

Chapter 2

Sale, Purchase, and Use of Agro-Inputs and Services in India: A Review

This chapter reviews evidence on the existence and significance of various channels of farm input selling and service provision in order to identify gaps in understanding of the various aspects of the market and the marketing function from the perspective of inclusive and effective input supply models and systems. The section below reviews the major trends in custom hiring mainly in the case of Primary Agricultural Co-operative Society (PACS) and their performance in Punjab which is also one of our study service providing agencies, as Punjab has been a pioneer in this since the last decade. This is followed by a review of studies on major aspects of the traditional and modern farm input retailing channels especially rural super-markets and the farmer behaviour in purchase and use of farm inputs.

2.1 Custom Rentals of Farm Machinery and Equipment

Since this innovative and cost-reducing service provision began in Punjab, first of all, during the last decade, as an institutional effort supported by the state, there have been some studies to assess its impact on farmers. A study of PACS run Agro Machinery Service Centres (AMSCs) in Punjab in 2012 found their operations economically viable and generating profits to the extent of 2–30% of their annual costs. Further, the services available to farmers were cheaper by 16 and 35% when compared with those from private sources and self-ownership, respectively. These AMSCs initiated in the early 2000s owned machines like tractors and laser levellers with the help of bank loans, subsidy from the government, and their own savings. The two AMSCs in Ludhiana district and their farmers, and farmers from two villages without AMSCs, were studied based on a sample of 88 farmers belonging to three categories—AMSC farmers, private service provider farmers, and self-owning farmers. The number of machines and equipment owned by the two AMSCs numbered 40 and 27 each with one owning four tractors and six reapers and two laser levellers and the other owning two tractors and four discs, seed drills,

and plunkers each. These AMSCs had total investment of the order of Rs. 41 lakh and Rs. 16.61 lakh and total income of Rs. 26 and Rs. 9.5 lakh giving them net return of Rs. 6.3 lakh and Rs. 17,000 being 31 and 2% of their annualised expenditure respectively. It was found that AMSC services were being availed by all categories of farmers. The average size of operational holding across categories was 12.10 acres. The study focused mainly on the use of machines and equipment in wheat and paddy crops as they accounted for 80% of the gross-cropped area of the state. Whereas most of the owners happened to be medium and large farmers, those hiring machines from private operators and AMSCs were largely marginal, small, and medium farmers. The average expenditure on use of farm machinery was the highest in the case of those hiring from private sources followed by those from AMSCs and those owning the machines. The hiring cost was 16% higher in case of private sources compared with the AMSCs. The fixed cost for self-owned machinery made the cost of use 35% higher than that incurred in case of hiring from AMSCs. Only 7% of the farmers using services of AMSCs owned a tractor or a disc which was even lower being only 3.4% each in the case of users of private services. On the other hand, of those owning machines, 90% had tractors, 83% disc harrows, 54% trailer, 23% generator, and 3% had a rotavator. The capital investment of the farmers using self-owned machines was 12 and 31 times higher than those hiring machinery services from private owners and AMSCs. The farmers perceived lack of timely availability of machines from the service centres as the only major problem with 46% reporting that. However, most of the farmers (89%) were satisfied with the functioning of the centres and almost all of them (96%) were happy with the hiring charges. Major suggestions for improvement included: increase in the number of machines in the centres (73%) and higher government support (8%) and training of manpower for handling machines more efficiently (19%) (Sidhu and Vatta 2012).

Another study of AMSCs in Punjab based on a sample of 40 custom hiring and 80 tractor-owning farmers across four districts in 2011–12 found that most of the custom hiring farmers were marginal, small, or semi-medium compared with tractor-owning farmers who were mostly semi-medium, medium, or large farmers, whereas none of the marginal farmers owned a tractor. The other categories of farmers had one or more tractors with an average of 1.23 tractors. A large majority of the tractors were of 35 horse power (HP) with the others being 36–60 HP range. The average HP per farm was found to be 49 HP and 3.6 HP per acre. The number of non-farm earners was higher on custom hiring households (20%) compared with those owning a tractor (7%). There was lower presence of permanent labour on custom hiring farms (12 h per annum per acre) compared with those owning a tractor (29 h per annum per acre). On both types of farms, family labour was of the order of 110 h per annum per acre followed by 95 h of casual labour. The custom-hiring farmers had a much smaller operated area, a much higher area under wheat compared with those owning tractors, and had slightly lower yields of the two crops of wheat and paddy. Though their annual per unit income from crops was similar, the custom hiring households had higher income from dairy and slightly lower gross farm expenditure and lower net farm income. However, marginal small

and semi-medium farmers using custom hiring services earned higher net income than their tractor-owning counterparts. Major problems faced by custom hiring farmers included high cost of hiring, lack of timely availability, and inadequate availability of services (Singh et al. 2013).

Another larger study covering 100 AMSCs across all the 20 districts of the state in 2011–12 out of a total of 1045 such centres, of which 208 were in the private sector, focused only on the operations of the AMSCs. It found that all the 100 centres which had come up during 2008 to 2012 had tractors with some owning more than one tractor each. The next major equipment was laser leveller owned by 96% followed by rotavator. The other equipments were owned by only some of 100 centres, ranging from above 50% in case of disc harrows and ploughs to 35% in case of plankers and drills, 25–30% in case of disc harrows, bund maker, and trailers. The specialised equipment like potato digger, paddy transplanter, sprayers, and generators was owned by a few of the older AMSCs. The proportion of own funds used in the purchase of the machinery was 100% in the case of sprayers and bund makers and in specialised equipment like happy seeders, potato diggers and seeder generators, and paddy transplanters. Only in case of tractors and laser levellers, it was around 40%. Another major component of financing was 33% subsidy (up to a maximum of Rs. 10 lakh investment) by the state Farmers Commission (PSFC) on the purchase of major machines which was availed by 89% of the centres. The AMSCs, on an average, served 114 farmers in 2011–12 which was 18% of the membership of PACS. The average area covered per Centre increased from less than 300 acres in 2009–10 to 400 acres in 2011–12. The centres had an annual average income of Rs. 3.3 lakh in 2011–12 ranging from Rs. 3 lakh to Rs. 6.7 lakh with average expenditure of Rs. 1.9 lakh ranging from Rs. 15,000 to Rs. 4.2 lakh. This gave a net income of Rs. 1.37 lakh per centre ranging from Rs. 10,000 to Rs. 3.05 lakh (Chahal et al. 2014).

In Raichur district of Karnataka, a study of farm machinery custom hiring service centres revealed that a centre covered, on an average, 11 villages, 10,386 hac of cultivable area, and 2926 small and marginal farmers. Depending on the type, machines and equipments were used ranging from 0 to 100%. The services offered were at lower charge than those by private operators. The net return for a centre on an average was as low of Rs. 8822 per annum. Therefore, only 25% of the centres were high performing, another 25% medium performing, and 50% low performing. The centres had led to an improvement in the income of small farmers by 10–15% (Hiremath et al. 2014).

In Bangladesh, the custom-hiring services are provided through the lead farmer who makes the initial investment and provides services to other farmers on a fee for service basis. More than 80% of the farm land is cultivated mostly using power tillers, and only one in 30 households owns a power tiller (Justice and Biggs 2013). Another primary study also found that only 10% households owned power tillers and offered their services to other farmers. A few power tiller owners also offered revenue shares to the appointed hired managers (25–30% of revenue) and a few others offered seasonal contracts (Bangladesh taka (BDT) 5000–13,000). About 50% of the power tiller owners serviced 15 hac or more land in the rabi season, 67% charged up

to BDT 2500 per hectare for a full one time tilling service and 60% earned up to one lakh BDT by providing tilling services in the dry rabi season. However, despite the fact that 1/3rd of the agricultural labour force in Bangladesh are women, they were less like to own or operate agricultural machinery (Mottaleb et al. 2016).

Another interesting case is that of agro-mechanisation in China where average farm size is only 0.34 acres and lease of land to farmers by state is for 30 years. With only 5% farm power being animal-based in China (as against 9% in India), the custom hiring farmer cooperative companies operate across provinces with one Combine Service Enterprise (CSE) harvesting 200 farms or 133 hac or two farms/days with 100 days of work. These cooperatives adopt a strategy to not compete with each other and access lower cost spare parts together for a group of 5–10 CSEs who are part of the cooperative. These are all private initiatives initially supported by the state with harvest calendars across regions in which overtime has been managed by the CSEs themselves with own experience across provinces (Yang et al. 2013).

There is private paddy-wheat custom hiring service sector in India where owners are mostly graduates or diploma holders and are medium land owners and operators (about 15 acres) including some landless and marginal farmers in Maharashtra; mostly with electrical tube well (multiple) irrigated lands and grew traditional crops. Mostly harvesting machines are tractor-driven, except in Maharashtra, and were mostly Standard and John Deere brands due to brand reputation and other farmer experience. In Punjab, these were bought since 1990 and Gujarat and Maharashtra only since 2005. They were either bought from company, dealer, or other farmer with 100% credit. Replacement sales were only in Punjab. The use varied from 90 days in Maharashtra to only 50 day each in Punjab and Gujarat and 600–800 h annually. They were mostly used in rabi in Gujarat and Maharashtra and both seasons in Punjab. Custom hiring was across states like in China (Singh 2009).

2.2 Profile and Behaviour of Customers of Modern Rural Supermarkets

In Punjab, 65.83% of the customers who purchased their agro-inputs from organised rural retail outlets had more than 20 acres of landholdings each. About 97.49% of the customers had more than 5 acres of landholdings and only 2.5% of the farmers had less than 5 acres of landholding. Only 15.83% of farm households had income below Rs. 150,000 and 1.66% below Rs. 80,000. These figures clearly indicate that the majority of the customers of organised rural retail are large landholders and belong to higher income group. More than 58% of farmers purchased implements and tools, seeds, fertilizers, pesticides, and lubricants from the organised rural retail outlets. A smaller percentage, 31 and 9%, also utilised soil testing and water testing services, respectively. Maximum expenditure was incurred on purchase of fertilizers and pesticides which, on an average, amounted to Rs. 15,570 and Rs. 14,150,

respectively. The findings indicate that fertilizers and pesticides consume a major share of the expenses incurred in purchasing agro-inputs (Dharni and Singh 2011).

Reardon et al. (2011) study in MP focused on farmer-level purchase of farm inputs and also the exploration and examination of innovations in business models attempted by modern supermarket retailers to ensure competitiveness, inclusiveness, sustainability, and scalability. Based on a sample of 810 farm households ((both Choupal Sagar (CS of ITC) users and non-users)) surveyed in 2009 in 30 villages around six out of the 11 CS outlets located in the peri-urban areas in the Malwa Plateau region which had similar agro-climatic conditions and Soybean and wheat are dominant crops, with horticulture having a little more presence in the east zone found that it comprised of 45% small/marginal farms (51% of the population weighted), 28% of semi-medium (27% for population weighted), and 27% medium/large farms (22% for population weighted). The average size of the farm for the sample was 4 hac. But, the average farm size for users of CS was 4.9 hac compared with 3.2 hac of the control group who did not use CS, while the average size of holding in the state was 2 hac. Further, 172 input retailers including 145 traditional (small private input shops), 6 CSs, and 21 PACSs, all reported the share of marginal and small in their clientele to be between 40 and 45%. The average size of CS was 10,500 ft², when compared to 1650 ft² of PACS store and 1500 ft² of traditional input shop.

Rao et al. (2011) studied the pattern of sources from where the marginal, small, and medium farmers purchased their agro-inputs in AP, and examined the inclusiveness of various types of channels so far as the small farmers were concerned. It also focused on new channels, i.e. chain stores like Viswas or Mana Gromor of Nagarjuna group to explore the existence of any bias in terms of selling their products mostly to medium farmers when compared to traditional retailers and state/coop stores. Based on a study of 810 households including 420 supermarket chain outlet users and 390 non-users across 39 villages in the periphery of six Viswas (retail chain) outlets across Andhra Pradesh (AP), it was found that 65% sampled farmers were marginal or small and the rest medium farmers. More of the marginal and small farms were irrigated than medium farms. A higher proportion of Viswas users was in medium (includes semi-medium, medium, and large) category (42%) compared with only 28% in case of non-users with average farm size being 2.61 hac in case of users and as large as 3.08 hac in one region, and 2.05 hac in case of non-users compared with average size of landholding in the state being only 1.26 hac. The study also interviewed about 100 other types of retail outlets like traditional retail or government or cooperative outlets selling agro-inputs. More of the marginal farmers were members of SC/ST (Scheduled Caste/Scheduled Tribe) community and most of them had Below Poverty Line (BPL) cards but 31% of marginal and 45% of small farm category had never visited the modern retail chain store which was the same for medium category as well. The number of footfalls was higher for traditional stores, and modern stores had only as many footfalls as the state or cooperative stores. But, modern stores catered more to medium and large farmers compared with traditional and state cooperative stores.

In Punjab, quality, freshness of the product, trustworthiness, variety under one roof, and credit availability were reported to be the main reasons for choosing to buy from the organised rural retail outlets by 65, 64, 63, 62, and 61% of the farmers, respectively. The organised retail outlets fared well on proximity, suitable timing, and price of products, with 44% farmers citing nearness/convenience, 41% citing suitable timing and 26% citing lower prices as reason for their choice to purchase from organised rural retail outlet (Dharni and Singh 2011). In Lucknow and Ghazipur districts of Uttar Pradesh, significant differences between perceived attributes of organised retail outlets and unorganised retail outlets were observed. Quality was reported to be better at organised retail store when compared to unorganised store/local market, whereas the price was found higher at organised store when compared to unorganised retail outlet. It was reported that needed products were readily available most of the times at organised retail stores, whereas they were in shortage many times at the unorganised retail stores (Ali and Srivastava 2013).

In Punjab, price, packaging, and brand were given the highest score by the farmers for importance as a factor while purchasing from organised rural retail outlets, i.e. 4.16, 4.10, and 4.05, respectively, on a scale of 5. Quality, fresh inventory, variety, credit facility, convenience/nearness, and other factors were given lower score than price, packaging, and brand (Dharni and Singh 2011). Further, farmers who purchased agro-inputs from top rural retail outlets gave the highest importance score to price, packaging, and expert advice (4.08 each) followed by credit facility (4.00), while brand, quality, freshness of inventory, variety, and company image were given lower scores. Farmers who purchased agro-inputs from bottom organised rural retail outlets gave highest importance score to price (4.23), brand (4.15), and packaging (4.12). Freshness, credit facility, and home delivery were considered as least important. Rank correlation coefficient of 0.616 indicated that the farmers who purchased agro-inputs from top rural retail outlets and who purchased agro-inputs from bottom rural retail outlets had given similar rankings to the factors considered important at the time of purchase (Dharni and Singh 2011).

In Uttar Pradesh (UP), farmers who purchased from Godrej Aadhaar outlets gave price, brand, packaging, expert advice, freshness, credit facility, safety, quality, and variety the highest importance scores in descending order of 4.35, 4.22, 4.17, 4.17, 4.12, 4.07, 4.03, 4.02, and 4.02, respectively. However, in case of HKB, the highest importance score was given to packaging, price, brand, expert advice, quality, convenience/nearness, variety, safety, and credit facility in descending order of 4.03, 3.97, 3.88, 3.85, 3.83, 3.83, 3.83, 3.82, and 3.72, respectively. Company image, home delivery, fair billing, and convenience/nearness were considered relatively less important for Godrej Aadhaar outlets as well as for HKB. Price came out to be a common important factor in both the outlets. Rank correlation coefficient of 0.626 indicated that the group of farmers purchasing from Godrej Aadhaar and HKB had similar consideration regarding important factors for purchasing agro-inputs. Convenience was considered less important in case of Godrej Aadhaar, while more important in HKB indicating that Godrej Aadhaar stores were located relatively close to the farmers when compared to HKB outlets (Dharni and Singh 2011).

2.2.1 Seed Purchase and Use

In general, in Punjab, seed purchased from market, seed purchased/obtained from other farmers, and self-retained seed were the three main sources of wheat seed. Most of the farmers (82%) used home-retained wheat seed (75% by quantity) and only 18% purchased from other sources. About 81, 73, and 74% of the small, medium, and large farmers used self-retained seed, respectively. Out of the total seed requirement of wheat seed, small, medium, and large farmers purchased 20, 22, and 14%, respectively (Singh et al. 2011). Higher price (almost double) for quality seed was the major discouraging factor in adoption of quality seed, besides the perception that the retained seed was virtually of similar quality as the stored wheat seed does not lose quality (Verma and Sidhu 2011).

Of the total 24.63% seed purchased by the farmers, commission agents, village shopkeepers, unauthorised private dealers, relatives and friends, fellow farmers, PAU, state department of agriculture, authorised seed dealers, and cooperatives sold 8, 2, 1, 0.72, 0.60, 4.31, 4.13, 3, and 1% of the wheat seed to farmers (Verma and Sidhu 2011). Out of the 8% wheat seed sold by commission agents, 5, 8, and 10% was sold to small, medium, and large farmers, respectively. Small farmers purchased 5% of their wheat seed from commission agents and 1% from PAU (Punjab Agricultural University). Medium farmers brought 8 and 4% of wheat seed from commission agents and PAU, respectively. Large farmers brought 10 and 7% of wheat seed from commission agents and PAU, respectively. Out of the total 4.13% seed supplied by authorised dealers, 6% was supplied to large farmers, 3% to medium farmers, and 2% to small farmers. Out of the 1% wheat sold by cooperatives, small, medium, and large farmers purchased 0.64, 1.08, and 1.25%, respectively. Seed replacement rate (SRR) of 7.80, 10.73, and 18.41 was observed for small, medium, and large farmers, respectively, with an overall average 12.36%. From the above findings, it is evident that small farmers have lower access to more public sources of seed like cooperatives and PAU (Verma and Sidhu 2011).

In Bathinda and Mansa districts of Punjab, the authorised seed dealers dominated the cotton (American) seed market by selling seed to 34% of the farmers followed by the village shopkeepers (24%), commission agents (14%), and unauthorised dealers (2%). Village shopkeepers, commission agents, Punjab Agricultural University (PAU), state department of agriculture, relatives and friends, and private seed companies sold cotton (American) seed to 24, 14, 5.08, 2.41, 3.31, and 0.14% of the farmers, respectively (Singh and Sidhu 2006).

Small farmers purchased their 19% cotton (American) seed from authorised dealers, 45% from village shopkeepers, 21% from commission agents, and 2% from relatives and farmers. It was surprising to note that none of the small farmers bought their seed from PAU or the state department of agriculture. Authorised seed dealers were major source of cotton (American) seed to medium farmers (41%), followed by village shopkeepers (26%), commission agents (17%), relative and friends (3%). Large farmers purchased their 39% cotton (American) seed from authorised dealers, 10% from village shopkeepers, 8% from commission agents, 4% from relatives and

friends, 8% from PAU, and 4% from state department of agriculture. Thus, more of medium and large farmers were buying seeds from authorised dealers (80%) when compared to 19% of small farmers. Village shopkeepers sold cotton (American) seed to 71% small and marginal farmers. This indicates that medium and large farmers are more aware in terms of source of seeds (Singh and Sidhu 2006).

Quality of seed, performance of variety, market acceptance of output, and the image of the company were major factors influencing the farmers' decision to buy a particular vegetable seed variety or brand in Andhra Pradesh (AP). Price of seed had the least effect on farmers' decision. The word of mouth from fellow farmers followed by dealer's recommendations was the other major influencing factor which shaped farmer decision to buy a particular type or brand of seed (Murthy et al. 2003).

In Madhya Pradesh (MP), there were choices for farmers in terms of seed selling outlets of different type of agencies numbering eight. The seed replacement ratio (all seed—certified and otherwise) for soya and wheat was 53 and 50%, respectively. Farm size did not alter the seed purchase pattern. At least some kind of seed was purchased by 77% of the farm households. The participation rate differed for small farmers and larger farmers, i.e. 79 and 70%, respectively. Choice of the vendor was not affected by availability of credit. Across all the three types of sellers, 94% of the transactions were reported to be in cash only. Overall 93% of the farmers were satisfied with the transaction. Dissatisfaction was reported in the remaining 7% cases due to spurious or fake seeds. Satisfaction levels were the highest for the transactions made with Choupal Sagar (CS) (98%), followed by state/coop retail (96%) and traditional retail (91%). Small farmers also reported high satisfaction levels of 90% (Reardon et al. 2011).

Traditional retail sold the highest quantity of wheat seed (54% by weight) and soy seed (54% by weight), followed by the state/coop retail (24 and 27%, respectively) and ITC CSs (13 and 14% of wheat and soy seed, respectively). About 34, 14, 12, and 36% of the soya seed was purchased by the small farmers from small shops, from other farmers, ITC, and from state/cooperative retail, respectively. Surprisingly, 33% of large farmers relied on state/cooperative retail, 11% on ITC, 32% on small shops, and 8% on other farmers.

It was observed that out of the total seed (by volume) sold by the state/cooperative retail, only 19% of wheat seed and 26% of soy seed were sold to small/marginal farmers. On the other hand, the CSs sold about 25% of their wheat as well as soya seed to small/marginal farmers. Both the traditional retailers and other farmers sold about 20% of their wheat seed and 22% of their soya seed to small/marginal farmers which are quite comparable with the state/coop stores thus indicating that the traditional sector excludes small farmers when compared to state and CSs in a relative sense.

The price of wheat seed was found to be the highest at the CSs (Rs. 19/kg), followed by state/cooperative stores (Rs. 16.2/kg) and traditional retail (Rs. 15.3/kg). Consistent with the price, the quality of the wheat seed was reported to be higher with state/coop and CSs when compared to traditional stores. However, the soya seed was 10% more expensive at CSs and traditional retail outlets compared with state/coop stores (Reardon et al. 2011).

Timely availability and proximity were found to affect the choice of outlets to a great extent. For soya, 60% of small farmers and 44% of large farmers reported the timely availability to be the strongest factor affecting choice of outlets. For soya, 23% of large farmers and 7% of small farmers reported quality to be the factor determining the choice of the outlet. Availability of credit did not have any significant impact on the choice of the outlet.

Wheat and soya seed sales of traditional shops comprised of 30% loose, 22% local brands, and 9% of unbranded seeds. Among the three formats, local brands sale was reported to be the highest in the traditional stores (17% of transactions), followed by 11 and 4% at the state/cooperative and CSs, respectively. Strikingly, the 32% of the soya seed sold by traditional retail was sold loose when compared to negligible 6 and 3% for state/coop and CSs. The widest range of stock-keeping units (SKUs) was available at traditional retail followed state/cooperative stores which stocked medium and large SKUs, and the least variety of SKUs was observed at CSs which stocked mostly large units (Reardon et al. 2011).

In Uttar Pradesh, Reardon et al. (2011) also found that farm size did not affect purchase of seed in case of 85% of the farm households. Seed was purchased by 82% of marginal farmers and 93% of the small and medium farmers. Rice and wheat dominated in seed purchase with 76% of transactions relating to them, 36 and 40% for rice and wheat, respectively. About 75% of the farmers had purchased wheat seed in the past year. About 56, 24, and 21% of wheat seed (by volume) was sold by traditional retail, modern supermarket retail, and state/cooperative retail, respectively, thus indicating the dominance of the private sector in wheat seed market. It was reported that medium farmers paid more for wheat seed when compared to small farmers. Wheat seed prices at the modern retail outlets were found to be 10% higher than other outlets. However, the quality of the seed at rural business hubs (RBHs) was reported by the farmers to be higher.

Only 12% of the marginal farmers, 16% of the small farmers, and 22% of the medium farmers purchased it from state/cooperative stores where 62% of the wheat seed was sold to medium farmers. This contradicts the fact that the state/coop stores are an important source of seed, especially for the poor. About 21, 27, and 20% of the marginal, small, and medium farmers, respectively, purchased wheat seed from the HKB. In fact, HKB was selling more of its seed to marginal and small farmers than that sold by state/cooperative stores. Traditional retailers with majority share of 55% dominated the wheat seed market.

Credit did not play any major role as 93% of the transactions were “spot” transactions on cash. This looks very surprising but it was possible that though seed was bought on cash mostly, it was made up of no option of credit at modern stores and cash sales backed by credit from other sources like commission agents, for seed purchase. Quality of seed followed by proximity and timely availability was the major factors influencing the choice of the retailer type. HKB was ranked the highest for quality (75%) followed by state/coop retail (42%) and traditional shops and other farmers stood last at 21%. However, for timeliness and proximity, first two positions were occupied by traditional shops followed by state/cooperative retail, respectively, and the HKB stood last (Reardon et al. 2011).

A majority (64%) of the farmers reported having purchased paddy seed last year. Moderate farm size bias was seen in paddy seed purchase as 59, 71, and 80% for marginal, small, and medium farmers bought paddy seed, respectively. Traditional retail dominated the paddy seed market with share of 57% (by volume) followed by HKB (27%) and state/cooperative retail (14%). State/cooperative stores were the cheapest source of paddy seed with price of Rs. 21/kg followed by traditional retail at Rs. 43/kg, and seed was the most expensive at HKB at Rs. 47/kg. The HKB outlets catered more to small and medium farmers, state/cooperatives catered more to medium farmers, and marginal farmers were catered mostly by the traditional retail. Only 16% of the marginal farmers purchased paddy seed from HKB. State/cooperative retail sold only 31% of the paddy seed to small and marginal farmers, which is contrary to their mandate that state/cooperative stores are meant to serve small farmers. However, it was interesting to find that HKB sells about 38% of its paddy seed to small/marginal farmers indicating that the products at HKB are not costly as it is generally perceived. Small local shops sold 53% of their paddy seed to small/marginal farmers. Quality of seed (38%) followed by proximity (32%) was the major factors influencing the choice of retailer type. Price and credit played a negligible role in choice of vendor. Highest quality seed was provided by HKB followed by state/cooperative retail and traditional retail ranked further third for quality (Reardon et al. 2011). CS was seen as quality seed provider and there existed unmet demand for quality seed.

In AP, paddy seed was available at Maximum Retail Price (MRP) as reported by 75% of the farmers. Only 5% of the farmers bought seed at a price higher than MRP, or they could not find seed at MRP or even at a price higher than MRP. Seed was purchased by 92% of the farm households. Farm size did not have any effect on seed purchase. Paddy, chillies, and cottonseed occupied a major share of the total seed purchased with shares of 48, 13, and 13%, respectively. Peanuts, maize, sunflowers, gram, *arhar/tur*, vegetables, pulses, and spices comprised the remaining 25% share of the seed purchased. Lack of timely availability of seed was a constraint for only 1% of the farmers and pricing as a constraint only for 1.7% of the farmers. Seed quality was not an issue for 95% of the farmers. About 93% of the transactions were spot cash transactions. Even the small shops provided credit in only 18% of the transactions. Paddy seed was purchased by 57% of the farmers. About 138 kg seed was purchased by an average AP farmer. There was not much variation in the price of paddy seed paid by different farm strata. This was similar to the trend found in MP. Traditional shops dominated the paddy seed market by selling paddy seed to 87.5% of the farmers, followed by state/cooperative stores with 3.3% and modern retail stores 0.4%, respectively. Price of paddy seed was the same at state/cooperative and traditional stores (Rs. 17.9/kg). Viswas sold paddy seed at a 16% higher price than the price at traditional and state/cooperative stores. The high price of seed at Viswas could be attributed to the perceived higher quality seed supplied (Rao et al. 2011).

In AP, only 6.7% of marginal farmers and 6.5% of small farmers purchased their paddy seed from state/cooperative stores. This is in contrast to results observed in MP where a higher percentage of farmers brought their seed from state/cooperative

stores. State/cooperative retail had a minor overall share of 6% in paddy seed. Modern retail was more or less absent from paddy seed sale in AP unlike in UP. Very small numbers (0.6 and 0.3%) of the small and medium farmers purchased paddy seed from Viswas, whereas none of the marginal farmers bought seed from there. Whatever small quantity of paddy seed was sold by modern retail was sold at Mana Gromor outlets, and not Viswas. Traditional retail dominated the paddy seed market in AP by selling 94% of the seed and 97, 93, and 93% of paddy seed sold to marginal, small, and medium farmers, respectively. This is similar to the trends observed in MP. Out of the total paddy seed purchased, 50% was purchased by medium farmers. Out of the total 3.3% paddy seed sold by state/coop stores, only 9% was sold to marginal farmers, 35% to small farmers, and 57% to medium farmers. This is in line with the results reported in MP showing that state/cooperative stores cater very little to marginal farmers. When compared to state/coop stores, PACS sold about 19% of their seed to marginal farmers and 50% seed to marginal and small farmers combined (Rao et al. 2011).

Viswas supermarket stores sold mainly to medium farmers, whereas Mana Gromor sold to small farmers. Majority of the small farmers (52%) were mainly catered to by traditional stores. Timely availability was the main reason cited by 49% of the farmers which influenced their choice of vendor followed by quality assurance (43%). Credit influenced choice of vendor in only 1% of the cases. The results are similar to those reported in MP. Best quality seed was reported at modern retail by 67% of the farmers, followed by state/cooperative (55%) and traditional retailers (43%). However, traditional stores were ranked highest with regard to timely availability of seeds. Branded seed occupied 66% of the share of the seed sold when compared to 25% of the seed sold loose. Almost all the farmers were satisfied with seed that they had purchased (Rao et al. 2011).

Only 19% of the farmers purchased chilli seed as only that many farmers grew chilli crop. Chilli seed was priced high at Rs. 28,000/kg. Traditional retailers dominated the market by selling to 87% to the farmers which accounted for 87% of chilli seed market, while only 2.6% bought from modern stores which had only 5.4% of chilli seed market. State/coop stores share was less than 1%. Rs. 8144 was the average expenditure of farmer on 330 gm of chilli seed. None of the marginal farmers purchased the chilli seed from modern stores, while 2.1% and 10.7 of small and marginal farmers brought their chilli seed from these outlets, respectively. Small farmers purchased the entire seed from Viswas, while medium farmers purchased 3/4th quantity from Viswas and rest from Mana Gromor, respectively. About 95% of the marginal farmers purchased their seed from traditional retailers and 4% of them depended on mandis for the seed, whereas small farmers purchased 91% of their chilli seed from traditional retailers. Out of the total chilli seed purchased, 61% was brought by the medium farmers. 81% of chilli seed as bought on cash transaction. Quality assurance (for 44% of the transactions) was a major factor influencing the choice of the outlet, followed by timely availability (30%). About 81% of the transactions for chilli seed were spot cash transactions. 88% of the transactions made by small farmers were paid by cash on the spot when compared to 72% by the medium farmers. Around 28% of the transactions were credited for

medium farmers. About 92% of the chilli seed is sold branded, 7.5% is unknown, and 0.5% is unbranded. Almost all the seed sold from state/coop retail was branded compared with 92% of the seed sold by traditional retailers being branded (Rao et al. 2011).

2.2.2 Pesticides

In Khargone, Dewas, Ujjain, and Sagar districts of Madhya Pradesh, only 1% of the farmers purchased agrochemicals from ITC e-choupal. Marginal farmers depended more on ITC for purchase of their agrochemicals (George and Lahiri 2009). Another study (Reardon et al. 2011) observed that pesticides were sold at all the Choupal Sagar (CSs), 29% cooperative/state stores, and 66% of the traditional stores. Pesticides accounted for noticeable share of the total agro-inputs sold by all kinds of retailers, with 42, 33, and 28% for traditional retail, CSs, and state/cooperative stores, respectively.

A pesticide or a herbicide was purchased by 88% of the farming households during the previous year. Farm size did not have any effect on the purchase of pesticide/herbicide. Pesticides dominated the farmer purchase among chemicals with 51%, followed by herbicides, fungicides, and plant growth regulators at 41, 6, and 1%, respectively. Chemicals were most of the time available at Maximum Retail Price (MRP) as reported by 93% of the farmers. The pesticide purchase approximately varied with the farm size in case of 77% of the households. It was observed that the smaller farmers paid 18% higher average price for pesticides (Rs. 716 per litre) when compared to medium/large farmers (Rs. 607 per litre). Traditional shops dominated the pesticide sales market by selling 80% of the total pesticide sold in market followed by CSs and state/cooperative stores with 13% and 4%, respectively. Surprisingly, most of the pesticide from the state/cooperative stores was brought by medium/large farmers (Reardon et al. 2011).

The pesticides sold at CSs were 18% costlier when compared to the traditional retailers and state/coop shops. It can be due to the fact that either the farmers purchased niche products from CSs which are generally priced higher or they purchased quality pesticides at higher prices. Special products were purchased from CSs by large farmers who bought commodity products from traditional shops. Small farmers applied 50% more input to their land. This can be attributed to the fact that they, small farmers, get less access to proper extension service, or they rely on advice of traditional retailers, or they might want to reduce the risk of unexpected crop failure by spraying more on the crop.

Among different retailers, ITC CS was the most pro-small farmer by selling 26% of its pesticides to small farmers, while the state/cooperative stores sold 87% of their pesticides to the large or medium farmers. Only 18% of the pesticide sales from traditional shops went to the small farmers. Small farmers bought 17% of the herbicide sold by ITC and 20% of the herbicide sold by traditional stores. Timely availability, proximity, and quality were the three factors which influenced the

choice of the retailer by the farmer. Credit played a negligible role. It was surprising to note that price was reported as a factor by middle and large farmers.

Traditional retailers provided the pesticides on time (74%) followed by ITC (50%), and the state/cooperative stores fared the worst (30%). Best quality pesticide was supplied by ITC, whereas the state/cooperative stores were found to be the most closely situated. Small retailers stocked the most diverse stock in terms of smaller units, whereas ITC stocked larger units. Herbicides were purchased by 56, 64, and 80% of the small, medium, and large farmers, respectively. Out of the total amount spent on purchasing herbicide, about 73% was spent at traditional retail outlets, 18% at CSs, and 5% at state/cooperative stores (Reardon et al. 2011).

In U.P., Reardon et al. (2011) reported that 86, 74, and 53% of the medium, small, and marginal farmers, respectively, purchased chemical pesticides with average being 66% for all farmers buying chemical pesticides. Pesticides and herbicides occupied 91% of the total chemical market share (pesticides 53% and herbicides 38%), fungicides 7% and plant growth promoters only 2% market share. It was generally observed that larger farmers were more aware of branded pesticides, and HKB was perceived to supply better quality pesticides. Farmers reported price variation for the same product at different stores.

State/cooperative stores sold pesticides to only 3% of the farmers when compared to 30 and 64% by HKB and traditional shops. About 1% of the pesticides were sold by sugar mills which supplied inputs and bought back sugarcane. About 27% of pesticides by volume (25% in value) were purchased from HKB by the marginal farmers, and the same figures for small and medium farmers were 34% by volume (16% in value) and 26% by volume (28% in value), respectively. This indicates that specialty products were purchased by medium farmers from HKBs and the commodity pesticides were purchased by small/marginal farmers. State/cooperative stores sold majority of their pesticides to medium farmers (83%) and only 17% to small and marginal farmers. Traditional shops sold 35% of their pesticides to small and marginal farmers, while the same figure for the HKB was 40%. Small and marginal farmers selected the outlet based on proximity.

Herbicide was purchased by 39% of the sample, and its use varied with farm size. Traditional stores dominated in the sales of herbicide with 60% herbicide market share, followed by HKB which held market share of 29% for herbicides and the least share (1%) was of the state/coop stores. Herbicides were 10% more expensive at HKBs which could be due to better quality being offered or because of brands of chemicals sold. Marginal farmers spent 36% of their total cost on herbicides at HKB when compared to small and medium farmers who spent only 18–25% of the total cost on herbicides at HKB (Reardon et al. 2011).

In AP, 99% farmers used various types of crop protection products. Out of the total transactions, 56% of the transactions were for pesticides, 31% for fungicides, 9% for herbicides, and 3% for plant growth promoters. About 90% of the farmers were usually able to find the chemicals at MRP. Farm size did not have any effect on pesticide purchase and 95% of the farmers purchased pesticides. This concurs with the fact that AP is the highest pesticide-consuming state in India. Marginal and small farmers played slightly lower price for the pesticides when compared to

medium farmers. State/cooperative stores sold pesticides to only 0.4% of the farmers and had just 1% market share (by volume sold) of which 2/3rd was sold by the PACSs; modern outlets (Viswas and Mana Gromor) sold to 17% of the farmers and traditional shops sold pesticides to 45% of the farmers. Further, 37% of the farmers purchased pesticides from more than one sources which was higher than that in UP and MP (Rao et al. 2011).

Modern stores sold 34% of the volume; however, the traditional retail was still the dominant player with 60% share. Out of the total pesticides sold by the modern stores, 39% was sold to marginal farmers, 33% to small farmers, and 32% to medium farmers, respectively. Most of the pesticides sold from modern stores were accounted for by Viswas outlets. Marginal and small farmers had higher usage rate of pesticides at 7.6 and 6.8 lt/hac, respectively, when compared to usage rate of medium farmers at 3.4 lt/hac. Marginal/small farmers were sold the highest share by modern stores (61% of their total sales), followed by state/cooperative stores (43%) and traditional retail (50%). Timely availability, quality assurance, lower price, credit, and proximity were reported as main factors influencing the choice of the outlet type in 42, 35, 11, 10, and 2%, respectively.

Herbicides were purchased by only 31% of the farmers. This is very low when compared to the figures in MP. About 41% of the farmers purchased herbicide from traditional shops and 16% from modern stores, and the state/cooperative stores did not sell herbicides. Further, 44% of the farmers bought herbicides from multiple sources. This figure is higher when compared to the ones in MP. In terms of volume, 27% of the herbicide was sold by modern stores; they sold more to marginal and small farmers. Out of the modern store sales, 74% of the herbicide market share was with Viswas. Traditional retail still dominated the market with 73% share. Reasons for choice of outlets included timely availability, quality assurance, lower price, and credit in that order.

A vast majority (74%) of farmers bought fungicides, and the expenditure on fungicides was higher than that on herbicides but lower than that on pesticides. A slightly lower price was paid for fungicides by the medium farmers when compared to marginal/small farmers. This is in contrast to the situation in pesticides. About 45% of the farmers purchased fungicides from traditional retail followed by 16% from modern stores (Viswas and Mana Gromor) and 0.5% from state/cooperative stores, respectively. 39% purchased from mix of sources. But, modern stores accounted for 40% of fungicides sold. This is in contrast to MP where much lower percentage of farmers purchased from multiple sources. Traditional retail dominated the fungicide market with a share of 59%. The modern retail sold only 36% (by volume) to the small/marginal farmers when compared to traditional retail which sold 43% to marginal/small farmers.

Higher number of smaller store keeping units (SKUs) was found at traditional shops when compared to the large number of large SKUs at modern stores. Out of the total pesticides sold, 75–90% belonged to the top three companies. Products of similar brands were found across different retailers. Farmers had to spend some time in order to find the chemical of their choice. It was observed that 7 out of 9 chemicals were missing at the state/cooperative stores, 3 out of 9 at modern stores,

and all 9 were available at traditional retail stores. Thus, traditional retail offered the widest variety of chemicals. Reasons for choice of outlets included timely availability, quality assurance, lower price, and credit in that order (Rao et al. 2011).

2.2.3 Selection of Brand

In Tuticorin district in Tamil Nadu, 48.33% of the farmers sought information from private dealers, 45.83% from extension workers, and 38.33% from advertisements (Padmanaban 2002). With an increase in farm size, the decision to purchase particular agrochemical was more influenced by the results obtained by application to crops than by the advice of the retailers (George and Lahiri 2009). In Coimbatore district in Tamil Nadu, private dealers and extension workers were the main source of information and played an influential role on the farmers' choice in selection of brand. Farmers were more loyal towards those dealers who supplied quality products and offered credit than to those who only offered credit. The price of brand and efficiency of brand played a significant role in the shaping up of brand loyalty of farmers (Padmanaban 1999). The farmer decision regarding the choice of pesticide and vendor was strongly influenced by the price of pesticide and availability of credit. Farmers were able to recognise the pesticide from its brand name, colour of packing, and symbol in south Tamil Nadu (Padmanaban and Sankaranarayanan 1999).

2.2.4 Problems in Pesticide Market

In Haryana, the major problems reported by the farmers with the purchase of pesticides included: poor quality of pesticides (63.75%), higher price (57.50%), and adulteration (46.25%). The other problems reported were: size of packing (27.5%), non-availability of particular pesticide (26.25%), distance to market (8.75%), and leakage of packing (5%). Farmers were more satisfied by purchasing pesticides from cooperatives as they reported very few problems there (Grover and Luhach 2006). Private traders dominated in the sale of pesticide to farmers in Haryana. About 83.34% of small, 97.22% of medium, and 85% of large farmers purchased pesticides from private dealers. The major reasons cited for this pattern were: easy availability, and payment at the time of harvest. In certain cases, it was observed that commission agents issued slips to farmers for facilitating buying of pesticides from the retailers of farmers' choice (Grover and Luhach 2006).

2.3 Fertilizer

Fifty per cent of the traders each in West Godavari and Adilabad and 33.34% in Chittoor (Andhra Pradesh) reported the non-availability of fertilizers as the main problem faced. The problem in the cooperatives outlets was much more critical as

the fertilizer companies hesitated to supply fertilizer to cooperatives because of the financial crunch the cooperatives were facing. There was no problem reported with the price as the fertilizer was supplied at government-controlled price in all the three districts. Cooperatives sold fertilizer only on cash, while the private traders sold both on cash and credit (Raghuram and Chawdry 1999).

A more recent study (Rao et al. 2011) showed that fertilizer is supplied by Indian Farmers Fertiliser Co-operative (IFFCO) and Krishak Bharati Co-operative (KRIBHCO) to the AP cooperative marketing federation (AP MARKFED) which in turn supplied to the PACS. All the farmers purchased fertilizer and irrespective of the farm size, the fertilizer usage rate was high. Only 56% of the fertilizer transactions were for Urea and DAP. This is in contrast with the findings of MP where 75% of the transactions involved Urea and DAP. Greater variety was found in fertilizer usage in AP when compared to MP, and the NPK balance was maintained unlike that in MP. In AP, farmers were using MOP-MAP (14%), NPK (12%), and other nutrients such as gypsum, zinc and iron (5%), and others (13%). Medium farmers used micronutrients the most, followed by small and marginal farmers.

Timely access was reported as a bottleneck to the availability of the fertilizer by 11% of the farmers, price by 7% and quality and variety by only 1% each. Fertilizer was not available at MRP or below in case of 22% of the farmers. The respective figures for MP were 5 and 20%, respectively. Overall, high brand consciousness was there and only 1% was sold without brand. The farmers reported high satisfaction from purchase. This is similar to the situation in MP.

Only 10% of the transactions at state/cooperative stores were done at above MRP, compared with 27 and 44% for modern retail and traditional retail, respectively. Timely availability was the major reason for selection of vendor by 53% of the farmers, followed by quality assurance (29%), credit (8%), and price (7%). State/cooperative stores were ranked the highest for quality followed by modern stores followed by traditional retail shops. Traditional retailers were ranked best for timeliness. About 15% transactions from traditional shops were on credit, followed by 1% from modern stores and none in case of state/coop stores.

Urea was purchased by 93% of the farm households. The high usage rate of Urea was similar to that in MP. Fertilizer cost 2% higher for marginal farmers when compared to small and medium farmers. AP farmers bought fertilizer from multiple sources when compared to the farmers in MP. Fertilizer was purchased from several sources by 44% of the farmers, while 45% purchased only from traditional retail, 11% only from state/cooperative stores, and 3.6% only from modern stores. Urea was found to be relatively cheaper (3%) at state/cooperative stores (Rs. 5.11/kg) when compared to traditional retail (Rs. 5.25/kg).

State/cooperative stores sold Urea only to 20% of the marginal farmers when compared to 31 and 32% of the small and medium farmers, respectively. This was also the case in MP, where the state/cooperative stores mainly catered to the small and medium farmers. Share of modern retail in Urea market in AP was only 10%. From this, sales to marginal farmers comprised 11% (by weight), small farmers 10%, and medium farmers 11%. Mana Gromor sold the remaining more than 80% of Urea to other categories of farmers. Traditional retail dominated the Urea sale

with 60% market share; out of the total Urea sold by state/cooperative stores, only 11% was sold to marginal farmers, 38% to small farmers, and 52% to medium farmers. PACS accounted for nearly all of the Urea sold through the state/cooperative stores. The results are in line with the findings in MP and UP that the state/cooperative stores mainly serve to the medium farmers. About 49% of the medium and 51% of the small/marginal farmers formed the clientele of modern stores which was like the clientele of the state/cooperative stores. Viswas chain which had a share of 1/4th catered mainly to marginal/small farmers when compared to Mana Gromor which has 3/4th share. Traditional retailers sold 54% of their Urea to small/marginal farmers. In AP, it was found that traditional stores have more variety of fertilizers when compared to modern retail and this was in contrast to MP and UP where more variety in fertilizer was found with the modern stores. Further, main fertilizers were sold in branded forms and in various stock-keeping units (Rao et al. 2011).

In MP, fertilizer was sold by all the Choupal Sagars (CSs), 62% of traditional shops, and 86% of the state/cooperative stores. Fertilizer comprised about 50% of the total sale of agro-inputs made by CSs, 70% by state/cooperative stores, and 57% by traditional stores. The widest variety of fertilizer was available at the CSs, followed by traditional retailers with the state/cooperative stores having the least variety. IFFCO and KRIBHCO brands were found to be sold most (90%) in state/cooperative retail, 73% in CSs, and 70% in traditional retail. The remaining percentage comprised of the private brands. Fertilizer was purchased by 98% of the sample farmers. Bottlenecks reported by farmers in getting the fertilizer included: timely access (15%), price (10%), and fertilizer quality (6%). Farm size did not affect farmers' responses with respect to bottlenecks in availability of fertilizers. A high rate of satisfaction of 98, 98, and 97% was reported for state/cooperative, CS, and traditional sector transactions, respectively. More than 93% of the farmers across all the three strata reported that they could always find fertilizer at MRP. It was reported that a small fraction on 0.5% of the farmers did not get fertilizer because of non-availability and 5% reported it not being available at MRP (Reardon et al. 2011). With regard to fertilizer, ITC was perceived to be quality supplier at lower prices, but its model was not good enough in terms of distance, thus providing timely fertilizers to farmers.

There was not much variation observed between the units in which fertilizer was purchased. Large sack comprised the main selling unit with 88, 81, and 87% of the sales taking place in large sacks for state/cooperative, CSs, and traditional retail, respectively. Timely availability in 44% of the transactions and proximity in 32% of the transactions were found to be two major factors influencing the choice of the vendor. Traditional retail performed the best on timely availability, while state/cooperative stores outperformed the others on proximity. Quality was considered to be an influencing factor in only 10% of the transactions. CS was ranked the best for quality. Price played a role as a factor in only 1% of the transactions.

Availability of credit was reported as a factor influencing the choice of outlet in only 5% of the transactions, and only 14% of the transactions were credit

transactions. Credit was part of the transactions made at the state/cooperative stores. However, still 78% of the transactions at state/cooperative stores were on the spot cash transactions, with the rest of the credit payments made at harvest time. About 78% of the fertilizer purchase comprised of Urea and Di-Ammonium Phosphate (DAP) followed by single super phosphate (13%). Urea was purchased by 89% of the households. An average 210 kg per hac of Urea was purchased by sampled households which is much higher than the usage rate recommended. It was reported that small farmers used twice the amount of Urea than that used by the large farmers (Reardon et al. 2011).

State/cooperative stores were found to sell majority of Urea (52% by weight) across all the strata of farms, followed by traditional retail (31%) and ITC (10%). Urea was found to be the cheapest at ITC (Rs. 4.6/kg) followed by state/cooperative stores and traditional retail at 4.9 and Rs. 5/kg, respectively. It was seen that the wholesalers also sold directly to medium/large farmers thus generating price advantage in order to compete in large market of medium/large farms. Large and medium farmer paid 4% less than small farmers as they bought it from CSs or wholesalers. Large farmers had preferential access to PACS whenever there was shortage of fertilizer. The state/cooperative stores which were meant to cater to the inputs needs of the small farmers sold only 28% of Urea to small/marginal farmers. This is in contrast to what the state/cooperative stores were meant for, i.e. to cater to the needs of the small farmers at subsidised rates. Only 18% of the Urea sale of ITC was made to small/marginal farmers (Reardon et al. 2011). But, given the land share of small and marginal farmers, state and cooperative stores were doing well.

In case of U.P., Reardon et al. (2011) also found that farm size did not influence the purchase of fertilizer. About 91% of the farmers reported having purchased fertilizer in previous year. Urea and DAP occupied first place with 79% of the transactions; third was NPK (7%) followed by SSP (4%), MOP (3%) and others (8%). Timely access to fertilizer was reported as a bottleneck by 47% of the farmers and price by 26% of the farmers. About 20% of the farmers reported that it was very difficult to get fertilizer at MRP or below. IFFCO/KRIBHCO brand had a share of 86% in state/cooperative stores, 53% in HKBs, and 52% in traditional retail. Fertilizer was purchased in large sacks at all the three kinds of retailers in at least 81% of the transactions. It was reported that traditional retail shops sold the fertilizer above MRP 58% of the times, while the same figure for HKB and state/coop stores was 18% and 16%, respectively. Traditional shops dominated in the sale with 33% share, followed by state/coop retail (28%) and HKB (11%).

This contradicts the long held belief that the Urea market is dominated by the state. Cheapest Urea is available at state/cooperative stores (Rs. 4.6/kg), followed by HKB (Rs. 5/kg) and traditional stores (Rs. 5.2/kg). About 21% of the marginal farmers buy Urea from HKB, and the same figure for medium farmers is 6%. Mostly the medium farmers buy Urea from state/coop stores where it is relatively cheap.

State/cooperative stores sold only 27% of their fertilizer to small/marginal farmers, and the same figure for medium farmers was 73%. It was interesting to note that 67% of the HKB sales of Urea were made to small/marginal farmers. It

was reported that larger farmers get preference at PACS due to various reasons whenever there is shortage of Urea. The choices of small farmers are further limited by the fact that traditional retailers refuse to give credit during the periods of shortage. Traditional stores were ranked the highest for timeliness and proximity, whereas HKB was ranked the best for quality. Fertilizer sales comprised 66–75% of the total sales of the traditional stores, for HKB 30–40 and 90–98% of the total input sales of the state stores. Most diverse range of fertilizers was stocked by HKB followed by the traditional retail (small shops) and the least by the state/coop stores (Reardon et al. 2011).

2.4 Extension

So far as role of extension in purchase and use of farm inputs is concerned, in MP, 80% of the households had availed extension service in the previous year. Of those who did not avail extension service, 62% cited no need for extension as a reason for not availing extension service, while in case of 29% farmers, extension was not available at the right time. Small farmers availed extension service in larger numbers (83%) when compared to large farmers (75%). From the farmers who were not using extension, it was the small farmers which stood higher chances of not using extension service (39%) when compared to large farmers (18%). Lack of timeliness and the lack of quality were main reasons for not availing extension service. Extension was availed to the same extent by CS and non-CS users. Extension service was found available most of the time by 88% of the farmers. About 10% of the farmers felt that they did not get proper extension service. “General advice” was the most sought after in extension service (55%), followed by the extension service for need of new varieties (12%) and advise on fertilizer (10%). Very high satisfaction from extension service was observed among the farmers. About 37% of the farmers availed extension from state extension officers, 35% from other public sector extension sources, 25% from private sector sources, and the remaining share of the extension service was held by NGOs. From the 25% of extension service provided by private sector, the private companies provided about 13% and the ITC CSs provide 10% of the extension service (Reardon et al. 2011).

It was revealed out that farmers take advice of government extension agents, and farmers trusted the advice of KVKs and universities. Extension service of ITC CSs is available throughout the season when compared to private companies but with a limited outreach. The farmers argued that there was paucity of information with respect to new and improved practices for crop production techniques and yield enhancement (Reardon et al. 2011).

On the other hand, in AP, extension was used by 95% of the farm households. The rate of extension usage was higher when compared to that in MP (18%). Among those who did not use extension, 53% did not need any extension. While marginal and small farmers did not use extension because they did not need it, the medium farmers did not use extension because they did not find extension at the

right time. Modern store users and non-users equally accessed extension. Extension was reported to be available in time by 85% of the farmers. Quality of extension was found high by 89% of the farmers, and 96% of the farmers had satisfaction for extension service accessed. Extension was sought for advice on disease, use of fertilizer, new seed varieties, irrigation, and weather by 41, 16, 10, and 7–8% of the farmers, respectively. Extension was provided by private sources in 68% of the events of extension. This is in line with the results reported in MP. From among the public sources of extension, state extension officers gave extension in 47% of cases, followed by KVKs in 21% cases, NGOs 18%, and plant protection unit provided extension in 9% of the cases. Private companies provided extension in 45% of events. Private companies also promoted their own products during extension. Modern stores provided extension in 17% of the events. Minor role was played by extensions officers belonging to fertilizer companies like IFFCO as they provided extension in only 7% of the events. Timely availability and quality topped the list of factors influencing the choice of extension source. Relevance and proximity were other important factors. Public sector provided extension to 33, 28, and 36% of the marginal, small, and medium farmers, respectively, while the private sector to 67, 72, and 64% for the marginal, small, and medium farmers, respectively. The modern stores provided extension to 13, 14, and 21% of the marginal, small, and medium farmers, respectively. All the modern stores got extension from input manufacturers when compared to 80% of the state and traditional retailers (Rao et al. 2011).

2.5 Summary

The above review of various studies on various inputs across state and years shows that there are alternatives available to farmers in terms of various channels for input purchase and use of custom rental services, though the traditional channel still holds the sway in farm input selling and the cooperative channel is declining. The modern retail has made an entry but by and large is a minor player despite many edges like better quality products and more choice. Also, there are issues like adequate access to small farmers and viable operations at the store or chain level. This has meant that the initial enthusiasm has waned away, and only a few innovative players remain but there are not many studies of such players. Further, most of the previous players in modern agro-input retail have relied on COCO model which has not worked, by and large. Therefore, there is a need to examine more innovative initiatives which may be small scale but hold promise for scale-up and more inclusive and effective reach to small farmers. The following chapters examine those models and their effectiveness with primary evidence.

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