uttar Pradesh. In the case of tur, net price was higher in Uttar Pradesh (Rs. 1718) compared to Maharashtra (Rs. 1590). Net price increased with the farm size in Uttar Pradesh while there was no clear trend in Maharashtra. Groundnut price was higher in Andhra Pradesh (Rs. 1554) than in Gujarat (Rs. 1473). Across farm size, price differences were there but without any specific bias towards any category of farmers. Last and the least, net price for cotton was in the ascending order of Gujarat (Rs. 1772), Andhra Pradesh (Rs. 1835) and Maharashtra (Rs. 2165). In all these three states highest and lowest prices occurred in the small to medium size holdings and no specific trend was apparent in all the three states.

In the discussion above, we summarized the price obtained by the farmers across various states and farm size holdings. To further investigate price efficiency, we compared the net price over space and time for the reference crops to see whether the price increased or decreased over and above the transportation and storage costs. The results are presented in **Tables 2.13 and 2.14.** Distance travelled by the farmers to market their produce is grouped into four ranges viz., less than 1 Kilometre, 1 to 10 Kilometres, 10 to 25 Kilometres and above 25 Kilometres. In the case of paddy, net price did not show any association with the distance covered except Andhra Pradesh where net price increased at higher distance. As was seen in the section on

marketing channels, paddy was disposed off mostly through informal sources within the village and sale through regulated *mandi* was very small. Therefore, the results of net price being neutral to distance covered by the farmers to find a more competitive market for their paddy produce more or less substantiate our earlier results. In the case of Tur and groundnut, there was apparently a positive association between net price and distance covered in both the states and both the crops, although the trend was not complete over all the four distance ranges. The trend was much less conclusive in cotton in all the three states. Thus, on the basis of this tabular analysis it is difficult to reach to any conclusion on the price efficiency across the space.

To check the price efficiency over time, we divided the time period of sale into four quarters. The first quarter consisted of the first three months after harvest, followed by the successive three months for each of the next quarters. No particular pattern emerged from the data on quarterly distribution of net prices for at least paddy and groundnut. The net price did not increase overtime nullifying the general perception that farmers get lower price by selling just immediately after harvest. In the case of tur and cotton, net price showed a rising trend over time although trend was not very overwhelming. It was also not clear from these results how many farmers withheld their product up to the fourth quarter.

Finally, to check the pricing efficiency of different channels of sale, we compared the net price across various channels for our reference crops. The results are presented in **Table 2.15.** It is hypothesised that the channel through which farmers receive highest net price is considered to be an efficient channel. In the case of paddy, keeping into account the most frequent channel used by the farmers in selling their product, highest price was obtained through the miller and the commission agent (*kutcha arhatiya*) while landlord paid the lowest price. In the case of tur, however, the highest price occurred in the case of landlord while miller and commission agents also provided competitive price to the farmers. For groundnut and cotton, regulated *mandi* was less efficient in terms of price efficiency while informal channels of landlord, village consumer and village miller provided a more competitive price to the farmers. Government agency also provided quite higher price for cotton but this channel was available to the farmers only in Maharashtra. Thus, concluding the debate, it is very difficult to say that regulated *mandis* being the most formal channel for agricultural marketing were the most efficient channel, at least for the reference crops in our six selected states. The above price trends also tender an explanation that why farmers take the route of

selling through landlords, money-lenders, village miller etc. even though having the option of selling through the better equipped regulated *mandis* or *kutcha arhatiya*s.

To draw conclusion on the net price at the aggregate of all crops grown by the households, we clubbed the prices of all crops together to get some aggregate price index. It is not appropriate to take a simple average of the prices of different crops because price is already an average figure. The following procedure is adopted to club the prices of different crops:-

$$P_j = \frac{\Sigma P_{ij} Q_{ij} W_{ij}}{\Sigma Q_{ij} W_{IJ}}, \quad i = 1, 2, ..., N \text{ (N crops)}, j = 1, 2, ..., M \text{ (M no of HH)},$$

Where:P = price obtained by the farmer, Q = quantity sold by the farmer and W_{ij} represents weight for jth farmer for the ith crop. The weight used here is the area under a particular crop divided by the gross cropped area. The results of aggregate price index **(Table 2.16)** show that in Andhra Pradesh the highest price was paid to the large farmers while lowest price was observed by the small farmers. In Gujarat and Tamil Nadu both, highest and lowest prices were realized by the medium and large farmers, respectively while marginal and small farmers lied in between. In Maharashtra, highest price was obtained by the semi-medium farmers while marginal farmers obtained the lowest price. In Uttar Pradesh, highest price was obtained by the medium farmers while marginal farmers ended up with the lowest price. Finally, in West Bengal, both lowest and highest prices occurred in the case of marginal and small farmers. Thus, the weighted price varied across the states but by and large there was no specific discrimination against the smaller size holdings.

3.11 Determinants of Marketed Surplus

Marketed surplus of any commodity at the farm level primarily depends on the amount of output produced by an individual farmer. Area operated or area under a particular crop could be used as a proxy for the output and therefore can be another determinant for marketed surplus. In addition to output and NOA, the other independent variables tried in the study are: Average household size (numbers); Irrigated area as a proportion of gross cropped area (at the aggregate we used a dummy for irrigated area with value one for irrigated area and zero for un-irrigated area); Total loans per acre of area operated (Rs.); Dummy for area leased in with value one for leased in land and zero otherwise, State dummy variables to compare the level of marketed

surplus across the selected states. Separate regressions were done for the aggregate of all crops and for the four reference crops. Within these two broad groups, we tried different equations with alternate sets of independent variables. Log linear regressions were used for the statistical estimations. The results at the aggregate are presented in **Tables 2.17** and crop specific in **Tables 2.18**.

Analysing the results of aggregate output, the value of output was the most important variable determining the value of marketed surplus. The coefficient of output was positive and significant at one percent. The value of the coefficient was less than but close to unity, indicating that any rise in output led to around proportionate increase in marketed surplus. Household size was the other important variable significant at one percent with a negative coefficient, indicating that an additional member in the family reduced marketed surplus by raising the retention requirement by 5 to 15 percent. Replacing the value of output by the operated area, it is observed that operated area also had a significant positive relationship with marketed surplus. One percent increase in net operated area raised the marketed surplus exactly by the same proportion. The variable on distance of farm or village from the market was significant with a negative sign. It indicates that those farmers who were located at a distant place from the market or those that were in the peripheral areas were at a disadvantageous position. The farmers better connected with the market or in the close vicinity of the commercial areas marketed higher amount than those who were distantly located. In other words, markets don't seem to be integrated as farmers' marketing activities were likely affected by their location factor. Variable on credit was also significant with a positive sign pointing out the possibility of some amount of distress sale among the farmers. With the rising indebtedness, farmers sold higher amount under pressure of repayment. However, it is not clear from the regression results whether some of the output (especially the foodgrains) sold under the pressure of debt was later repurchased from the market for self-consumption in the lean season. Dummy for area un-irrigated and area under tenancy, both were significant albeit not in all equations. Un-irrigated area was significant with a negative sign indicating that un-irrigated area was used more for subsistence crops. The area under tenancy had a positive sign signifying the fact that farmers tried to produce more and more commercial output on leased-in land to bear the additional cost of rent on land. Last but not the least, dummy for state and farm size categories were significant. The coefficient of state dummies indicated that the marketed surplus was highest in Gujarat and Andhra Pradesh and it was lowest in West Bengal. This is the order we also obtained in the tabular analysis.

Similarly, category dummies clearly show an inverse relationship between farm size and marketed surplus.

As in the case of aggregate marketed surplus, output of each of the four reference crops was also the most significant variable affecting the marketed surplus of the respective crops. The magnitude of the coefficient of output was around one in all the four crops indicating proportionate relationship between the marketed surplus and output. In the alternate equations, marketed surplus is regressed on the cultivated area of the crop instead of output. The results show that area was also highly significant in all the crops with a positive coefficient. The crop wise area coefficient had similar trend as that of output. Among the other determinants, household size had a significant negative coefficient in paddy and groundnut while coefficient was negative but insignificant in cotton and tur. Cotton being a commercial crop was expected not to be associated with family size. However, tur being a subsistence crop was conspicuously not related with family size. The variable on distance was mostly insignificant except that of groundnut indicating higher amount of output sold by the distnat households. Irrigation variable was significant for paddy and groundnut indicating higher sale for irrigated land possibly because of higher productivity on such land. The coefficient of indebtedness was insignificant in almost all the crops.

Summing up the regression results, at the aggregate as well as that of four reference crops, the most significant variables explaining marketed surplus were value of output, operated area and family size. The variables on value of output and operated area to some extent represented the economic strength of the farmer. As the farmer's economic position improves his participation in the market also increases. The family size played an opposite role in the marketed surplus as higher members in the family raised the retention requirement and affected the marketed surplus negatively. The technology factor had a positive association with the commercialization as percentage of area irrigated had a positive and significant coefficient with marketed surplus at the aggregate and for paddy and groundnut. The variable on indebtedness indicated possibility of some amount of distress sale among the cultivators. The variable on distance indicated lower commercialisation among the distant farmers pointing towards lack of integration in the domestic markets. However, this was partially nullyfied by the positive and significant coefficient of distance in the case of groundnut.

3.12 Factors Determining Farm-gate Prices

The results of multiple regression analysis carried out to ascertain the volume and direction of factors entering into price formation for the four reference crops are presented in **Table 2.19.** The net price (price obtained by the farmer – marketing cost) was taken as the dependent variable**.** Independent variables were: marketed surplus of reference crop (quintals); net operated area of the reference crop, acres; credit, Rupees; Distance covered in marketing the produce, kilometres; Quarter dummies for sale; dummies for channels of sale, viz., village consumer, shopkeeper, money-lender and regulated *mandi*/government agency. We tried two models, with crop quantity sold as independent variable in the first model and crop area in the second model along with other independent variables.

The results of the two models were almost similar. The marketed surplus and area, also representing the economic strength of the farmers, were not found significant, in tur and groundnut while both were significant with a negative sign in paddy and cotton. These results imply that due to lack of proper infrastructure at the farmers' end and lack of competition (few big traders) in the market, those farmers who had higher amount of output for sale ended up with a lower net price. It was seen in the previous section that for the selected reference crops a large proportion of output was being sold in the village through informal channels without any proper bidding. The price fixed for the output offered for sale under such informal channels was completely on the discretion of the buyers. This is also clear from the dummy variables of channels of sale. In both the models, the price received by the farmers was minimum for those farmers who sold their product either through moneylenders, *sahukars* or village shopkeepers whereas the farmers who sold directly to the village consumers or regulated *mandis*/government agencies obtained the highest price in most of the cases. It signifies the fact that there is a lot of ground for improvement in the marketing structure. Farmers' markets, whereby produce is sold directly to the consumers by minimising the number of intermediaries; modern terminal markets and corporate led contract farming can play a vital role in reducing the inefficiency in the present marketing set up.

Lack of storage and warehousing with the farmers was also apparent from the fact that farmers sold their significant amount of output after the harvest. From the regression coefficients of dummy time period of sale, it is clearly evident that highest net price occurred in the third and fourth quarters in all the four crops. However, net price here does not take care of the spoilage

that occurs during the storage period. It seems despite rise in price much more than that of storage costs, farmers do not withhold their product because of risk of spoilage, in the wake of lack of scientific storage and warehouses. The variable on distance was significant but negative in the case of paddy and groundnut. It implies that those farmers, who were located at a distant place got lower net price because of higher transportation and other carrying costs. Last but not the least, the variable on credit was not significant in any of the equations not confirming the usual credit and marketing inter-linkages generally found in the Indian product markets (Kumar and Sarkar, 2005 and Kumar, 2007). Before closing the discussion, it must be pointed out that the value of R^{-2} was quite low in price equations. The low value of R^2 indicates that the explanatory variables are not able to explain sufficiently the variation in the dependent variable and probably some important variables are not included in the model. It is well known that the price in the market is determined by a multiple number of factors like the number of traders present in the bid, the total amount of output under auctioning, price expectations of the traders, size and location of the *mandi*, government price policy, etc. All these explanatory variables could not be included in the regression analysis. The regressions with low R^{-2} are kept in the analysis because of their desired economic interpretation.

4. Marketing Problems

To our question of major problems faced by the farmers in marketing their produce, the farmers identified many problems that are summarised in the following paragraphs. In Andhra Pradesh, paddy farmers cited three major marketing problems, namely, traders' collusion, late payment and incorrect weighment. The first two problems were mentioned by more than three-fourths of the responding farmers while the problem of incorrect weighment was mentioned by about three-fifths of the farmers. The problem was relatively more intense among the marginal and small farmers. The latter farmers also faced price fluctuations as a major marketing problem. Traders collusion was also one of the major marketing problem for more than 70 per cent of the responding cotton farmers in Andhra Pradesh while marginal farmers faced additional problem of transportation and credit facilities. Credit scarcity was also a problem for the groundnut farmers in that state. Lack of storage in market yard was another problem by and large faced by all the farmers especially in the case of perishables.

In Gujarat, almost all cotton and groundnut farmers cited lack of packing material as one of the major marketing problems faced by them. High transportation cost because of bulk nature of cotton and lack of information were the other problems faced by the cotton and groundnut farmers in Gujarat. There was no government procurement for these two crops in Gujarat that raised marketing problems of the farmers especially the small and marginal ones. Lack of credit and storage facilities in market yards hit small size-classes more than to other size-classes. Paddy farmers in Maharashtra identified high cost of transportation, price fluctuations, traders' collusion and lack of accommodation for night stay in the market yards as the major problems faced by them. Tur farmers in Maharashtra observed traders' collusion as a major marketing problem. Cotton farmers on the other hand suffered because of late payment and incorrect weighment of their produce. Small and marginal farmers starved of purchasing power were particularly affected by the late payment of the produce sold by them. The paddy farmers in Tamil Nadu were selling in the village as the commission agents from the regulated markets were purchasing their product at the farm gate itself. However, these farmers cited the lack of market information on prices as the major problem for them because they were mostly not visiting the *mandis* centres in the town. The paddy farmers in Uttar Pradesh and West Bengal sold their produce mostly in the village without looking for other options. Around one third of the tur farmers in Uttar Pradesh considered lack of market information, lack of storage facilities in market yards and lack of accommodation for night stay in market yards as the major problems in marketing their produce. High cost of transportation was sighted as the main reason for sale of paddy within the village to the informal channels in West Bengal.

At the aggregate, more than half (54 per cent) of the surveyed farmers for all crops and all states did not sell atleast one reference crop under survey in the APMC markets. Majority of farmers quoted four main reasons for not selling at least one of the reference crops in the APMC markets (regulated *mandis*). These reasons were: a) the *mandi* or market centre was too distantly located; b) high transportation cost; c) reasonable prices received in the village/rural markets; and d) convenience of selling in the village/rural markets **(Table 3.1).**

4.1 Price Dissatisfaction for Farmers Selling in APMC Market Yards

Farmers selling in the APMC market yards were asked whether they received a reasonable price for their produce, compared to the maximum price that prevailed in the APMC market on the day of their sale. Farmers in Gujarat and Uttar Pradesh who sold their produce at the APMC market yards were satisfied with the prices prevailing in the APMC markets. In fact, in these two states there was no price difference between maximum prevailing and the realised price. In the case of Andhra Pradesh, responses from the farmers revealed that 61 per cent of the cotton and 71 per cent of the groundnut farmers were not satisfied with the prices received by them in the APMC markets **(Table 3.3)**. Cotton farmers expressed that on an average, they were paid 15 per cent less than the maximum price prevailing in the market yard on the day of their sale and the groundnut farmers estimated the underpaid difference at 10 per cent.

In Maharashtra, 93 per cent of the paddy farmers who sold their produce in the APMC market yards felt that they did not get reasonable price. The corresponding proportion was 65 per cent for tur and 46 per cent for cotton farmers. The dissatisfied paddy farmers, on an average, felt that they received 6 per cent less than the maximum price that prevailed in their respective market yards on the respective days of their sale. The extent of underpayment of prices was 8 per cent for tur and 10 per cent for cotton. However, part of the price differentials might have existed because of varietal differences across the lots sold on the same day.

4.2 Facilities in Agricultural Markets and Farmers Expectations

APMC market yards are expected to provide certain facilities for the benefit of the farmers who visit these yards to sell their produce. These facilities include, auction platforms; banking facilities; grading facilities; roads in and around the market yards; parking at the market place; rest house facilities; market information unit; and handling of trade by APMC etc. Farmers selling in APMCs were asked as to which facilities needed improvement. In the Adilabad market in Andhra Pradesh, which is one of the largest in India for cotton trade, 88 per cent of the farmers expressed the need for improvement in grading facilities and 79 per cent of the farmers felt the need for improvement in banking facilities **(Table 3.5)**. About 68 per cent of the responding farmers in Adoni market, dealing in cotton and groundnut, pointed

out that grading needs improvement and an equal proportion of farmers felt for better market information.

The farmers were asked whether they were satisfied with their overall interactions with the APMC markets. All the farmers in Gujarat were satisfied selling in the APMC market yards. In contrast, 95 per cent paddy farmers in Maharashtra were not satisfied selling in APMCs or to rice mills **(Table 3.6)**. In other crops, 36 per cent of the tur farmers and 41 per cent of the cotton farmers in Maharashtra were not satisfied with the facilities provided by the APMCs. While the proportion of paddy farmers not satisfied with APMC markets was high across all the size classes in Maharashtra, the same was not true for tur and cotton farmers. A larger proportion of the marginal and small farmers were not satisfied with the APMC markets as compared to the semi-medium and medium farmers. In Andhra Pradesh, 92 per cent of groundnut farmers were not satisfied while the proportion was relatively low at 44 per cent for cotton farmers. In Uttar Pradesh, 61 per cent of the tur farmers also expressed their dissatisfied with the APMC market yards. Thus, there was tremendous scope for improvement of functioning of APMCs and at the same time setting up of new markets in the private sector and Farmers' Markets for which provision has now been made under the Model Markets Act 2004. Steps in these directions would lead to more competition among the buyers for farmers' produce and help them at the multi stages of marketing as was also expected by the farmers.

4.3 Farmers Willing to Sell Directly to the Buyers without Commission Agents

Farmers were further questioned if they wished to sell directly to wholesalers/retailers or other buyers in the market rather than through commission agents. They were also questioned for the reasons behind their choice pattern. The four major reasons quoted by the farmers were a) fair weighing; b) faster sale of produce; c) better price; and d) immediate payment. The responses were strongly in favour of direct sales to buyers rather than through the commission agents with 70 per cent of the surveyed farmers willing to sell their produce directly to the buyers whether in villages or in the APMC markets **(Table 3.2)**. In fact in the case of paddy in Andhra Pradesh, Maharashtra and Uttar Pradesh, more than 90 per cent of the farmers in each of the three states were in favour of direct sales to the buyers. More than 90 per cent farmers in Maharashtra and 44 percent in Uttar Pradesh in the case of tur,

preferred direct sales over the sale through commission agents. About 77 per cent of the cotton farmers in Andhra Pradesh and 35 percent in Gujarat and Maharashtra also revealed their preference for direct sale over the sale in regulated *mandi* through the commission agent. In the case of groundnut, 70 per cent farmers in Andhra Pradesh and about one third of the growers in Gujarat preferred direct sales over sales through commission agents.

Among the major reasons for farmers' preference for direct sale, In Andhra Pradesh in the case of paddy, getting a better price turned out to be the most important reason for farmers' choosing in favour of direct sales. The expectation of receiving immediate payments was the second important reason mentioned by paddy and cotton farmers and third most important reason by the groundnut farmers for whom possibility of fair weighing was also the other reason for the same. While only one-third of the cotton and groundnut farmers in Gujarat revealed their preference in favour of direct sales over sale through commission agents, all of them gave equal importance to all the four reasons. Tur farmers considered fair weighing to be the most important reason followed by better price and immediate payment with equal weights. Immediate payment was the reason for the direct sale preference among the Tamil Nadu paddy farmers while West Bengal farmers preference for direct sale was for the possibility of better price received for their product from direct buyers as compared to commission agents.

4.4 Traders' Responses

In addition to household questionnaire, we also surveyed a group of traders including that of kutcha and *pucca arhatiya*s and market functionaries through separate questionnaires for traders and market functionaries. The responses of traders are summarised in the following lines. Traders in all the markets were asked about whether alternative marketing channels, such as private markets and futures trading, should be established to benefit the farmers.[23] They were also asked about their openness to new traders entering their respective markets.

Out of the 160 traders interviewed across 16 markets in 5 states regarding the above two issues (excluding Gujarat, where there was no response by the 20 traders) 54 per cent felt that

[23] The responses include that of some commission agents as well as rice and oil millers also. Moreover not all traders were interviewed in markets as discussed in Section 2.1.4.

alternative marketing channels should be established **(Table 3.7)**.[24] The traders in Uttar Pradesh were most receptive to alternative marketing channels with 18 out of 20 responding favourably to alternative channels. In West Bengal, 13 out of 20 traders supported the above issues. West Bengal is a state where most of the trade in paddy currently takes place in the village or rural markets. Traders in Tamil Nadu, where also sampled farmers sold mostly in the villages, appeared least receptive with only 6 out of the 20 traders responding positively to alternative marketing channels. The response was moderate from Andhra Pradesh with 42 per cent and Maharashtra with 58 percent supporting alternative channels.

On the issue of private markets, 21 per cent of traders across the six selected states were of the opinion that private markets would be beneficial to farmers. Half of the responses came from Maharashtra alone followed by Andhra Pradesh and West Bengal. Only two traders in Tamil Nadu supported private markets but none in Uttar Pradesh even though they favoured other alternative channels the most. A detailed scrutiny at individual markets within states revealed that the maximum support for private markets came from Guntur AMC of Andhra Pradesh where 8 out of 10 traders were in favour of private markets. Guntur is a market area where most of farmers produce paddy that is sold within the villages. Most of the traders in the Nellore market area were in favour of alternative marketing channels as there was no functional AMC market yard, but they did not specify the exact channel they wanted to have. In Burdwan district of West Bengal, 6 out of the 10 traders surveyed favoured private markets. The licensed traders in that market traded mainly in the rural markets or in the villages. This was followed by Wardha and Jalgaon APMCs in Maharashtra, where about half the traders in each of the two markets supported private markets. Traders in other markets surveyed did not seem to be very supportive of private markets.

Regarding traders who were not in favour of private markets, three major reasons for their views were recorded, viz., private markets would be inefficient; delay in payments; and low prices. On the question of futures trading that is not yet a common practice in India, only 11 per cent of traders (mainly in Uttar Pradesh and Maharashtra) mentioned it as an alternative marketing channel they would support. The highest response came from Pratapgarh in Uttar Pradesh, where 9 out of 10 traders favoured futures trading, followed by 4 out of 10 traders in

[24] Some traders opted for multiple alternative marketing channels leading to double counting of responses from the same trader. Such multiple responses have been omitted while calculating the number of traders in favour of alternative marketing channels.

Wardha, Maharashtra. Finally, 31 per cent traders across the states expressed their support for alternative marketing channels but most of them did not specify the type of channel. With regard to traders view on more providing more competition through more players being given licenses to operate in the existing markets, only 35 per cent of traders were in favour of more licenses **(Table 3.8)**. These traders corroborated that this would lead to fair competition and better prices to farmers. Maximum number of traders in Maharashtra were opened to new entrants, with 23 out of 50 traders responding positively. This was followed by 12 out of 20 traders in West Bengal with a similar view. Interestingly only one trader in Uttar Pradesh favoured more licenses. Even in Tamil Nadu just 5 out of 10 traders in Thiruvallur appeared amenable to more traders entering the market. In Andhra Pradesh only 30 per cent supported more licenses. Within states, the maximum response was from Wardha in Maharashtra with 8 out of 10 traders favouring more licenses. This was followed by 7 out of 10 traders each in Burdwan district of West Bengal and Guntur in Andhra Pradesh. An important observation was that these were also the markets where traders were supporting private markets.

Among reasons expressed for not favouring more licenses to new traders the most cited one was enough traders already existed in the market. Across the states, 13 per cent of traders expressed the same with maximum responses (11 out of 50 traders) from Andhra Pradesh, particularly Nellore and Anantapur and 7 out of 20 traders in West Bengal felt the same. However, none of the traders in Maharashtra and Uttar Pradesh shareed this view. In fact in Shahganj and Pratapgarh markets of Uttar Pradesh, where 19 out of 20 traders surveyed rejected the proposal of more licenses, their reason for this response was that there were few buyers in the market. Incidentally, traders only in Uttar Pradesh cited this reason. 12 per cent of traders across all states feared fall in profits and hence were not in favour of more licenses. Other reasons given for reluctance to allow new traders included the lack of assurance of payment to the commission agents, management problems for APMCs, lack of knowledge about the likely behaviour of the new traders and the possibility of price fluctuations.

4.5 APMC Officials' Responses

The APMC officials of all the 18 selected markets were questioned on what were the main functions of APMCs, State Agricultural Marketing Board, the number of existing traders and facilities APMC was supposed to provide to the farmers. The main functions according to

officials of the APMCs included, the issuance and renewal of licenses to traders; supervision of market transactions including timely sale of farmers' produce; monitoring accurate weighment of the farmers' produce and timely payments to the farmers; collection of market fees; and provision and maintenance of infrastructure facilities in the market yards. The APMCs perform some additional tasks as well, including arranging loans for the farmers[25], sale of fertilizers and checking black-marketing.

The State Marketing Boards supervise the overall functioning of the APMCs under their jurisdiction. They also undertake tasks of development of market yards, arrange seminars and workshops for farmers, grant loans to deficit market committees and collect part of funds available with the APMCs. The percentage of income of the APMCs that is transferred to the State Marketing Boards varies across states. For example, it is 5 per cent in Maharashtra, 10 per cent in Andhra Pradesh and 15 per cent in Tamil Nadu. The APMC officials were asked whether regulations of markets were beneficial for the farmers. They supported this view and claimed that the market regulation had led to fair auction, guaranteed payment to the farmers, better prices, correct weighment and control on price fluctuations. With regard to the number of traders/agents that operate in the APMCs, it was found that most of the traders were trading for a long time. Less than 25 per cent of the total registered traders had entered the market during the last 5 years in most markets. In six of the APMC markets across the states, "few" traders controlled most of the trade indicating the existence of an oligopsonistic market structure. Officials in eight of the APMC markets reported collusive behavior of the traders with buyers. However, such instances were very few in most of the markets except for two markets where the extent of collusion was quite high.

With regard to sale of farmers' produce, the APMC officials were asked about issues such as delay in auction, incorrect weighment and delay in payment. Officials in some of the markets admitted to instances of incorrect weighment. Instances of delay in auction of farmers produce, though very few, was a problem cited in seven APMCs. Some cases of delay in payments to farmers were admitted in five APMCs. On the issue of possibility of direct sales to the buyer without commission agents, there was an overwhelming positive response in ten APMCs. In the remaining APMCs, officials were against this view anticipating lower prices,

[25] Specially the *Rythu Bandhu Padakam* (or pledge loan scheme) in Andhra Pradesh

incorrect weighment and delay in payments to the farmers. Officials in eight APMCs felt that it would be beneficial for both the farmers and the buyers if the buyers were allowed to purchase farmers' produce directly from the village.

APMC officials were also asked to list facilities existing in the market yards. In most of the markets some facilities were lacking, mainly grading (in six markets) and banking facilities (in five markets) in addition to storage space, auction platform, parking space, market price information and accommodation for night stay for the farmers. With regard to the restrictions on trade, APMC officials admitted to existence of restrictions such as need for licenses by traders for undertaking inter-district/inter-state trade and payment of certain taxes at state borders. Limit on storage by traders was also cited as a restriction by the APMC officials in Tamil Nadu and Uttar Pradesh. Finally, though officials of most of the APMCs were aware of the Model Act (2003), officials in only three APMCs stressed upon the need for private markets. However, many of the respondents were in favour of more APMC regulated markets. Some other important issues also came up in discussions with the APMC officials. For example, the Secretary of one of the markets felt that APMCs lacked power and that they were influenced by the taluk-level Boards. In Uttar Pradesh, the Officials of the APMCs stressed upon the need for uniform market fee across states and computerization of records. The Official in one of the markets felt that the entry of private markets would result in loss of trade of the APMC markets.

5. Concluding Remarks

5.1 Production Structure

The farm households falling under the categories of marginal to semi-medium (up to 10.0 acres) formed the majority in our sample across all the states under study. However, the distribution of operational holdings by farm size was skewed as medium and large farmers (above 10.0 acres), constituted less than 30 percent holdings and occupied more than 50 to 60 percent of the total operated area. The farm size and family size were by and large positively related across the states. The average family size was highest, 9.05 in Uttar Pradesh followed by West Bengal 7.02, and Tamil Nadu 6.07. It was lowest in Andhra Pradesh where the average size was 5.29. Comparing the structure of tenancy across various farm size categories, net leasing-in land by large farmers was less than that of small and marginal

farmers in all the states except Tamil Nadu. Thus, switching-in was in favour of smaller holdings in all other states whereas in Tamil Nadu, in consonance with the trend observed in Punjab and Haryana it favoured the large farmers. The latter phenomenon was happening in agriculturally advanced states because of economies of scale on large holdings and reverse tenancy was also playing a role for consolidation of holdings in these states. Comparing the cropping intensity across various states, multiple cropping was highest in Uttar Pradesh, followed by Tamil Nadu and West Bengal. Incidentally, these three states also had higher irrigated area (around 70 percent of the net operated area). Cropping intensity was almost unit in Maharashtra, Andhra Pradesh and Gujarat possibly because of lack of irrigation facilities as these states had less than one-third area irrigated. Cropping intensity across farm size was higher for smaller size holdings, except the case of Tamil Nadu where large farmers had higher cropping intensity than all other categories.

Cropping pattern revealed that paddy was the most predominant crop among the four reference crops occupying about 99 per cent of gross cropped area (GCA) in West Bengal with multiple paddy crops during the year and 68 per cent in Tamil Nadu. Its share in Uttar Pradesh and Andhra Pradesh and Maharashtra was around one third of the gross cropped area. Groundnut occupied 57 percent of gross cropped area in Gujarat and 24 percent in Andhra Pradesh. Cotton was the most important crop in Gujarat, Maharashtra and Andhra Pradesh with a share ranging between 37 to 43 percent each in these three states. The fourth reference crop, namely tur (arhar) was relatively minor crop with a share of 11 percent in Maharashtra and 7 percent in Uttar Pradesh. The land productivity was highest in Uttar Pradesh (Rs. 18 thousand) followed by West Bengal (Rs. 17 thousand) and Tamil Nadu (Rs. 13 thousand). The productivity was relatively lower in Gujarat (Rs 12 thousand) and Andhra Pradesh (Rs 11 thousand) and it was the minimum in Maharashtra (only Rs. 7 thousand). A part of the explanation of differences in productivity might lie in the proportion of area irrigated as those states where irrigation percentage was higher had a higher productivity than those, which had lower irrigated area. Across farm size, productivity had a direct relationship with farm size in Tamil Nadu while it had indirect relationship with farm size in all other states. Thus, trends in agriculture in Tamil Nadu juxtaposed similarity with the advanced states of Punjab and Haryana while other selected states indicated implicit backwardness still prevalent in agriculture in those states.

The production cost analysis revealed that material cost accounted for around 38 to 64 percent of total cost of production and it was highest in Uttar Pradesh and lowest in Gujarat. Similarly labour cost varied between 33 and 58 percent across the selected states. Labour cost revealed that agriculture was more mechanized in Uttar Pradesh, Tamil Nadu and Andhra Pradesh as compared to Gujarat, Maharashtra and West Bengal. Looking at various components of material cost, plant protection chemicals was the largest and most important component of material cost in all the six selected states. Irrigation was least important component of material cost, except the case of Uttar Pradesh as diesel and electric tube-well were the rare sources of irrigation among our selected states except Uttar Pradesh and some parts of Tamil Nadu. Among various farm size holdings, family labour was higher for small farmers compared to large farmers in almost all the states without any exception. Hired labour was tilted towards large farmers in most of the states. The total labour cost per acre, however, was by and large higher for small and marginal farmers as compared to large farmers, with the exception of Tamil Nadu where large farmers had higher labour cost on account of much higher hired labour per acre. Total material cost per acre was higher for small and marginal farmers compared to large farmers, except Tamil Nadu where material cost for large farmers was almost double to that of small and marginal farmers. Thus, total cost per acre was higher for marginal and small farmers compared to large farmers in all the states, except Tamil Nadu. The higher material and labour cost per acre for small and marginal holdings indicate their higher input intensity on the operated land on account of working on a smaller piece of land as compared to large farmers.

The value addition was highest in West Bengal, around Rs. 11 thousand, followed by Uttar Pradesh Rs 9 thousand, Gujarat Rs. 8 thousand, Andhra Pradesh Rs. 7 thousand, Tamil Nadu Rs. 5 thousand, and Maharashtra Rs. 4.5 thousand. Among farm size categories, value added was higher for marginal and small farmers in Andhra Pradesh, Maharashtra and West Bengal, while in other states there was no clear trend across farm size. Farm business income estimates reveal that net returns from farming business were even negative among some of the farm categories on account of rising paid out cost. The figures indicated that in many cases, agriculture does not fetch enough returns and if farmers have also to bear the cost of land, a majority of them would discard agriculture and go in alternate occupations. Across the states, FBI was highest in Uttar Pradesh, followed by West Bengal, Andhra Pradesh, Maharashtra, Gujarat and Tamil Nadu. The average value of per acre farm income during the

year was observed to be around Rs. 2 to 4 thousand only. The statistics revealed that farmers, especially that of small and marginal categories were operating only on account of their family labour. The total earnings from farming in their case were only what have been termed as imputed value of family labour. Large farmers, on the other hand, not having the advantage of family labour subsisted on farming on account of higher operated area. On an average, output-input ratio in the six selected states lied between less than one to less than two.

5.2 Market Structure

The structure of agriculture produce marketing in India consists of a mix of public and private sectors. Barring direct intervention by the government in some commodities, marketing in most others is dominated by the private sector. Private trade in agriculture is regulated under the provisions of 'Agricultural Produce Markets Act' passed by various State Governments and regulated markets created under this act. The overall impact of the working of these institutions on agricultural marketing has decidedly been positive and has helped to increase its competitiveness and efficiency. With the changing perception and growing need of free trade at the international as well as domestic front, the market legislation is once again under preview. The market legislations are being changed by various state governments in line with the Model Act whereby emphasis is on bringing farmers in direct contract with the consumers and reducing the intermediaries in the process of marketing. In this study we make an attempt to study the marketing behaviour of the selected household in six selected states.

Marketed surplus per acre was higher for smaller size holdings in Andhra Pradesh, Gujarat, Uttar Pradesh and West Bengal, while it was higher for the larger size holdings in Maharashtra and Tamil Nadu. Marketed surplus as a percentage of output, by and large, increased with the increase in farm size thus having a direct relationship with the farm size. The percentage of output marketed widely differed across our selected states. It was as high as 95 percent in Andhra Pradesh and Gujarat, about 75 percent in Tamil Nadu and around 50 to 60 percent in West Bengal, Maharashtra and Uttar Pradesh. However, differences in percentage output marketed across various states was not true reflection of their commercial nature because of arbitrariness in the choice of reference crops that affected to a great extent, in the difference of their marketed surplus. Large farmers contributed comparatively much higher share in the aggregate marketed surplus in all the six states as there was a direct relationship between farm size and percentage of output marketed. Thus, one concludes from

these facts that subsistence concerns were prime for smaller holdings while large farmers contributed much higher proportion of output in the market. Out of the four reference crops, paddy turned out to be highly subsistence crop while tur was also a subsistenve crop but it was more commercialized than that of paddy. Groundnut and cotton, on the other hand being commercial crops were fully marketed by all size of holdings.

The place of sale utilized by our sample households at the aggregate included sale within the village, sale in the primary rural markets and sale in the wholesale markets (*mandis*). In Andhra Pradesh, farmers sold on average about 73.0 percent of marketed surplus within the village and 26.0 per cent in the wholesale market (regulated *mandi*). Majority of sample farmers in Gujarat and Maharashtra sold in wholesale market (*mandi).* Most farmers in Uttar Pradesh preferred to sell either through village markets (64 percent) or through wholesale markets (32 percent). Sale within the village emerged to be the most preferred channel in Tamil Nadu and West Bengal. However, whereas in West Bengal, sale within village was though the millers, sale within village in the case of Tamil Nadu was on behalf of the commission agents of the wholesale markets. Among the major buyers of farmers' produce were village consumers, village shopkeepers, landlord/money lenders, village millers, itinerant merchants, *kutcha* and *pucca arhatiya* (commission agents in the regulated *mandi*) and government agency. In many of the cases, more than one buyer operated on a single place or channel of sale. Farmers generally sold their produce through intermediaries and direct sale from producer to consumer was completely absent except a small amount in Uttar Pradesh and West Bengal. Informal buyers like landlords, itinerant merchants and village millers played a dominant role in Andhra Pradesh, Uttar Pradesh and West Bengal. On the other hand, large proportion of agriculture produce was sold through commission agents in the regulated *mandis* in Gujarat, Maharashtra and Tamil Nadu. It seems wholesale *mandis* worked quite efficiently in the latter three states whereby commission agents including the government agency handled majority of the produce.

It was rather ironical to observe that farmers who sold through regulated markets were paying higher per quintal marketing cost compared to those who were selling through informal channels mostly within the village. The marketing cost of paddy was higher in Maharashtra and Andhra Pradesh where the product was sold through regulated *mandis* while it was almost nil in the three states, viz., Tamil Nadu, Uttar Pradesh and West Bengal. Marketing

cost of Tur was higher than paddy on account of higher transportation and loading charges. Groundnut and cotton were sold mostly through regulated markets and therefore, marketing cost for these two crops was little higher than paddy but comparable with that of tur. Across various farm sizes, no definite trends emerged for the marketing cost of all the four crops across the six selected states. Across different channels market cost was higher in the rural markets, followed by wholesale *mandis* and other informal channels in the descending order. The marketing cost was lowest for sale within the village. However, the actual efficiency of a channel might be reflected not only through lower marketing cost but also through competitive prices to the sellers.

Net price for paddy varied between Rs 483 and Rs. 587. It was in the ascending order of Tamil Nadu, West Bengal, Maharashtra, Uttar Pradesh and Andhra Pradesh. Across various farm size categories, paddy price tended to increase with the farm size in Andhra Pradesh and Maharashtra, it had seemingly inverse relation with farm size in Tamil Nadu while net price remained almost stagnant across farm size in West Bengal and Uttar Pradesh. In the case of tur, net price was higher in Uttar Pradesh compared to Maharashtra. Net price increased with the farm size in Uttar Pradesh while there was no clear trend in Maharashtra. Groundnut price was higher in Andhra Pradesh than in Gujarat. Across farm size, price differences were there but without any specific bias towards any category of farmers. Last and the least, net price for cotton was in the ascending order of Gujarat, Andhra Pradesh and Maharashtra. In all these three states highest and lowest prices occurred in the small to medium size holdings and no specific trend was apparent in all the three states. The tabular analysis did not observe any specific pattern of the price efficiency across space. Even across time, no particular pattern emerged from the data on quarterly distribution of net prices for at least paddy and groundnut. In the case of tur and cotton, net price showed a rising trend over time although trend was not very overwhelming. Checking the pricing efficiency of different channels of sale, highest price was obtained through the miller and the commission agent (*kutcha arhatiya*) while landlord paid the lowest price in the case of paddy. In tur, however, the highest price occurred in the case of landlord while miller and commission agents also provided competitive price to the farmers. For groundnut and cotton, regulated *mandi* was less efficient in terms of price efficiency while informal channels of landlord, village consumer and village miller provided a more competitive price to the farmers. Government agency also provided quite higher price for cotton but this channel was available to the

farmers only in Maharashtra. The results on weighted price index varied across the states but by and large there was no specific discrimination against the smaller size holdings.

Summing up the regression results, at the aggregate as well as that of four reference crops, the most significant variables explaining marketed surplus were value of output, operated area and family size. The variables on value of output and operated area to some extent represented the economic strength of the farmer. As the farmer's economic position improves his participation in the market also increases. The family size played an opposite role in the marketed surplus as higher members in the family raised the retention requirement and affected the marketed surplus negatively. The technology factor had a positive association with the commercialization as percentage of area irrigated had a positive and significant coefficient with marketed surplus at the aggregate and for paddy and groundnut. The variable on indebtedness indicated possibility of some amount of distress sale among the cultivators. The variable on distance indicated lower commercialisation among the distant farmers pointing towards lack of integration in the domestic markets. However, this was partially nullified by the positive and significant coefficient of distance in the case of groundnut.

In the price equations, it was observed that due to lack of proper infrastructure at the farmers' end and lack of competition in the market, those farmers who had higher amount of output for sale ended up with a lower net price. The variable on dummy of channel of sale indicated that price received by the farmers was the minimum for those who sold their product either through moneylenders, *sahukars* or village shopkeepers whereas the farmers who sold directly to the village consumers or regulated *mandis*/government agencies obtained the highest price in most of the cases. From the regression coefficients of dummy time period of sale, it was evident that highest net price occurred in the third and fourth quarters in all the four crops. The variable on distance was significant but negative in the case of paddy and groundnut with the implication that those farmers, who were located at a distant place got lower net price because of higher transportation and other carrying costs. Last but not the least, the variable on credit was not significant in any of the equations not confirming the usual credit and marketing inter-linkages generally found in the Indian product markets.

Among the problems faced by the farmers in marketing their produce, the major ones were traders' collusion, late payment and incorrect weighment. The first two problems were

mentioned by more than three-fourths of the responding farmers while the problem of incorrect weighment was mentioned by about three-fifths of the farmers. The other problems faced by the farmers included lack of packing material, high transportation cost, lack of credit and storage facilities in market yards and lack of market information on prices. At the aggregate, more than half of the surveyed farmers for all crops and all states did not sell at least one reference crop under survey in the APMC markets. Majority of farmers quoted four main reasons for not selling at least one of the reference crops in the APMC markets. These reasons were, the *mandi* or market centre was too distantly located, high transportation cost, reasonable prices received in the village/rural markets and convenience of selling in the village/rural markets. On the question of farmers satisfaction in selling in the APMC market yards, a majority of the farmers were not satisfied in their sale to the APMC as they expressed that the prevailing price in the market was higher than what the price they realised. Thus, there was tremendous scope for improvement of functioning of APMCs and at the same time setting up of new markets in the private sector and Farmers' Markets for which provision has now been made under the Model Markets Act 2004. Steps in these directions would lead to more competition among the buyers for farmers' produce and help them at the multi stages of marketing as was also expected by the farmers. These steps were by and large also supported by the traders and market officials as was indicated by them in the separate questionnaire executed on selected traders and the APMC market officials.

6. Policy Implications and Guidelines

- Adequate irrigation facilities have positive impact on cropping intensity and hence there is need for increased public investment to improve the existing and build new irrigation facilities with emphasis on minor irrigation projects keeping in mind the requirements of the small and medium size holdings.
- While the regulated agricultural produce markets have helped the farmers in reducing their illegal exaction during the pre-liberalisation era, something more is needed with the changing time and keeping pace with the competition. With border trade having been gradually liberalised there is need to de-regulate restrictive environment of the APMC markets. There is further need for multiple options provided to the farmers to maintain the healthy competition including that of private markets.

- Due to lack of proper infrastructure at the farmers' end and lack of competition in the market, those farmers who had higher amount of output for sale ended up with a lower net price. Therefore it is urgently needed that the farmers are provided with multiple options of sale so that they do not have to face diseconomies of scale in the market
- Marketing costs of selling per quintal of crops are observed to be high in regulated markets than through other channels. Hence there is need to reduce various compulsory costs charged in the regulated markets.
- Improved economic strength of a farmer improves his participation in the market. Thus it is important to create conditions that improve productivity of the farmers hence enhancing their economic strength.
- The dependence of a large family on agricultural income reduces the size of the marketed surplus since more members in the family raise the retention requirement. It is therefore important that conditions for earnings from non-farm income are facilitated through creating better physical infrastructure in the rural areas.
- There is urgent need to improve upon the existing technology since it has positive association with the commercialization of agricultural produce
- The variable on indebtedness indicated possibility of some amount of distress sale among the cultivators. Hence, there is need to review the lending policies with careful watch of the productive use of lent-out resources. There is need to enhance institutional credit especially to the small and marginal farmers who are observed to be easy prey of distress sale.
- Distant markets have negative influence on efficient commercialisation of agricultural produce among the farmers pointing to need for facilitating opening up of new private markets closer to the farmers' fields.
- The price received by the farmers was the minimum for those who sold their product either through moneylenders, *sahukars* or village shopkeepers whereas the farmers who sold directly to the village consumers or regulated *mandis*/ government agencies obtained the highest price in most of the cases. Therefore, these findings point out a need for setting up Farmers' Markets in the vicinity of urban centres whereby farmers can sell their produce directly to the consumers, thereby getting rid of a number of

intermediaries which jack up the price for the consumer and eat up a proportion of farmers' profitability.

- Majority of farmers are not satisfied in their sale to the APMC as they expressed that the prevailing price in the open market was higher than what the price they realised. Thus, there is tremendous scope for improvement of functioning of APMCs and at the same time setting up of new markets in the private sector and Farmers' Markets for which provision has now been made under the Model Markets Act 2003.
- Steps in these directions would lead to more competition among the buyers for farmers' produce and help them at the multi stages of marketing as was also expected by the farmers. These steps were by and large also supported by the traders and market officials as was indicated by them in the separate questionnaire executed on selected traders and the APMC market officials.
- Last but not least, farmers face some major problems while marketing their produce. These include traders' collusion, late payment and incorrect weighment. An efficient competition policy is required to take care of these problems.

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Table 2.1: Distribution of households, family size and operational holdings (per cent)

Category	No of house-holds	%	Net operated area	%	**HH Size**
Andhra Pradesh					
Marginal	37	20.0	2.01	4.5	4.76
Small	49	26.5	4.21	12.6	4.78
Semi-medium	56	30.3	8.17	27.8	5.41
Medium	38	20.5	17.97	41.6	6.05
Large	5	2.7	44.40	13.5	7.00
Total	185	100.0	8.88	100.0	5.29
Gujarat					
Marginal	15	15.0	1.66	2.7	4.47
Small	31	31.0	3.61	12.0	4.65
Semi-medium	24	24.0	7.77	20.0	5.38
Medium	23	23.0	15.02	37.1	7.96
Large	7	7.0	37.51	28.2	6.71
Total	100	100.0	9.31	100.0	5.70
Maharashtra					
Marginal	28	17.5	1.58	3.0	4.32
Small	50	31.3	4.09	13.8	5.56
Semi-medium	35	21.9	7.79	18.4	5.66
Medium	38	23.8	16.45	42.2	6.34
Large	9	5.6	37.39	22.7	7.78
Total	160	100.0	9.26	100.0	5.68
Tamil Nadu					
Marginal	8	13.3	2.00	2.7	5.13
Small	18	30.0	3.89	11.6	6.44
Semi- medium	17	28.3	8.06	22.7	6.41
Medium	11	18.3	15.57	28.4	5.00
Large	6	10.0	34.67	34.5	7.17
Total	60	100.0	10.04	100.0	6.07
Uttar Pradesh					
Marginal	22	20.0	2.17	10.1	6.86
Small	63	57.3	3.88	51.7	9.59
Semi- medium	24	21.8	6.94	35.2	9.58
Medium	1	0.9	14.00	3.0	10.00
Large	0	0.0	0.00	0.0	0.00
Total	110	100.0	4.30	100.0	9.05
West Bengal					
Marginal	7	11.7	1.95	3.7	4.57
Small	21	35.0	3.63	20.7	8.57
Semi- medium	27	45.0	7.61	55.9	6.07
Medium	5	8.3	14.46	19.7	9.00
Large	0	0.0	0.00	0.0	0.00
Total	60	100.0	6.13	100.0	7.02

Table 2.2: Distribution of landholdings (Acres/household)

	Own land	Non-cultivable land	Net leased in	Net operated area	GCA	Cropping Intensity
Andhra Pradesh						
Marginal	2.01	0.19	0.16	2.01	2.04	1.01
Small	5.81	1.41	-0.10	4.21	4.32	1.02
Semi-medium	7.78	0.32	0.55	8.17	8.53	1.04
Medium	19.22	2.59	1.34	17.97	17.97	1.00
Large	46.80	2.40	0.00	44.40	44.40	1.00
Total	9.51	1.11	0.45	8.88	9.02	1.02
Gujarat						
Marginal	1.73	0.08	0.00	1.66	1.66	1.00
Small	3.83	0.23	-0.11	3.61	3.61	1.00
Semi- medium	9.00	2.01	0.00	7.77	7.77	1.00
Medium	15.97	0.94	0.00	15.02	15.02	1.00
Large	37.51	0.00	0.00	37.51	37.51	1.00
Total	9.91	0.78	-0.03	9.31	9.31	1.00
Maharashtra						
Marginal	1.72	0.24	0.00	1.58	1.58	1.00
Small	4.38	0.54	0.24	4.09	4.26	1.04
Semi- medium	7.61	0.41	0.33	7.79	7.86	1.01
Medium	16.75	1.70	1.39	16.45	17.21	1.05
Large	41.56	4.17	0.00	37.39	37.39	1.00
Total	9.65	0.94	0.48	9.26	9.51	1.03
Tamil Nadu						
Marginal	2.00	0.00	0.13	2.00	3.75	1.88
Small	3.78	0.06	0.17	3.89	6.61	1.70
Semi- medium	7.65	0.00	0.41	8.06	12.35	1.53
Medium	14.02	0.00	1.55	15.57	28.57	1.84
Large	22.17	0.00	5.83	34.67	73.00	2.11
Total	8.35	0.02	1.05	10.04	18.52	1.85
Uttar Pradesh						
Marginal	2.27	0.00	-0.10	2.17	5.74	2.64
Small	3.93	0.00	-0.02	3.88	10.35	2.66
Semi- medium	6.77	0.00	0.17	6.94	16.56	2.39
Medium	16.00	0.00	-1.00	14.00	21.00	1.50
Large	-	-	-	-	-	-
Total	4.33	0.00	-0.01	4.30	10.88	2.53
West Bengal						
Marginal	1.95	0.00	0.00	1.95	2.76	1.41
Small	3.90	0.87	0.00	3.63	6.00	1.65
Semi- medium	7.18	0.00	0.33	7.61	10.97	1.44
Medium	13.13	0.00	0.00	14.46	15.46	1.07
Large	-	-	-	-	-	-
Total	5.92	0.31	0.15	5.80	8.65	1.41

Table 2.3: Percentage of operated area irrigated in the states (% of NOA)

	Canal	Electric tube well	Diesel tube well	Bore well	Tank	Others	Total
Andhra Pradesh							
Marginal	20.19	-	-	11.44	-	-	31.63
Small	26.15	-	0.97	25.42	-	-	52.54
Semi-Medium	17.92	0.44	0.00	12.24	-	0.66	31.26
Medium	11.57	0.29	1.46	22.25	-	-	35.58
Large	13.51	-	-	55.86	-	-	69.37
Total	15.82	0.24	0.73	23.92	-	0.18	40.89
Gujarat							
Marginal	-	-	-	-	-	-	-
Small	-	-	-	-	-	-	-
Semi-Medium	-	-	-	23.38	-	-	23.38
Medium	-	-	-	41.60	-	-	41.60
Large	-	-	-	36.24	-	-	36.24
Total	-	-	-	30.33	-	-	30.33
Maharashtra							
Marginal	-	4.53	-	-	-	-	4.53
Small	-	-	-	-	-	5.63	5.63
Semi-Medium	-	-	-	-	-	16.88	16.88
Medium	-	-	-	-	-	12.40	12.40
Large	-	-	-	-	-	9.21	9.21
Total	-	0.13	-	-	-	11.20	11.33
Tamil Nadu							
Marginal	25.00	-	-	50.00	-	-	75.00
Small	4.29	32.86	10.00	34.29	-	-	81.43
Semi-Medium	-	26.28	-	46.72	2.92	-	75.91
Medium	4.09	36.79	-	39.71	-	-	80.58
Large	-	-	-	73.08	-	-	73.08
Total	2.32	20.26	1.16	52.47	0.66	-	76.88
Uttar Pradesh							
Marginal	50.26	-	35.60	-	-	-	85.86
Small	46.99	-	44.13	-	-	-	91.11
Semi-Medium	50.45	-	21.62	-	-	-	72.07
Medium	71.43	-	0.00	-	-	-	71.43
Large	-	-	-	-	-	-	-
Total	49.26	-	34.04	-	-	-	83.30
West Bengal							
Marginal	85.35	-	-	-	-	-	85.35
Small	55.91	3.49	-	-	-	-	59.39
Semi-Medium	71.97	-	-	-	-	-	71.97
Medium	81.58	-	-	-	-	-	81.58
Large	-	-	-	-	-	-	-
Total	71.02	0.72	-	-	-	-	71.75

Table 2.4: Cropping Pattern (% GCA)

Name	Andhra Pradesh	Gujarat	Maharashtra	Tamil Nadu	Uttar Pradesh	West Bengal
Paddy	**24.6**	**0.0**	**19.3**	**67.9**	**32.2**	**98.9**
Wheat	0.0	0.0	3.0	0.0	32.7	0.0
Maize	1.0	0.0	0.3	0.0	0.0	0.0
Jowar/sorghum	1.0	0.1	11.4	0.0	0.7	0.0
Tur	**1.2**	**0.0**	**11.1**	**0.6**	**6.7**	**0.0**
Other pulses	3.0	0.0	16.7	26.6	0.0	0.0
Groundnut	**23.5**	**56.6**	**0.4**	**1.9**	**0.5**	**0.0**
Other oilseeds	5.2	0.0	0.0	0.1	0.0	0.0
Cotton	**37.7**	**43.3**	**36.6**	**0.0**	**0.0**	**0.0**
Scane	0.0	0.0	0.5	0.0	0.0	0.0
F&V	1.6	0.0	0.7	0.5	0.0	0.3
Jute-Mesta	0.4	0.0	0.0	0.0	0.0	0.0
Fodder	0.7	0.0	0.2	2.4	27.3	0.8
Total	100.0	100.0	100.0	100.0	100.0	100.0

Table 2.5: Gross value of output (main + byproduct) (Rupees)

Category	Output per Household	Output per acre	Output per capita	Output per crop
Andhra Pradesh				
Marginal	21465	10571	6235	10325
Small	46124	10728	12287	10525
Semi - medium	96859	11777	25297	10994
Medium	184803	10557	38380	10557
Large	347400	8489	53354	8489
Total	93178	10918	21485	10579
Gujarat				
Marginal	16515	10101	3724	10101
Small	46095	13094	10125	13580
Semi - medium	90521	11320	17888	12049
Medium	192254	12503	33904	13099
Large	334718	9737	50022	9826
Total	106141	11848	19290	12318
Maharashtra				
Marginal	11409	8298	2816	8297
Small	24877	6307	5339	5993
Semi - medium	51652	6823	10835	6760
Medium	122667	7299	21522	6976
Large	250376	7149	33866	7181
Total	64287	7051	11548	6864
Tamil Nadu				
Marginal	27227	13613	5481	7264
Small	49906	13286	10598	7891
Semi - medium	79496	9804	13925	6015
Medium	79496	9804	13925	8755
Large	270425	15692	57134	8082
Total	149653	13145	26496	7454
Uttar Pradesh				
Marginal	40954	18913	6103	7155
Small	74942	19230	8609	7246
Semi - medium	112095	16310	12205	6801
Medium	129320	9237	12932	6158
Large	-	-	-	
Total	76745	18439	8932	7121
West Bengal				
Marginal	31136	16900	7582	11091
Small	68462	19353	12240	11373
Semi - medium	125226	16216	25080	11179
Medium	169060	11894	20874	11019
Large	-	-	-	-
Total	98034	17034	18194	11223

Table 2.6: Input use, output and returns realized (Rs. per acre) - Andhra Pradesh

Category	Marginal	Small	Semi-Med	Medium	Large	Total
Seed	1026	1077	1187	1145	893	1109
	(12.6)	(12.9)	(14.8)	(18.4)	(30.1)	(14.5)
Manure / fertilizer / Pesticides	1651	1970	2690	2096	256	2104
	(20.2)	(23.7)	(33.4)	(33.7)	(8.6)	(27.6)
Irrigation	73	114	113	39	238	93
	(0.9)	(1.4)	(1.4)	(0.6)	(8.0)	(1.2)
Fuel charges for tractor, other machinery/bullock cost	466	505	483	368	467	461
	(5.7)	(6.1)	(6.0)	(5.9)	(15.7)	(6.0)
Total material cost	3217	3666	4473	3648	1853	3768
	(39.4)	(44.0)	(55.6)	(58.6)	(62.4)	(49.4)
Family labour (mandays)	37.63	28.89	14.69	10.81	1.90	22
	(0.5)	(0.3)	(0.2)	(0.2)	(0.1)	(0.3)
Hired labour (mandays)	50.15	44.28	37.58	26.84	8.60	39
	(0.6)	(0.5)	(0.5)	(0.4)	(0.3)	(0.5)
Imputed cost of family labour	1694	1300	661	487	85	985
	(20.7)	(15.6)	(8.2)	(7.8)	(2.9)	(12.9)
Hired labour charges	2257	1993	1691	1208	387	1750
	(27.6)	(23.9)	(21.0)	(19.4)	(13.0)	(22.9)
Depreciation	480	681	586	535	425	575
	(5.9)	(8.2)	(7.3)	(8.6)	(14.3)	(7.5)
Interest on working capital	358	361	346	111	220	301
	(4.4)	(4.3)	(4.3)	(1.8)	(7.4)	(3.9)
Rent paid for leased in land	162	323	291	236	0	255
	(2.0)	(3.9)	(3.6)	(3.8)	(0.0)	(3.3)
Total fixed cost	1000	1365	1224	882	644	1131
	(12.2)	(16.4)	(15.2)	(14.2)	(21.7)	(14.8)
Total Cost	8167	8323	8048	6224	2969	7633
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
Gross value added	7354	7063	7304	6909	6636	7151
Farm business income (FBI)	2403	2405	3728	4333	5520	3285
Output per acre	10571	10728	11777	10557	8489	10918
Output-input ratio	1.29	1.29	1.46	1.70	2.86	1.43

Table 2.6 (Contd.): Input use, output and returns realized (Rs. per acre) - Gujarat

Category	Marginal	Small	Semi-Med	Medium	Large	Total
Seed	1024	1022	959	885	1085	980
	(6.2)	(8.9)	(10.5)	(10.8)	(13.9)	(9.2)
Manure / fertilizer / Pesticides	2629	2361	2616	2833	2927	2611
	(15.8)	(20.6)	(28.6)	(34.7)	(37.4)	(24.5)
Irrigation	0	0	0	0	0	0
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Fuel charges for tractor, other machinery/bullock cost	593	507	575	387	117	481
	(3.6)	(4.4)	(6.3)	(4.7)	(1.5)	(4.5)
Total material cost	4246	3890	4150	4105	4129	4072
	(25.6)	(33.9)	(45.3)	(50.3)	(52.8)	(38.2)
Family labour (mandays)	236.32	135.00	72.97	44.75	28.30	107
	(1.4)	(1.2)	(0.8)	(0.5)	(0.4)	(1.0)
Hired labour (mandays)	24.31	26.71	30.65	35.36	31.53	30
	(0.1)	(0.2)	(0.3)	(0.4)	(0.4)	(0.3)
Imputed cost of family labour	10634	6075	3284	2014	1273	4819
	(64.1)	(52.9)	(35.8)	(24.7)	(16.3)	(45.1)
Hired labour charges	1094	1202	1379	1591	1419	1333
	(6.6)	(10.5)	(15.1)	(19.5)	(18.2)	(12.5)
Depreciation	614	312	336	334	957	413
	(3.7)	(2.7)	(3.7)	(4.1)	(12.2)	(3.9)
Interest on working capital	0	8	13	121	39	36
	(0.0)	(0.1)	(0.1)	(1.5)	(0.5)	(0.3)
Rent paid for leased in land	0	0	0	0	0	0
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Total fixed cost	614	320	349	455	996	449
	(3.7)	(2.8)	(3.8)	(5.6)	(12.7)	(4.2)
Total Cost	16589	11487	9162	8165	7817	10673
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
Gross value added	5855	9204	7170	8398	5609	7776
Farm business income (FBI)	-6488	1607	2158	4338	1921	1175
Output per acre	10101	13094	11320	12503	9737	11848
Output-input ratio	0.61	1.14	1.24	1.53	1.25	1.11

Table 2.6 (Contd.): Input use, output and returns realized (Rs. per acre) - Maharashtra

Category	Marginal	Small	Semi-Med	Medium	Large	Total
Seed	551	678	541	589	543	597
	(10.7)	(15.0)	(12.5)	(12.9)	(12.2)	(13.0)
Manure / fertilizer / Pesticides	1193	1080	1019	1174	1256	1119
	(23.1)	(23.8)	(23.5)	(25.8)	(28.3)	(24.3)
Irrigation	36	23	70	222	68	85
	(0.7)	(0.5)	(1.6)	(4.9)	(1.5)	(1.9)
Fuel charges for tractor, other machinery/bullock cost	651	693	691	730	1141	719
	(12.6)	(15.3)	(15.9)	(16.0)	(25.7)	(15.6)
Total material cost	2430	2474	2321	2716	3007	2520
	(47.0)	(54.6)	(53.5)	(59.6)	(67.8)	(54.8)
Family labour (mandays)	28.35	13.33	8.15	5.12	2.18	12
	(0.5)	(0.3)	(0.2)	(0.1)	(0.0)	(0.3)
Hired labour (mandays)	28.08	27.27	31.15	28.44	19.85	28
	(0.5)	(0.6)	(0.7)	(0.6)	(0.4)	(0.6)
Imputed cost of family labour	1276	600	367	230	98	551
	(24.7)	(13.2)	(8.5)	(5.1)	(2.2)	(12.0)
Hired labour charges	1264	1227	1402	1280	893	1265
	(24.4)	(27.1)	(32.3)	(28.1)	(20.1)	(27.5)
Depreciation	32	0	2	17	144	18
	(0.6)	(0.0)	(0.0)	(0.4)	(3.3)	(0.4)
Interest on working capital	167	133	210	216	290	185
	(3.2)	(2.9)	(4.8)	(4.7)	(6.5)	(4.0)
Rent paid for leased in land	0	96	38	98	0	62
	(0.0)	(2.1)	(0.9)	(2.2)	(0.0)	(1.3)
Total fixed cost	199	229	251	331	435	264
	(3.9)	(5.1)	(5.8)	(7.3)	(9.8)	(5.7)
Total Cost	5169	4530	4340	4558	4433	4601
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
Gross value added	5867	3833	4501	4584	4142	4531
Farm business income (FBI)	3129	1777	2482	2742	2716	2450
Output per acre	8298	6307	6823	7299	7149	7051
Output-input ratio	1.61	1.39	1.57	1.60	1.61	1.53

Table 2.6 (Contd.): Input use, output and returns realized (Rs. per acre) – Tamil Nadu

Category	Marginal	Small	Semi-Med	Medium	Large	Total
Seed	981	1572	1029	1538	2811	1457
	(8.4)	(10.4)	(8.6)	(9.9)	(9.3)	(9.5)
Manure / fertilizer / Pesticides	3863	5521	4925	6051	11565	5833
	(33.2)	(36.3)	(41.0)	(38.8)	(38.3)	(37.9)
Irrigation	263	482	153	305	333	312
	(2.3)	(3.2)	(1.3)	(2.0)	(1.1)	(2.0)
Fuel charges for tractor, other machinery/bullock cost	850	761	770	743	1536	850
	(7.3)	(5.0)	(6.4)	(4.8)	(5.1)	(5.5)
Total material cost	5956	8337	6877	8637	16245	8452
	(51.1)	(54.9)	(57.2)	(55.4)	(53.8)	(54.9)
Family labour (mandays)	9.56	7.97	4.23	3.29	2.83	6
	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)
Hired labour (mandays)	94.13	122.13	97.94	127.62	271.36	127
	(0.8)	(0.8)	(0.8)	(0.8)	(0.9)	(0.8)
Imputed cost of family labour	430	359	190	148	127	259
	(3.7)	(2.4)	(1.6)	(0.9)	(0.4)	(1.7)
Hired labour charges	4236	5496	4407	5743	12211	5736
	(36.4)	(36.2)	(36.7)	(36.8)	(40.4)	(37.3)
Depreciation	766	787	356	640	792	636
	(6.6)	(5.2)	(3.0)	(4.1)	(2.6)	(4.1)
Interest on working capital	76	74	74	40	21	63
	(0.7)	(0.5)	(0.6)	(0.3)	(0.1)	(0.4)
Rent paid for leased in land	188	139	115	386	826	253
	(1.6)	(0.9)	(1.0)	(2.5)	(2.7)	(1.6)
Total fixed cost	1029	1000	545	1066	1639	951
	(8.8)	(6.6)	(4.5)	(6.8)	(5.4)	(6.2)
Total Cost	11651	15191	12020	15594	30223	15398
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
Gross value added	7658	4948	2927	7055	650	4693
Farm business income (FBI)	1963	-1906	-2216	98	-13327	-2253
Output per acre	13613	13286	9804	15692	16895	13145
Output-input ratio	1.17	0.87	0.82	1.01	0.56	0.85

Table 2.6 (Contd.): Input use, output and returns realized (Rs. per acre) – Uttar Pradesh

Category	Marginal	Small	Semi-Med	Medium	Large	Total
Seed	976	1085	998	621	-	1040
	(5.7)	(7.4)	(9.4)	(11.1)	-	(7.3)
Manure / fertilizer / Pesticides	2378	2570	2132	1143	-	2423
	(13.8)	(17.6)	(20.0)	(20.4)	-	(17.1)
Irrigation	3464	2426	1235	467	-	2356
	(20.1)	(16.6)	(11.6)	(8.4)	-	(16.6)
Fuel charges for tractor, other machinery/bullock cost	3947	3297	2285	1214	-	3188
	(22.9)	(22.6)	(21.4)	(21.7)	-	(22.5)
Total material cost	10766	9377	6651	3446	-	9006
	(62.4)	(64.3)	(62.4)	(61.6)	-	(63.5)
Family labour (mandays)	138.13	97.55	63.66	35.00	-	98
	(0.8)	(0.7)	(0.6)	(0.6)	-	(0.7)
Hired labour (mandays)	2.29	8.57	10.03	3.93	-	8
	(0.0)	(0.1)	(0.1)	(0.1)	-	(0.1)
Imputed cost of family labour	6216	4390	2865	1575	-	4397
	(36.0)	(30.1)	(26.9)	(28.2)	-	(31.0)
Hired labour charges	103	386	451	177	-	342
	(0.6)	(2.6)	(4.2)	(3.2)	-	(2.4)
Depreciation	0	382	609	393	-	355
	(0.0)	(2.6)	(5.7)	(7.0)	-	(2.5)
Interest on working capital	147	19	0	0	-	40
	(0.9)	(0.1)	(0.0)	(0.0)	-	(0.3)
Rent paid for leased in land	14	29	89	0	-	39
	(0.1)	(0.2)	(0.8)	(0.0)	-	(0.3)
Total fixed cost	160	430	698	393	-	434
	(0.9)	(3.0)	(6.5)	(7.0)	-	(3.1)
Total Cost	17245	14583	10664	5590	-	14179
	(100.0)	(100.0)	(100.0)	(100.0)	-	(100.0)
Gross value added	8148	9852	9659	5791	-	9432
Farm business income (FBI)	1668	4647	5645	3647	-	4260
Output per acre	18913	19230	16310	9237	-	18439
Output-input ratio	1.10	1.32	1.53	1.65	-	1.30

Table 2.6 (Contd.): Input use, output and returns realized (Rs. per acre) – West Bengal

Category	Marginal	Small	Semi-Med	Medium	Large	Total
Seed	448	619	455	370	-	505
	(3.5)	(4.0)	(3.7)	(3.9)	-	(3.8)
Manure / fertilizer / Pesticides	2894	3246	2595	1926	-	2802
	(22.4)	(20.9)	(20.8)	(20.6)	-	(21.0)
Irrigation	348	443	222	170	-	310
	(2.7)	(2.9)	(1.8)	(1.8)	-	(2.3)
Fuel charges for tractor, other machinery/bullock cost	1971	2701	2302	1838	-	2364
	(15.3)	(17.4)	(18.5)	(19.6)	-	(17.7)
Total material cost	5661	7010	5573	4303	-	5980
	(43.9)	(45.2)	(44.8)	(45.9)	-	(44.9)
Family labour (mandays)	19.72	26.25	21.28	11.84	-	22
	(0.2)	(0.2)	(0.2)	(0.1)	-	(0.2)
Hired labour (mandays)	132.72	158.55	127.20	99.55	-	137
	(1.0)	(1.0)	(1.0)	(1.1)	-	(1.0)
Imputed cost of family labour	887	1181	957	533	-	992
	(6.9)	(7.6)	(7.7)	(5.7)	-	(7.4)
Hired labour charges	5972	7135	5724	4480	-	6143
	(46.3)	(46.0)	(46.0)	(47.8)	-	(46.1)
Depreciation	228	186	54	50	-	120
	(1.8)	(1.2)	(0.4)	(0.5)	-	(0.9)
Interest on working capital	152	13	5	0	-	24
	(1.2)	(0.1)	(0.0)	(0.0)	-	(0.2)
Rent paid for leased in land	0	0	135	0	-	61
	(0.0)	(0.0)	(1.1)	(0.0)	-	(0.5)
Total fixed cost	380	199	195	50	-	206
	(2.9)	(1.3)	(1.6)	(0.5)	-	(1.5)
Total Cost	12901	15525	12449	9365	-	13321
	(100.0)	(100.0)	(100.0)	(100.0)	-	(100.0)
Gross value added	11239	12343	10643	7591	-	11053
Farm business income (FBI)	3999	3828	3767	2528	-	3712
Output per acre	16900	19353	16216	11894	-	17034
Output-input ratio	1.31	1.25	1.30	1.27	-	1.28

Table 2.7: Marketed surplus by the selected households (value in Rs)

Category	Net output produced*		Net output Marketed		Marketed Surplus (%)
	Per hh	Per acre	Per hh	Per acre	
Andhra Pradesh					
Marginal	19600	9647	17905	8813	91.35
Small	45539	10516	42060	9704	92.36
Semi - medium	96096	11629	91991	11115	95.73
Medium	191678	10778	184404	10366	96.21
Large	337960	8110	312810	7440	92.56
Total	93576	10668	88899	10028	95.00
Gujarat					
Marginal	15127	9269	14620	8975	96.65
Small	42811	12182	40661	11589	94.98
Semi - medium	85900	10671	82900	10282	96.51
Medium	183350	11949	176752	11529	96.40
Large	313112	9190	294759	8720	94.14
Total	100245	11119	95980	10668	95.75
Maharashtra					
Marginal	10783	7165	6545	4097	60.70
Small	23496	5992	16495	4137	70.21
Semi - medium	159482	20337	33382	4461	20.93
Medium	179729	9669	128786	7245	71.66
Large	292637	8727	280714	8393	95.93
Total	103263	10362	59979	5178	58.08
Tamil Nadu					
Marginal	26498	13249	17693	8846	66.77
Small	50730	13484	34132	9064	67.28
Semi - medium	76894	9447	53546	6620	69.64
Medium	196101	11400	136182	7871	69.44
Large	576263	16357	473787	13547	82.22
Total	134117	12214	100115	8572	74.65
Uttar Pradesh					
Marginal	182872	80982	24604	11360	13.45
Small	61566	15847	49773	12729	80.84
Semi - medium	118494	16434	76202	10954	64.31
Medium	96300	6879	82720	5909	85.90
Large	-	-	-	-	-
Total	98564	28920	50805	12006	51.55
West Bengal					
Marginal	28363	15460	13512	7556	47.64
Small	72268	20288	35400	10053	48.98
Semi - medium	137387	17849	67831	8892	49.37
Medium	200620	14209	99795	6934	49.74
Large	-	-	-	-	-
Total	107145	18120	52807	8979	49.29

Note: Net output here excludes the by-products and green fodder which is generally used to feed own livestock

Table 2.8: Percentage distribution of output and marketed surplus

Category	% of house-holds	% of area operated	% of output	% of marketed surplus
Andhra Pradesh				
Marginal	20.00	4.52	2.84	2.76
Small	26.49	12.57	6.59	6.48
Semi-Med	30.27	27.84	13.91	14.17
Medium	20.54	41.56	27.74	28.41
Large	2.70	13.51	48.92	48.19
Total	100.0	100.0	100.0	100.0
Gujarat				
Marginal	15.00	2.67	2.36	2.40
Small	31.00	12.01	6.69	6.67
Semi-Med	24.00	20.02	13.42	13.60
Medium	23.00	37.11	28.64	28.99
Large	7.00	28.19	48.90	48.35
Total	100.0	100.0	100.0	100.0
Maharashtra				
Marginal	17.50	2.98	1.62	1.40
Small	31.25	13.78	3.53	3.54
Semi-Med	21.88	18.38	23.94	7.16
Medium	23.75	42.16	26.98	27.64
Large	5.63	22.70	43.93	60.25
Total	100.0	100.0	100.0	100.0
Tamil Nadu				
Marginal	13.33	2.66	2.86	2.47
Small	30.00	11.62	5.48	4.77
Semi-Med	28.33	22.75	8.30	7.49
Medium	18.33	28.44	21.17	19.04
Large	10.00	34.54	62.20	66.23
Total	100.0	100.0	100.0	100.0
Uttar Pradesh				
Marginal	20.00	10.10	39.82	10.55
Small	57.27	51.74	13.41	21.33
Semi-Med	21.82	35.20	25.80	32.66
Medium	0.91	2.96	20.97	35.46
Large	0.00	0.00	0.00	0.00
Total	100.0	100.0	100.0	100.0
West Bengal				
Marginal	11.67	3.71	6.47	6.24
Small	35.00	20.74	16.48	16.35
Semi-Med	45.00	55.89	31.32	31.33
Medium	8.33	19.66	45.74	46.09
Large	0.00	0.00	0.00	0.00
Total	100.0	100.0	100.00	100.00

Table 2.9: Marketed surplus (Ref. Crops) by the selected households (quintals)

Category	Net output produced*		Net output Marketed		Marketed Surplus (%)
	Per hh	Per acre	Per hh	Per acre	
Paddy					
Andhra Pradesh					
Marginal	47.3	23.3	36.5	17.0	77.11
Small	67.2	18.9	56.4	15.4	84.00
Semi - medium	128.3	17.3	112.1	14.4	87.38
Medium	178.9	16.6	161.7	13.3	90.38
Large	-	-	-	-	-
Total	107.7	18.5	93.8	14.6	87.04
Maharashtra					
Marginal	18.4	14.5	5.4	4.1	29.51
Small	39.1	10.2	9.5	2.5	24.30
Semi - medium	67.8	9.3	14.1	1.9	20.75
Medium	114.0	8.3	36.0	2.6	31.58
Large	-	-	-	-	-
Total	44.9	11.2	11.6	2.9	25.85
Tamil Nadu					
Marginal	39.3	16.2	24.8	10.0	63.05
Small	86.7	17.6	58.0	11.0	66.91
Semi - medium	120.3	16.6	80.2	10.5	66.68
Medium	302.3	16.0	226.1	9.7	74.78
Large	1027.5	20.6	727.2	15.1	70.78
Total	223.5	17.1	157.6	10.9	70.51
Uttar Pradesh					
Marginal	27.3	14.2	23.6	12.2	86.61
Small	47.9	14.0	43.2	12.5	90.11
Semi - medium	103.6	20.0	50.9	10.2	49.09
Medium	45.0	9.0	40.0	8.0	88.89
Large	-	-	-	-	-
Total	55.9	15.3	40.9	11.9	73.17
West Bengal					
Marginal	50.4	27.2	19.9	10.2	39.38
Small	93.7	24.7	42.3	11.9	45.12
Semi - medium	180.2	24.5	90.9	12.5	50.43
Medium	328.4	26.0	159.6	12.4	48.60
Large	-	-	-	-	-
Total	147.2	25.0	71.3	12.0	48.47
Tur					
Maharashtra					
Marginal	1.3	3.0	0.5	1.0	40.00
Small	2.0	2.1	1.2	1.0	57.97
Semi - medium	4.0	2.8	2.9	1.9	72.26
Medium	10.0	4.3	8.7	3.7	86.49
Large	18.6	3.2	16.6	2.8	89.23
Total	6.9	3.2	5.7	2.3	82.65
Uttar Pradesh					
Marginal	1.3	3.9	0.6	1.4	48.43
Small	1.7	2.0	1.3	1.4	73.18
Semi - medium	3.4	1.8	2.6	1.4	75.38
Medium	6.0	1.5	5.0	1.3	83.33
Large	-	-	-	-	-
Total	2.3	2.3	1.7	1.4	72.14

Groundnut					
Andhra Pradesh					
Marginal	6.5	3.5	6.3	3.4	97.62
Small	11.2	3.9	10.3	3.5	91.78
Semi - medium	13.6	2.7	13.1	2.6	96.49
Medium	39.0	2.8	37.2	2.6	95.46
Large	85.0	4.3	73.5	3.7	86.47
Total	19.2	3.2	18.1	3.0	94.13
Gujarat					
Marginal	9.2	6.1	8.4	5.5	91.55
Small	19.4	7.3	17.6	6.6	90.74
Semi - medium	28.9	6.8	26.4	6.1	91.61
Medium	56.7	7.0	52.2	6.4	92.06
Large	171.7	6.1	157.3	5.6	91.65
Total	41.1	6.7	38.1	6.2	91.52
Cotton					
Andhra Pradesh					
Marginal	11.6	6.0	11.5	6.0	99.38
Small	17.0	6.2	17.0	6.2	100.23
Semi - medium	40.8	6.8	40.8	6.8	100.00
Medium	89.4	7.7	88.7	7.6	99.19
Large	198.8	8.3	190.0	7.4	95.60
Total	47.6	6.8	47.5	6.8	99.81
Gujarat					
Marginal	6.9	5.2	6.8	5.1	99.19
Small	18.8	8.4	18.8	8.4	100.00
Semi - medium	39.7	6.5	39.7	6.5	100.00
Medium	84.1	8.4	83.5	8.4	99.30
Large	91.8	5.0	91.8	5.0	100.00
Total	44.2	7.3	44.2	7.3	100.00
Maharashtra					
Marginal	6.6	4.0	6.6	4.0	100.00
Small	10.3	3.5	10.3	3.5	100.00
Semi - medium	19.6	4.0	19.4	4.0	99.03
Medium	35.4	4.6	35.0	4.6	98.77
Large	49.4	4.1	49.4	4.1	100.00
Total	23.9	4.1	23.7	4.1	99.22

Table 2.10: Place (channel) of Sale (% of output sold)

	Village	Rural market	Wholesale market	Others	Total
Andhra Pradesh					
Marginal	70.4 (2.7)	0.0	29.6 (15.0)	0.0	100.0 (8.8)
Small	78.1 (3.4)	0.8 (10.6)	21.1 (13.1)	0.0	100.0 (7.0)
Semi - medium	82.0 (1.9)	0.0 (12.8)	16.2 (7.5)	1.8 (9.2)	100.0 (4.3)
Medium	77.9 (1.8)	0.1 (20.1)	22.0 (6.3)	0.0	100.0 (3.9)
Large	16.9 (0.0)	2.4 (2.6)	80.7 (6.2)	0.0	100.0 (4.9)
Total	73.0 (2.4)	0.4 (12.8)	26.0 (9.7)	0.6 (9.2)	100.0 (5.6)
Gujarat					
Marginal	8.2 (1.5)	0.0	91.8 (9.4)	0.0	100.0 (8.9)
Small	0.0	0.0	100.0 (8.6)	0.0	100.0 (8.6)
Semi - medium	0.0	0.0	96.1 (6.3)	3.9	100.0 (6.4)
Medium	0.0	0.0	100.0 (6.7)	0.0	100.0 (6.7)
Large	0.0	0.0	100.0 (8.3)	0.0	100.0 (8.3)
Total	0.2 (1.5)	0.0	98.9 (7.6)	0.8 (10.6)	100.0 (7.6)
Maharashtra					
Marginal	2.0 (0.0)	4.8 (26.7)	93.3 (7.4)	0.0	100.0 (9.1)
Small	0.0	9.7 (14.8)	89.4 (8.6)	0.9 (24.8)	100.0 (10.1)
Semi - medium	0.0	0.5 (5.3)	95.7 (7.9)	3.8 (7.0)	100.0 (7.8)
Medium	0.3 (3.9)	0.0	73.0 (5.3)	26.7 (1.9)	100.0 (5.0)
Large	0.0	0.4 (3.1)	64.9 (4.7)	34.6 (0.0)	100.0 (4.5)
Total	0.2 (2.0)	1.1 (14.3)	75.4 (6.7)	23.3 (5.6)	100.0 (7.1)

Tamil Nadu					
Marginal	100.0 (3.1)	0.0	0.0	0.0	100.0 (3.1)
Small	100.0 (2.7)	0.0	0.0	0.0	100.0 (2.7)
Semi - medium	100.0 (1.6)	0.0	0.0	0.0	100.0 (1.6)
Medium	100.0 (0.6)	0.0	0.0	0.0	100.0 (0.6)
Large	100.0 (2.6)	0.0	0.0	0.0	100.0 (2.6)
Total	100.0 (1.8)	0.0	0.0	0.0	100.0 (1.8)
Uttar Pradesh					
Marginal	91.8 (0.0)	8.2 (0.0)	0.0	0.0	100.0 (0.0)
Small	69.6 (0.0)	6.4 (0.0)	24.0 (10.7)	0.0	100.0 (2.2)
Semi - medium	48.2 (0.0)	0.0 (0.0)	51.8 (12.5)	0.0	100.0 (6.2)
Medium	40.1 (0.0)	0.0	59.9 (10.8)	0.0	100.0 (6.5)
Large	-	-	-	-	-
Total	64.0 (0.0)	4.3 (0.0)	31.6 (11.7)	0.0	100.0 (2.9)
West Bengal					
Marginal	100.0 (0.0)	0.0	0.0	0.0	100.0 (0.0)
Small	92.7 (0.0)	0.0	0.0	7.3 (0.0)	100.0 (0.0)
Semi - medium	100.0 (0.0)	0.0	0.0	0.0	100.0 (0.0)
Medium	100.0 (0.0)	0.0	0.0	0.0	100.0 (0.0)
Large	-	-	-	-	-
Total	98.5 (0.0)	0.0	0.0	1.5 (0.0)	100.0 (0.0)

* Figures in parentheses are total marketing cost excluding storage (Rs/qtl)

Table 2.11: The buyer to whom the product was sold (% of output sold)

	Village consumer	Village shopkeeper	Landlord	Village miller	Itinerant merchant	Katcha *arhatiya*	*Pucca* arhtia	Govt. agency	Others	Total
Andhra Pradesh										
Marginal	0.0	1.5	18.4	24.6	18.4	23.2	13.9	0.0	0.0	100.0
Small	0.8	0.6	14.5	24.1	33.9	19.1	6.6	0.4	0.0	100.0
Semi - medium	0.0	1.0	18.1	21.8	37.1	15.4	6.6	0.0	0.0	100.0
Medium	0.0	0.1	2.6	32.2	37.3	21.0	6.7	0.0	0.0	100.0
Large	0.0	2.4	11.9	0.0	0.0	60.2	25.5	0.0	0.0	100.0
Total	0.1	0.7	10.5	24.5	32.5	22.9	8.8	0.1	0.0	100.0
Gujarat										
Marginal	0.0	0.0	0.0	0.0	0.0	48.6	51.4	0.0	0.0	100.0
Small	0.0	0.0	0.0	0.0	0.0	20.7	79.3	0.0	0.0	100.0
Semi - medium	0.0	0.0	0.0	0.0	0.0	11.2	88.8	0.0	0.0	100.0
Medium	0.0	0.0	0.0	0.0	0.0	21.4	78.6	0.0	0.0	100.0
Large	0.0	0.0	0.0	0.0	0.0	3.2	96.8	0.0	0.0	100.0
Total	0.0	0.0	0.0	0.0	0.0	15.9	84.1	0.0	0.0	100.0
Maharashtra										
Marginal	0.0	0.0	2.6	28.7	4.1	1.3	0.0	63.3	0.0	100.0
Small	0.0	0.6	3.7	9.0	5.4	11.1	8.2	61.0	0.9	100.0
Semi - medium	0.0	0.0	0.0	1.2	0.4	18.3	6.3	70.0	3.8	100.0
Medium	0.0	0.3	0.7	0.7	0.0	22.8	4.7	45.5	25.3	100.0
Large	0.0	0.0	0.0	0.0	0.0	18.8	8.7	37.8	34.6	100.0
Total	0.0	0.2	0.7	1.8	0.6	19.9	6.1	48.1	22.6	100.0
Tamil Nadu										
Marginal	0.0	0.0	0.0	0.0	0.0	44.8	55.2	0.0	0.0	100.0
Small	0.0	0.0	0.0	0.0	0.0	32.0	68.0	0.0	0.0	100.0
Semi - medium	0.0	0.0	0.0	0.0	0.0	39.5	60.5	0.0	0.0	100.0
Medium	0.0	0.0	0.0	0.0	0.0	15.3	84.7	0.0	0.0	100.0
Large	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	100.0
Total	0.0	0.0	0.0	0.0	0.0	15.6	84.4	0.0	0.0	100.0
Uttar Pradesh										
Marginal	1.2	0.0	10.6	42.0	40.7	2.0	3.5	0.0	0.0	100.0
Small	6.1	0.0	13.8	36.4	16.3	4.7	22.8	0.0	0.0	100.0
Semi - medium	9.9	0.3	13.4	24.7	0.0	8.2	43.6	0.0	0.0	100.0
Medium	17.9	0.0	0.0	22.2	0.0	0.0	59.9	0.0	0.0	100.0
Large	-	-	-	-	-	-	-	-	-	-
Total	7.1	0.1	13.1	32.8	12.9	5.5	28.5	0.0	0.0	100.0
West Bengal										
Marginal	0.0	0.0	47.9	0.0	0.0	52.1	0.0	0.0	0.0	100.0
Small	0.0	0.0	46.5	7.3	0.0	42.1	4.1	0.0	0.0	100.0
Semi - medium	6.5	0.0	59.1	0.0	0.0	27.6	6.9	0.0	0.0	100.0
Medium	0.0	0.0	63.7	0.0	0.0	12.1	24.3	0.0	0.0	100.0
Large	-	-	-	-	-	-	-	-	-	-
Total	3.8	0.0	57.0	1.5	0.0	28.5	9.2	0.0	0.0	100.0

Table 2.12: Marketing cost and gross (net) price received by the farmers (Rs. per quintals)

	Marketing cost						Gross price	Net price
Category	Transportation	Loading etc.	Market fee	Total marketing cost	Storage cost	Spoilage etc.		
Paddy								
Andhra Pradesh								
Marginal	0.00	3.22	0.02	3.24	0.00	0.00	536	533
Small	0.00	3.55	0.00	3.56	0.00	0.00	596	593
Semi - medium	0.00	2.40	0.00	2.40	0.00	0.00	579	577
Medium	0.01	1.97	0.01	1.99	0.00	0.00	602	600
Large	0.00	0.00	0.00	0.00	0.00	0.00	-	-
Total	0.00	2.81	0.01	2.82	0.00	0.00	589	587
Maharashtra								
Marginal	2.20	3.08	0.00	5.27	0.00	0.00	510	506
Small	1.58	2.27	0.00	3.85	0.02	0.38	526	523
Semi - medium	3.26	1.43	0.00	4.68	0.02	4.91	537	532
Medium	8.35	0.54	0.00	8.90	0.03	1.80	554	545
Large	-	-	-	-	-	-	-	-
Total	2.79	2.10	0.00	4.89	0.01	1.40	541	535
Tamil Nadu								
Marginal	0.00	0.93	0.00	0.93	0.00	0.00	538	538
Small	0.00	1.86	0.00	1.86	0.00	0.00	519	519
Semi - medium	0.00	0.27	0.00	0.27	0.00	3.23	506	506
Medium	0.00	0.26	0.00	0.26	0.02	0.00	489	489
Large	0.00	0.01	0.00	0.01	0.00	0.00	461	461
Total	0.00	0.80	0.00	0.80	0.01	0.91	483	483
Uttar Pradesh								
Marginal	0.00	0.00	0.00	0.00	0.00	0.00	558	558
Small	0.00	0.00	0.00	0.00	0.00	0.00	559	559
Semi - medium	0.64	0.01	0.00	0.64	0.00	0.00	557	556
Medium	0.00	0.00	0.00	0.00	0.00	0.00	560	560
Large	-	-	-	-	-	-	-	-
Total	0.14	0.00	0.00	0.14	0.00	0.00	558	558
West Bengal								
Marginal	0.00	0.00	0.00	0.00	0.15	6.46	503	503
Small	0.00	0.00	0.00	0.00	0.12	9.46	523	523
Semi - medium	0.00	0.00	0.00	0.00	0.06	0.41	520	520
Medium	0.00	0.00	0.00	0.00	0.13	0.00	525	525
Large	-	-	-	-	-	-		
Total	0.00	0.00	0.00	0.00	0.10	4.25	521	521
Tur								
Maharashtra								
Marginal	16.67	7.00	0.00	23.67	0.00	0.00	1545	1523
Small	15.45	8.73	0.00	24.18	0.00	0.00	1490	1473
Semi- medium	8.13	3.61	0.00	11.74	0.00	0.00	1657	1649
Medium	4.05	3.13	0.05	7.23	0.01	11.38	1596	1590
Large	5.31	2.11	0.00	7.42	0.00	0.00	1591	1586
Total	8.07	4.42	0.02	12.51	0.01	4.47	1597	1590

Uttar Pradesh								
Marginal	0.00	0.00	0.00	0.00	0.00	0.00	1700	1700
Small	6.26	0.46	0.00	6.72	0.01	0.00	1713	1707
Semi - medium	15.47	1.67	0.00	17.13	0.87	0.00	1738	1725
Medium	4.00	2.00	0.00	6.00	0.00	0.00	1750	1744
Large	-	-	-	-	-	-	-	-
Total	8.30	0.82	0.00	9.12	0.31	0.00	1727	1718
Groundnut								
Andhra Pradesh								
Marginal	2.12	1.13	2.14	5.40	0.00	0.00	1644	1640
Small	1.82	0.78	1.10	3.70	0.00	0.00	1480	1476
Semi - medium	1.44	0.89	1.06	3.39	0.00	0.00	1645	1641
Medium	2.83	0.93	0.40	4.16	0.00	0.00	1521	1516
Large	1.19	0.00	0.11	1.30	0.00	4.29	1543	1542
Total	1.95	0.90	1.13	3.97	0.00	0.14	1558	1554
Gujarat								
Marginal	6.25	3.48	0.34	10.07	0.00	0.00	1475	1465
Small	6.13	1.38	0.12	7.63	0.00	0.00	1480	1471
Semi - medium	5.14	0.86	0.09	6.08	0.00	0.00	1470	1463
Medium	6.24	0.59	0.05	6.88	0.00	0.00	1483	1476
Large	8.21	0.96	0.02	9.19	0.00	0.00	1488	1478
Total	6.09	1.26	0.11	7.46	0.00	0.00	1482	1473
Cotton								
Andhra Pradesh								
Marginal	6.74	2.49	7.16	16.39	0.00	0.00	1820	1814
Small	5.06	2.48	3.21	10.74	0.00	0.00	1911	1904
Semi - medium	2.16	1.86	1.89	5.91	0.00	3.72	1876	1873
Medium	1.44	1.75	0.52	3.71	0.00	0.52	1899	1897
Large	3.60	1.35	0.05	5.00	0.03	0.50	1574	1571
Total	3.47	2.07	2.60	8.14	0.00	1.37	1838	1835
Gujarat								
Marginal	4.03	3.49	0.25	7.77	0.00	0.00	1743	1736
Small	7.47	2.34	0.16	9.96	0.00	0.00	1794	1783
Semi - medium	5.70	0.94	0.09	6.72	0.00	0.00	1783	1776
Medium	5.73	0.64	0.04	6.41	0.00	0.00	1772	1765
Large	6.81	0.22	0.02	7.06	0.00	0.00	1794	1787
Total	6.03	1.56	0.11	7.71	0.00	0.00	1780	1772
Maharashtra								
Marginal	9.61	1.94	0.00	11.55	0.00	0.00	2163	2155
Small	4.91	3.28	0.05	8.24	0.00	0.00	2132	2127
Semi - medium	2.80	2.88	0.06	5.74	0.01	0.00	2151	2147
Medium	1.38	1.75	0.04	3.16	0.01	4.01	2191	2188
Large	0.64	0.35	0.01	1.01	0.00	0.23	2149	2148
Total	3.35	2.30	0.04	5.69	0.00	1.32	2168	2165

Table 2.13: Net price across various distances covered

	0 - KM	1-10 KM	10-25 KM	Above 25 KM
Paddy				
Andhra	586	584	599	800
Maharashtra	549	520	513	-
Tamil Nadu	440	483	514	499
Uttar Pradesh	557	563	557	550
West Bengal	513	523	539	524
Average	534	532	527	541
Tur				
Maharashtra	1584	1491	1615	1650
Uttar Pradesh	1705	1727	1730	1724
Average	1637	1745	1670	1652
Groundnut				
Andhra	1503	1343	1714	1732
Gujarat	1451	1483	1467	1489
Average	1473	1472	1514	1582
Cotton				
Andhra	1872	1749	1837	1965
Gujarat	1769	1780	1770	1790
Maharashtra	2160	2167	2179	2162
Average	1931	1820	1865	1998

Table 2.14: Net price by different quarters of sale

	1 Quarter	2 Quarter	3 Quarter	4 Quarter	Average
Paddy					
Andhra	800	593	544	627	587
Maharashtra	524	609	-	-	535
Tamil Nadu	522	452	-	477	483
Uttar Pradesh	557	-	650	-	558
West Bengal	504	536	533	546	521
Average	535	527	542	531	-
Tur					
Maharashtra	1492	1577	1653	-	1590
Uttar Pradesh	1718	-	-	-	1718
Average	1492	1638	1687	-	-
Groundnut					
Andhra	1589	1738	1492	940	1554
Gujarat	1473				1473
Average	1501	1469	1583	940	-
Cotton					
Andhra	1642	1902	2005	1992	1835
Gujarat	1772	-	-	-	1772
Maharashtra	2169	2164	-	-	2165
Average	1770	2049	2005	1992	-

Table 2.15: Net price obtained from different buyers (Rs per quintal)

	Village consumer	Village shopkeeper	Landlord	Village miller	Itinerant merchant	Katcha *arhatiya*	*Pucca* arhtia	Govt. agency	Others
Paddy									
Andhra	-	-	508	600	551	775	-	-	-
Maharashtra	-	-	-	511	-	541	542	-	1000
Tamil Nadu	-	-	-	-	-	637	466	-	-
Uttar Pradesh	-	-	550	560	561	544	541	-	-
West Bengal	-	-	523	500	-	516	531	-	-
Average			527	581	552	574	469	-	1000
Tur									
Maharashtra	-	-	1481	1697	1582	1609	1513	-	1390
Uttar Pradesh	-	-	1700	-	1700	1716	1730	-	-
Average			1863	1697	1667	1615	1584	-	1390
Groundnut									
Andhra	1700	1268	1764	-	-	1557	1501	-	-
Gujarat	-	-	-	-	-	1483	1471	-	-
Average	1700	1268	1765	1598	-	1508	1473	-	-
Cotton									
Andhra	-	1493	1997	1997	1940	1624	1695	-	-
Gujarat	-	-	-	-	-	1789	1770	-	-
Maharashtra	-	2235	2019	-	1839	-	2190	2168	2292
Average		1641	1998	1997	1939	1662	1755	2168	2292

Table 2.16: The weighted price index (aggregate of all crops)

State	Marginal	Small	Semi-Medium	Medium	Large
Andhra Pradesh	916.8	885.6	993.3	1018.4	1592.5
Gujarat	1581.3	1598.2	1636.7	1639.3	1547.8
Maharashtra	1043.2	1293.9	1485.3	1265.9	1360.3
Tamil Nadu	587.2	537.3	589.4	717.6	495.5
Uttar Pradesh	600.5	606.8	640.9	652.5	-
West Bengal	505.1	541.3	512.4	524.4	-

Note: Weighted Price = $\sum a_{ij} q_{ij} p_i / \sum a_{ij} q_{ij}$

Table 2.17: Determinants of marketed surplus (aggregate of all crops)
(Dependent variable: Ln value of marketed surplus)

Variable	1	2	3
Lnvop	0.967985 (48.57)***		0.893376 (30.71)***
Ln nsa		1.025073 (27.56)***	
Ln family size	-0.05068 (-1.09)	-0.14187 (-2.05)**	-0.12598 (-2.63)***
Dum leased-in	0.097921 (1.26)	0.480687 (4.28)***	0.177445 (2.12)**
Ln loan	0.015849 (3.25)***	0.009959 (1.39)	0.005189 (1.05)
Ln distance	-0.00359 (-0.2)	-0.1104 (-4.23)***	0.039408 (2.33)**
Dum unirrigated	-0.0531 (-0.99)	-0.54332 (-7.22)***	-0.14107 (-2.76)***
Dum Andhra	-0.11066 (-1.56)	-0.66461 (-6.57)***	
Dum Maharashtra	-0.62275 (-9.12)***	-1.19982 (-12.29)***	
Dum Tamilnadu	-0.51757 (-5.12)***	-1.25259 (-8.66)***	
Dum UP	-0.2849 (-3.11)***	-0.3962 (-2.95)***	
Dum WestBengal	-0.70053 (-7.26)***	-0.72313 (-5.13)***	
Dum_Marginal			-0.56792 (-3.96)***
Dum_Small			-0.41507 (-3.26)***
Dum_Semi-med			-0.37218 (-3.1)***
Dum_Medium			-0.16134 (-1.36)
Constant	0.41915 (1.69)*	10.04576 (62.5)***	1.410193 (3.48)***
F	324.61***	120.81***	283.74***
Adj. R-squared	0.8414	0.6626	0.8082
No. of observations	672	672	672

Notes:
1. Figures in parenthesis are 't' values
2. ***, ** and * refer to significance of coefficients at 1 per cent, 5 per cent and 10 per cent levels, respectively.

Table 2.18: Determinants of marketed surplus (cropwise)
(Dependent variable: Ln value of marketed surplus)

Variable	Paddy	Tur/Arhar	Groundnut	Cotton
Model I				
Ln area	1.079069 (22.45)***	1.08255 (12.67)***	0.967537 (18.89)***	1.144174 (16.59)***
Ln distance	-0.09962 (-1.22)	-0.00555 (-0.11)	0.188829 (4.78)***	-0.18502 (-3.89)
Ln familysize	-0.14982 (-2.02)**	-0.13999 (-0.84)	-0.26035 (-1.95)*	-0.13448 (-1.00)
Ln irrigation	0.26757 (6.46)***	0.054439 (1.39)	0.090375 (3.47)***	0.034797 (1.32)
Ln loan	-0.01638 (-1.67)*	0.006943 (0.44)	-0.00193 (-0.13)	-0.00625 (-0.55)
Constant	1.309269 (6.17)***	0.679773 (1.96)*	1.337798 (5.78)***	1.826089 (7.41)***
F	159.03***	41.74***	79.16	65.68
Adj. R-squared	0.6823	0.5985	0.7186	0.5629
No of observ.	369	146	161	261
Model II				
Ln output	0.945999 (29.57)***	1.019293 (25.66)***	0.951715 (32.57)***	0.95387 (52.46)***
Ln distance	-0.07909 (-1.16)	0.022143 (0.72)	0.103953 (4.04)***	-0.00281 (-0.14)
Ln family size	0.011293 (0.18)	-0.12624 (-1.23)	-0.19808 (-2.28)**	0.042914 (0.77)
Ln irrigation	0.18776 (5.35)***	-0.01759 (-0.73)	0.000192 (0.01)	0.01237 (1.12)
Ln loan	0.004266 (0.52)	-0.00301 (-0.31)	-0.01326 (-1.43)	-0.00724 (-1.54)
Constant	-1.08694 (-5.44)**	-0.12439 (-0.59)	0.156025 (0.97)	0.090364 (0.80)
F	258.12***	157.17***	230.69	610.81
Adj. R-squared	0.7775	0.8434	0.8777	0.9214
No of observ.	369	146	161	261

Notes:
1. Figures in parenthesis are 't' values
2. ***, ** and * refer to significance of coefficients at 1 per cent, 5 per cent and 10 per cent levels, respectively.

Table 2.19: Determinants of farmgate prices – Model - I
(Dependent variable: Net price obtained by the farmers)

Variable	Paddy	Tur/Arhar	Groundnut	Cotton
Qty sold_crop	-0.16857 (-4.74)***	1.051832 (1.32)	-0.2022091 (-0.56)	-0.5811717 (-2.48)
Dum loan	13.99527 (0.82)	-28.8081 (-0.80)	51.04952 (0.58)	-36.24565 (-1.26)
Credit outstanding	0.000117 (0.21)	0.00000977 (0.02)	-0.0020959 (-1.21)	0.0002726 (0.78)
Distance	-3.63439 (-3.87)***	1.175758 (0.75)	-2.748903 (-2.02)**	-0.2949018 (-0.21)
Dum qurt1	-28.4673 (-1.04)	-178.821 (-2.02)**	34.34782 (0.33)	-155.3986 (-2.93)
Dum qurt2	-25.436 (-0.93)	-127.343 (-4.50)***	-166.4972 (-1.47)	-74.07154 (-1.52)
Dum qurt3	12.99486 (0.42)			
Dum qurt4			-617.3761 (-4.41)***	30.71805 (0.24)
Dum villagecons			126.9903 (0.73)	
Dum shpkeeper	-19.8843 (-2.08)**	142.6035 (1.22)	183.8417 (1.86)*	108.7684 (1.77)
Dum money	-51.4165 (-4.36)***	65.23552 (1.89)*	106.7536 (1.22)	114.7174 (2.47)
Dum govtagency		432.1468 (3.70)***		304.2706 (9.18)
Constant	617.4456 (21.94)***	1664.043 (51.86)***	1540.482 (14.55)***	1963.221 (33.96)
F	4.97***	8.12***	5.11***	24.30***
Adj. R-squared	0.0903	0.3370	0.2075	0.4735
No of observations	361	127	158	260

Notes:
1 Figures in parenthesis are 't' values
2 ***, ** and * refer to significance of coefficients at 1 per cent, 5 per cent and 10 per cent levels, respectively.

Table 2.19 Contd.: Determinants of farmgate prices – Model - II
(Dependent variable: Net price obtained by the farmers)

Variable	Paddy	Tur/Arhar	Groundnut	Cotton
Crop area	-1.773888 (-2.29)**	2.00519 (0.48)	0.1591709 (0.08)	-5.040247 (-2.43)
Dum loan	2.989131 (0.17)	-36.13443 (-1.00)	35.39571 (0.40)	-34.62544 (-1.21)
Credit outstanding	0.0001898 (0.33)	-0.0000119 (-0.02)	-0.0020942 (-1.20)	0.0001611 (0.47)
Distance	-2.984497 (-2.97)***	1.088826 (0.68)	-2.864758 (-2.12)**	-0.4204163 (-0.30)
Dum qurt1	-1.40908 (-0.05)	-163.812 (-1.85)*	652.2799 (6.14)***	-148.5636 (-2.82)
Dum qurt2	-3.240817 (-0.11)	-115.1006 (-4.28)***	453.2151 (4.02)***	-62.15198 (-1.29)
Dum qurt3	29.62497 (0.91)		621.7876 (4.41)****	
Dum qurt4				52.31488 (0.40)
Dum village cons			128.3404 (0.74)	
Dum shopkeeper	-20.38077 (-1.95)*	134.3379 (1.14)	180.3767 (1.81)*	95.34109 (1.55)
Dum money	-51.83089 (-3.84)***	69.79788 (2.01)**	103.3113 (1.16)	102.3995 (2.20)
Dumgovt agency		427.8131 (3.64)***		303.4091 (9.13)
Constant	592.3381 (20.43)***	1660.154 (48.44)***	918.743 (8.68)***	1962.945 (33.92)
F	2.62***	7.85***	5.03***	24.25***
Adj. R-squared	0.0427	0.3284	0.2055	0.4731
No of observations	361	127	158	260

Notes:
1 Figures in parenthesis are 't' values
2 ***, ** and * refer to significance of coefficients at 1 per cent, 5 per cent and 10 per cent levels, respectively.

Table 3.1: Major Reasons for Not Selling in APMC Markets (per cent of farmers)

Farm Size Class	Total no. of farmers	per cent of farmers not selling atleast 1 crop in APMC market	Major Reasons for not selling in APMC market			
			Mandi very far	High transport cost	Reasonable price in village/rural mkt.	Convenient to sell in village/rural mkt.
Andhra Pradesh: Paddy Farmers						
Marginal	*12*	100	75	92	67	75
Small	*23*	100	96	87	91	91
Semi Medium	*15*	100	80	87	80	80
Medium	*10*	100	100	100	90	90
Large						
All Classes	*60*	100	88	90	83	85
Andhra Pradesh: Cotton Farmers						
Marginal	*13*	23	100	100	100	100
Small	*17*	29	40	40	60	60
Semi Medium	*24*	54	77	69	54	77
Medium	*17*	65	73	64	73	91
Large	*4*	25	0	0	0	100
All Classes	*75*	44	70	64	64	82
Andhra Pradesh: Groundnut Farmers						
Marginal	*12*	33	0	0	0	0
Small	*9*	56	0	0	0	0
Semi Medium	*17*	53	0	0	0	0
Medium	*11*	55	0	0	0	0
Large	*1*	100	0	0	0	0
All Classes	*50*	50	0	0	0	0
Maharashtra: Cotton Farmers						
Marginal	*5*	20	100	0	0	0
Small	*19*	37	43	43	29	29
Semi Medium	*9*	33	0	0	0	0
Medium	*14*	36	0	0	0	0
Large	*3*	67	50	50	0	0
All Classes	*50*	36	28	22	11	11
Tamil Nadu: Paddy Farmers						
Marginal	*8*	100	50	100	38	50
Small	*18*	100	44	83	39	44
Semi Medium	*17*	100	53	82	65	76
Medium	*11*	100	27	73	55	55
Large	*6*	100	0	100	67	50
All Classes	*60*	100	40	85	52	57
Uttar Pradesh: Paddy Farmers						
Marginal	*14*	100	93	93	93	93
Small	*40*	100	43	53	98	95
Semi Medium	*6*	100	0	17	100	83
Medium						
Large						
All Classes	*60*	100	50	58	98	95
Uttar Pradesh: Tur Farmers						
Marginal	*8*	100	88	100	100	100

Farm Size Class	Total no. of farmers	per cent of farmers not selling atleast 1 crop in APMC market	Major Reasons for not selling in APMC market			
			Mandi very far	High transport cost	Reasonable price in village/rural mkt.	Convenient to sell in village/rural mkt.
Small	*23*	96	77	86	100	100
Semi Medium	*18*	94	18	18	100	100
Medium	*1*					
Large						
All Classes	*50*	96	56	63	100	100
West Bengal: Paddy Farmers						
Marginal	*7*	100	14	29	14	0
Small	*21*	100	14	43	14	0
Semi Medium	*27*	100	11	48	7	0
Medium	*5*	100	0	0	0	0
Large						
All Classes	*60*	100	12	40	10	0

Notes:

1.Groundnut farmers in Anantapur, Andhra.Pradesh, who are not selling in APMC markets, cited reasons other than those given in the table.

2. None of the farmers in Gujarat were found selling outside the APMC markets.

3. In Maharashtra mainly some cotton farmers are selling either in rural markets or to ginners. All tur farmers are selling in the APMC markets, and even paddy farmers' sales have been classified as sales in APMC markets.

4. In Uttar.Pradesh paddy is being sold in the village, but tur may be sold in the APMC market, but since even tur farmers grow paddy, the result may be 100 per cent not selling in APMC market.

Table 3.1A: Major Reasons for not selling in APMC Markets (Summary of all classes)

Farm Size Class	A.P.			Mah	T.N.	U.P.		W.B.	All States
	Paddy	Cotton	G'nut	Cotton	Paddy	Paddy	Tur	Paddy	
Total no. of farmers	60	75	50	50	60	60	50	60	675*
per cent of farmers not selling at least 1 crop in APMC market	100	44	50	36	100	100	96	100	54
Major Reasons for not selling in APMC market *(per cent of farmers)*									
Mandi very far	88	70	0	28	40	50	56	12	46
High transport cost	90	64	0	22	85	58	63	40	60
Reasonable price in village/rural mkt.	83	64	0	11	52	98	100	10	60
Convenient to sell in village/rural mkt.	85	82	0	11	57	95	100	0	60

*Including paddy and tur farmers in Maharashtra and farmers in Gujarat.

Table 3.2: Farmers Willing to Sell Directly to Buyers (per cent)

Farm Size Class	Total no. of farmers	per cent of farmers willing to sell directly	Reasons			
			Fair weighing	Faster sale of produce	Better price	Immediate payment
Andhra Pradesh: Paddy Farmers						
Marginal	12	92	91	91	100	100
Small	23	100	87	96	100	96
Semi Medium	15	100	100	93	100	100
Medium	10	100	70	90	100	100
Large		-	-	-	-	-
All Classes	60	98	88	93	100	98
Andhra Pradesh: Cotton Farmers						
Marginal	13	69	78	56	89	56
Small	17	76	31	38	69	62
Semi Medium	24	71	65	71	88	71
Medium	17	88	73	87	93	93
Large	4	100	0	50	50	100
All Classes	75	77	57	64	83	74
Andhra Pradesh: Groundnut Farmers						
Marginal	12	58	71	43	86	43
Small	9	78	57	43	86	86
Semi Medium	17	71	100	8	100	75
Medium	11	73	88	25	88	88
Large	1	100	100	100	0	100
All Classes	50	70	83	29	89	74
Gujarat: Cotton Farmers						
Marginal	9	22	100	100	100	100
Small	13	46	100	100	100	100
Semi Medium	14	29	100	100	100	100
Medium	11	27	100	100	100	100
Large	3	33	100	100	100	100
All Classes	50	32	100	100	100	100
Gujarat: Groundnut Farmers						
Marginal	6	33	100	100	100	100
Small	18	33	100	100	100	100
Semi Medium	10	10	100	100	100	100
Medium	12	33	100	100	100	100
Large	4	75	100	100	100	100
All Classes	50	32	100	100	100	100
Mahar ashtra: Paddy Farmers						
Marginal	19	89	94	12	94	18
Small	22	95	95	48	100	48
Semi Medium	13	85	91	82	91	91
Medium	6	100	67	67	100	100
Large		-	-	-	-	-
All Classes	60	92	91	45	96	53
Maharashtra: Tur Farmers						
Marginal	4	50	100	100	100	100
Small	9	100	100	89	89	89
Semi Medium	13	85	73	55	73	82
Medium	18	94	82	65	71	71
Large	6	100	100	67	67	50
All Classes	50	90	87	69	76	76
Maharashtra: Cotton Farmers						
Marginal	5	80	100	25	0	0
Small	19	79	73	53	67	73

Farm Size Class	Total no. of farmers	per cent of farmers willing to sell directly	Reasons			
			Fair weighing	Faster sale of produce	Better price	Immediate payment
Semi Medium	9	78	71	29	43	57
Medium	14	93	54	46	46	46
Large	3	100	67	67	33	33
All Classes	50	84	69	45	48	52
Tamil Nadu: Paddy Farmers						
Marginal	8	50	0	0	0	100
Small	18	44	0	0	0	100
Semi Medium	17	41	0	0	14	86
Medium	11	45	0	0	0	100
Large	6	100	0	0	17	83
All Classes	60	50	0	0	7	93
Uttar Pradesh: Paddy Farmers						
Marginal	14	100	86	86	100	100
Small	40	98	67	67	100	100
Semi Medium	6	100	83	83	100	83
Medium						
Large						
All Classes	60	98	73	73	100	98
Uttar Pradesh: Tur Farmers						
Marginal	8	13	100	100	100	100
Small	23	22	80	80	100	100
Semi Medium	18	83	80	100	87	100
Medium	1	100	100	100	100	100
Large		-	-	-	-	-
All Classes	50	44	82	95	91	100
West Bengal: Paddy Farmers						
Marginal	7	71	60	0	80	60
Small	21	48	70	20	60	70
Semi Medium	27	74	45	35	75	50
Medium	5	80	50	25	100	50
Large		-	-	-	-	-
All Classes	60	65	54	26	74	56

Table 3.2A: Farmers Willing to Sell Directly to Buyers (Summary of all classes)

Farm Size Class	**A.P.**			**Guj.**		**Mah.**			**T.N.**	**U.P.**		**W.B.**	**All States**
	Paddy	**Cotton**	**G'nut**	**Cotton**	**G'nut**	**Paddy**	**Tur**	**Cotton**	**Paddy**	**Paddy**	**Tur**	**Paddy**	
Total no. of farmers	60	75	50	50	50	60	50	50	60	60	50	60	675
per cent of farmers willing to sell directly	98	77	70	32	32	92	90	84	50	98	44	65	70
Reasons *(per cent of farmers)*													
Fair weighing	88	57	83	100	100	91	87	69	0	73	82	54	73
Faster sale of produce	93	64	29	100	100	45	69	45	0	73	95	26	59
Better price	100	83	89	100	100	96	76	48	7	100	91	74	81
Immediate payment	98	74	74	100	100	53	76	52	93	98	100	56	78

Table 3.3: Farmers Not Getting a Reasonable Price by Selling in APMC Markets

Farm Size Class	Andhra Pradesh				Maharashtra					
	Cotton		Groundnut		Paddy		Cotton		Tur	
	1	2	1	2	1	2	1	2	1	2
Marginal	10	100	5	56	17	100	3	50	2	100
Small	7	44	6	75	21	95	9	56	9	90
Semi Medium	11	61	10	83	11	92	8	62	9	82
Medium	6	67	6	75	2	50	8	36	11	50
Large	1	25	0	0	-	-	0	0	2	33
All Classes	35	61	27	71	51	93	28	46	33	65

Column no. 1 = Total number of farmers under the particular farm size class for given crop, who are not getting reasonable price selling in APMC market.
Column no. 2= Column 1 as a percentage of total no. of farmers who are selling given crop in APMC market.
Note: In Gujarat and Uttar Pradesh, all farmers feel that they are getting a reasonable price in the APMC markets, while paddy farmers in Andhra Pradesh, Tamil Nadu and West Bengal are selling in villages/rural markets.

Table 3.4: Difference between Maximum Price and Realized Price by Farmers Selling in APMC Markets (per cent)

Farm Size Class	Andhra Pradesh		Maharashtra		
	Cotton	Groundnut	Paddy	Cotton	Tur
Marginal	12	8	7	10	8
Small	15	9	7	10	10
Semi Medium	14	9	4	13	8
Medium	14	12	3	9	7
Large	24	18	-	9	9
All Classes	15	10	6	10	8

Note: In Maharashtra, cotton is sold mainly to Maharashtra Cotton Federation, while paddy may also be sold to rice millers but has been classified as sale in APM C markets by the investigators.

Table 3.5: Facilities Needing Improvement in APMC Markets

Market	*No. of farmers selling in APMC marktet*	Market Facility							
		Auction platform	**Banking facilities**	**Grading**	**Roads linking market**	**Parking**	**Rest house for farmers**	**Market information unit**	**Handling of trade by APMC**
		(per cent of farmers suggesting improvement)							
Andhra Pradesh									
Adilabad	*24*	13	79	88	0	8	4	0	21
Adoni	*50*	28	14	68	50	44	46	68	48
Total	*74*	23	35	74	34	32	32	46	39
Gujarat									
Amreli	*49*	0	0	71	47	0	0	12	51
Bhavnagar	*49*	2	4	100	24	10	2	51	18
Total	*98*	1	2	86	36	5	1	32	35
Maharashtra									
Jalgaon	*24*	63	71	96	79	100	100	100	100
Kalyan	*26*	100	100	100	100	100	100	100	100
Wardha	*22*	41	100	59	0	5	100	100	100
Yavatmal	*43*	84	60	72	70	63	100	100	100
Total	*115*	81	86	86	74	76	100	100	100
Uttar Pradesh									
Pratapgarh	*19*	100	100	100	100	100	100	100	100
Shahganj	*29*	100	100	100	100	100	100	100	100
Total	*48*	100	100	100	100	100	100	100	100

Note: Farmers in Anantapur, Guntur and Nellore districts of Andhra Pradesh, Raigarh district of Maharashtra and in West Bengal and Tamil Nadu were selling in the village.

Table 3.6: Farmers Not Satisfied with Selling in APMC Markets

Farm Size Class	Paddy		Tur				Cotton						Groundnut			
	Maharashtra		Maharashtra		Uttar Pradesh		Andhra Pradesh		Gujarat		Maharashtra		Andhra Pradesh		Gujarat	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Marginal	17	100	1	50			6	60	0	0	2	50	7	88	0	0
Small	20	91	6	75	2	50	7	50	0	0	9	69	3	75	0	0
Semi Medium	11	92	5	38	9	64	7	50	0	0	2	22	8	100	0	0
Medium	5	100	5	28	0	0	2	25	0	0	3	23	5	100	0	0
Large			0	0			0	0	0	0	1	33			0	0
All Classes	53	95	17	36	11	61	22	44	0	0	17	41	23	92	0	0

Column no. 1= number of farmers not satisfied selling in APMC market.
Column no. 2= column 1 as a percentage of total farmers selling in APMC markets.
Notes:
1. Blank spaces mean no response or no farmers in that class.

Table 3.7: Traders' Reponses on Alternative Marketing Channels in Selected Markets

State	Andhra Pradesh					Maharashtra					Tamil Nadu		Uttar Pradesh		West Bengal		Total	
Main Crop Traded	Paddy	Cotton			Groundnut	Paddy		Other	Tur		Paddy		Tur		Paddy		All Crops	As a per cent of all traders across states
Market	Nellore	Adilabad	Guntur	Adoni	Anantapur	Alibag	Kalyan	Jalgaon	Yavatmal	Wardha	Thanjavur	Thiruvallur	Shahjang	Pratapgarh	Birbhum	Burdwan	All Markets	
Traders in favor of alternative marketing channels																		
Private markets	0	0	8	0	1	3	3	4	2	5	2	0	0	0	0	6	34	**21**
Futures trading	0	0	0	0	0	0	0	1	2	4	0	0	2	8	0	0	17	**11**
Other*	7	5	0	0	0	1	1	2	3	3	2	2	7	9	5	2	49	**31**
*Total no. of traders in favour of alternative marketing channels^*	*7*	*5*	*8*	*0*	*1*	*4*	*4*	*6*	*6*	*9*	*4*	*2*	*8*	*10*	*5*	*8*	*87*	**54**
As a per cent of all traders	**42**					**58**					**30**		**90**		**65**		**54**	
Private markets would be inefficient	0	0	0	8	9	1	0	0	0	0	0	0	0	0	0	0	18	**11**
Delay in Payments	0	1	1	0	0	2	1	3	2	1	0	3	1	0	0	0	15	**9**
Low Prices	0	2	0	2	0	1	3	0	0	0	0	2	0	0	0	0	10	**6**
Other[$]	3	2	1	0	0	2	2	0	0	0	2	0	1	0	5	2	20	**13**
Total No. of Traders who did not favour alternative market channels	*3*	*5*	*2*	*10*	*9*	*6*	*6*	*3*	*2*	*1*	*2*	*5*	*2*	*0*	*5*	*2*	*63*	**39**
No Response[#]	0	0	0	0	0	0	0	1	2	0	4	3	0	0	0	0	10	**6**
Total No. of Traders	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**160**	**100**

* includes mostly traders that were in favor of the alternative marketing channels but did not mention the channel.

^ Some of the traders opted for more than one alternative market channel resulting in double counting of their responses. Such multiple responses as in Maharashtra and Uttar Pradesh have been removed to present the total number of traders in favour of alternative market channels.

$ traders that were not in favour of private markets but did not specify reasons.

traders that did not respond to the issue of alternative market channels.

Note: In the case of Anantapur, Nellore, Alibag, Birbhum and Burdwan, the traders operate in the vicinity of the selected markets and were surveyed outside the market yards.

Table 3.8: Traders' Reponses on Licenses to More Private Traders in Selected Markets

State	Andhra Pradesh					Maharashtra					Tamil Nadu		Uttar Pradesh		West Bengal		Total	As a per cent of all traders across states
Main Crop Traded	Paddy	Cotton			Groundnut	Paddy		Other	Tur		Paddy		Paddy, Tur		Paddy		All Crops	
Market	Nellore	Adilabad	Guntur	Adoni	Ananthapur	Alibag	Kalyan	Jalgaon	Yavatmal	Wardha	Thanjavur	Thiruvallur	Shahjang	Pratapgarh	Birbhum	Burdwan	All Markets	
Reason given by those traders in favour of more licenses																		
Fair competition &better prices	3	5	7	0	0	2	5	5	3	8	5	0	0	1	5	7	56	**35**
As a per cent of all traders	**30**					**46**					**25**		**5**		**60**		**35**	
Reasons given by those traders not in favour of more licenses																		
Enough traders in market	5	0	2	0	4	0	0	0	0	0	0	2	0	0	4	3	20	**13**
Few buyers in market	0	0	0	0	0	0	0	0	0	0	0	0	10	9	0	0	19	**12**
Fall in profits	2	3	1	0	0	1	3	2	1	0	2	3	0	0	1	0	19	**12**
Others	2	2	0	10	6	5	2	3	6	2	3	4	0	0	0	0	45	**28**
No Response	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	3	**2**
Number of traders not in favour of more licenses	*7**	*5*	*3*	*10*	*10*	*8*	*5*	*5*	*7*	*2*	*5*	*10*	*10*	*9*	*5*	*3*	*104*	**65**
As a per cent of all traders	**70**					**54**					**75**		**95**		**40**		**65**	
Total respondents	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**160**	**100**

*Traders in Nellore mentioned more than one of the four reasons given in the Table for not favouring more licenses resulting in double counting of their responses.

ANNEX 1

NCAER Field Visits: Major Observations

2.1 Narrative Report

The survey exercise was executed simultaneously in the selected regulated markets as well as the sample villages chosen at their respective peripheries. The pilot survey was conducted by the NCAER team followed by a full-fledged survey by the survey team including selected networking agencies during October to December 2005.

The NCAER research team visited various states, districts and markets in order to have the first hand experience of implementing the complete survey. This turned out to be a major learning experience for the NCAER team to understand the nuances of regulated market operations as well the farmers' impressions at the field level.

The project team carried out personal visits to Adilabad, Adoni and Nellore in Andhra Pradesh; Bhavnagar in Gujarat; Alibag and Yavatmal in Maharashtra; Thiruvallur in Tamil Nadu and Burdwan in West Bengal. A brief description of our observations in each of these states and markets is presented as follows.

While the field experience as recounted in this section is anecdotal and based on discussions of the NCAER research team with farmers, traders and market officials in some of the select markets from within the sample of markets under study, nevertheless, it adds to our understanding of the ground-level realities facing the farmers who operate their business within these markets.

<u>Andhra Pradesh</u>

A peculiar feature of marketing in Andhra Pradesh is that while in some regions (such as Telangana) sale of farmers' produce mostly takes place in the AMC market yards, in other areas (such as coastal Andhra Pradesh), much of sales, particularly of paddy, materialise in the village itself. This has been a traditional practice despite the presence of market yards in these areas. Thus, for example, in Guntur, though commodities such as chillies are sold in the AMC market yard, paddy is procured by rice millers mostly through commission agents in the village. However, the market fee has to be paid by millers/traders even if they are not buying in the AMC yard. AMCs in these areas can generally be considered as revenue raising authorities rather than providing service to farmers.

Even where farmers' produce is sold in the AMC markets, different methods of sale may be practiced. In some of the AMC markets, tender system of sale is present and purchasers give the maximum price they are willing to pay for farmers' produce, for example in Adoni. In some places, for example in Warangal, traders are buying directly from farmers in the AMC yard. Irrespective of the place of sale, i.e. whether AMC yard or the village, the AMC intervenes to ensure timely payment to a farmer in case the farmer lodges a complaint of delay in payment.

Regarding movement restrictions, we were informed that until 1998 the Mandal Revenue Officer's permit was needed for inter-district movement of paddy (based on considerations such as output, family consumption etc.). Also there was a check on movement between Andhra Pradesh and Tamil Nadu at the border check posts and the District Collector's

permission was needed for inter-state movement of paddy by farmers. However, now there is no restriction on inter-district as well as inter-state movement of paddy in Andhra Pradesh.

In Andhra Pradesh, 10 per cent of the income of the AMCs goes to the Department of Marketing as 'Central Market Fund'. The budgets of AMCs have to be approved by the Department and all accounts are maintained by the Commissioner and Director of Marketing. Loans are given to deficit and emerging markets by the Department and the Central Market Fund is also used for providing HYV seeds to farmers, constructing rural roads, and is also used by department of agriculture. However, according to a senior government official, agriculture has become a losing proposition for the last 6-7 years and even big farmers are not getting reasonable income. Labour and input costs have gone up during the last few years but the returns have not been matching. Perhaps the new alternatives of marketing such as direct marketing, contract farming and private markets may bring down costs to farmers and offer better prices with increased competition.

Adilabad

The Adilabad AMC market, which is considered as one of the largest markets for cotton in India, has a somewhat different method of operation. The sale of cotton is conducted in a peculiar way. For about half an hour every morning, commission agents and buyers gather in the yard where there is open bidding for samples of cotton brought by farmers. The rate quoted by the highest bidder becomes the official price of cotton for the day. It is at this price that farmers can sell through AMC commission agents to the ginning mills or to the traders. Based on the differential quality of cotton being sold, there can be some variation in the rate for the day. The Cotton Corporation of India (CCI) also buys cotton directly from the farmers, and like other buyers, it pays the market cess of 1 per cent. Commission of 1.25-1.5 per cent is paid by farmers, while weighing is paid for by buyers in the AMC market. In Adilabad AMC market, we found electronic weighing bridges for trucks, tempos and bullock carts. It appeared that there was not much scope for incorrect weighing of farmers' produce.

Another striking feature of Adilabad market is that more than half the cotton comes to the market from Maharashtra. Cultivators in Maharashtra sell in Adilabad when they get a better price. We were informed that inter-state movement restrictions did not exist any more. Previously, when the monopoly procurement scheme was in place in Maharashtra, the Maharashtra police would stop farmers from crossing the borders to other states on some pretext, for example to recover loans, which farmers had taken from State Cooperatives of Maharashtra State Cotton Growers Federation. A.P. police did not stop farmers from coming into A.P.

The market fee of 1 per cent is collected at Adilabad check post even if the fee has already been paid by the farmers in Maharashtra. If traders in any market of A.P. want to sell any commodity outside the notified area, they need an export permit[26]. A trader needs to file for exemption from market fee if he wants to sell his procurement in other markets of A.P. He gets a certificate that the market fee has already been paid. In case a farmer wants to sell his produce outside his notified market area, he needs a certificate of land ownership and other details from the revenue department, which acts as proof that he is a farmer and not a trader. In fact till a few years back, farmers were not allowed to sell in AMCs outside their respective notified market area. But now the farmers can earn the benefit of higher price through selling another market area.

[26] The permit is valid for 1-2 days i.e. till goods are sold in the desired destination.

Adoni

In Adoni AMC yard of Kurnool district, Tender System of sale is followed for all commodities. Buyers quote their rate for each lot that they are interested in buying by filling a tender form and put it in a tender box. They have about one hour in the morning to quote their rates. The AMC officials collect the ballots and sort out the highest bidder for each lot and then announce the results for each lot to be sold at each commission agent's shop. The farmer has the option of not selling his lot at the announced price on a particular day if he finds it low. In most of the cases, payment is made to the farmers within one or two days the sale.

According to AMC officials in Adoni, the existing AMC markets were helpful as commission agents in these markets acted as money lenders for the farmers. Better prices, as in case of sunflower, were bringing farmers from even other districts to Adoni. Regarding setting up of private markets, some of the market officials in Andhra Pradesh feel that these should be supervised by the government since the owner of the private market may act as a monopsonist.

As we were informed in Adoni, certain schemes are in operation to help farmers. For example, *Rythu Bandhu Padakam* (or pledge loan scheme) is a scheme under which a farmer could deposit his produce with the AMC and get a loan of either Rs. 50,000 or 75 per cent of the value of his produce, whichever was lower. The farmer did not have to pay interest for the first 90 days after which interest was 10 per cent per annum[27]. The agency MARKFED (AP cooperative marketing federation) operates women self-help groups and purchases maize at MSP without charging weighing and commission charges. Another cooperative agency, A.P. OILFED has also been purchasing some crops in Adoni at MSP.

Anantapur[28]

In Anantapur, we found that groundnut and other crops like sunflower, paddy etc. did not come to the AMC market, which is non-functional. In case of groundnut, farmers sell to the commission agents in the villages or directly to the oil millers directly. Oil millers have licenses of the notified market area and they also pay market fee to the AMC. However, commission agents who sell to oil millers generally do not have licenses, and in some cases if they are caught at the check posts while taking oilseeds to the millers, they may pay some bribes. Commission agents may sell as far as Sholapur in Maharashtra, Chilikera in Karnataka, Tamil Nadu etc.

Nellore

Similar is the case with Nellore, where paddy is sold by farmers to village merchants or unauthorized commission agents (without licenses) who, in turn, sell to rice mills. However, rice millers do have licenses and they also pay market fee to the AMC. No transaction takes place in the AMC market yard, which has been non functional since 1985. In fact an AMC official at Nellore informed us that in Andhra Pradesh, 90 per cent of paddy was sold by farmers to millers/traders in the village itself and not in the market yards. Reasons cited by farmers for selling in the village include traditional practice, no transportation cost, timely cash payment (latest within a month), no commission, convenience etc. However, the price of paddy paid to farmers in Nellore is determined by rice millers association in the district,

[27] In 2004-05, Rs. 67 lakhs was given to farmers through the *Rythu Bandhu Padakam* scheme in Adoni for paddy.

[28] The information on Anantapur was provided by a field staff member.

which fixes only one price for paddy which may be different from the MSP.[29] The actual price paid may be Rs. 50/Qtl. more or less depending on quality. The millers bring their own lorries, weighing scales, labour, etc. for procuring from farmers. Millers pay commission of about 1 per cent to the village merchants and octroi paid is about Rs. 4/quintal.[30]

Gujarat

Bhavnagar

In the Bhavnagar market, open auction method of sale is followed for both of the reference crops, cotton and groundnut. The market has commission agents, traders as well as commission agents-cum-traders. An agent who was interviewed said that they made immediate payment to farmers. Loans by the farmers were generally taken from outside the market since the cooperative bank present in the market yard asked for some collateral security. According to an agent, familiarity was an important factor for farmers to sell through a particular commission.

Farmers in this market do not pay anything except unloading charges to labour. Weighing, loading, commission and market cess (0.5 per cent) is paid by buyers, who are mainly traders. 1 per cent of the total market fee collected by the APMC is sent to Gujarat State Agricultural Marketing Board.

Regarding movement restrictions, we were informed by APMC officials that there was no such restriction in Gujarat. Traders were supposed to have a license and buy commodities from farmers only in the APMCs of the notified area where they operated.

Maharashtra

Alibag

During our visit to Alibag in Maharashtra, we found that though an APMC office existed, there was no market yard.[31] Despite the absence of a yard, the APMC collects market fee of 1 per cent from traders and like all other APMCs in the state, it sends 5 per cent of its income to Maharashtra State Agricultural Marketing Board (MSAMB), which is then used for various purposes such as grants and loans to deficit market committees.[32]

Farmers in Alibag generally sell to private licensed traders, rice millers or sub-agents (cooperative societies) of Maharashtra State Co-operative Marketing Federation Ltd. (MSCMF), which gives milled rice to the FCI. MSCMF has an office in every district of Maharashtra and purchases major crops of each district. It buys only paddy in Alibag (through 5 sub-agents). According to Alibag APMC officials, most of the paddy is sold by farmers to the Federation's sub-agents, and only those who take advance from traders or are in need of immediate cash at time of harvest, sell to traders/rice mills at a lower price. We were informed that there were only 5 to 10 big traders in Alibag.

The sub-agents are supposed to procure paddy between October 25 and January 31 all over Maharashtra at MSP fixed by Central government, but in practice they may start procurement later, say in November.[33] Farmers alleged that the formal procurement started late so that traders could get time to purchase their paddy requirements at lower prices than sub-agents' prices. Reasons for delay in procurement as given by the Federation and APMC officials were lack of gunny bags, high moisture content in paddy, lack of labour, etc. Payment by

[29] In 2004-05, the rate was Rs. 550/Qtl. as compared to MSP of Rs. 560/Qtl.
[30] There are generally three to four village merchants operating in each village.
[31] But a GOI (2000) publication mentioned Alibag as an important market for paddy.
[32] There are generally three to four village merchants operating in each village.
[33] This scheme of purchasing directly from farmers through sub-agents started in 2001-02.

sub-agents is made with a delay of 10-15 days so farmers in need of immediate cash were forced to sell to traders/rice millers. Further, some farmers alleged that the sub-agents purchased paddy only if the farmers gave proof that they had paid land tax. If no proof was available, then the farmers were forced to sell to private traders/rice mills.

We also observed an instance of a trader/rice miller in Poynad (near Alibag) adopting a very rudimentary method of checking the quality, i.e. the length of grain and it moisture content. This puts the farmers at the mercy of the trader regarding the price at which the trader would accept the farmer's produce. Also there were not many traders/millers in this area, which resulted in lack of competition.

Regarding private markets, the APMC officials said that there was no place for private markets in Alibag and also there were not many crops to be traded, just paddy and few others such as mango. According to one of the big traders/rice millers in Poynad, agricultural land in Raigarh district was being sold by farmers to big companies (such as Reliance, ISPAT, NITCO Ceramics etc.). Lack of irrigation facilities is also an important reason for losing interest in growing paddy. With regard to restrictions on stocking, the rice miller informed us that until few years back, government had to be informed of amount of goods stocked, but this did not apply anymore.

Yavatmal

In Yavatmal, we found ITC was purchasing soyabean directly from farmers in its private market yard.[34] Direct sales by farmers to the ITC benefit farmers through better returns compared to sales in the APMC market yards. Farmers get payment immediately and do not have to pay any charges such as unloading, weighing, commission etc. The ITC also undertakes grading without any extra cost to the farmers.

In the case of cotton trade in Maharashtra, the monopoly procurement by Maharashtra State Cooperative Cotton Growers Marketing Federation (MSCCGMF) has been relaxed since 2002-03 and now Cotton Corporation of India (CCI), private traders, ginners, etc. can buy cotton from farmers in the regulated APMC markets. Farmers have started selling in APMCs as they get immediate cash payment, while the Maharashtra Federation, at times, delays in making payments.[35] Some of the traders, without licenses, buy cotton illegally from farmers in the villages at low prices and sell at higher prices to MSCCGMF, acting as farmers.[36]

Officials of the CCI were also interviewed in Navi Mumbai. The CCI purchases cotton directly from growers or through commission agents in open auctions in the regulated markets in various states under the supervision of APMCs to ensure remunerative prices to the cotton farmers. The CCI mainly undertakes purchases in commercial terms and not on MSP basis. Purchases on MSP basis took place only 4-5 times in the last 15 years. However, in Maharashtra, the CCI has been making commercial purchases only since 2002-03 and MSP purchases were made in 2004-05. The Corporation pays market cess to APMCs just like any other buyer. It makes payment to the farmers immediately after the purchase or within a few days. It also claims that farmers have developed so much confidence in CCI that many of them insist that auction should take place only when a CCI representative is present in the market. The CCI provides the cotton purchased to textile mills and it also exports cotton. In

[34] It is called Sagar Choupal. ITC has already established it's presence in several villages through its e-Choupals.

[35] Also, we were informed in Yavatmal that since 2005-06, the APMC has to issue a token to farmers who want to sell to Maharashtra Cotton Federation with 5 signatures that have to be shown while selling to the Federation.

[36] For example at Rs 1600/Qtl, while price paid by MSCCGMF was Rs. 2300/Qtl including bonus and Rs 1800-1900/Qtl. in APMC market in Yavatmal.

fact export quotas on cotton were removed in 2001-02 and cotton has been placed under Open General License.

Regarding setting up of private markets in Maharashtra, which is now allowed under the Maharashtra Agricultural Produce Marketing (Regulation) Act 2005, certain conditions include issuance of licenses to operators, minimum specified infrastructure, MSP requirement and certain distance from existing APMCs. But private markets will need huge investment. Also legal problems exist such as problem of land acquisition since land can be purchased only by agriculturists. However, with more options being made available such as private markets and direct marketing, there will be competition for buying farmers' produce and this would lead to improvement in infrastructure.

Tamil Nadu

Our survey of Tamil Nadu was undertaken for paddy. In the Cauvery Delta Area (which includes Thiruvallur and Thanjavur). There was 100 per cent monopoly procurement by Tamil Nadu Civil Supplies Corporation (TNCSC) before 2002 for the Tamil Nadu government at a price above MSP but generally lower than market price in non TNCSC procuring areas in Tamil Nadu. The monopoly procurement by TNCSC would be for a period of time and at that time it was not legal for private traders to buy from farmers. Since there were some illegal operators offering higher than government prices for paddy, there was competition, albeit illegal, with TNCSC. But when there was no procuring by the TNCSC, parallel private markets could operate legally.

The main functions of the Corporation are price support/stabilisation and to tap surplus paddy and use it for PDS. The objective of the Tamil Nadu government was to depend on internal supply rather than on imports to meet demand, particularly because it is a rice deficit state. During the time of the monopoly procurement under the Essential Commodities Act, farmers and traders were not allowed to take paddy to districts outside districts where TNCSC was procuring. However, movement of produce from non procuring districts to procuring districts, which was rare, was allowed. In practice, consignments could be seized if officials felt that the farmer was a trader in disguise who wanted to sell in another district.

There are no such restrictions now on the movement of goods either by farmers or traders though a transport permit is needed from the APMC to carry paddy from one market to another which lies outside the notified area. Also, since October 2002, paddy procurement has been decentralised and TNCSC now functions as an agent of the Government of India and procures for FCI at MSP fixed by the Central Government. Market fee is exempted for TNCSC. The TNCSC has direct purchase centres (DPCs) set up wherever needed and farmers can bring their paddy to these centres and sell without the involvement of any agents. The TNCSC claims to make immediate payment to farmers. The procured paddy is hulled either directly in TNCSC mills or through private mills and the resultant rice is taken by FCI as part of the Central Pool. It must be noted, however, that it is not compulsory for farmers to sell to TNCSC as was the case before 2002 and they can sell to private traders also. Hence, there is a parallel system of purchasing paddy. According to TNCSC, private traders may delay in making payments though they may offer a slightly higher price. In fact, in recent times though, the DPCs have not been able to procure much since private traders offered a better price. Traders may sell paddy purchased to other states also, such as Kerala, if prices there are higher.

According to the Tamil Nadu Agricultural Produce Marketing (Regulation) Act, licensed traders can buy from anywhere in the notified area and it is not necessary for them to buy from the APMC market only, though they must pay market cess of 1 per cent. In fact we were

informed by a senior government official that since Tamil Nadu already allowed setting up of private markets, the Central Government had commented that Tamil Nadu did not really need much amendment based on the Model Act (2003). But even in the private markets, the APMC officials check accounts of private traders for payment of cess. In the case of any complaint by farmers the APMC officials can intervene in these private markets. In the APMC markets, tender system of purchasing is operational and buyers give their bids on paper and the APMC officials select the highest bidders who get the lot. About 15 per cent of the market cess is collected by APMCs is sent to the Tamil Nadu State Agricultural Marketing Board.

Thiruvallur

A visit to one of the villages near Thiruvallur revealed that the farmers preferred to sell their paddy to traders through village brokers who do not have licenses. Relatively large farmers may prefer to sell in the APMC if prices there are better than those received within the village.

West Bengal

There are only 46 Regulated Market Committees (RMC) in West Bengal and they have very small scale of operations and have not been able to construct sufficient infrastructure to accommodate large number of farmers. In fact, 90 to 95 per cent of farmers' produce is sold through channels outside of RMCs. Many of the farmers are chained to traders / middlemen due to loans taken and hence are forced to sell to these intermediaries rather than in the RMC markets. At the same time, just like in Tamil Nadu, farmers in West Bengal are not under any compulsion to sell in RMCs even though prices in these markets maybe somewhat higher than in rural markets. Another reason for farmers to sell outside the RMC markets is small quantities of marketable surplus.

The farmers thus sell either at home to village agents/traders or in small village haats (markets). The farmers may also sell in private wholesale markets. There are about 200 wholesale and wholesale-cum-retail private markets in West Bengal. The traders in these markets have to obtain licenses from their respective RMCs and pay the required market fee, which is collected at check posts if not paid in RMC markets. But in practice, not many have taken licenses, though rice millers who buy from traders/wholesalers do have licenses. Some of the private markets are even run by local Panchayats, which may also charge some fees from buyers to operate in these markets. Out of the income generated by RMCs, 20 per cent of the surplus of income over expenditure goes to West Bengal State Marketing Board, which uses the money for development of infrastructure of sick markets, providing link roads, new projects etc.

The procurement and distribution of rice in West Bengal is undertaken mainly by the Food and Supplies Department on behalf of the FCI and to some extent by West Bengal Essential Commodities Supply Corporation (WBECSC). The Food and Supplies Department and the FCI ask millers to purchase paddy and give them milled rice. BENFED (West Bengal State Co-operative Marketing Federation Limited) is a subsidiary of Food and Supplies Department which also undertakes paddy procurement. The Department has several directorates that look after procurement and distribution of foodgrains. Paddy and rice procurement amount is fixed by West Bengal government in concurrence with the Central Government. BENFED and FCI procure paddy through sub-agents or primary agricultural cooperatives, which, in turn, either buy directly from farmers or in the markets. There are instances in West Bengal in which paddy is generally bought at below MSP by the traders,

though the government agencies must buy paddy at MSP. Market forces decide prices in the private markets. In our visit to a village near Burdwan, we found that the price for farmers' paddy was fixed by an association of millers though actual price paid varied to some extent around the fixed price.[37] One of the reasons for paddy being sold at below the MSP in West Bengal is that it is a paddy surplus state. The FCI is not able to buy much. The ruling price of paddy paid to farmers was Rs. 490-500/Qtl. as against MSP of Rs. 560/Qtl. in 2004-05.

The traders are generally free to take rice or paddy anywhere within or outside West Bengal. Within 15 kilometres of the international border with Bangladesh, traders are required to have permits to trade. In case the exporting traders, traders need a 'No Objection Certificate' from the State Trading Corporation and some other agencies before exporting to other countries. Finally, certain new developments are taking place in West Bengal agricultural marketing. The Model Act was under examination of the Chief Minister at the time of the survey. An effort is being made to constitute farmers' service societies in which groups of say 100 farmers would sell their produce to the wholesalers without any middlemen. Contract farming is also being practiced, as in case of potatoes for snacks, which offers a more remunerative price for farmers. A major shortcoming in RMC markets is the lack of an organised system of grading.

[37] There were 30 to 40 rice mills in a range of 40 km in that area near Burdwan.