USAID
FROM THE AMERICAN PEOPLE

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
sustainable solutions for ending hunger and poverty
Supported by the CGIAR

Agri-services in Uttar Pradesh for Inclusive Rural Growth

Thomas Reardon
IFPRI/MSU Joint Program on Markets in Asia

Bart Minten
IFPRI

Meeta Punjabi Mehta
IFPRI Consultant

Sunipa Das Gupta
IFPRI

Srinivasalu Rajendran
JNU

Sunit Singh
GB Pant Institute of Social Sciences
University of Allahabad, Uttar Pradesh

SYNTHESIS

Agri-Services in Uttar Pradesh for Inclusive Rural Growth

Baseline Survey Findings & Implications

Thomas Reardon
IFPRI/MSU Joint Program on Markets in Asia,
and IFPRI/USAID-PIKA Project Coordinator; reardon@msu.edu

Bart Minten
IFPRI

Meeta Punjabi Mehta
IFPRI Consultant

Sunipa Das Gupta
IFPRI

Srinivasalu Rajendran
Jawaharlal Nehru University, New Delhi

Sunit Singh
GB Pant Institute of Social Sciences, University of Allahabad, Uttar Pradesh

Submitted May 2011 to USAID/New Delhi.

This is a synthesis of the Report of the baseline survey findings of the IFPRI-PIKA Project on Rural Service Hubs: Business Catalysts for Rural Competitiveness and Inclusiveness. The full report (200 pages with all tables) is available on request. Our thanks to Dan Miller, PK Joshi, Arjun Uppal, and RB Singh for comments on earlier drafts and presentations.

Contents

Chapter 1

Introduction

1.1. Objectives of the Report and its Role in the Overall Project

The purpose of this report is to present the findings from farm, trader, and input retailer surveys and focus group discussions undertaken in 2009 by IFPRI and collaborators (Michigan State University and GB Pant Institute of Social Sciences, University of Allahabad, Uttar Pradesh). We draw implications from the findings for policymakers, donors, and other public stakeholders, and for rural business hubs in the private sector.

The project has three steps as follows.

1) There is a survey-based study of each study state (UP, MP and AP), based on farm household samples where there is a confluence of input supply and output procurement options (among state/cooperative retail, private modern rural retail or "RBH" (rural business hubs), and traditional input retailers and output traders (rural brokers, mandi commission agents)).

2) Informed by the above new information base generated by the project, the partner companies of the study introduce innovations in the products and services they provide (in inputs, extension, enabling services like credit, output procurement and FMCG (fast-moving consumer goods) retail), or the ways in which they provide these goods and services, or the segments of users or potential users they target, or a combination of these. These innovations are focused on building the "CISS" (competitiveness, inclusiveness, sustainability, and scaleability) of the agrifood system, in a way that benefits both the partner company's business and small and marginal farmers' incomes.

3) After the innovations are introduced, the project returned to the study areas and other relevant areas of HKB innovation in April/May 2011 and re-surveyed in order to estimate the impacts of the innovations and to identify further implications for delivery design and product and service mix most apt to serve CISS.

The present document reports on the first two steps of the project, with a focus on the baseline survey results on broad findings regarding agri-services in Uttar Pradesh.

Each chapter's synthesis contains a summary in bold at the end.

1.2. Introducing the "new" player in the rural agri-services market: the "Rural Business Hub" Company

As noted above, the project's purview is to study the broad range of suppliers of agri-services, and the farm households' uses and choices over them. That broad range has, until relatively recently, been composed mainly of traditional private sector suppliers of services (rural/field brokers, mandi wholesalers, small input retailers, money lenders, private banks) and public sector suppliers of services (state and coop stores, state banks).

To this double set has recently been added a third set of options for the farmer, and that is the modern private sector supplier of services (the "rural business hub" (RBH) companies such as Hariyali Kisaan Bazaar (HKB) or ITC's Choupal Saagar; and input manufacturers' extension/promotion units.

By 2010, HKB had 300 outlets in two formats: centers (85) and stores (215). The geographic spread of HKB is mostly in northern India, but is spreading into Andhra Pradesh. HKB outlets are spread over Uttar Pradesh (96), Punjab (32), Haryana (22), Rajasthan (28), Maharashtra (14), Uttar

Pradesh (28), and Andhra Pradesh (5). HKB is involved in all the four parameters of rural business – agri-input sale, consumables sale (of nonfood and processed foods/ staples), procurement of agricultural commodities, as well as providing other services such as insurance and selling petrol/diesel. However, the focus is on agri-input sale.

1.3. Issues, Conventional Wisdoms cum Hypotheses, and Research Questions concerning The Rural Market for Agricultural Services

The working hypothesis of this project is that there is some lack in agricultural services supplied to small farmers in the study states (Madhya Pradesh, Uttar Pradesh, and Andhra Pradesh). That lack can be in types, in quantity, in quality.

Nevertheless, despite there being so many rural agri-services "on paper," there is much doubt hanging over public debate suggesting that it is possible that in the various services noted above there are various lacks (in type, amount, quality, cost, or distribution/coverage). The hypotheses "in the air" in the debate include the many points of "conventional wisdom" that one hears often. These are the main points of conventional wisdom by theme of services that we observe in the debate and that allow us to have a set of hypotheses to test regarding lacks in services.

a) In output markets, conventional wisdom appears to contend that while, yes, there are many mandis, small farmers are in thrall to traders who tie credit from the trader to output sales by the farmer to that trader; the other "conventional wisdom" is that that farmers mainly sell into "long chains" of many hands, with the rural/field broker still dominant.

b) In input markets, conventional wisdom appears to contend that while, yes, there are many small input shops, these tie small farmers to them by linking credit to making inputs available; and that their quality is poor and their supply inconsistent. Yet conventional wisdom also holds that state and coop stores are there "for the small farmer", supplying needed seeds and fertilizer at subsidized prices. The conventional wisdom also holds that modern players emerging on the scene, such as rural business hubs, are selling to the elite of farmers, and at higher prices, hobbled by their not being able to offer credit.

The following then are the research questions that guide the chapters.

1) Where and from what vendor types do small (versus medium and large farmers) obtain their inputs, their credit, their extension, and sell their output? Do those vendor types tend to charge more or less for those services than other vendors?

2) Turning the first question from what the demanders do to what the suppliers (of all the services noted above) do, to what farm strata (and in what proportions) do the three different vendor types (traditional, state/coop, RBH) sell, and are those shares proportional to the farmers' strata in the farm population? Or their shares in volumes marketed in the zones?

3) Are products and services provided by the different service providers on different terms (such as with or without credit) and with different quality? Are small farmers reporting satisfaction or dissatisfaction with the services they receive (comparatively over state/coop, traditional/ private and modern/private or RBH vendors)?

Chapter 2

Samples, Survey Methods, Sample Characteristics

Rural business Hubs (the HKB) and zones: sample, case study methods, key characteristics of hubs and zones

The six zones of the survey in UP were selected around nodes, the latter being RBH centers, so that the catchment area (as treatment) and nearby (as control) would be an area where farmers had the choice of all three possible types of agri-service providers – state/coop, modern/private, traditional/private. Beyond these catchment areas, UP farmers nearly only have the state/coop and traditional/private agri-service market options and thus do not allow us to study the fullest set of market options open to UP farmers today.

As of 2009, HKB had 30 centers/hubs and 67 "stores" (marginal units with partial product coverage, mainly agri-inputs) in UP, totally 97 outlets. We selected 6 of the HKB hubs of the 30 HKB centers in UP, to get geographic and zone type variation.

The first two study locations are in Sambhal (near a city of population 182,478) and Atrauli (near a town of 43,744, which is near the city of Aligarh, with population of 1,000,000) in the "west UP" zone. This is primarily a cereal (wheat and rice) and vegetable zone near Delhi.

The second two study locations are Del Panderva (near a city, Hardoi, with population of 112,486, and the first HKB in UP, started in 2002) and Powayan (next to a town of 23,406, in turn near a city, Shahjahanpur, of 300,000). This "center" zone is primarily a sugarcane and cereal zone between the west zone and the capital of the state, Lucknow.

The third two study locations are Salon and Farenda. These are in the broad "eastern" zone. The zone is very large, stretching from Lucknow (a city of nearly 3 million) in the center of the state to the border with Bihar; Salon (near a town of 13,189, in turn near RaeBareli, a city of 170,000) is near one end (and thus in the dense market grid area of Lucknow), and Farenda or Pharenda (a small town near the town of Maharajganj, 25,000 population, and just north of the city of Gorakhpur, nearly 3 million) near the Bihar and Nepal borders. The eastern zone is mainly rice.

It should be noted that while we call the HKB's "Rural Business Hubs", they are located in densely populated zones, and mainly near towns and cities. Thus, most of the HKBs studied (and many in the UP) are near or right next to Tier 4 cities that themselves are near Tier 3 cities. In the dense UP countryside, "peri-urban" and "rural" seem to blend together. The upshot is that these study zones are not in remote areas or highly rural or hinterland areas, but in very dense rural cum peri-urban areas (which in fact is the situation for most of UP farmers). It should also be noted that the UP rural areas are very densely populated and nothing is far from a town. UP itself, with a population of 199 million (as of March 2011), has a population density of 817; if it were a country it would be second to the most densely populated country (that is not a city state), Bangladesh (at 1127), but much denser than India as a whole (368).

2.1. Farm Households: sample, survey methods, key characteristics

2.1.1. Sampling of Farm Households

Household surveys were conducted in 30 villages in the catchment area and just beyond, of 6 HKB stores, equally distributed over the Western, Center, and Eastern study zones in UP.

A household and a village survey were conducted during June-July 2009 in the six zones noted above. To draw samples, all the villages in the catchment area of the HKB were identified and were assigned to the following categories by estimation of the HKB: a) high-intensity use (category I): more than 50 farmers in the village use the agri-input or procurement

services of the HKB; b) medium-intensity use (category II): between 20 and 50 farmers in the village use the agri-input or procurement services of the HKB; c) low-intensity use (category III): less than 20 farmers in the village use the agri-input or procurement services of the HKB. The sample was set up in this way as to give a representative idea of the catchment areas of HKB.

The census was conducted so as to divide farmers into RBH users and non-RBH users. From this census list, 30 farm households were then randomly selected, i.e. 20 RBH users and 10 non-RBH users in the case of category I villages and 15 RBH users and 15 non-RBH users in the case of category II villages. From category III villages, 15 farm households were randomly selected.

810 households were interviewed, i.e. 420 RBH users and 390 non-RBH users.

Note that because we have the data from our full census of farms in each village, in the results we present "non-population-weighted" (just using the sample as is) and "population weighted" statistics; the latter corrects for the dis-proportional sampling to show the sample average using true population weights for the strata.

2.1.2. Method of the Farm Household Survey

The survey teams were composed solely of the collaborating university supervisors and enumerators. The survey was not presented as having anything to do with HKB, rural business hubs, or the donor USAID, so as not to bias the results. Rather, the survey was presented to farmers as about rural services in general.

No HKB staff or government officials were allowed to be present, including the team did not come accompanied to the village in any way, and only the enumerator and the household were present at the interview, so as not to bias the results. Rural business hubs were not singled out but were just part of a set of possible input suppliers and output procurers. The interview was conducted formally.

2.1.3. Characteristics of the Farm Households in the Sample

We use the strata as defined by the Government of India: "marginal" farmers are those with more than 0 and up to 1 ha, "small farmers" are those with more than 1 and up to 2 ha; medium farmers (which can be medium and large) are all those above 2 ha.

We thus present two averages per table where we stratify by user or by farm size strata: the unweighted average (from the sample), and the population weighted average, using the weights from our census of the villages.

On average over the three zones, our sample is composed 77% of small/marginal farms, and 23% of what we call "medium" farms. The shares are roughly similar over the west and Center zones (with about 70% small/marginal and 30% medium), but marginal in the East zone (with about the same share of small farmers, but more marginal farmers (68% versus about 45% in the west and Center), and only 11% medium farms (versus about 30% in the west and Center).

The average for the whole sample is 1.7 ha per farm. The average for the west and center is about 2 ha versus only 1.1 ha for the east.

The average for the sample areas from our census of the villages in the sample shows a somewhat lower "true" size distribution: the average for the study areas is 0.64 ha, ranging from 1.14 in the west, 1.25 in the center, and 0.59 in the east. The share of marginal/small farmers is 86% in the west, 84% in the center, and 89% in the east, for 86% overall.

However, for the whole state of UP (from secondary data), the average is 0.8 ha per farm household – about half the size of that of our sample average. Moreover, 92% of the farmers in the state are marginal and small – versus only 86% in the "true" population of the study zones.

Note that for each stratum, such as marginal, the results can be held to be representative from the sample for the study area as the state farm-size average for that category is similar to that of the average size of the marginal

farms in our sample, as is the case for the small, and the medium.

Hence, the sample is similar to the state average in the east z1) but larger than the state average in the west and center zone samples. The reasons the sample average farmers are larger than the state average appear to be the following: (1) 54 of the 78 locations of HKB in UP are in the area to the west of Lucknow, roughly half the state geographically; this area has our west and center zones. That area also has on average somewhat larger farms (though still dominated by small farms) compared to the region east of Lucknow; The 24 locations of HKB in the east are scattered widely with a number of districts uncovered. (2) Most of the HKBs are relatively near the district-head cities or near bigger towns; these main be the main "commercialized agriculture" areas and thus have even within the districts slightly larger farms; we did not test this hypothesis; (3) It may be that the 24 (of the 70 districts in UP) districts not yet with HKB locations may be particularly under-developed with marginal farm populations that bring down the state average.

Nevertheless, an important point that is often neglected in policy debates is the following. While 77% of our sample in terms of number of farmers are marginal/small, those two strata farm only 32% of the farmland of the sample, and 36% of the farmland in the population-weighted true population. The secondary data for the whole state show that while 92% of the farmers are marginal/small, they operate only 63% of the farmland of the state. Thus, both in the more commercialized farming areas where we have our sample (where medium farmers are only 23% of the farmers but operate 64% of the farmland) and in the state overall (where medium farmers are but 8% but operate 37% of the farmland), medium farmers are important in output.

From the viewpoint of a business selling inputs or procuring output, while in the commercialized zones (especially in the west/Center) it faces a market in which the number of marginal/small farmers is large – the marketable surplus volumes are supplied in their majority by medium farmers. A company could grow for a long time in these more dynamic zones west of Lucknow without having to try to tap the market of the small/marginal farmer. This is at odds with what we perceive as a popular assumption that rural businesses in India are somehow naturally or automatically going to "have to" woo and serve the small/marginal farmer.

The above makes it all the more interesting that in fact the modern retail (HKB) client base reflects mostly the structure of the farm population in the area, with only some small bias toward medium farmers. That is, rather than just targeting medium farmers, as they could surely do given HKB's small market share but the large base of medium farmers, it is noteworthy that their clientele include many marginal and small farmers. (We show below that often they even have a larger marginal/small client base for certain products compared with state/coop vendors.) The data show that medium farmers are more apt to be buying from HKB, but the pattern is slight, not sharp. For overall sample of RBH users average farm size is 1.9 ha, and for non-user, 1.5 ha.

2.2. The wholesale survey: sample, methods, characteristics

The sampling of 78 wholesalers/brokers was done in two sets. The first set was in the nearest mandis in the towns or cities where the study zones are. 50 wheat and rice wholesalers ("commission agents") were selected in the mandis of these six towns/cities. The second set was the village broker/collector. 30 of these were selected, one from each study village. The wholesale Survey Methods were similar to those used for the household survey.

The general picture in UP, as in the MP study, that emerges from the trader data is that mandi traders that are educated, operating at a sophisticated national level, accessing information widely, and operating all year – and this rises from west to east – even as farm size and income drops from west to east.

2.3. The input retailer survey: sample, methods, characteristics

There are three segments of the input retail sector in UP: (1) "state retailers" linked to the State Department of Agriculture (as part of their involvement in provision of seeds, fertilizer, credit, and extension) such as UP Agro stores and the PACs (cooperatives); (2) (informal sector) traditional private input retailers (mainly small shops in

villages and towns); (3) modern input retailers which are mainly the rural business hubs of several agrifood companies, such as Hariyali Kisaan Bazaar, ITC, and Triveni. The latter category is relatively new (mainly emerging in the past five years).

Key informants in UP government estimated that there are some 42,000 small traditional input retail shops, some 10,000 state stores, and several hundred modern retailers in UP. Information on market shares is not available officially, but rough estimates were made by the informants, for example of fertilizer, that 60% is provided via state stores (mainly cooperatives), 35% via traditional shops, and some 5% at most via modern retailers. It is hypothesized by the informants that farmers go to the state stores especially to get subsidized urea and to get credit. For chemicals, the great majority is thought to be via traditional shops and some 10% via modern retailers and very little via state stores.

The sample consisted of 190 input retailers: 173 small shops in the traditional sector (approximately 1 chosen at random in each of the 30 villages selected from concentric circles (per HKB, 2, 2, and 1 village were respectively selected in high-intensity, medium-intensity and low-intensity use of rural business hubs) in the catchment areas around the 6 HKBs), 11 stores in the government sector, i.e. Primary Agricultural Society and IFFCO-KRIBHCO outlets (approximately 2 from the nearest town to the HKB outlet, and 6 private modern sector stores (the HKBs themselves) in the catchment areas of 6 HKB stores, equally distributed over Western, Center, and Eastern UP.

Chapter 3

Seed Markets in the UP

3.1. Background Context: Seed Suppliers in UP from which Farmers can Choose

Both rice and wheat seeds are sold via the following set of outlets:

(1) traditional input stores;

(2) PACS (primary agricultural credit society, a state organization of farmers found in most states);

(2) State seed stores (located mainly at district head, with extension agents also on-selling for them);

(3) universities' direct retail of breeder and foundation seed to select farmers;

(4) rural business hub company outlets (with HKBs the most commonly found);

(5) mandi traders.

3.2. Farm Household Survey Findings on Seed Use & Acquisition

3.2.1.Overview of seeds

1) 91% of the farmers note that seed is always or usually available at MRP or below. That rate was in a U shape from west (94%) to center (82%), with surprisingly the highest share of farmers finding seed at MRP in the east (98%). Thus the farmers were not signaling significant violation of MRP.

2) Seed purchase is widely distributed over farmers– barely skewed by farm size. 85% (population-weighted thus "true" distribution) of the farm households bought some seed. Despite the conventional view that marginal farmers rely on their own seed and larger farmers use the seed market, we found that the 82% of the marginal farmers, and 93% of both the small and medium, bought seed.

3) 76% of transactions (36 & 40%) were in rice and wheat seed (not differing much over strata).

3.2.2. Focus on Wheat Seed

1) The wheat seed market is very active. 75% of the sample bought wheat seed in the past year (before the survey in mid-2009), with little farm size bias - ranging over 69%, 83%, and 79% for marginal, small, and medium farms.

2) The data show that the poor do not pay more for their wheat seed than do the other strata.

3) Only 21% of the total volume (tons) of wheat seed bought by the average household in the sample (not population weighted, thus moderately biased toward users) was bought from state/coop retail, 24% from RBHs, and 56% from traditional retail (mainly small shops but also other farmers). The state/coop presence in the market is a minority. 80% of the wheat seed market is thus in the private sector, traditional or modern.

4) The state/coop and the traditional shops' prices are about the same (16.1 rs/kg), while the HKB price is about 10% above that. While the price is higher at the RBH, we showed that still quite a number of marginal/small farmers buy wheat seed from the RBH. This could be due to quality differences as noted in the farmer assessments of quality (many emphasized in the survey that RBH has the highest quality seed). It is thus possible

that the effective price of seed is similar over the three vendor types.

4) Marginal farmers (who bought seed) bought only 12% of their wheat seeds from state/coop stores. This rose to only 16% and 22% in the cases of small and medium farmers. This is at odds with the hypothesis that state/coop stores are important for the seed needs of the poor at present. Even overall the state/coop sector has a minor presence: their true (population-weighted) market share in the study areas is only 18%.

   Moreover, marginal farmers (who bought seed) bought only 4% of their wheat seed from other farmers – this is at odds with what we were repeatedly told by key informants (based on conventional wisdom) that small farmers just bought from other farmers. This dropped to 2% in the case medium farmers.

   Surprisingly, HKB's share in the wheat seed market is about the same as that of the state/coop, and an important share for marginal and small (21and 27% of their seed purchases), and 20% of the medium farmers. Rather than a regressive structure (that we expected), instead we found that the marginal and small rely for wheat seed rather more than the medium farmers do on the RBH.

   Finally, by far the lion's share of the wheat seed market is in the hands of the small shops. The overall share they have is 55%. This is higher for the marginal farmers seed purchases (63% from small shops) than for the small and medium (53%).

5) 93% of transactions of wheat seed are "spot" – with no credit. This is similar across farm strata. This runs counter to the conventional wisdom that small farmers buy seed on credit.

6) Importantly, the survey data show that for all state/coop categories of outlets, only 16% of wheat seed sales go to marginal and 22% to small farmers: fully 62% of their volume is sold to medium farmers. This contradicts sharply the conventional view that the (subsidized) state/coop outlets are focused on selling to the poor.

   As in MP, we find in UP also that while the above has the surprise that the state/coop's sales are skewed toward medium farmers – the bias actually mirrors the dominance of the medium farmers in the land distribution and therefore roughly in overall seed purchase.

   By contrast, and again a surprise, the table shows that the HKB is actually selling a somewhat larger share to marginal and small farmers (24% to the marginal and 32% to the small) than do the state/coop stores. They are more progressive (means having a higher share sold to the smaller farmers) than is the state/coop system.

7) The strongest reasons for vendor choice are quality assurance (35% of the transactions having that reason reported), with a slight positive correlation of farm size and importance of quality, and proximity of vendor (at 34%, with timely availability, a closely linked idea, at 15%), with a strong negative correlation of farm size and choosing the vendor for being close by.

8) HKB ranks first for quality assurance (at 75%), followed by state/coop (at 42%), with the traditional shops or farmer exchange only at 21%. The ranking is reversed for proximity and timeliness, with the small shops far dominant.

3.2.3. Focus on Paddy Seed

1) The paddy seed market is very active. 64% of the sample bought rice seed in the past year (before survey), with moderate farm size bias - ranging over 59%, 71%, and 80% for marginal, small, and medium farms.

2) 14% of the physical volume of paddy seed bought by the sample (not population weighted, thus moderately biased toward users) was bought from state/coop retail, 27% from HKB, and 57% from traditional retail (mainly small shops but also other farmers).

3) The price differences are striking over vendors: the state/coop stores sell much more cheaply (at 31 rs/kg) compared with 47 at the RBH and 43 at the traditional shop. Controlling for quality, those

able to buy from state/coop stores at subsidized prices clearly pay less.

4) Farmers relied mainly on small traditional shops for paddy seed; beside that smaller farmers relied on neighbors and HKB, and medium mainly on HKB and state/coop stores: Marginal farmers relied most (in terms of shares of their rice seed purchase) 74% on traditional retail - for 52% from small shops and 22% from other farmers– and only 16% on HKB, and only 5% on state/coop retail. By contrast, medium farmers relied little (but still more than marginal and small farmers) (at 15% of their paddy seed) on state/coop retail. By contrast they bought fully 33% of their paddy seed from HKB, and 48% from small shops (but 1% from other farmers).

4) The household transactions data show that for all state/coop categories of outlets, only 31% of rice seed sales go to small/marginal farmers. Again, as with wheat seed, this contradicts sharply the conventional view that the (subsidized) state/coop outlets are focused on selling to the poor. Again, however, the skewedness of sales toward the small/larger farmers roughly tracks their share in farmland itself.

   The data show that the HKBs are selling a slightly higher share (38%) of its rice seed to small/marginal farmers than do the state/coop stores. This surprises as the image of "modern retail" is that it would be less progressive than the state/coop system, but it is the opposite.

   As expected, the small retailers and sales from other farmers are sharply more progressive than the other two. Some 53% of small shops' sales go to the marginal/small, and 95% of inter-farmer sales go to the marginal.

6) For choice of rice seed supplier, the strongest reason in the sample is actually quality assurance (for 38% of the cases, rising from 35% for the marginal to 44% for the medium farmers). Second is proximity of the vendor (in 32% of the cases for the sample, and 39% for the marginal farmers). Interestingly as with wheat seed, for rice seed "lowest price" and "provides credit" are very minor reasons.

7) HKB is by far the highest rated for paddy seed quality by the sample. This is followed a distant second by state/coop retail, then rather low for traditional retail. The ranking is reversed, but less dramatic, for proximity.

3.3. Findings from the Input Retailers Survey, regarding Seed Retail

1) Roughly 80% of traditional retailers and state/coop stores in the west region sell seeds; it dips in the center with half of the small shops and a third of the state/coop stores selling seed, then in the east all the state stores and nearly 80% of the small shops sell seed. All HKBs sell seeds.

2) Nearly all the RBHs report selling hybrid rice. Most of the state/coop stores do also. Predictably, that is much lower among the traditional shops, at only 48% in the west, 36% in the center, and 73% in the east. These are "self-declarations" of such sales. For conventional paddy seed that about half the traditional stores declare to sell it. By contrast, state/coop stores selling rice seed are only 20% in the west, 33% in the center, and 67% in the east. All the RBH stores sell paddy seed.

3) For input retailers selling hybrid wheat, by self-declaration. This is mainly available from the HKBs, and the state/coop stores in the east. For input retail of conventional wheat seed the data show the following. All the HKBs sell this seed. Again, there is a U curve from West to East of these sales by traditional shops, with high in the west and east and lower in center. Interestingly, we find the same U curve for the state/coop stores for share of stores selling wheat seed.

Chapter 4

Fertilizer Markets in UP

4.1. Background Context: Fertilizer Suppliers in UP from which Farmers can Choose

Farmers buy fertilizer from several types of outlets.

(1) PACS (one for around 8-10 villages in principal)

(2) State stores (mainly in district head)

(3) Traditional Private input stores

(4) HKBs, mainly, and some other RBHs such as ITC and Triveni

4.2. Farm Household Survey Findings and FGD Information regarding Fertilizer Use & Acquisition

4.2.1. Overall Fertilizer Use & Acquisition

1) Farmers are highly engaged in fertilizer markets: 91% of the sample bought fertilizer in the year before the survey (2008/9). There was no farm size bias – as all three strata had this high rate (90%, 92%, and 92% for marginal, small, and medium farm size strata). These rates held whether in the west, center, or east.

2) 79% of fertilizer transactions were of Urea and DAP. NPK was third at 7%, SSP fourth at 4%, MAP MOP at 3%, and others at 8%. These did not differ much over farm strata.

3) Farmers noted severe problems with fertilizer access (much greater than reported in our report on Madhya Pradesh). 47% of the farmers (unexpectedly, slightly correlated with farm size) felt timely access to fertilizer was a major bottleneck. For price, this was only 26%. Note that the severe problem of timely availability expressed by the farmers in the survey triangulates with that expressed by many input retailers in the input retail survey.

4) Also in contrast to our findings in MP, in UP farmers reported a big problem of finding fertilizer at MRP or below: 20% of the farmers so report (going from 20 to 17 to 25% as one goes from marginal to small to medium farmers). The differences over regions were less than we expected: whereas 17% of farmers in the west and 21% in the center could not find fertilizer at MRP or less, it was only a bit more (25%) in the east region. Surprisingly, the fertilizer problem is generalized across zones in UP – in sharp contrast to the situation in MP. Even the best situation in UP is worse than the worst situation in MP in terms of fertilizer supply.

5) The farmers reported that the IFFCO/KRIBHCO share of branded offer is 86% in the state/coop retail, 53% in HKBs, and 52% in traditional retail – and from 62% in the west to 41% in the east.

6) Perhaps surprisingly, we found (as we did in the MP) that farmers report similar shares of sales-unit sizes over the vendor types – with 91%, 84%, and 81% of the transactions in the three retail types (state/coop, HKB, and traditional retailer) in large sacks (instead of small and medium sacks).

7) When farmers did get fertilizer – they were happy with it. 95% for state/coop, 99% for HKB, and 95% for small shops, found the fertilizer satisfactory – and 94% in the west, 99% in the center, and 98% in the east, satisfied.

8) Farmers report that state/coop and HKB outlets sell above MRP only 16 and 18% of the time, respectively, while traditional shops do so in 58% of the transactions. Combined with the fact that the great majority of fertilizer purchases are from traditional shops, the "price problem" in UP is mainly due to traditional retail's pricing practices.

4.2.2. Focus on Urea (as the main fertilizer)

1) The marginal farmers pay on average 4% more for urea than do small and medium farmers.

2) 28% of the kg of urea bought by the sample was from state/coop retail (half the figure we found in MP), 11% from HKB (similar to the RBH share in MP), 33% from traditional retail (and 28% from a combination of sources). These results undermine strongly the conventional view in the area that "the state dominates the fertilizer market" – in fact the private market is clearly dominant in share.

3) The three main sources have ascending prices: from the cheapest, the state/coop stores, at 4.6 rs/kg, to the HKB, at 5, to the traditional stores at 5.2. As the marginal farmers shop closest, and where they can access (for non-economic reasons, as they explained in the focus groups that they had difficulties accessing the coop stores), they tend to shop mostly at the traditional stores, which have the dearest urea.

4) UP results are sharply different from the MP situation (shown in the companion report). In MP, the state stores and PACS dominated urea sales. By contrast, in UP study areas, marginal and small farmers buy only 13-14% of their urea from state/coop sources – while medium farmers buy 29% of their urea from these.

   Interestingly, the marginal farmers rely more (21%) on HKB than do on state/coop stores. Medium farmers buy only 6% of their urea from HKB (as they buy more from the state/coop stores which are 10% cheaper for the same urea).

5) Echoing the results for seed, we find that state/coop stores sell only 27% to the small/marginal farmers – and thus 73% to the medium farmers; note the similarity to the MP results. Again, as in the discussion of seed, while this shocks against conventional wisdom which sees the state/coop stores as dedicated, with their subsidized sales, to the poor farmers, the shares here roughly track the distribution of land to these different strata in the sample.

   However, HKB sales of urea are much more biased toward the marginal/small farmers (than are the state/coop stores) – with 67% of their sales going to these.

6) These empirical points about distribution of fertilizer to different farm strata had their echoes and explanations in the FGDs in the areas. The marginal farmers noted that when fertilizer is in shortage, larger farmers have preferential access at the PACS, with various ambiguous practices reported by the farmers. The small farmers are further constrained when fertilizer is in shortage because input retailers tend not to extend credit. (This was corroborated by our surveys.)

7) Farmers rank the traditional shops highest for proximity (at 40%) and timeliness, versus second place for the state/coop stores and HKB (with 15%). Quality assurance is highest at state stores and HKB and much lower in traditional shops, per the ranking.

4.3. Findings from the Input Retailers Survey, regarding Chemical Fertilizer Retail

In all the study areas, for the share of traditional stores selling fertilizer, there is a pronounced inverted U curve from west to center to east, with 25% on the tails and 60% in the center (where sugar production is most developed). By contrast, the great majority of the state stores sell fertilizer, as do all the RBHs.

Moreover, it is striking how important fertilizer sales are to stores selling fertilizer: for traditional stores, this is two-thirds to three-quarters; for HKBs, they are about 30-40% of input sales; for state stores, 90-98% in the west and center and 73% in the east.

While most of the stores carry the main types of fertilizer, the HKBs tends to have by far the most diverse offer of fertilizer types beyond the main types. Roughly second are the small shops (taken together), and last, and most focused, is the state/coop store.

Across vendor types, the main fertilizers are sold branded, in large units, packaged.

Chapter 5

Pesticide and Herbicide Markets in UP

5.1. Background Context: Pesticide and Herbicide Suppliers in UP from which Farmers can Choose

The options for the farmer to buy these chemicals are thus the following:

(1) Private traditional retailer

(2) HKB

(3) PACS (a narrow range)

(4) State stores (a narrow range)

5.2. Farm Household Survey Findings Regarding Pesticide and Herbicide Use & Acquisition

5.2.1. Farm Chemicals in General

1) A surprisingly high - 66% for the sample and 61% for population-weighted overall – of the of the sample bought farm chemicals in the year before the survey (2008/9). (Compare this with our finding of 88% in MP.)

2) Chemical market participation rises with farm size: 53%, 74%, and 86% for marginal, small, and medium farms – and in an "inverted U" relation going from west to east: 61, 73, and 54% of households in the west, center, and east regions, buy some chemicals. This may be correlated with both input-purchasing power, size of average farm, and crop mix (with more horticulture and sugar cane in the first two regions.

3) 91% of the market is for pesticides and herbicides (53% for pesticides, 38% for herbicides), with only 7% for fungicides and 2% for Plant Growth Promoters.

   These high shares and their distribution over all zones and strata show how advanced the diffusion of chemical use has been. Our understanding from key informants is that this was much less even five let alone 10 years ago.

4) The farm chemicals market appears easily accessible: 91% of the farmers felt that they could "always or usually find chemicals sold at MRP."

5) The Focus Group Discussions (FGDs) dealt with chemicals in general. With respect to quality and branding, the general feeling was that larger farmers were more aware of brands, and could tell easier (than the many illiterate poorer farmers) whether at least the labeling was fraudulent (some small change from the authentic). HKB was associated with better quality of product sold. The farmers noted that there is large price variation for the same product over stores (within and between retail categories) and locations in the market, and also over months, with the prices shooting up for a given pesticide when it is most needed.

5.2.2. Focus on Pesticides

1) 50% of households bought pesticides (46% population-weighted), with strong correlation with farm size (38%, 57%, and 71% over the farm strata).

2) The price for those who bought pesticides was sharply lower for the marginal than for the small and medium farmers. But it is hard to interpret this, as it masks a mix of composition effects and possibly price differences per product over farmers and retailers.

3) Only 3% of the farmers buying pesticides do so at state/coop stores, a very minor source, versus 30% from RBHs (nearly all HKBs), and 64% from traditional shops, and only 1% from processors (mainly sugar processors that buy cane and sell pesticides to the farmers).

4) The derived price per liter of pesticide is about 10% lower at the HKB compared with the traditional

shop. But again, it is difficult to interpret this for the reasons noted above.

5) Interestingly, there is an inverted-U curve for reliance of farm strata on the HKBs for pesticides, with 27% in liters (but 25% in rupees outlay) for the marginal farmers, and then 34% in liters (but only 16% in rupees outlay) for the small farmers, and then dipping again to 26% in liters (but 28% in rupees) for the medium farmers. The difference between liter and rupee share tell a tale: for the medium farmers, that the physical share is lower than the value share suggests the medium farmers go to HKB for higher-value pesticides, and clearly the marginal and small go to HKB for commodity/ cheaper pesticides – perhaps offered at prices below those of traditional shops. This suggests there is a Porter-type market segmentation.

6) More even than in seed or fertilizer, the state/coop categories focus (83% of sales) on the medium farmers when selling pesticides, with only 17% to small and marginal farmers.

7) By contrast, HKB sells 40% of its pesticide to marginal and small farmers. This means they just have a match of share of sales to this group and the share of that group in land in the area, as noted in chapter 2. The share of their sales in liters (40%) is much more than in rupees (24%), underscoring that they are selling the smaller farmers the cheaper pesticides. By contrast, the reverse is true for the medium farmers, showing HKB are selling the more expensive types of pesticides to the medium farmers. This reveals again a Porter-type product differentiation strategy. By contrast, the traditional shops sell about 35% of their pesticides (in rupees and in liters) to the marginal and small farmers.

8) Proximity of vendor is more important for marginal and small than for medium farmers. The reverse is true for quality assurance.

5.2.3. Focus on Herbicides

1) 39% of the sample (and 35% population-weighted) bought herbicides. Herbicide use is sharply correlated with farm size: 51% and 58% of the small and medium farmers in our UP sample buy herbicides – versus only 26% of the marginal farmers. These herbicide market participation rates surprise us for UP – where we had expected hand weeding by cheap labor, the traditional scenario, to prevail. It is probable that the same factors causing herbicide diffusion in other parts of Asia are also those driving it in UP (and MP)– rising opportunity cost of time from off-farm employment, and need to intensify production.

2) As with pesticides, very few farmers (1%) buy herbicides at state/coop stores, 29% at HKBs, and fully 60% at traditional stores.

3) The herbicide price per liter in the HKBs is about 10% above the traditional store. This might reflect a quality and/or type difference. Despite this higher price, marginal farmers rely more for their herbicide expenditure (36% of rupees spent) on HKB than do small and medium farmers (18-25% of rupees).

4) The data show that HKB – and small shops – sell about 30% of their herbicide to small/marginal farmers. But again, this is not far off the land share of these groups combined with their herbicide use rates. That is, HKB and small shops are simply tracking the market, neither more nor less regressive compared with demand.

5.3. Results concerning Pesticides and Herbicides from our Input Retailer Survey

1) About two-thirds of traditional shops (with some decline west to east), all of the HKBs, and none (in the sample of our input retail survey) of state/coop stores, sell pesticides and herbicides.

2) Unlike the case of seeds, the two main retail types for chemicals are selling a range of unit sizes, with perhaps a small bias toward larger units in the HKBs.

3) Regarding retailers' practices selling animal husbandry inputs, the main findings is the very small set (7, 9, and 2% over the three zones) of traditional shops selling these inputs (we did not interview vet med shops); all the HKBs sell these inputs.

4) A small set of traditional shops and state stores, and most of the HKBs, sell equipment.

Chapter 6

Financial Services Markets

6.1. Background Context: Financial services providers in UP from which Farmers can Choose

1) Since the late 1990s, NABARD (the National Bank for Agriculture and Rural Development), in consultation with major banks, has implemented a scheme, called the Kisaan Credit Card (KCC), to provide credit to farmers for farming purposes. Only those farmers that operate land are eligible. The KCC can now be got from PACS, Nationalized banks and Regional Rural Banks. Through the KCC, the banks give the farmers loan at the beginning of the crop cycle, which they are supposed to repay at the end of the cropping cycle, so they can get a loan once again at the beginning of the next cropping cycle. Note that the farmer can have access to a certain loan amount, but not necessarily use that amount.

2) Another source of credit, at least in theory, in the formal sector is direct loans from commercial and other banks, for agricultural or non-agricultural purposes.

3) Another source of credit is from the "informal sector"- the money lender or family members.

6.2. Survey findings on Access by Households to Credit and Supply of Credit by various Actors

6.2.1. Credit: Focus on KCC, Household Survey Findings

1) There is substantial KCC ownership, but with sharply regressive distribution (as we also found in the MP results). 30% (but only 26% population-weighted) of the households own (but do not necessarily use in the past year) a KCC. There is a very sharp farm size bias – rising from 17% of marginal farmers to 58% of medium farmers. Compare this with our finding in MP of 45% of the sample owning a KCC.

2) Ownership of KCCs falls as one moves from the west zone (where 35% of the farmers have a KCC) to 27 and 29% in the center and east zones. Also, in the west, the share of marginal/small farmers with KCC is higher than in the other zones.

3) 49% of the sample (and 44% of the true population) got their KCCs from nationalized banks (similar to our results in MP). As we found in MP, in UP the share of smaller farmers getting their KCC from nationalized banks is smaller than that of larger farmers: it goes from 41 to 55%. Very unlike the MP (where cooperative societies are a more important source), only 5% of the farmers got their KCCs from cooperative societies. Again at odds with findings in the MP (where regional rural banks are less important for KCCs) we find that fully 33% of the farmers get their KCCs from regional rural banks. As in UP, private banks are minor, only 5% for the sample.

4) There is sharp inverted-U curve shape for reliance on nationalized banks for KCCs as go from west to east, and sharp U curve (as one goes west to east) for regional rural banks. Private banks are sources only in west. The cooperative society is equally small-shared over zones.

5) The yearly limit on loans on for KCC owners is reported by the farmers to rise from 31,000 rupees (about 700 USD) for marginal farmers to 112,000 rupees (about 2500 dollars) for medium farmers – a 3.6 to 1 ratio over farm sizes, only a third of the farm size difference over the strata.

That is thus somewhat compensatory of farm land distribution.

6) For actual use of KCCs, the shares over the three farm strata rise quickly with farm size – frm 14%, to 26, and to 46%. While in MP we found that smaller farmers actually used the cards they owned but the larger farmers tended to hold them but use them much less, in the UP we find that 80% of the (few) farmers who own also use the KCC. For cards used, the owners used up to 80% of the card limit. Moreover, the share of farmers actually using the KCC drops from 27 and 29% in the west and center to 18% in the east.

7) For loan drawdowns via the KCC system, the marginal farmers drew 92% of their funds from nationalized banks and regional rural banks in equal shares. For small farmers this is 52% from nationalized banks but only 26% from regional rural. The medium farmers rely most on the nationalized banks at 59%, with only 29% from regional rural banks.

8) KCC payout is biased toward medium farmers (away from small/marginal farmers). We figured total rupees of KCC payout received by the sample by credit source from household data, and found striking results. The Nationalized Banks' payout on KCC is sharply biased toward the medium farmers – with 77% going to them, and only 22% to marginal and small farmers. The other major player, the regional rural banks, are not far from that: 72% go to the medium farmers. This means that for the two KCC sources, the payout is disproportional to the share of medium farmers in total land in the sample (about 75% payout share versus 60% land share).

   Moreover, KCC payout is sharply biased toward the west zone (with 51% of regional rural bank all-zones' payout) and center zone (with 53% of all-zones' payout). The east got a disproportionately low payout of each (while it is a third of the sample, it received 12% of the nationalized bank payout and 25% of the regional rural banks' payout (but depended for half its KCC credit from the latter).

8) Focus Group Discussions for credit focused on small farmers' problems getting KCCs. Small farmers told us: (a) banks try to avoid them because of high risks; (b) they felt there is an "unwritten norm" of a threshold of 2 ha for a loan; (c) they are concerned about taking the risk of borrowing even via the KCC as they fear their land will be confiscated if they cannot pay back; (d) they feel that one cropping season is too short to pay back the loan; (e) they felt there are too many procedural hurdles to getting the loans. (f) Yet they feel that KCC has become a key supplier of credit to farmers.

6.2.2. Overall Credit, Household Survey

1) Overall only about 28%, 31%, and 14% over the three regions received credit in the past year. There is no clear pattern over farm strata that holds over regions. In the west, there is a sharp inverted U curve over farm size strata; in the center, a rising share, and in the east, a sharply falling share of farms taking credit.

2) Interestingly, the nationalized bank (mainly via KCC) lends 56% of the total borrowings of the sample; regional rural banks lend another 27%, again mainly via KCC. This means banks are supplying fully 84% of the credit.

   By contrast, money lenders – which are by far the most widespread in terms of presence in the villages (per our village survey), and often believed to be very important in credit markets – only lent 2% of the funds actually borrowed by the sample (although they accounted for 11% of the credit transaction events, hence there were many small loans). Input retailers provide only 1% of the credit used by farmers. Private banks (not lending via KCC) were minor: 10% of the credit. These results are similar to what we found in the MP study.

   Another way to see the relative (non-)importance of the moneylenders is to compare their share (13%) of the credit received by marginal farmers

(even though they are 30% of the transactions of credit, hence many small loans) with that of the share (87%) of KCC borrowings by marginal farmers in their total borrowings. KCC is far more important to marginal farmers than money lenders, despite the constraints they face getting KCCs. A similar story is shown by the data for the small farmers.

3) We find marginal farmers pay much higher interest rates for their credit: 19% vs 7 and 8.5% for other two strata; this higher rate is inversely related to their KCC access. 79% of the transactions were reported by farmers as believing that they are using land as collateral. (We did not do survey with lenders to check whether this is just perception of farmers or reality or both.)

4) Farmers expressed, in the Focus Group Discussions, that they try to avoid borrowing from the informal channel (whether village money lender or trader). The farmers said that the informal lenders rates are much higher, and variable (and difficult to calculate if it is "hidden" in the traders price), and it ties the farmer to the trader. Finally, the farmers felt that lenders compete for the larger farmers, but eschew the marginal farmers.

5) Most credit is used for farm inputs - from 85% in the west to 92% in the east. Very few (summing over all types to only 15%) of the transactions of credit were for other purposes (land, livestock, farm equipment, other equipment, health, education, and others).

6.3. Data on Credit Provision by Input Retailers and Crop Wholesalers to Farmers

1) Data from the input retail and grain trader surveys counters conventional wisdom that these are important sources of credit to farmers – rather, they are very minor.

2) Only 9% of grain traders provide credit to farmers– and that actually declines from 13% in the west to 7% in the center then 5% in the east. The loans in the west are mainly for inputs, and the east, for social/educational purposes. But even these small numbers mask how very small the coverage of these loans are – only 6% of the traders' farmer suppliers in the west, and 2 and 3% in the other two zones, get loans from the traders. **This works out to less than 1% of the UP farmers getting loans from traders**.

3) Grain traders also extend very little credit to their (mainly retailer and also other traders) clients: 3, 7, and 2% over the three zones – 4% in all.

4) Input retailers extend credit – 59% of them in the west, 50% in the center, and 36% in the east. In those zones only traditional and state/coop stores extend input credit. But for the 48% of input stores providing input credit – they do so to only 12% of their client. That means that 6% of farmers buying inputs in UP (in our sample areas) get credit from input retailers. This again destroys conventional wisdom that input retailers are heavily engaged in credit to clients. Many supply a very little.

6.4. Insurance and money transfers

1) 24% (near to that of MP) of the farmers bought life insurance in the past 12 months before the survey (about the same in all zones) – with a sharp correlation with farm size. The most important provider of life insurance in rural UP is by far LIC (79% of the transactions).

2) Weather- and crop insurance is bought by only 2% of the farmers - mainly in the west and center, and mainly by medium farmers.

3) Money transfers are used by only 2% of the farmers in the last 12 months.

Chapter 7

Use of Extension and Technical Assistance by Farm Households

7.1. Background: Extension services providers in UP from which Farmers can Choose

In the public and cooperative sector, extension is provided in several ways:

(1) UP Agriculture Department via village extension officers;

(2) All-India Radio and TV; the government broadcasts "Kisaan Vani";

(3) KVK (Krishi Vigyan Kendra, or Farm Science Center);

(4) Extension agents of the Plant Protection Unit (PPU) of the Ministry of Agriculture;

(5) IFFCO extension;

(6) ATMA (Agricultural Technology Management Agency);

(7) "Kisaan Melas" or crop fairs organized by the government.

In the private sector there are various sources of "extension" and training, including:

1) Input companies, such as DSCL, Bayer or Syngenta, that send agents to villages;

2) Processing companies;

3) Traditional input retailers giving advice;

4) HKB and other RBHs;

5) Donor projects and NGOs;

6) Other farmers.

7.2. Farm Household Survey Findings regarding access to Extension & Technical Assistance in UP

1) The survey shows that a mere 18% of the households used extension (from any source, public or private) in the past year. The rates differ greatly over regions: 18% in the west, 30% in center, and 7% in the east. Compare the 18% we find in UP with the 80% we found in MP.

2) If farmers did not use extension, only 24% on average (and only 18% in the east) said it was because they did not need it. Rather, the main reason (48% on average but 53% in the east) said it was because they were unable to find extension at the right time. (Compare that with only 29% as that reason in our study on MP). There appears from these data to be a large problem with farmer access to extension in UP.

3) Striking is that only 20 and 16% of farmers found extension "always" or "usually" available. (Note that this is half the rate that we found in MP.) This declined a bit – but not much – as one went from west to east region. By contrast, there was revealed a strong problem of large numbers of farmers who wanted extension and it was not available – gone from a third in the west and center to more than half in the east. (Compare this to 10% in MP found in the survey there.)

4) Marginal farmers access extension less than do the two other strata: 15% versus 21%. Farmers reporting "extension service not available" declined from 44% among the marginal farmers, to 35% for each of the small and medium.

5) RBH users do not fare better on extension access. In 2009, 21% of RBH users got any extension versus 15% of non-users.

6) Timeliness arose as the main bottleneck – declared by 50% of farmers over all zones. Also, quality of extension was considered a bottleneck again for about 30% of the farmers. Keep in mind that this pertains to any type of extension, private and public.

7) As to theme-categories of extension used, "general advice" is most cited – for 45% of the farmers, similar over regions. Of the more specific needs, only "new seed varieties" (at 12% of farmers' uses of extension), fertilizer (at 17%), and disease problems (11%) stand out. The share citing fertilizer as goal of visiting extension was, at 32%, much higher in the east, as were new seeds and diseases as reasons in the west. The other reasons– irrigation, soil

problems, weather problems, marketing problems, and help getting credit – were very minor.

8) For the few farmers who actually got extension advice, the satisfaction rate was fairly high – from 75% in the west, to 86% in the center, to 98% in the east. Keep in mind that this is for ALL types of extension, private and public. Satisfaction rate was similar over the three strata for those who got extension – 81, 91, and 83%. We had expected the marginal farmers to be much less satisfied. Thus, the main issue seems to be access – apparently not quality (from whatever combination of public and private sources they use).

9) Of total uses of any extension, **only 10% were from state extension officers in the west, 4% in the center, and 9% in the east – only 7% overall**. This is in sharp contrast with the findings in MP (37%). This minority of use is sharply different from conventional wisdom that equates "farmer extension use" with "consulting the state extension officer."

10) Other public-sector extension sources that together rival the state extension officer per se. Other public extension services (KVK, All-India Radio, university extension, plant protection unit) together equal 18%.

That means that of the little extension accessed by farmers in our sample areas of UP, only 25% is from the public sector. (Compare that with our finding of 65% in MP.)

11) The other 75% of extension comes from the private sector. The most important include: (a) the private input companies that are promoting their own products (like Bayer, Syngenta, and so on), at 17% of extension occurrences (by far highest in the west): (b) HKB itself, at about 19% (highest by far in the east region, where other options are limited), and other RBH companies (like ITC) providing another 5%; (3) Processing companies (mainly sugar companies) extension agents provide the largest amount, 25% overall – and mainly in the center where they form 40%.

12) Marginal farmers depend less (than the medium farmers) on agents from fertilizer companies and other companies promoting their products, much less on HKB (14% versus 24% for medium farmers), and far more on extension agents of sugar companies (twice as much the medium farmers). These differences appear to reflect that input companies and RBHs target (on purpose or de facto) their extension services to the medium farmers, while the sugar companies appear to target more the smaller farmers in their extension.

13) Focus Group Discussions noted that farmers usually use government extension agents for information about availability of agricultural inputs, and that farmers tend to trust the advice of KVKs and universities. Large pesticide companies come at the start of the season, and at the launch of new products. HKB extension is available throughout the season, but the farmers said the reach is limited. From input retailers and other farmers one generally gets information about crop spraying; from the media, about pests and diseases, and general farm advice; from KVKs and universities, about varieties and production practices; from HKB, production techniques. The most common information from any extension is for spraying of chemicals and pesticides. The farmers felt there is a dearth in quality of extension services regarding new practices for enhancing productivity, new varieties, and scientific planting techniques.

7.3. Input Retail Survey Findings regarding access to Extension in UP

1) All the RBHs reported that they provide extension advice. For the traditional shops, about 80% in the west and center zones and 50% in the east reported to do so. For state/coops stores, the share providing extension advice declines from 100 to 67 to 33% as one goes from west to east. Only the RBHs are providing demonstrations and specific advice, while the others tend mainly to provide general advice only.

2) Regarding retailers' assisting input companies with input promotion, about a third of state stores and small shops report doing this, while half of the RBHs thus report.

3) Half the state/coop and traditional input retailers in all zones report that they get "extension" from input manufacturers, while a third of RBHs do. Basically only small shops get "extension" from input wholesalers. From universities and the state, a small share of each group reports getting some "extension."

4) The survey showed that half of traditional shops reporting getting "promoters" from input companies; this is only a third for each of the other retail categories. 30% of the traditional shops get credit from input suppliers, a fifth of state stores do, but no RBHs do.

Chapter 8

The Dairy and Livestock Husbandry Input Markets in Uttar Pradesh

This analysis does not include RBH firms because at the time of the survey (2009) no RBH had begun sourcing milk from farmers in Uttar Pradesh – a situation that then changed with the HKB dairy initiative in UP and Rajasthan in 2010.

8.1. Background Context: Milk buyers in UP from which Farmers can Choose

There were four main channels of farmers' sale of milk in 2009:

1) Direct to neighbors;
2) To the local broker (collector or "dudhya");
3) To local sweet shops;
4) To cooperative dairies;
5) To private sector milk processing companies.

8.2. Farm Household Survey Results Concerning Milk Marketing by Households to Various Buyers

8.2.1. Overview of Livestock holdings and Milk Output by Farm Households in study areas

1) The shares of farms with any livestock are 86%, 78, and 62% going from west to east.
2) The shares of farms with milch animals goes from 69% to 55% and then drops to 39%, going west to center to east region. Cattle are more limited: from 44 to 55 to 35% of farms from west to east, and buffalo, from 75% to 46 to 35%, and goats, from 9% to 10, to 12% from west to east. Livestock per farm also drops fast from 3.2 to 1.9, west to east, and number of cattle, from 1 to 1.2 to 0.7 from west to east, and buffaloes, from 1.9 to 0.9 to 0.7 from west to east.

   The overall pattern is thus that the more developed west and center have much broader livestock ownership (and more milch animals) than the poorer east.
3) The survey shows rapid growth in livestock holdings over the five years before the survey. The shares of farms with livestock jumped from 64% to 86 (35% increase) in the west, 61 to 78 (28% increase) in the center, and 55 to 62% (13% increase) in the east. By far the fastest growth being in the west, is striking: for cattle 52% jump in the west, 22% in the center, and only 6% in the east. For buffalo the jump was also striking: 41% in the west, 23% in center, 16 in the east.
4) Most milch animals over the zones are buffalo cows; interestingly, the share of buffaloes in milch animals is highest in west, at 75%, down to 59% and 69% in the other zones. Cross-bred cows are rare in the zones, from 12% of milch animals in west to 8% elsewhere.
5) The share of cows received as gifts rises from 5% to 7 to 11% as one goes from west to east, and share born from own stock rises sharply from 41 and 29% in west and center, to 53% in east.
6) Loans for livestock purchase are rarely used in the west (8%) and center (3%) – in contrast to a more important share in the east (21%).

   Interpretation of patterns: The strong preponderance of use of own-funds for livestock purchase, and the stronger commercial agriculture and nonfarm employment of the west and center zones, may be linked to the rapid accumulation of livestock in the west and center in what appears

to be a self-re-enforcing dynamic. The far slower herd growth in the east, the greater reliance on gifts, own stocks, and loans to build it, and the less dynamic eastern region's economy, point to a more limited livestock sector development and a traditional animal husbandry sector in the east. This regional dichotomy will continue to deepen as we discuss dairy markets and livestock husbandry input market development in the regions.

7) Natural insemination is still by far the most common over the zones. Interestingly, artificial insemination is actually slightly more present in the more traditional east (but only at 11%) versus 6 and 10% in the other west/center zones.

8) Overall, for the UP sample, milk production from cross-bred cows in the flush period amounts to 9.5 liters per day. This is much higher in comparison to 4.5 liter per day for the indigenous cows and 6.9 liter per day for the buffalo. During the lean period production halves compared to the flush period: production drops to 4.3 liter per day for cross-bred cows, 2.3 liter for indigenous cows, and 3.2 liter for buffaloes.

   Aside: (That large drop in milk output in the lean season, combined with it not being storable (hard cheese is not used), and is not brought in from other areas (as market is not developed), would suggest a potential protein nutrition problem for both children and adults in an area where dairy is large part of protein.)

8.2.2. Marketing of Milk by Farm Households

1) Given more milch animals, combined with yield differences, the average milk sale by the milk producer in the west is 14 liters, or 1.5 times that of the center and 2.5 times that of the east.

2) For just milk-producing farms, the outputs over farm size strata are 7.6, 10.6, and 15.3 liters/day, hence an output gap of 2:1 over strata; and sales are 3.9, 5.9, and 6.4: hence a sales gap of 1.6 between medium and marginal. The flattening we see comparing the ratio of medium to marginal farms in output versus in sales, is due to an – unexpected – reduction in marketed surplus rate from marginal/small to medium farms – with the marketed surplus (sales/output) going from 51% to 56% to 42% from marginal to medium farms, among farmers milking. This implies an income strategy to compensate for smaller land size.

3) The share of farms selling milk in the three zones was 49%, 17, and 17; compare this with the ownership of milch animals over zones (69% to 55% to 39%). The ratio of sellers to owners is 71%, 31%, and 54% from west to east.

4) The marketed surplus rates per average farm with milch animals, from west to east, are 61%, 20%, and 56%. That the share of marketing (over farmers with cows, and per farmer) is so much higher in the west was anticipated: but surprising was that share of farmers selling is much lower in center than east. This implies an untapped marketed surplus. (This latter finding encouraged HKB to set up dairy operations in the center zone in 2010.) The table shows the immensely larger – nearly 6 times larger - milk market existing in the west region compared to the others (with sample in the west producing 70% of all milk produced in sample in three zones).

5) The most traditional market channel – selling to neighbors, is only 8% in the west, and 23% in each of the other zones.

6) The traditional channel "dudhiya" or local collector/broker, is the one to which 78% of the milk transactions are made in the west, and only around 55% in the other zones.

7) Sales to milk coops are very minor – none in the west, then only 3% of transactions in the other two zones.

8) Interestingly, the share of transactions going to "private dairies", a modern channel (like Parag or Gopaljee) increases from 8 to 10 to 13% of transactions going from west to east. "Contractors", also work for private dairies, and are found only in the center, at 3%.

9) The marginal farmers rely twice as much on sales to neighbors as other strata do. But the dudhiya is still by far the main buyer for the marginal farmers. Cooperatives only buy from the small and medium (not the marginal). But the most striking difference over strata is the importance of private dairies, which account for only 3% of the transactions of the marginal, but 18 and 9% of the small and medium farmers. There is a definite farm size bias in modern channel participation.

8.3. Purchase of Livestock Husbandry Inputs by Farm Households

1) It is striking how very small the fodder and feed market is in the UP. Our survey showed that a mere 4% of farmers bought green fodder in the west, descending to 1% in the east. Dry fodder was more important, but mainly in the west – and still at only 18% of the farmers, dropping to 9% in the other zones. Concentrates (feed) involved but 12% of the farmers in the west, and 4% in the other zones.

2) Both green and dry fodder tend to be more bought by the marginal, then small, and least by the medium farmers. By contrast, as one would expect, the order is reversed for feed concentrates, with the medium farmers buying a greater share.

3) The share of transactions where the feed/fodder is bought from the most traditional market channel - "other farmers" - rises fast from 30 to 66% as one goes from west to east. The opposite holds for retail stores, from 62% in the west, to 33% to 27%. Other sources are very minor – with coops, private dairies, and feed companies with 4% among them, and RBHs (HKB mainly) at only 2% of transactions (and that mainly in the center, and a little in the west, none in the east).

4) As expected, the share from "other farmers" drops quickly over strata: 49% by marginal farmers to 27% by medium farmers; the opposite (but not as strongly as we had expected) held for retail stores: from 42% among marginal farmers, to 58% among medium farmers.

5) The share of households having bought vet care declines from 38 to 24 to 29% as one goes west to east. Recall that the shares of households with livestock went from 86 to 78 to 62% over the three zones, so roughly 40%-50% of the farmers who had animals got vet care for them.

6) By far the most common (50%) vet care expenditure was for vaccination for foot-and-mouth disease (at half of vet care transactions, rising as one goes from west to east), with other vaccinations (hemorrhage septicemia and unknown vaccinations) only 24% of vet care (going from 35% to 9% over the zones). Purchases of antibiotics are very little (only 4% of transactions, least in the east), as are de-worming meds (only 1% of the transactions). Surprisingly, both artificial and natural insemination outlays are few (at only 3 and 4%, and mainly in the center and east). Finally, general animal health checkups are practiced little – (they are 7% of vet care transactions). The picture emerging is that aside from vaccinations, farmers make very few purchases of vet meds and other services.

7) By far (66%) the main vendor of the vet care services are government vet centers – and that is so for all ones. Second in line are private vets, responsible for 25% of the vet care transactions (actually rising from 23% in the west to 34% in the east). The latter could indicate some supply constraint for government vaccination services in the east.

8) We expected vet care to be a "luxury good", and show a steep increase along with farm size – but instead we found that the rise was modest: from 25% of marginal farmers to 36% of small and medium farmers. There was a slight negative correlation with farm size for the "commodity" vaccination, for foot-and-mouth disease, and a small positive correlation with farm size for "differentiated product" vaccinations. The was a sharp correlation with land size for antibiotics and artificial insemination, hence modern inputs/practices.

Chapter 9

Crop Marketing by Farm Households and Output Procurement by Wholesalers

9.1. Background: Procurement service providers in UP from which Farmers can Choose

There were four main channels of sale for paddy (raw rice) and wheat:

1) the local field-broker (collector);
2) the commission agents in the mandis in rural areas;
3) processing companies (such as ITC)
4) seed companies (among these are, to a limited extent, HKB itself, among others)
5) direct to traditional retailers
6) direct to consumers.

For sugarcane, another key crop in UP, the sales are to

1) large sugar processing companies.
2) Local small-scale processors
3) Mandi
4) Local retailers

9.2. Farm Household Survey Results Concerning Output Marketing by Households to Various Procurement Actors

9.2.1. Overview of Marketing of Crops by Farm Households in the study areas

1) Most farmers in study zones are at least semi-commercial farmers (sold some of their crop) in all three zones: those shares are 73%, 78, and 58 over the west, center, and east zones. (Compare this with 92-96% in our three study zones in MP.) Seen from share of farmers, marginal farmers are mainly semi-commercialized/semi-subsistence (only 52% sell crops), while small and medium farmers are really commercial farmers (85% and 97% sell crops).

2) Seasonality of cropping becomes sharper as one moves west to east, correlated with lessening irrigation coverage: share of farmers selling in dry season (rabi) drops 60 to 55 to 45%. Irrigation and farm size are strongly correlated: 33%, 67, and 84% of the farmers over the three strata sell in the rabi season.

3) Average (zeroed-out, thus including the zeroes of non-sellers) crop sales income is about 73,000 rupees (about 1600 USD) and 90,000 (about 2000 USD) for the west and center, and only 22,000 (500 USD) in the east. The average (over all farms, thus confounding sales and market participation) is 1400 USD – compared with 2900 in our MP study.

4) Total crop sales per farm climb by a factor of 20 over the three strata – 4 times more than in our MP results – and 4 times more than the average farm size difference over strata. This can be accounted for by four things: bigger farms, more multi-cropping (more seasons per farm), a higher marketed surplus rate per selling-farm, a greater share of farms selling, and higher grain yields on medium farms (shown below).

5) For all zones taken together, the market is very product-concentrated - the average sales per household is nearly the same over paddy, wheat, and sugarcane, and together 77% of the crop market. Potato is by far the most important vegetable and has only 11% of total sales. Thus,

to now, there is still only minor horticultural diversification in these regions.

6) The above general picture masks large differences in crop mix over the regions. Crop diversification (away from rice/wheat/sugarcane) is by far highest in the west and the east, at 39 and 31% of sales. Sugarcane is by far most important in the center, at 42%, and minor in the others. Paddy is much more important in the east (at 41%) compared to 22 and 27% in the west and center. Wheat has about a quarter in all zones.

7) Interestingly, while there is some farm size bias in crop composition – it is small. The share of rice falls somewhat with farm size, and the share of wheat and sugar rise, a bit. The share of sales from potato however jumps from 4% for the marginal farmers to 12-13% for the others, and the opposite for other crops. But the "diversification crops" share only changes from 16% to 20% of sales as farm size increases, not a large change.

8) Barter is nearly extinct; markets are monetized. 91% of transactions (compared with our finding of 99% in MP) are in cash (not in kind or barter). Payment by check is for 5% of transactions, and 3% of the transactions partly in kind (barter) (increasing with farm size).

9) Smaller farmers are paid sooner (by buyers) than are medium farmers, with 77% of marginal farmers paid on the day of sale, followed by 74% of small farmers and 70% of medium farmers. Nearly all the rest were paid in few days to a week after sale – the transaction cycle.

10) Input credit advances are nearly extinct. Input advances (traders paying farmers some at the start of season to help them finance inputs) are extremely rare – 2.7% overall (note that our MP study showed this to be 1%), and even only 2% of the small/marginal farmers' transactions had input advances attached to them (versus 5% and 3% for small and medium). **This again underscores that there is little support for current day existence of tied output-credit markets in these study zones (just as we found for MP).**

9.2.2. Wheat output and sales by Farm Households in the study areas

1) Wheat area per household is sharply different between the west and center regions (1.17 and 1.37 ha) versus the east (0.73 ha). Yields between these two regional sets differ as well: 3.05-3.33 tons/ha versus 2.33. The population-weighted average tracks government statistics.

2) At odds with conventional wisdom that smaller farmers have higher yields, we find yields go up with farm size: marginal farmers have wheat yields of 2.07 tons per ha, followed by 3.09 for small farmers and 3.40 for medium farmers.

3) Shares of farmers selling wheat rise fast from marginal to medium farmers, 27% to 74%.

4) While 31% of the farms sell to local village brokers– the "traditional image" of where grain is mainly sold when it first leaves the farm - only 19% of the wheat is sold to them. By contrast, while 45% of the farmers sell to wholesale markets, 53% of the wheat is thus sold; 15% of the sample sells to local retailers (haats) but 16% of the volume goes there.

5) Marginal farmers sell 45% of their wheat to rural/village brokers (collectors); this plummets to 23% for small farmers and 16% for medium farmers. By sharp contrast, 38% of marginal farmers' sales of wheat are to wholesalers on mandis: versus 51 and 53% for the other two strata.

6) Interestingly, while marginal and small farmers dominate in numbers, they are minorities in the market – where medium farmers dominate volumes. The village collectors buy fully 63% of their wheat from medium farmers – and 18% from each of the small and marginal strata. The mandi wholesalers (who source 80% of their wheat directly from farmers, per our trader survey) buy 80% of their farmer-sourced wheat from medium farmers.

7) Input credit/advances from wheat traders to farmers are nearly extinct. As noted for all crops, for wheat, there is extremely little credit supplied

at start of season – only 3% of the transactions get it, and that is actually increasing in farm size (from 2 to 4 to 3% over the strata). This adds to our data exploding the myth of the prevalence of tied credit-output relations.

8) Speed of payment differs little over wheat market channels. 85% of the transactions with the collectors, 80% with wholesalers, 77% with local retailers, were paid the same day.

9.2.3. Output and Marketing of Paddy (Raw Rice) by Farm Households in the study areas

1) Paddy area per household is sharply different between the west and east (with only 0.65 and 0.73 ha per farm) and the center region (with 1.21 ha). At odds with conventional wisdom that smaller farmers have higher yields, the data show paddy yield is correlated with farm size: marginal farmers have 2.68 tons per ha, 3.47 for small farmers and 3.71 for medium farmers.

2) Shares of farmers selling paddy goes up rapidly from marginal to medium farmers, from 29% to 81%. Medium farmers sell 8 times more paddy than marginal farmers. But paddy prices are similar over farm strata, about 7.6-7.8 rs/kg.

3) Most paddy is sold direct to mandis. While 41% of the farms sell to local village brokers, only 23% of the paddy is thus sold; While 36% of the sample sells to wholesale markets, 48% of the paddy is thus sold; 13% of the sample sells to local retailers (haats) but 14% of the paddy volume goes there.

4) As with wheat, marginal paddy farmers tend to sell "the old way" - to village collectors, and other strata mainly sell straight to the mandi. Marginal farmers sell 49% of their paddy to village collectors; this drops to 32% for small farmers and 18% for medium farmers. By contrast, 32% of marginal and 35% of small farmers' sales of paddy are to wholesalers on the mandis: versus 53% for the medium farmers.

5) There is a fascinating story of paddy market concentration – but from the supplier's (farmer's) side– a point seldom if ever made in the literature. Although marginal and small farmers are prevalent in the population, paddy traders buy the bulk of their paddy from … medium farmers: village collectors buy 59% of their paddy from medium farmers – and 20% from each of the small and marginal strata. The mandi wholesaler sources fully 85% of the wheat that he buys direct from farmers, from medium farmers.

6) As for wheat, for paddy, there is extremely little credit supplied at start of season – only 3% of the transactions get it, and that is increasing in farm size (from 2 to 5 to 2% over the strata).

9.2.4. Output and marketing of sugarcane by the farm households

Average output (zeroed-out averages) is far higher in the center z1) as expected. The data show that sugarcane is by far a medium farmer's crop – far less the domain of the small and marginal farmers. It is sold mainly to large processors, and in minority to informal processors.

9.2.5. Marketing of Crops by Farm Households: Focus Group Discussion Insights

The focus group discussions noted that the MSP (minimum support price) for wheat announced by the government in the year of the survey was Rs. 1080/ quintal – but almost all the farmers in the discussion groups complained that they were selling wheat at about Rs. 900-950/quintal at the mandi. Farmers also complained that selling at the mandi was costly in time: they said it usually took about 12 hours after arriving at the mandi during peak season. They also explained that there are "hidden costs" associated with marketing at the mandi.

9.3. Insights from the Trader Surveys

1) The auction system is used by only 35% of the traders (compare that with 50% in our MP study), declining rapidly as one goes from west to east, from 55 to 16%. In the direct system (without use of an auction), the supplier is present only 23% of the time.

2) 82% of the traders weigh just manually, not electronically. 82% report sampling the grain for quality. The majority (78%) say the price varies over the day of transactions, and only 19% say the price is a single price over the day.

3) Few traders collect grain from farmers in their own trucks (only among 9% of traders). Very few (4%) grade and sort for farmers and then buy by grades. 58% of the traders deliver to buyers, and that mainly for small retailers and less for large processors. 42% of the traders said they grade and sort the grain to sell to clients.

4) Volume per trader is much higher in the center than in the east or west. The traders rely mainly on direct provision by farmers (in 70% of the cases, with that share predictably (from the farmer results) falling from 78% in the west to 55% in the east (note that this is a similar inter-zone pattern and result as we found in MP). From rural brokers, traders got only about 7% of their grain, rising fast from 4% in the west to 8-9% in the center and east.

5) The reported buy and sell prices and costs show that the wheat traders' net margin is fairly low (as we found in MP) (less than 10%).

6) Paddy traders mainly source directly (67% - rising from west to east) from farmers; only 8% is direct from rural brokers. Again, few (only 5%) of the traders get an advance from their clientele. Again, as with wheat, for paddy traders we find the net margin is fairly low (as we found in MP), less than 10%.

Chapter 10

Summary and Implications

First, that we found that, far from the UP countryside being a homogeneous mass of tiny farmers with similar assets and behavior, we found sharp differences in land distribution, non–land assets, and market behavior over zones and farmer strata. The implication is that there needs to be differentiated strategies and policies for very different zones within UP and over farm strata. The medium and even the small farmers are mainly small-commercial farmers, highly engaged in crop and input markets, with high rates of marketed surplus. They should be engaged as small farm businesses, and helped to further develop commercially with business development services and strategies.

By contrast, marginal farmers are very different from the small and medium farmers – they are asset-poor, are much less engaged in crop and input markets, have little surplus. We have shown that they are very little included in subsidized sales of inputs and credit. Asset building in terms of irrigation, education, health infrastructure, livestock holdings for dairy and meat, and so on, is of the first order. **Marginal farmers need special programs focused on them.**

Second, he point above has its analogy with zones. The west and the center appear to be already in a ferment of rural development, which needs further encouragement and capacity building. As we will show, these areas are already far (yet still not as far as we observed in our study in MP) from the traditional image of the Indian countryside.

By contrast, the east is not only poorer and growing less rapidly, and to some extent less engaged in input and output markets, but asset poor in irrigation and education. It is risk-prone with frequent flooding. Basic and rapid asset building is the first step there, and the links with markets and new opportunities can then be encouraged. However, while the east region needs special attention, in the medium-long run its economy will be integrated with that of Lucknow and the west and center zones, with flows of products and labor, and product cycles of commodities shifting from west to east while niche and differentiated products develop over time in the west and center. The regional puzzle cannot be solved seeing zones in isolation.

Third, while marginal and small farmers dominate rural populations, in the study areas medium farmers sell the majority of crops and buy the majority of inputs. We will show they are the majority of the supply to markets. In many ways, the choices that medium farmers make – in marketing, in production – decide the food fates of the cities, and determine the development of markets. We will show that in fact they are far from neglected – and even receive the great majority of state assistance to agriculture (via subsidized agri-services) in the zones. But the reality of their important role is not often explicitly in the policy debate. They are de facto the "modernizers" in the Indian countryside. While encouraging them to modernize further, it is important that their access to public help and private markets spread more to the small and marginal farmers.

On the rural business side, it is a challenge to strive to help poor farmers when the majority of or a large part of the market for inputs and suppliers of output – can be tapped by just focusing on medium and maybe small farmers. NGOs and other programs trying to engage agribusinesses in development need to figure out where this can be sustainable (beyond subsidies from donors) because the businesses see a need and logic to market to small and marginal farmers. Reaching asset-poor small farmers and marginal farmers in the west and center, and reaching the east region, is not automatically obvious as a business opportunity in all crops or inputs. It seems that the confluence of business opportunity and the needs of the poor is most strong and immediate in the UP situation in dairy and livestock husbandry input and service provision, where the payoff to the poor and women is high, and the unmet market potential exists. This is in fact where HKB has focused its busi-

ness innovations recently in UP. We have suggested that this will also have a nutrition (protein) payoff for the poor.

Fourth, regarding implications specifically for seed markets, first we recall key findings and then state implications. **The main seed market findings are four:**

(a) UP farmers, of all strata, are very engaged in seed markets (outside of own seed use and buying from neighbors);

(b) the market share of the government (state & coop stores) is minor – most of the market is private sector (by far mainly the traditional shops, and also some modern (RBH)); how those private actors behave are the main determinants of the market conditions facing farmers;

(c) the marginal/small farmers depend more on the traditional retailers and the RBHs than the state/coop stores for seed;

(d) Very little seed is sold on credit; e) State/coop stores sell only 38% of their seed to small/marginal farmers; 62% is sold to medium farmers.

The main **seed market policy implications** are as follows.

(a) For the state & coop seed stores to fill their role in subsidizing the poor, they will need to correct their current strong sales bias toward medium farmers.

(b) But policymakers should recognize that 82% of the seed market is private (mainly traditional, and also some modern through the RBHs), and only the rest is state/coop stores. Policies and programs that affect private suppliers have far more effect on farmers than state direct-sales.

(c) Rural business hubs (here mainly HKB) sell much more seed to marginal/small farmers than does the state/coop store system in the study areas. Yet HKB is 10% more expensive for seed than the other retailers. The farmers note that it is the higher quality that attracts them. That implies two things: reduce impediments to HKB expansion of seed contracting and selling; put in place programs to increase seed quality monitoring at traditional shops.

Fifth, regarding implications specifically for fertilizer markets, first we recall key findings and then note implications. **The main fertilizer market findings** are six alarming findings.

(a) UP farmers are very engaged in fertilizer markets, from marginal to medium farmers.

(b) But there is a SEVERE problem of fertilizer access, according to 47% of the farmers (the best situation in UP is worse than worst situation we found in MP). 20% of the farmers could not find fertilizer at MRP or less. The problem worsens as one goes west, to center, to east region: 17, 21, and 25%.

(c) Contrary to conventional wisdom, state/coop stores have only a minority of the fertilizer market: the lion's share is sold by the traditional shops. Yet we found the latter often sell above MRP, and are more expensive than the state/coop or RBH stores.

(d) State/coop stores are cheapest – but sell only 27% of their fertilizer to marginal & small farmers, but 73% to medium farmers. They are biased toward the medium farmers.

(e) The poor pay more for their fertilizer – and that is mainly because they have to depend on the traditional shops who overcharge.

(f) RBH and state/coop store are seen as having the highest quality fertilizer – and small shops as having poor quality.

The main **fertilizer market policy implications** are as follows.

(a) The alarm should be sounded: there is severe problem of fertilizer access for the poor in UP.

(b) For the state & coop fertilizer stores to fill their role in subsidizing the poor, they will need to correct their current strong sales bias toward medium farmers.

(c) But policymakers should recognize that the lion's share of the fertilizer market is private (mainly traditional, and also some modern through the RBHs), and only the rest is state/coop stores. Policies and programs that affect the private suppliers have far more effect on farmers than the state direct sale programs.

(d) The big problem is with small shops selling over-price and low quality. Input stores even told us that state inspectors come but "do not actually inspect." Thus, it seems that the first priority (after fixing the pro-medium farmer bias of the state/coop stores) is to get more fertilizer supply to stores, to monitor and inspect effectively the price and quality of the traditional stores.

(e) Rural business hubs (here mainly HKB) are playing a minor role at present. They actually sell fertilizer cheaper than

the traditional shops, are seen as having better quality, but note they have severe constraints on access to fertilizer themselves to sell. That should be remedied by easing their sourcing of fertilizer.

Sixth, regarding implications specifically for farm chemicals (mainly pesticides and herbicides), first we recall key findings and then note implications. **The main farm chemicals market findings** are six findings.

(a) UP farmers are very engaged in farm chemical markets; 66% of farmers in our sample do. Marginal farmers and the east zone are least engaged in the chemicals market. Market participation rises fast with farm size, and declines with going from west to east zone. 50% of the sample buys pesticides – again with a sharp correlation with farm size – from 38% to 57 to 71% over marginal, small, and medium farms. 39% of the sample buys herbicides, with a sharp jump from mere 26% of marginal farmers, to 51 and 58% of small & medium farmers.

(b) 91% of the sample feel the market is easily accessible, but with varied pricing.

(c) Informants note that the farm chemical market expanded fast over the past 5 years.

(d) State/coop stores have tiny market share in chemicals, and sell almost all to medium farmers.

(e) Most of the chemicals are sold by the small shops. Farmers found their quality and pricing variable, but they are close by.

(f) The market share of the RBH (mainly HKB) is higher in chemicals than it was in seeds and fertilizer, also forming an important part of the purchases of the poor (pesticide purchases of the marginal farmers is 27%, small farmers, 34%, and medium farmers 26%; for herbicides, HKB's share of the marginal's spend is 36%, the small's, 18, and the medium's 25%. HKB itself (derived from farm transaction data) sells some 30-40% of its chemicals to the small and marginal farmers – about the same as small stores). The farmers felt their quality assurance is high, but they are not close.

The main **chemical market policy implications** are as follows.

a) The state has very little direct role in chemical sales so there appear to be no key implications in that realm.

b) The RBH stores appear to be playing a positive role in providing quality chemicals to small farmers. This is a positive role of modern retail for farmers who demand chemicals.

c) The small shops appear to have inconsistent quality and prices. The need for effective inspections is patent.

Seventh, regarding implications specifically for financial services markets, first we recall key findings and then note implications. **The main financial services market findings are six.**

a) Only about a quarter of farms in the sample received credit from any source (with sharp decline from west to east; sharp drop from medium to marginal farmers).

b) While conventional wisdom has it that crop traders and input vendors "tie" farmers to them through giving credit (advances), we found that this has all but disappeared in our study zones in UP – just as we found in MP. Only 2% of transactions get such credit from traders.

c) While conventional wisdom assigns a key role in rural credit to village moneylenders, our survey showed their role to be very minor – 2% of the credit received by the sample. Even for marginal farmers it was 13% (although 30% of their transactions, so they had many small loans but it amounted to a small amount of credit).

d) The lion's share of credit comes via Kisaan Credit Cards. KCCs distribution is biased toward medium farmers, and west/central UP: KCC ownership increases rapidly with farm size – from 17% of marginal farmers to 58% of medium farmers, and drops west to east, from 35% of farmers to 25%. Nationalized banks and regional rural banks were by far the main actors.

e) 77% of KCC total payout over the whole sample went to medium farmers – and only 23% went to the large majority of the rural population (marginal and small farmers)

f) 85% of credit went to buy inputs for farming. The rest was for education, social, etc.

g) The poor pay more for credit because they have less access to the cheaper source (KCC).

The main **financial services market policy implications** are as follows.

a) Policy concerning and implementation of the KCC is CRUCIAL to access to credit by poor farmers in UP. It is the single main source of credit, in a situation where actually few take credit. Other sources thought traditionally to be important (moneylenders, traders) simply turned out to be very minor, even for the poor.

b) The key problem is that access to KCC is biased toward the medium farmers – and away from the marginal and small farmers. The data showed this, but so did the discussion groups after the survey with small farmers – who bitterly complained about hurdles and constraints, some real (economic and social) and some apparent misconceptions. Erasing the constraints and correcting the misperceptions should be the policy priorities.

c) Rural business hubs play a very little role in financial markets to date, but this could be a potential line of business to help the poor. This has, for example, been recognized in HKB's new dairy business in UP and Rajasthan, where BASIX has partnered with them to provide credit to farmers supplying milk.

Eighth, regarding implications specifically for extension, first we recall key findings and then note implications. **The main extension findings** are six.

a) Strikingly few farmers get extension advice in the UP: our survey shows 18% got it from ANY source (public or private sector), with shares over zones of 18, 30, and 7%. Compare this with 80% in MP. Only 15% of marginal farmers got extension, compared with 21% of small and medium farmers.

b) The lack of use was not because farmers did not need or want extension: If farmers did not get it, 48% said they wanted it but could not find it. (Compare that with 29% in MP.)

c) Yet for the few farmers that got extension (from any source), satisfaction rate was high.

d) Strikingly, only 25% of the extension used by the (few) farmers who got extension, was from the public sector. (Compare that with 65% in our study on MP.) The other 75% was from the private sector.

e) 7% (a third of the public sector extension; the rest is KVK, Public Radio, etc.) is from State extension officers – the latter play a tiny role in extension in the UP. (Compare that 7% with our finding of 37% in MP.) **Overall, as 18% of the farmers got any extension (from any source), and 7% was from state extension officers, that means the latter reached about 1% of the farmers in UP. This finding is sharply different from conventional wisdom that equates "farmer extension use" with "consulting state extension officer."**

f) **The main extension agents in UP right now are input companies (and shops selling their inputs), sugar companies, and RBHs.** 75% of the little extension received by farmers, is provided by private sector in the study areas. This includes 17% from input companies, 19% from HKB and 5% from other RBHs, and 25% from sugar companies. **Keep in mind this is 75% of the 18%, so private extension is touching only 14% of the farmers.** This means that RBHs extension, touch only about 3% of the farmers – and that is mainly of medium farmers (few small farmers).

The main **extension policy implications** are as follows.

a) Our finding that extension touches a far lower share of farmers in UP (compared with MP), and that it is mainly private sector, with the state sector playing a small role, suggests that there is a case for expanding the effective provision of public sector extension in UP. Unlike the other agri-services, this is needed in all zones and across farm strata. However, and beyond the scope of this report as we did not study extension services directly (only through the farm survey), there is evidence that "on paper" there is LOTS of public extension in the state. Frankly, the discussion groups with farmers say that they feel it is hard to access and not the source of extension they seek

out. Making existing extension teams more effective and accessible is our main recommendation.

b) We did not assess the content of private sector extension. While it is preponderant in share, it is very little in volume, as it covers very few farmers. Farmers noted in the discussion groups that input companies tend to push their own products (naturally). RBHs and sugar companies also provide extension to increase their own business. Provision of information for private goals is not necessarily harmful to the "public good" for poor farmers. It can be helpful, such as HKB's current extension program helping dairy farmers that are supplying milk to its new collection centers. It can be helpful in supplying information about specific products, and about techniques such as sugar production or dairy farming. The ideal policy setting is one where farmers' education is substantially increased so that they can assess extension information in an informed way, where public extension is useful and accessible so as to cover minimum information for most farmers, and private sector extension and information services are allowed to flourish to provide specialized information.

Ninth, regarding implications specifically for dairy markets, first we recall key findings and then note implications. **The main findings on dairy markets in UP** are seven.

a) There is a sharp divide in the dairy market and livestock sector, with a strong pattern of highest development in the west region, intermediate in the center, and low in the east. This shows in milk yields, livestock holdings in general and milch animals in particular, and very sharply in growth rates of holdings. Also, herds grow mainly by purchase from own-funds in the west, and mainly by births, gifts, and loan-based purchases in the east.

b) While the share of farms selling milk drops precipitously from 49% in the west to 17% elsewhere, the share of sellers to owners is U shaped over zones – 71%, 31%, 54%. That same U shape is seen in marketed surplus rates per milk farm: 61, 20, and 56% from west to east. This shows high opportunity to increase milk markets in the center zone.

c) The production of milk HALVES between the flush and lean seasons (causing us to worry about children's protein intake in the lean season).

d) The main market channels are still, in this order, the traditional ones of the village milk trader (dudhiya), and neighbors. Modern channels (private dairies) average around 10% of milk sourced, and buy mainly from small and medium farmers, much less from marginal farmers). The Coops play a tiny role only.

e) The fodder market is still very small. Feed concentrate market is smaller yet. The smaller farmers tend to buy fodder, and the medium farmers, feed. The feed stores are mainly concentrated in the west z1) with few in others. Medium farmers focus on buying from feed stores, marginal farmers from neighbors (for the tiny amount of fodder they buy).

f) A minority of farmers buy vet care – 38% to 24% to 29% from west to east; about 40-50% of owners get vet care. Marginal farmers buy care only a bit less than do others.

g) Half of vet care is foot and mouth vaccine. A quarter is for other vaccines. Very small amounts (bought mainly by medium farmers) are for antibiotics, de-worming meds, and either kind of insemination. Two-thirds of vet care is sold by the government, and a quarter by private vets.

The main **dairy market policy implications** are as follows.

a) Market development programs and enabling policies are most pressing in the center region, where milch animal ownership is high but market surplus rates are low and sellers are few compared with ownership. Note that there is also private sector investment in this area, such as HKBs new dairy program in that zone for that reason.

b) By contrast, the first step in the East region is to increase milch animal holdings and productivity, which are very low.

c) Public investment in electricity grids for cooling tanks is the top investment priority; this will help investment by modern private dairies and coops.

d) Only half the farmers with animals use vet care at all; its supply needs to be sharply increased. As it is mainly public sector supply for vaccinations, this can be a state action.

e) Modern inputs and practices for dairy (AI, antibiotics, deworming medicines, etc.) are used extremely little in UP, and nearly only by medium farmers. Greater emphasis

on this in public extension will increase demand for and knowledge of these practices.

f) Food safety and hygiene regulations on milk will increase investment costs for farmers and processors, but extend the milk market from rural to urban areas. This transition will need to occur in the medium run. As feed markets increase, it is likely that India will have the equivalent of a "melamine" milk crisis as China recently did, and should act now to forestall this occurring.

Tenth, regarding implications specifically for crop markets, first we recall key findings and then note implications. **The main findings on crop markets in UP** are ten.

a) The data show that marginal farmers in the study zones are mainly semi-commercialized/ semi-subsistence, while small and medium farmers are "small commercial farmers."

b) The market is very product-concentrated with wheat, paddy, and sugarcane having 77% of the crop market. Potato is by far the most important vegetable and has only 11% of total sales. There is still only minor horticultural diversification in these regions. There is little farm size bias in crop composition. The crop mix differs over zones, with more emphasis on wheat and vegetables in the west, sugarcane and paddy in the center, and paddy in the east.

c) Barter is nearly extinct; markets are monetized.

d) Input credit advances are nearly extinct. For each of wheat and rice they cover only 3% of transactions. That is, very few traders provide credit to farmers.

e) Grain supply chains are shorter than the traditional image, with village collectors and haats playing a minority role: local village brokers buy only 19% of farmers' wheat (23% for paddy) and local retailers (haats) only 16% of the wheat (12% for paddy), while mandi traders (directly buy) 53% of wheat (48% of paddy). Mills buy little directly from farmers.

f) Selling direct to the mandi is strongly correlated with farm size. Marginal farmers sell 45% of their wheat to village collectors; this drops to 23% for small farmers and 16% for medium farmers. By sharp contrast, 38% of marginal farmers' sales of wheat are to wholesalers on the mandis: versus 51 and 53% for the other two strata. The patterns are similar in paddy. "Dis-intermediation" or chain shortening has thus far mainly affected medium and small farmers, while marginal farmers sell traditional way at the farm gate to the village collector.

g) Interestingly, while marginal and small farmers dominate in numbers, they are minorities in the market – where medium farmers dominate volumes in both paddy and wheat.

h) Sugarcane is by far a medium farmer's crop – less the domain of small and marginal farmers.

i) Our trader survey showed that the auction system is used by only 35% of the traders (compare that with 50% in our MP study), declining rapidly as one goes from west to east, from 55 to 16%.

j) For both wheat and paddy, traders are not making large net margins: The reported buy and sell prices and costs show that the wheat traders' net margin is fairly low (as we found in MP) (less than 10%).

The main **crop market policy implications** are as follows.

a) Contrary to conventional wisdom, the net margins of paddy and wheat traders are modest – well below 10%. There appears also to be competition, at least inter-segment, as supply chains are shortening and mandi traders are buying the bulk of the grains direct from farmers, cutting out the village collector. APMC reform in UP may further accelerate the development of this competition by allowing direct purchase by modern private actors. But it is probable that the main efficiency gains in grain supply chains will come from infrastructure development, not elimination of – popularly assumed – high profits of traders.

b) There is a sharp divide between crop market participation by marginal farmers (with low marketed surplus rates) and what are really small commercial farmers – the small and medium farmers of UP. Policies should be differentiated to deal with the different needs of those two groups.

c) Diversification into horticulture is still small in UP, and in pockets. It is shared by small and medium farmers however, so can have a poverty alleviating effect. The same cannot be said of sugarcane, which is overwhelmingly a medium-farmer's crop per the data.

d) The old image of traders providing credit to farmers is simply now a myth. The data show it in UP and in MP. Policymakers should not assume that small farmers can depend on traders or input vendors for credit. That puts the focus on the need for KCC expansion.

e) As noted above, while marginal and small farmers dominate numbers, medium farmers have near half the supply in the state, and more than half in the study areas. Harnessing and developing the technology of medium farmers can boost food supply and create labor demand for the landless. They are also the main interlocutors with the mandi system, as they dominate those who sell direct to the mandis.

f) Unlike in MP, the RBHs are not yet much present in crop markets in UP. This seems like another opportunity for market modernization to be encouraged, as another option for farmers, adding to competition among service providers, usually advantageous to the poor.

Contact:

USAID India
American Embassy
New Delhi - 110 021
Phone: 91-11-2419-8000

International Food Policy Research Institute
CG Block, NASC Complex, Pusa New Delhi 110 012
Phone: 011-25846565/67