

BASMATI RICE VALUE CHAIN IN PAKISTAN



State Bank of Pakistan
Agricultural Credit & Microfinance Department
www.sbp.org.pk

BASMATI RICE VALUE CHAIN **IN PAKISTAN**



State Bank of Pakistan

Agricultural Credit & Microfinance Department

www.sbp.org.pk

Preface

The value chain financing (VCF) is evolving as an attractive model of spreading the various risks in agri/rural finance among different fund providers. Keeping this in perspective, and to sensitize lending institutions about the potential business prospects in VCF, SBP carried out a research study to identify the potential agri. value chains in Pakistan through reputable consultants. The study highlighted various layers and players within different value chains in terms of activities, potential for investments, issues & challenges in strengthening VCF.

The desired research study and its findings' report were completed in December, 2014. The report provides a detailed assessment of six main value chains in the country: i) Potato, ii) Tobacco, iii) Beef, iv) Dairy, v) Basmati Rice, and vi) Aquaculture and Inland Fishery.

This report on Basmati Rice value chain in Pakistan is a part of that comprehensive report. Its basic aim is to enable financial institutions to more clearly understand the specific value chain dynamics and prepare their related strategy for increasing agri. financing thereto.

Disclaimer: Whilst every effort has been made to ensure the quality and accuracy of this report; however, State Bank of Pakistan shall not be responsible for the contents of this report. This report is meant for educational purposes and for general information only. In no event will the State Bank, its affiliates or other stakeholders be liable for any mistakes.

Executive Summary

World rice market is growing at an annual rate of 12.2 %, Pakistan rice export in this market is growing at the rate of 18 percent, a rising star in this expanding market. But this growth is partly due to strong demand for our coarse rice in low end markets. In fact share of Basmati rice in total rice production has declined from 74% in 2008 to 50 % in last season and even it was 39 % a year before. This decline can partly be attributed to the growing popularity of Indian variety Pusa Basmati (imported illegally) being increasingly adopted by small farmer (less than 5 ha), as it opens up opportunity to grow third crop in between rice and wheat, a cropping pattern that makes them survive in a scenario where cost are rising with uncertain revenues.

The trend might change, as shortage in supply has resulted in record price hike to the point that domestic market price for basmati rice is even higher than the export price, good news for producers if these high prices are transmitted back to farmers, but consumers and exporter are at the losing end. The real winners in this story are millers/processors who were able to store produce during the last season to realize a wind fall profits.

At the production levels the key issues are low population of rice plantation, labour shortage, water scarcity. Outdated method of planting rice through nursery, using harvesters designed for wheat and lack of storage facilities further adds to the problems of developing a competitive rice industry. Today in rice industry producer is looking for high rice yields, the processors wants a better quality that can stand the competition and consumer is looking for aroma, nutrients and its convenience to cook. For this reason rice being demanded today is quite different than our traditional supply offers. To meet market demand rice industry is adjusting to produce parboil and brown rice, by passing the traditional markets and offering contract farming to meet quality parameters. The work is just at a pilot stage, it needs to be scaled up with a view to provide access to small rice producer of credit, technology and market.

Financing at processing or trading level was not an issue, the major complain is high energy cost and frequent breakdown of electricity. With present crisis getting worst, processors are finding it difficult to stay competitive in export markets. On the other hand, the favorable exchange rate, high domestic prices of basmati rice has provided windfall profits to processor and traders who could hold the stock. For this reason storage at farm or village level is key to enhancing farmer profitability. We need to develop small to medium size farmer focused storage or warehouse programme.

Basmati rice value chain is dominated by power of commission agents (Arthi) and millers. A good 80 per cent of farmers sell their produce to Arthi in the Mandi. The rest of 20 percent from farmers goes evenly to sheller's and integrated rice mills. The processors in basmati rice belt procure their supplies from two sources, the farmers and from the wholesale market (Mandi). The system works against the small farmer (resource poor) as it does let him get out of this so called vicious cycle of low appetite for risk, investment, productivity, market orientation, value addition and income, a characterization being fully exploited by Arthi.

Profitability analysis was undertaken for each business model. In the case of resource poor farmer who depends to a large extent on Arthi for credit and input supply, has a profitability of Rs 1539 per acre, hardly enough to cover the cost of production. The profitability of farmer who has better access to market as he is not bound and can sell his produce to Arthi or Miller, carries a profits of Rs 19449 per acre, a reasonable returns on investment, though not as much as the progressive grower are obtaining in the rice belt. The processor or miller driven business model (contract farming) where both small and large farms are contracted carries a high profitability of Rs 54012 per acre, a attractive returns to investments compared to other two business models.

The good news is that there are new modalities in rice production, marketing and trading taking place where farmers are required to produce quality rice in return for better price. Rice Partners Ltd (PRL) joint venture with Mars and Engro/EXIMP are good example as these initiatives are bringing a paradigm shift in the rice industry by providing farmers an informed choice, a farmer can sell his produce either through the traditional market or directly to processor provided he meets quality standard. It has the potential to solve the commonly talked about problems---taking famers out of middleman domain by providing viable options to access technology and markets. The trust of the program is to reduce cost that can increase his income and cash flow and bringing some price stability to the market. The challenge is to bring small and resource poor farmers to move the ladder and join collective action either through contract farming or through miller incentive.

The key action areas for financing the chain are identified as priority for technical and financing support (1) harvesting machinery suitable for rice cultivation (2) creating storage at farm, village or market levels (Stockist), (3) promoting contract farming, especially for small and resource poor farmers and (4) devising a programme that brings, farmers or group of farmers, warehouse/storage, bank, input supplier with use of IT (cell phone) that provide farmers with access to technology, credit and market .

As proposal for action, scale up the Engro/EXIMP model as it holds promise to provide farmers a choice to market directly instead of traditional Mandi, to reduce cost and increase yield of farmers so his profit margin is increased with better cash flow. As his income increase he has better chance to get out of vicious cycle mentioned above.

List of Abbreviations Used

Commission Agents	CA
Kala Shah Kaku	KSK
Fauji Fertilizers	FFC
Engro Fertilizers Limited	EFL
International Finance Cooperation	IFC
Rice Partners Ltd	PRL
Trading Corporation of Pakistan	TCP
Punjab Seed Cooperation	PSC
Rice Research Institute, kala Shah Kaku	RRK
Micro Finance Institution	MFI
Ministry of Food, Agriculture and Livestock	MINFAL
National Agriculture Research Council	NARC
Pakistan Storage and Supplies Corporation	PASSCO
Punjab Seed Corporation	PSC
Zarai Taraqati Bank Limited	ZTBL
Wholesale markets	WSM
Rice Partners Ltd	PRL
Information Technology	IT
Social cooperate responsibility	SCR

Contents

Value Chain Overview.....	1
Value Chain Actors and their Roles & Relationships	6
Input Supply.....	8
Production System and Characteristics.....	10
Opportunities for Value Chain Development and Financing	12
Technical and Quality Requirements	13
Processing	14
Linkage between Processors and their Suppliers	14
Markets	16
SWOT Analysis	17
Economics Analysis	19
Access to Finance	22
Enabling Environment	25
Institutions	25
Conclusions and Recommendations	27
Bibliography	29

Value Chain Overview

Overview of the Rice Sector

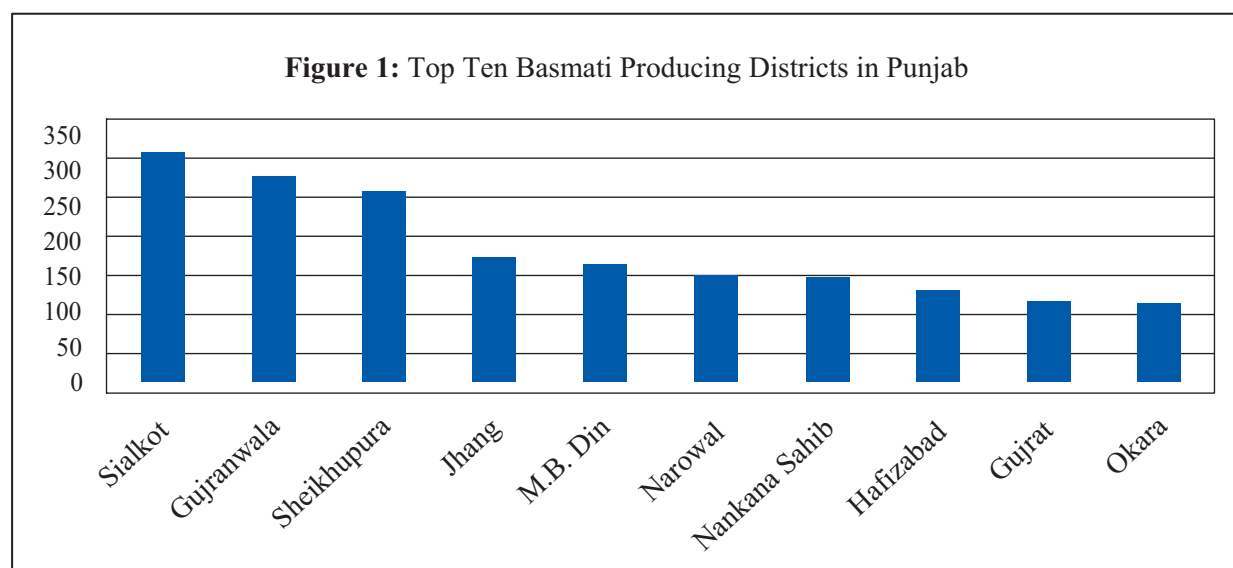
Rice, an important food and cash crop, is the third largest crop of Pakistan after wheat and cotton and one of the main export items of the country. It accounts for 6.4 percent of value added in agriculture and 1.4 percent in GDP. Pakistan grows high quality rice to meet both domestic demand and for exports. Area sown for rice is estimated at 2883 thousand hectares, 2.7 percent less than last year. The size of the crop is estimated at 6883 thousand tons 1.0 percent less than last year (Economic Survey of Pakistan). World rice market is growing at an annual rate of 12.2 %, Pakistan rice export in this market is growing at the rate of 18 percent, a rising star in this expanding market. But this growth is partly due to strong demand for our course rice in low end markets. In fact share of Basmati rice in total rice production has declined from 74% in 2008 to 50 % in last season and even it was 39 % a year before.

Pakistan is ranked 13 in production rice in the world (table 1) but its productivity is extremely low at 2.24 tons per ha, compared to Egypt obtaining as high as 9.6 and China at 6.2 tons per ha. Sindh and Punjab are two provinces supplying rice to domestic and export markets, Punjab is known for its Basmati rice, where as Sindh dominates with production of course rice, mainly for export markets.

Table 1: Top 15 Producer of Paddy		
Country	Production (MT)	Production (Int \$1000)
China	197212010	48759650
India	143963000	38424912
Indonesia	66469400	17951110
Bangladesh	50061200	12926460
Viet Nam	39988900	10697573
Myanmar	33204500	8109981
Thailand	31597200	7909097
Philippines	15771700	4159474
Brazil	11236000	3072187
United States of America	11027000	3019696
Japan	10600000	2940699
Cambodia	8245320	2204941
Pakistan	7235000	1952838
Republic of Korea	6136300	1697624
Madagascar	4737970	1228425
Source: FAO Stat, 2012		

Basmati Rice

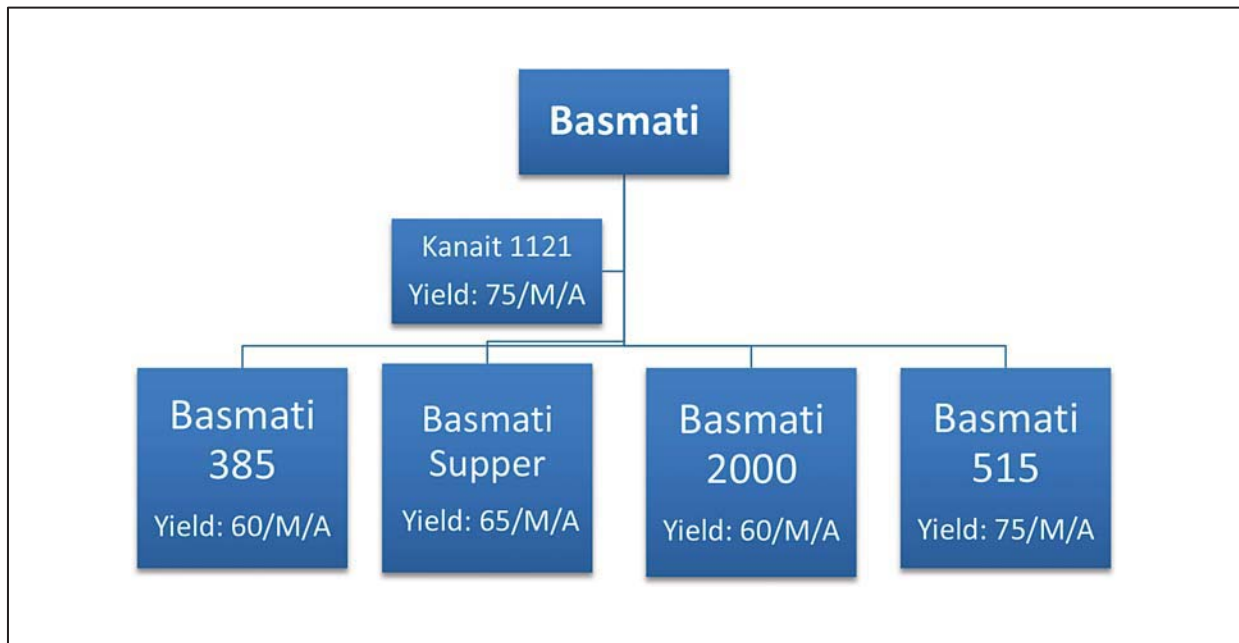
In Pakistan during 2011-12 seasons, the total area under Basmati rice is about 1.54 million hectares and production is estimated at about 2.7 million tonnes. The largest area under Basmati rice is in Punjab (60%) followed by Baluchistan (17.1%) and KPK (16.1%), there is no reported acreage for basmati rice in Sindh. The productivity of basmati rice ranges from 15 to 50 mounds/ha. Figure 1 ranks the top ten basmati producing districts in Punjab with Sialkot, Shiekupura and Gujrawala indicating a dominant share.



Seed and Varieties

Several varieties of aromatic rice are grown and consumed as basmati rice. Figure 2 depicts the most popular varieties being used by farmers. Basmati varieties such as Basmati 370 and Basmati Pak cultivated before 80s had low yield of 30 mounds per ha. The rice variety 385 coming out in the year 1986 brought a revolution in Pakistan to spur yield as high as 60 mounds per ha. The second break though was in 1996 with development of Super Basmati which could realize a yield of 65 mounds; this variety has kept its dominance as of today. Pusa Basmati-1, a variety brought from India, multiplied by local farmers with business orientation, and since then has been very popular with farmers. The adoption rate of this variety has been phenomenal due to its very high yield, short duration that provides the possibility of water saving and cultivation of third crop thus enhancing farmers profitability.

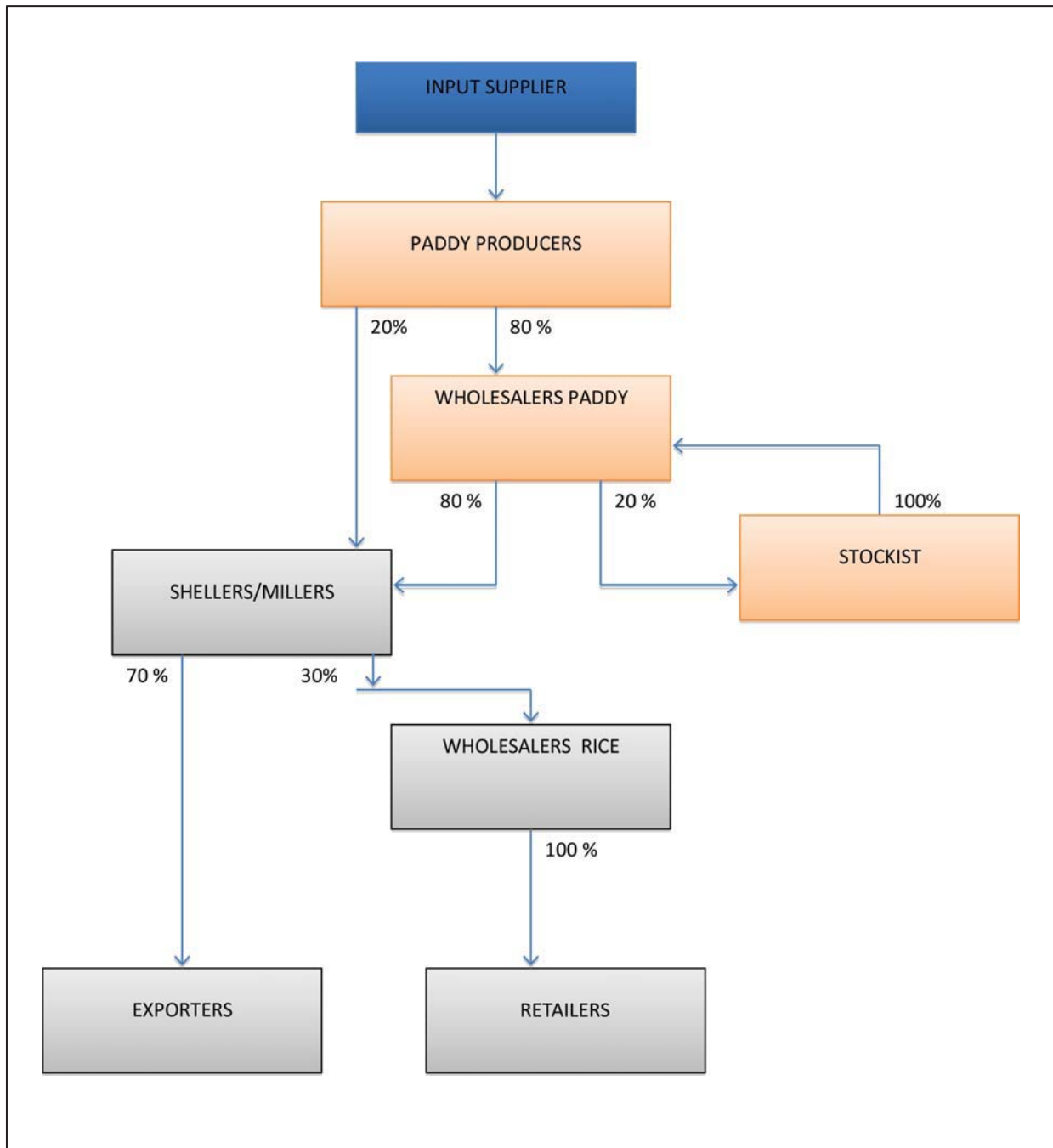
Figure 2. Varieties used by Farmers



Rice Value Chain: Core Functions

Table 2 on the following page represents core functions of the rice value chain that comprise the full range of activities required to bring a product from consumption to end use. It provides a detail account of stages of chain, types of function performed, the agents involved and how if the commodity is transformed.

Table 2 : Paddy/Rice Supply Chain						
Stage of the Chain	Function	Agent	Commodity		Commodity	
			In	From	Out	To
Production	Cultivation	Farmers		Outside the chain	Paddy	Paddy traders
					Paddy	Sheller's
					Paddy	Millers
					Straw	Animal feed industry
Primary Marketing	Marketing and Transport to mills	Farmers	Paddy	Farmers	Paddy	Paddy traders
					Paddy	Sheller's
					Paddy	Millers
		Paddy Traders	Paddy	Farmers	Paddy	Sheller's/millers
Millers (Processors)	Milling	Sheller's	Paddy	Farmers	Rice	Human consumption
					Husk	Fuel industry
		Millers	Paddy	Farmers	Rice	Wholesalers
					Rice	Exporters
				Paddy traders	Bran	Animal feed industry
					Husk	Fuel industry
Marketing of Processed Commodity (white rice)	Marketing and Transport to Final Consumption	Wholesalers	Rice	Sheller's/millers	Rice	Retailers
						Exporters
		Retailers	Rice	Wholesalers	Rice	Human consumption
		Exporters	Rice	Sheller's/millers	Rice	Rest of the world
				Wholesalers		

Figure 3: Rice Value Chain Product Flow: Traditional Model

The flow of commodity within the chain is presented in figure 3, this represents a typical business model where paddy producers can sell his produce either to the Arthi or direct to the miller. The important point is that still a good 80 % of paddy is channeled through traditional mandi or through the Arthi.

Value Chain Actors and their Roles & Relationships

Input Suppliers

Farmers obtain seed from two sources, from the public sector, Punjab Seed Cooperation and Rice Institute at Kala Shah Kaku both providing a limited quantity in the range of 10 percent of seed to the farmers. In the private sector seed and fertilizer is supplied by Miller or Arthi through a network of dealers. These middlemen/dealers usually have arrangements with seed and fertilizers manufacturers. However, to have a regular supply of the inputs, they have to maintain an advance with the manufacturers. The dealer is a 1 stop shop for seed, pesticides and other agricultural inputs. The dealers sold to both farmers and arties, approx. 50/50, some exclusively on a cash basis while the other did about half his business on credit, which he charged 10-20% interest

Advice on using seeds, fertilizers, timing of fertilizer and pesticide input, etc. is often acquired by farmers from the middlemen persons who are not qualified to give adequate technical Information and knowledge about best practices for farming. Although there are agricultural department offices situated in each district, they do not have the capacity (adequate number of human resources) to reach out to all farmers in the area. This results in use of sub-standard seed, inadequate or inappropriate use of fertilizers, pesticides and herbicides, as well as untimely irrigation, etc. Such practices result in lower productivity of the crop as well as destruction of the soil, thus reducing the productivity of the land over time. Additionally, the unavailability of finances also leads the farmers to buy substandard inputs, since they are relatively cheaper.

Producers

According to a survey conducted by Rice Research Institute, farms in rice belt can be divided into small, medium and large. The farm with less than 10 acres is considered small and they hold 20 percent of total rice producing farms. The medium size farms are in the range of 10 to 25 acres and carry a good 60 percent of farming population. The large farms ranging from 25 to 100 acres and above make rest of 20 percent. The tenancy structure indicates that a good 80 percent of farmers are owners cultivators, than 10 percent are tenants and another 10 percent are lease or contract holders. It is clear that rice belt is characterized as driven by medium size and owner operated farms. The average productivity for basmati growing farm is around 32 maunds per acre, where for non basmati rice the average productivity is around 58 maunds. Lands being close to urban centers will continue to increase rapidly in value, while some observers expect an increase in absentee ownership.

Aggregators

Paddy seed is aggregated partly at Punjab Seed Cooperation (cPSC) and partly at private seed companies. Similarly, other inputs either manufactured locally or imported are placed near the growing areas prior to planting season. The seed for nursery is needed well before other inputs. Once paddy is produced, it carries a very short window to sell the produce due to its moisture contents and needs drying up as early as possible, in the absence of storage at farm level, aggregation or storage at farm level is not possible. The bulk of aggregation takes place at processors or stockist facilities. The main aggregators are briefly discussed below.

Commission Agents and Wholesalers

Commission Agents or Arthi's are the main driver of the rice supply chain. They finance the input needs (working capital) of the growers, especially smaller growers having land less than 10 acres. A small grower is paid in advance for his planned rice or wheat crop. He lives off this advance until next season, but many run out of cash before the next season starts. At this point the commission agent again finances them for the purchase of crop inputs, effectively binding them for another season. Commission agents hold the market power as he provides financing to farmers and traders and also information flow within the chain. Commission agents usually operate from wholesale markets, where their product is auctioned to wholesalers, who may then store the produce and sell it to Sheller's or millers. (More details in section 5.2 and 8.2)

Stockist

Most of the commission agents with well established business are the stockist, who would hold good quality rice either at their own or at millers storage facility. A large number of mills in rice belt are operating below capacity that provides stockist opportunity to strike a business deal to use milling and storage facility at a discounted price. He stores at a time when market price is down due to excess supply coming from small farmers needing cash. In our view, the stockist is already running a warehouse programme in its rudimentary form.

Processors

There are three kinds of processors, first hullers who process rice at village or local levels meeting the local needs of population, these units are fast disappearing. Sheller's process rice on demand either as final produce for sale or storage. The processors produce rice for domestic or export markets. The processing units range from very old traditional Sheller's to very modern fully integrated mills. Usually the processing is only done when the rice has to be sold; otherwise it is stored as brown rice or slightly polished rice. The packing for both domestic and export market is done at the processing mills. Some processor indicated that investment in dryers is only feasible and economical if volume is large.

Retailers

At retail levels rice is sold either in open bag at the groceries stores or to modern stores where name brand are competing. These large rice processing companies have network at retail levels to position their produce to obtain a larger share. The produce is sold in 5 to 50 Kg bags.

Exporters

Exporters have very close business links with wholesalers and processors. Most rice for export is sourced from Sheller's or millers, graded and packed at milling site, directed to Middle Eastern, Asian and European markets, exporters are in touch with agents in these countries to lure export.

In general, export consignments are poorly handled lacking knowledge and implementation of proper postharvest practices, with mixing of different rice varieties, poor inventory management due to under developed market information systems. Limited knowledge of markets and their individual requirements is a common problem. The progressive and modern mills geared for exports try to keep records and traceability of each lot received from farmers and to lesser extend from commission agents. Each variety is separately handled and the final product is stored accordingly.

Input Supply

The most important inputs needed to produce good quality basmati rice include:

1. Seeds
2. Fertilizers
3. Farm Machinery
4. Irrigation

Seeds

Seeds are marketed to the farmers through

1. Sindh and Punjab Seed Cooperation
2. Rice Research Institute, Kala Shah Kaku
3. Private seed companies

Above mentioned sources supply 50 percent of seed, the rest is procured through their own farms. As explained, dealers have close links with the Arthi to supply seeds to the farmer under contract for financing.

Fertilizers and Pesticides

Farmer access their fertilizer needs through the private dealer operating for companies like Fauji Fertilizers (FFC), Engro Fertilizers Limited (EFL), Daud Hercules, Ali Akbar Group (AAG), Jafer Brothers Limited, FMC, Syngenta, Bayer Crop Sciences, and FMCs. They maintain distribution network operating in the rice belt. As mentioned above, Arthi provides inputs through his network of dealers. The quality of fertilizer in use has been a major problems highlighted by paddy growers. The use of pesticide and insecticide has also been on the rise due to lack of integrated pest management approach. The plant protection coverage at the national levels is close to 40 % of the total cropped area. The major issues highlighted during our field visit are high pesticide costs, health hazards for farm workers, rising immunity in pests and their adulteration.

Farm Machinery

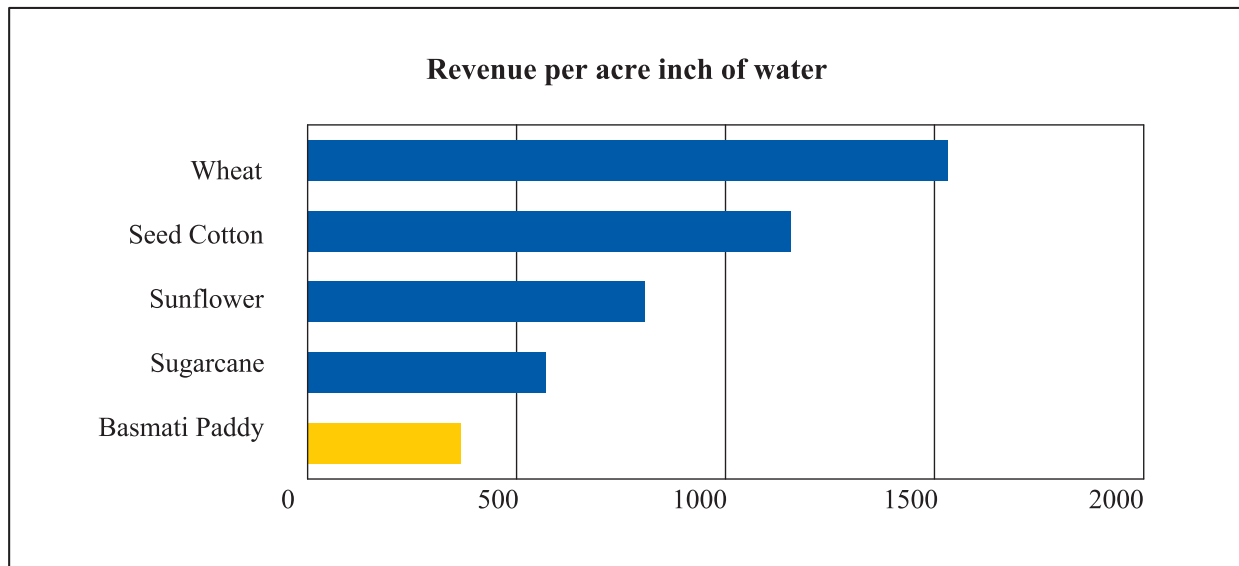
In the rice belt land preparation has been fully replaced by farm machinery now using tractors and harvesters. A service industry has emerged that provides farm machinery on rents. Small farmers with less than 5 ha are demanding maximum services for tractors followed by harvester/thrashers. The cost of these services has gone up due to rising prices of diesel. In cropping season 2000, the cost of harvesting and trashing was estimated at Rs 800 per acre; in 2011-12 cropping season it has increased to whopping Rs 5383, more than 6 fold increases. (API 2012)

Another area requiring intervention is better harvesting for basmati rice. Farmers often use machines designed for wheat harvesting without proper equipment adjustment resulting in sizable by-products as trash and broken grains. For this reason lack of proper machines and poor processing of rice, exports have often fetched lower prices than those offered to our competitors. Engro and some other large miller's are supporting farmers to use machines suitable for rice harvesting; it is too early to assess the impact of this new technology.

Irrigation

As water scarcity is a binding constraint on rice production, it would be prudent policy to promote enhancing water productivity/values, the one estimated (figure 4) for Basmati rice is lowest in comparison to other crops. The water productivity/values can be enhanced by developing short-duration varieties that consume less water and to use recommended on farm water management practices.

Figure 4. Water Values in Punjab



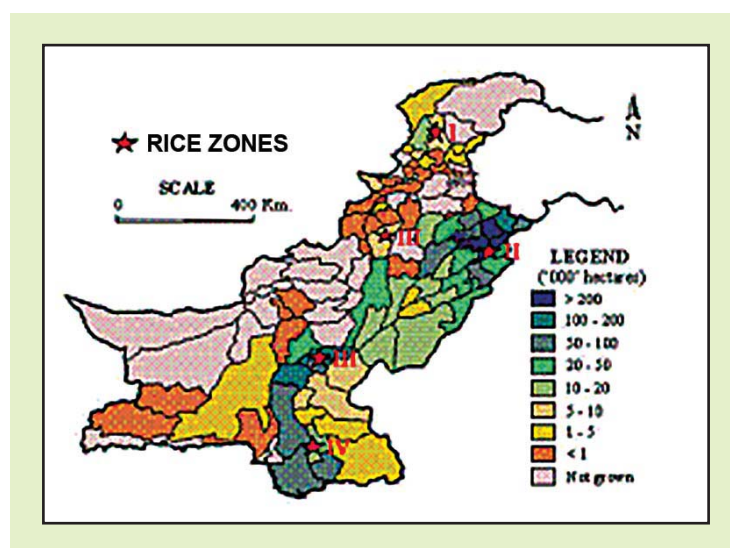
Source: Policy Research Institute, 2009

Production System and Characteristics

Rice Zones

In Pakistan, rice is grown under diverse climatic and climatic conditions. Basmati predominates in traditional rice tracts of Punjab (Zone II). In Swat (Zone I) at high altitude mountain valleys, cold tolerant rice varieties are grown. In the south of NWFP, Sindh and Balochistan (Zone III and IV), IRRI type medium long grain heat tolerant tropical rice are grown (Figure 5).

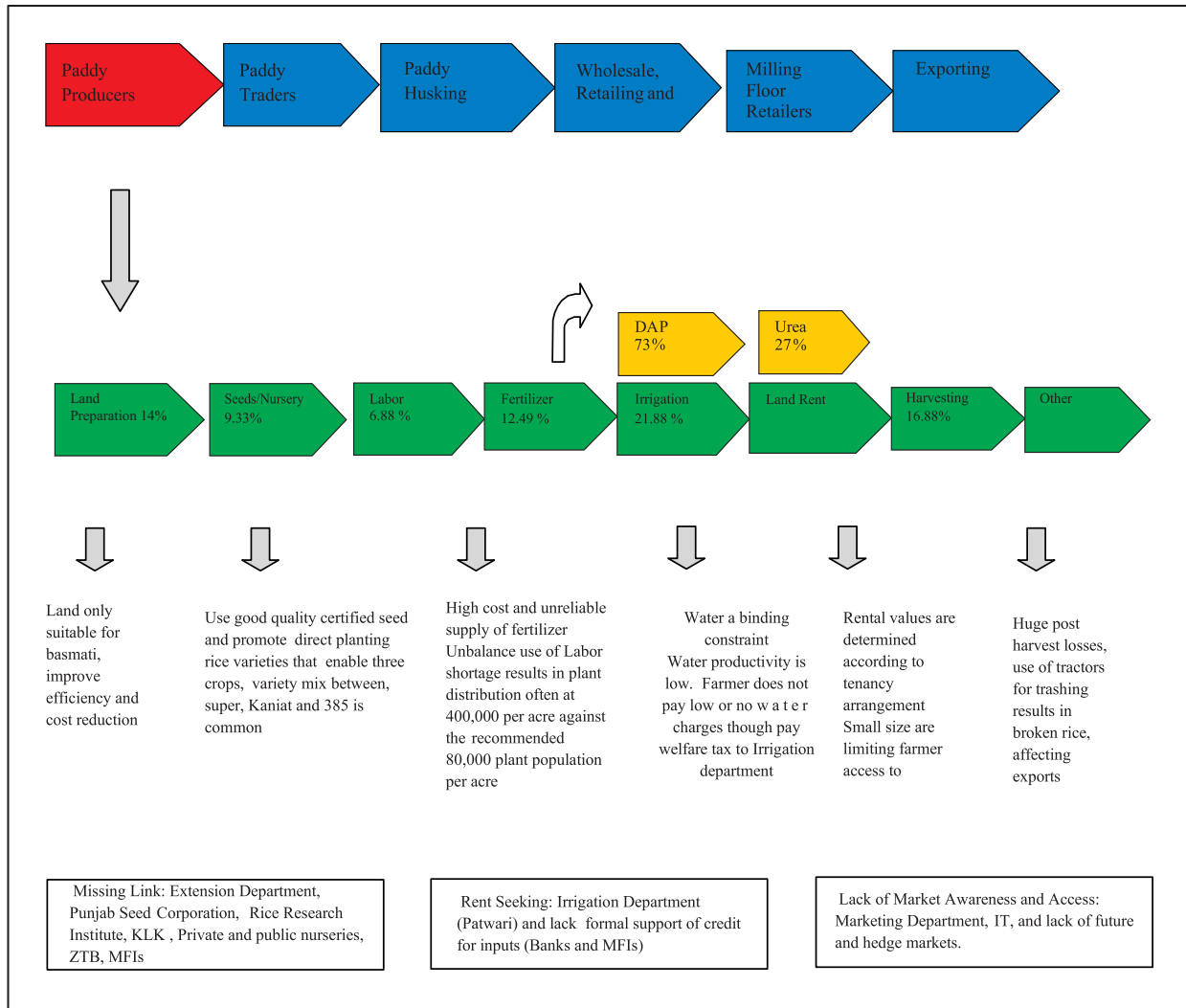
Figure 5: Rice Production Zones



Production Systems

As indicated in Figure 5, basmati rice is grown in all four ecological regions of Pakistan. Course rice is a dominant crop in zone 3 and 4. Basmati rice is grown on a large scale in Zone 2 with Rice-Wheat has dominated the cropping pattern. The rice growing season is fairly long and suitable for both basmati and non basmati rice varieties. The “Kalar” tract which is well suited for cultivation of basmati rice, in fact only suitable for rice crop during Kharif season (RIK, 2012), offering good opportunity for investors to cover some production risks. The rice is grown in crop rotation with wheat or a viable vegetable crop/fodder in between.

A typical basmati rice production system is elaborated in figure 6 below, highlighting problems at each farming operation and their share in overall cost structure.

Figure 6: Paddy Producer Chain


At production levels the key issue is low population of rice plantation, labor shortage, water scarcity. According to Researcher at KSK this problems can be solved through changing methods of cultivation. In Basmati growing areas of Pakistan, crop is sown by two methods. First method where seeds are sown in nurseries. When plants are 6 to 9 inches high, they are transplanted to the wet and well-puddled (wet-ploughed) rice fields. The second method is the direct seed method where seed is directly sown/broadcasted in well-prepared fields. In the past, the nursery seed method was more common, but now growers are recommended to shift to the direct method as this requires less water and other inputs and also better yields. The table 3 below shows the benefits of adopting such a technology.

Table 3: Impact on Improved Technology			
	Production Tiller/m2	Yield (t/ha)	Water Use (Acre-inches)
Tradition	266	3.98	75
Direct Sowing	403	5.12	57

Source: Rice Research Institute, KSK

Opportunities for Value Chain Development and Financing

A Paradigm Shift In Rice Industry—Case of Engro/EXIMP

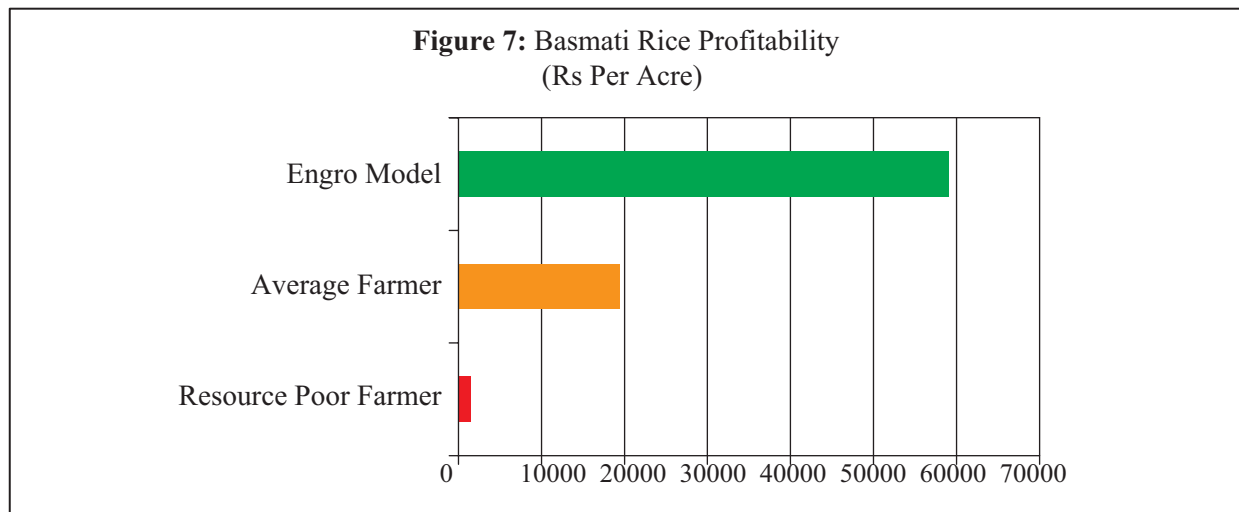
Engro Eximp has set up a large and state-of-the-art rice processing mill in Mureed Kay, Shiekupura, and the heart of the basmati growing area in Pakistan. The objective being to provide farmers a choice to market his produce directly instead of going through traditional Mandi, reduce waste, decrease cost, increase yield and better profit margin and cash flow. The business model offers two possibilities, contract and contact farming. The contract farming is based on written agreement by the farmer to produce quality rice, according to the required specification. The contact farming is not obligatory on farmer to deliver the produce. Last season Engro procured 100,000 tons of paddy, 40 % of this coming out from the 1500 contracted farmers valued at Rs 1.7 billion.

The main features that make Engro approach different are:

- i. Productivity enhancement and cost reduction. Providing pure certified seeds and supporting adopting good agriculture practices has resulted in enhancing productivity to 45 Maunds per acre.
- ii. Intensive technical support resulted in water and labor saving on one hand and enhanced supply of rice through reduction in waste.
- iii. Marketing, the price paid to the farmer is market and quality based, an incentive built for farmers to bring a better quality (example, moisture content, purity, etc) and obtain a premium price. Average payment time is two days, no one in the industry carry such a track record of prompt payment

The Engro initiative is promoting resource poor and average farmers with better market linkages and enhancing profitability. This is evident from our analysis presented in figure 7. The high profitability of Engro business model, among other factors, is driven by 45 percent increase in yield and 15 percent reduction in the costs due to good agriculture practices and better post harvest handling. The model also provides a window of opportunity to bring reforms to our marketing system that is dominated by middleman/processors and is deeply embedded in the marketing act of 1939 that forces farmers to sell produce through this long and inefficient supply chains.

The challenge is to scale up the model to bring more and more resource poor farmers in this innovative mode and provide them with financial product that meets the financing needs of the rice value chain.



Technical and Quality Requirements

As large part of the basmati rice is exported, it is important that production, harvesting, post-harvest management and its processing is done according to global agriculture practices/standards and in a cost effective mode to enhance profit and competitiveness. At production levels the produce going through Mandi has minimal technical and quality parameters needed to sell, other than moisture content measured by Arthi. On the other hand, the business model using contract farming is embedded in philosophy to produce quality produce accepted in the export markets having stringent quality parameter.

There is constant debate that is to be blamed for poor quality. The miller point of view is that exporters demand supplying rice based on a board specification and as such they process rice accordingly. Further they claim that it is not difficult to invest in new technology but demand for export keeps changing, the type rice demanded and the needed ratio of rice and broken rice. They also hold the view that there is limited demand for refined rice, even if they invest in value addition, given exporter monopoly to access external markets. Limited demand can also result in excess supply and hard to find exports with profitable disposal.

Millers blame this problem on the poor quality of rice produced in rice producing belts. Crop mismanagement is due to the lack of adequate seed bed preparation, certified seed, adequate plant population, weed control and integrated pest management, judicious use of micronutrients and balanced application of fertilizers and poor selection of farm machinery for harvesting and trashing.

Risks in Production and Marketing

There are number of risk involved in rice production and marketing, first is the production risk which arises due to unreliable input supply, lack of or late credit, low quality standards, lack of storage facilities and packing facility. Further, weather and disease risk are common in rice cultivation. Than pest attack of stem borers, leaffoderls and white backed plant hopper can reduce the yield (RRA 2012). Weeds attack is also a serious risk for substantial reduction in yield. Too much or too little water has been hall mark of on-going climatic change, becoming a serious risk to paddy producers.

Financing Production

There are two broad types of financing mechanisms that exist in the value chain: Institutional through banks (formal) and non Institutional (informal) that include friends, relatives, Arthi, wholesalers, storage operators, processors and input suppliers. They are further elaborated in section value chai financing.

Processing

Processing Capacity

There is no data or information available in Pakistan that provides a clear picture of types of mills, their capacities and utilizations. Information below is based on limited information collected during our field work. There are more than 2000 (old data, may be more) rice milling units in Punjab alone, with most operating in basmati belt. The units are mainly located in District of Lahore, Shiekupura, Gujrawala and Sialkot. A typical modern mill goes through a number of processes before paddy is transformed to brown or white rice as presented in figure 8. The processing / milling capacity of these units ranges from 0.5 metric ton per hour to 3 metric tons/hour and for big units the range is from 4 to 8MT/hr & above. There are about 25 to 30 rice mills that are fully integrated, these mills use advanced plants supplied by manufacturers by Japan, German or other countries which are fully/ semi automatic with one line / chain processing plants. Engro Rice in Mureed Kay and Guard Rice in Lahore are good examples. These are very costly plants and control each and every activity /process of the plant including automatic cleaning, grading, drying, milling, separation, bran separators, de- stoning, computerized sorting and packaging unit. The production capacity and efficiency of such plants is enormous and prove highly effective and produce quality rice.

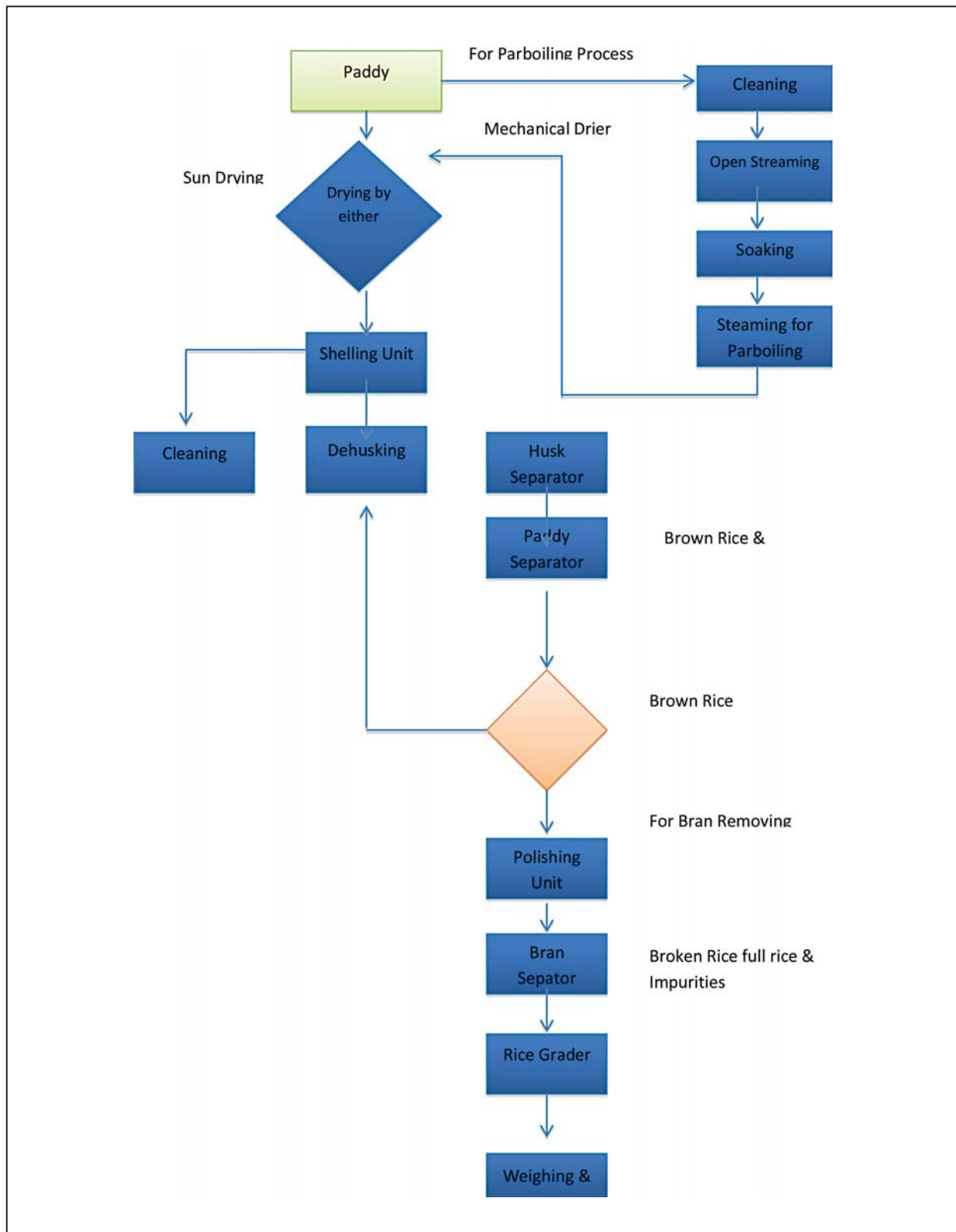
Linkage between Processors and their Suppliers

The rice mills are operating below capacity as the there is not enough rice to meet the processing demand, for this reason the competition is immense to procure the available supply. The processor (sheller's¹²) procure their supplies from two sources, the farmers and wholesale market. The farmer sell their produce directly to Sheller's to get a better price what they can otherwise can get from Arthi in the wholesale market. The processors/miller has their agents in WSM who knows the market well to procure the required amount. We visited procure 75 % of rice from mandi and 25 % directly from farms and selling rice mostly in the domestic markets where quality parameters are not strict.

The Rice mills and large integrated processors mentioned above have business contacts with commercial banks to meet financing needs, especially during the peak buying period from December through January they occasionally have a cash flow issues. However, small processors require working capital for processing and storing paddy and rice. Small and medium processors and start-ups require financing for machinery used for drying, husking, whitening, cleaning /sorting and packing.

¹² Sheller is a terminology used for those rice processor who process rice for domestic market, where it needs minimal processing. The millers on the other hand cater to export markets where rice is required with higher degree of processing such as polished or silk rice.

Figure 8: Raw Rice/ Parboiled Rice Processing



Markets

Market Channels or Business Models

An efficient marketing system from production to retailers is important for developing a profitable and competitive rice industry in Pakistan. The bulk of rice marketing is in the hand of private sector with minimal regulatory framework in place. In the absence of efficient marketing system (good 70 % sell through Mandi) high market prices at retail or international levels are not being transmitted to the farmers. The Government intervention in rice is not as pervasive as in wheat, but generally institutional marketing infrastructure is weak and regarded as inadequate and inefficient (see section on Arti). It lacks institutional support such as marketing associations at farm levels, forward trading, and farm to market roads, integrated markets, and lack of market information, multiplicity of intermediaries and limited grading and standardization. One can understand inability of small farmer to invest in storage at farm levels, but even medium to large farmers have not invested as individual or groups to address this vital issues. The rice value chain also lacks good cadre of professional trained in various marketing management techniques like branding, trade marking, costing and pricing techniques and various marketing methods.

REAP at export level has done an excellent job in bringing producers, traders, processors and exporter at a platform where they have successfully created a larger market share for rice exports from Pakistan, the impressive growth in rice highlighted in this analysis is partly attributed to efforts by REAP to create a better image of Pakistani rice. Allegation often leveled against the association that it has an export monopoly is not well founded due to the fact that alternative business models are in place that is exporting rice directly.

Proper storage is the missing link within the chain. The storage is only available at processing levels, giving miller the market power as no other agents within the chain carries. A number of millers who had storage facilities obtained a windfall profits last year. In 2011-12 season buying price for miller was around Rs 1200 per maund and ex factory paddy was selling around Rs 2000. Within one crop cycle, the price rose dramatically to Rs 3300, and those who could store the rice had a windfall profit of Rs 1200 per maund. A proper storage in rice industry would be needed to distribute this value addition equitably.

The marketing channels identified in basmati rice belt are:

- Trader dominated
- Direct selling to millers
- Contract farming

Trader Dominated Marketing System

Trader dominated represents a case where farmer access to market, credit and technology (seeds, fertilizers) is primarily through Arthi. He deals with resource poor farmers whose situation is characterized as one caught in vicious cycle of low appetite for risk, low investment, low productivity, low market orientation, low value addition and low income that limits access to technology, credit, and market. In this case farmer does not have an informed choice--- he is at the mercy of Arthi as key stakeholders that determines the market structure – he sets the price as farmers is in a weak position or no position to negotiate. He also holds leverage when it comes to quality of rice, he can simply accept or reject the produce based on the grounds that rice sample does not meet the required moisture levels as there is no scientific procedure to assess moisture contents. Further, once paddy producer is in the market with his produce, has already incurred transport cost, even when bargaining fails he is not in position to take his produce back, a classic case of sunk cost. The small farmers is also hard press to receive some cash to meet his private obligations, at the same time needs working capital to plant wheat,

making his bargaining power quite low. All these factors lead Arthi's market dominance. On the other hand Arthi makes a good cases that he bears all the risks, provide market access (further information section on role of Arthi)

Direct Selling to Millers

There are large number of Sheller's , with small capacities usually undertake processing only when the rice need to be sold, otherwise it is stored as brown rice or slightly polished rice. Then there are number of reprocessing units that operate on demand with agreement on volume and rate at which to process. Then there are new modalities in rice marketing and trading taking place where farmers are required to produce quality rice in return for better price. One such a case is the Rice Partners Ltd (PRL) joint venture with Mars to export brown rice from Pakistan. The project selected 15 farms last year and intends to increase this number to 30 to produce approximately 2,500 tons of basmati brown rice each year -first major international buyer to engage directly with local rice farmers in Pakistan, providing an opportunity to set new marketing trends that can benefit medium to large farmer a great deal.

According to information provided by PRL team , the project support the farmers by providing free quality seeds and under writes the transportation cost to bring produce to milling factory. The farmer also receives support and advice from a team of local agricultural experts, to ensure that they comply with good agriculture practices in meeting their quality standards. The project also plans to help farmers to minimize use of chemicals by supplying fertilizers and pesticides that comply with strict EU food safety requirements. Use of IT (cell phones) to provide advice on good agriculture practices is in place, good to introduce this innovation, as other developing countries both in Asia and Africa are widely using it.

Contract Farming

There are few large scale millers who are involved in contract farming with a view to partly meet social cooperate responsibility (SCR) objectives. This production and marketing modality provides quality seeds and other inputs, a private sector driven extension services in producing a paddy/rice that meets standards for exports. The numbers of farmers, both small and large are joining for mutual benefits. Effective measures are taken to maintain quality throughout the supply chain. The paddy is stored in silos with temperature and aeration control. This allows paddy to be stored in optimum conditions for longer term storage.

The program also has the potential to address two other major problems facing agriculture sector-- provide better market access to small farmers by minimizing the role of Arthi and providing an alternative export channel than through REAP. As discussed above, in fact both are providing valuable services, the Arthi do provides market access to small farmers but at a very high cost which farmers are unaware. On the other hand REAP has been instrumental in making rice export competitive and opening up new markets.

SWOT Analysis

Strengths

- Basmati rice belt, it is the only suitable crop for this cropping zone
- Easy availability of paddy within rice cluster
- Easy availability of machinery and maintenance.
- High capacity for investment of entrepreneur
- Pakistan carry a huge comparative and now carries a good competitive advantage in basmati rice
- Compared to other crops, operates in relatively free market environments
- Highly profitable

- Exposure to export market
- Farmers ability to adopt new varieties when incentive exists, new rice variety Kaniat is a good example
- Active market for paddy and rice throughout the year
- High demand in local and international market.
- Non perishable , offers storage possibility which is lacking in most other crops
- Large numbers of modern processing mills
- Good transport facilities

Constraints

Production

- Low level of education
- Good quality seed, excessive use of water, poor pre and post harvest handling
- Labor shortage because of competition from other economic activities
- Rice transplanting use outdated methods using excess water and labor
- Harvesting machines are not tailored for rice, resulting 20 to 30 percent wastage
- Weed control management at best is poor, resulting in lower yield and waste of value able inputs.
- Farmers have limited access to financial services to give them capacity to access farm inputs and implements and consequently, the production and productivity at farm level is very low.
- Small farmer financing needs are met by Arthi, but at a very high cost, his mark up goes as high as 100 percent
- Farmers undertake marketing activities as individuals and this give less bargaining power compared to buyers

Marketing and Trade

- Frequent power breakdowns and high cost of diesel
- Mixing varieties, farmers do not use uniform seed variety and this affects quality of rice when processed
- Poor quality of paddy produced
- Critical to remove moisture from 22 % to 12 % and for storing at 9%
- Most farmers sell upon harvest to obtain badly needed cash
- Large number of processing units with outdated technology with high percent of broken rice
- Inefficient plants in use: lackof energy conservation, poor maintenance , low productivity and hence lead to higher cost of production.
- Poor manpower skills
- Lack of quality assurance & control mechanism.
- Storage facility only available at processing levels
- Lack of marketing awareness
- Un-hygienic conditions within milling process
- Lack of credit to finance up gradation of outdated mills

Opportunities

Production

- Possibility to promote improved seeds
- Improved and innovative technology available
- Collective action for procuring inputs and marketing of the produce.

- Harness IT technology to access information
- Trade off to invest in sun versus mechanical drying
- Possibility to raise three crops instead of two in traditional cropping pattern
- Investment in storage provides a high returns

Processing

- Profits margins are good
- Collective action for storage, warehouse receipt?
- Promoting producer marketing groups (PMGs) for collective bulking and marketing of their produce.
- Adopt good agronomic practice, use uniform improved variety seeds to attain enhanced productivity
- Regulating market power of miller

Threats

- Quality requirement of international market (e.g. Aflatoxin)
- Supply of mix-up varieties.
- Rejection of product by exporters
- Water scarcity is growing, in future we have to produce more rice per drop, it is not happening
- The Kaniat or Pusa variety introduced from India has been a success story, it has outperformed on all scores and is replacing our varieties, even though it is not legal and we can easily be drawn in another legal battle like patent rights for Basmati.
- Climatic change can dramatically alter existing rice-wheat or rice-vegetable-maize crop mix
- Urbanization along the trunk road, growing town centers all eating very good agriculture land that can never be brought back.

Economics Analysis

Cost, Revenues and Profitability Analysis

Based on identified business model, the analysis for resource poor farmer reveals that he receives 35%, the processor 27% and retailers share of 28% of the retail price. The commission agents and wholesalers get a meager share 2.8 and 5.6 % respectively but their turn over volumes is large, perhaps making more money than other agents. If farmers are able to sell his produce directly to miller, farmers share of retailer price increase from 35 % to 46 %, significant increase making rice cultivation a much more profitable business (table 4). The third model is similar to second but the paddy is produced using good agriculture practices that meet the export standards. The challenge would be to move 80 per cent of farmers from traditional mode of marketing to a business model that can sell his produce to miller either directly or through contract farming.

Table 4: Share of each agent in consumer price (%)			
	Resource Poor Farmer	Average Farm	Contract Farm
Retailers	28.57	24.1	24.88
Wholesalers	5.6	5.41	5.54
Processors	27.31	22.54	30.78
Traders	2.87	-	-
Producers	35.86	46.41	38.68

Profitability Analysis

Table 5 provides a comparative analysis of three identified business models. The resource poor farmer has a profitability of Rs 1539 per acre, hardly enough to cover the cost of production. The profitability of farmer who has better access to market as he is not bound and can sell his produce to Arthi or Miller, has a profits of Rs 19449 per acre, a reasonable returns on investment, though not as much as the progressive grower are obtaining in the rice belt. For these farms, the preferred cropping pattern is the growing basmati rice in rotation with wheat--the size of farm, good agriculture practices and better access to market make farming a profitable proposition.

Table 5. Basmati Rice Profitability							
	Yield/M/A	Price/Maund	Revenues/Acre	Cost/Acre	Profit/Acre	Profit /40 Kg	Profit /ton
Resource Poor Farmer	26.35	1300	34255	32715	1539	58	1460
Average Farmer	31	1800	55800	36351	19449	627	15685
Progressive Farmers	45	2000	90000	35987	54012	1200	30,007

The third model is processor or miller driven where both small and large farms are contracted to sell the produce. A win-win situation is created for both exporter and producers by eliminating number of agents within the chain. In this case the producer profitability is estimated at Rs 54012 per acre, an attractive return to investments compared to other two business models.

To address these issues and work out a long term viability /strategy of rice industry in Pakistan, a study on incentive structure, comparative and competitiveness of rice growing according to ecological zones and water availability in Pakistan is needed that would calculate domestic resource cost (DRC) which will determine how competitive rice production is when resources are evaluated at its true value.

Processing Cost and Profits

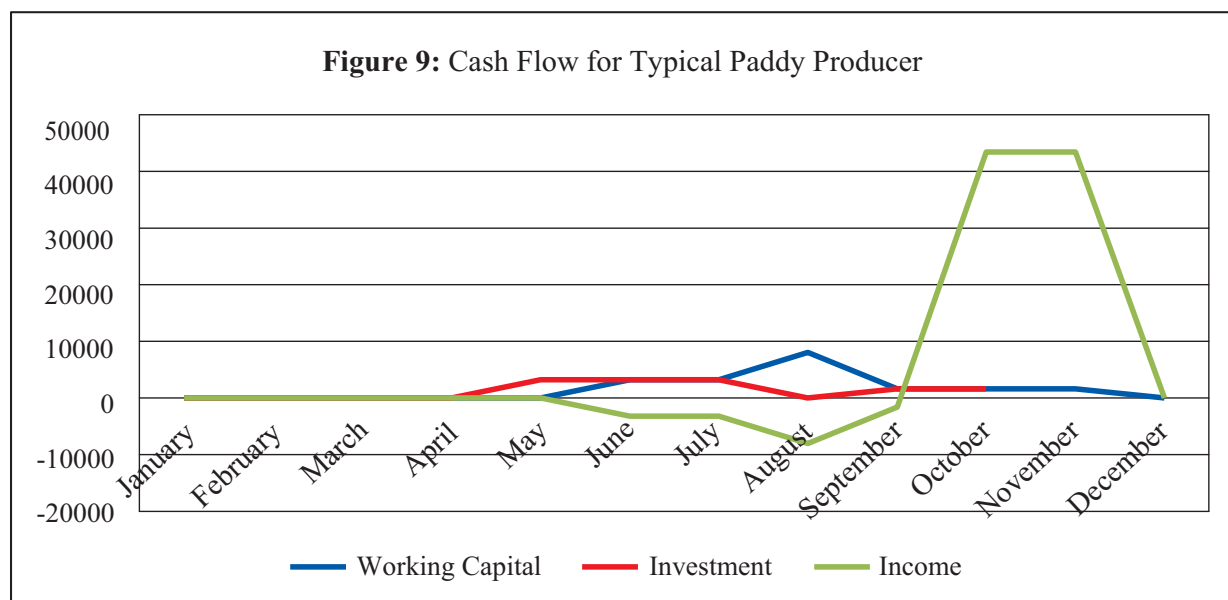
The profitability of average rice processing and husking unit in Sheikupura region is presented in table 6.

Table 6: Processor Profitability	
Costs	Rs KG
Buying cost	55
Processing Cost	3.05
Marketing	1.65
Total Cost	59.70
Revenues	Rs Per Unit
Selling Price	82.5
Profit Per Kg	22.80
Profit per 40 Kg	912.15
Profit Per Ton	22803.85

Clearly the margins for processor are quite high, especially at this time as rice markets offers attractive price both in the domestic and export markets. The analysis reveals that domestic prices of basmati rice has been on the rise to a point that export price is less than the domestic prices, making difficult for exporters to procure the needed quantities. Following matrix (table 7) depicts the cash conversion cycles at various nodes of the value chain:

Table 7: Financing Conversion Cycle	
Functions	Organization
Crop Inputs	Rice inputs cycle is through May to July, one month cycle for purchasing seed from dealers, financing through Arthi, or Sheller's with credits cycle of 6 month Fertilizer cycle on cash is from ordering to delivery to its final users and it takes 15 days to a Month. Whereas, the credit cycle takes 3-4 months for duration of crop and its sales to market. Other plant protection is financed on similar lines
Primary Production	Small and medium growers who have contract with Arthi or Sheller's, sell at lower than Market price (example if farmer borrowed Rs 100000, he has to return Rs 135000, a flat rate charged), but those who do not have contract with Arthi can negotiate a price. These grower have a choice to hunt for the best price. They have relatively better cash flow than farmers who has a contract with Arthi. Growers under contract with processors are in a better position and have better cash flows as their pay back from processors are based on immediate payments.
Markets	Grower and Arthi contract: cash cycle on borrowed inputs continue for 6 months. Arthi Mostly keeps large portion of cash in this cycle and extend cash to grower on a need basis. This extra liquidity enables Arthi to have a daily or weekly cash flow with whole seller.
Processing	Processors runs a 9 month cycle with producers, whereas the end buyers have an arrangement On invoice to invoice basis.
Storage	Storage is needed for 9-12 month, millers provide this facility, Bank pledging takes place.

The financing needs for paddy producer are further elaborated in figure 9 below; the analysis is based on farm budget data obtained for an average basmati rice producer in rice belt of Punjab. Our analysis reveals that farmer financing needs for working capital are in the months of May through August; his investment needs are mostly during May through June at the time of land preparation and harvesting. His cash flow is positive only during harvest/sale time in October November.



Access to Finance

Financing of Working Capital

Financing of input supply (working capital) at producer levels of the value chain is financed by Arthi through the input dealers. Medium to Large farmer are in a position to obtain limits from the bank for working capital. Again the dividing line is not so clear, even some large farms do go to Arthi but they are exceptions. Traders, stockist and processors get their limits from the Bank, they pledge their produce. The loan is obtained at 18 % plus operation cost.

Table 8 summarizes different sources of loan for paddy producers that can be accessed from four possible sources.

Table 8: Formal and Informal Credit

Informal	Zarai Taraqati	MFIs Banks (5) ¹	Commercial Banks
Commission Agents, or arties, are commodity specific	Nearly all loans are individual (tenant farmers do not qualify)	Min capital Rs 100-500mln ² Deposits not allowed; though this can be revised by SBP on a case by case basis	Min Capital required varies ³ May lend unsecured up to Rs 5.5mln
Average 200 clients, 75 having long term relation,	Loan size is determined by a PIU (Produce Index Unit) formula, determined by the government.	Funded by loans, donor funds individual and group loans allowed	Don't lend to MF clients; largely corporates, SMEs and individual with property to pledge as collateral.
Provides loan for working capital, Farmer needs to deliver produce, price settled with auction, plus he withholds his commission range from 4 to 8 %.	The bank will lend for seasonal inputs as well as for capital equipment and livestock Collateral/advance rates differ based upon the status of the pledged land	Typical 1st cycle loan Rs 10- 15000 (may be revised now) Maximum loan size Rs 150,000 (may be revised now)	Group loans not permitted No interest rate cap
only handles the sale and collects a commission		No interest rate cap, typical interest 29% for MF Banks, 20% for NGO lenders.	Paddy traders and millers often take the loan and pledge paddy under storage as collateral

- i. 5 MF Banks are Khushhali, First Microfinance Bk, Tameer Bk, PakOman Bank and Rozgar Bank.
- ii. No MFB shall commence business as microfinance bank unless it has a capital of Rs.500mln, Rs.250 mln, Rs 150 mln and Rs.100 mln respectively, for countrywide, province-wide, region-wide and District-wide microfinance banks. NGOs transforming into banks may contribute up to 50% of the reqd capital in the form of existing loan portfolio, remainder to be in cash.
- iii. According to a State Bank of Pakistan circular (4/16/09) banks will now be required to raise their minimum paid-up capital (free of losses) to Rs6 billion by December 31, 2009, Rs7 billion by December 31, 2010, Rs8 billion by December 31, 2011, Rs9 billion by December 31, 2012 and Rs10 billion by December 31, 2013. This is a reduction from earlier requirement of Rs10 billion by December 31, 2010, Rs15 billion by December 31, 2011, Rs19 billion by December 31, 2012, Rs23 billion by December 31, 2013.

Role of the Arthi

We interviewed a number commission agents in Lahore, Shiekupura, Gujrawala and Sheikura districts, operating out of wholesale markets. They deal exclusively in Rice, Wheat or both, providing all necessary inputs to farmers as well as providing cash loans to farming households during the growing season and harvest. Since the Arthi advances the cost of the inputs and is repaid from the harvest sale, the return to the Arthi can be high. They emphasized the point that he faces considerable risks in their business, in addition to the carrying out the cost of providing inputs. There is the risk of crop failure or disease and more importantly, the risk of farmer defaulting or selling to another agent

Arthi provides financial product for Short-term, seasonal loans generally between agricultural producers and either input suppliers or produce buyers (processors, traders, etc.). Financial institutions are rarely involved. When provided as a loan, it tends to be limited to working capital (for inputs) and is usually provided in-kind.

Relationships between the farmer and Arthi are often more temporary and price-driven than in the case of contract farming and out-grower schemes. The major contribution of such institutional set up is that he is providing a market access to poor farmer otherwise difficult to obtain and this may also results in improved yields via improved inputs. Arthi credit is also vulnerable to “side-selling” arrangements, in which the farmer sells his or her product to competing buyers rather than making good on their purchasing agreement with the “lender.”

Any reforms in rice value chain development or its up gradation would need to provide better alternative to this long, inefficient. Engro model of contract farming has the potential to address this issue and is highlighted below. The matrix below (table 9) provides and insight on two things, the financing nodes and each agent needs for working and fixed capital.

Table 9 : Working and Fixed Capital Needs with Rice Value Chain				
Participant in the Chain	Financial Needs	Financing within the Chain	Financing from Outside the chain	Awareness on Available Financial Products
Input Distributor	Working Capital (WC) Fixed Capital (FC)	Factory Purchased Capital	MFIs, Commercial Banks	Non
Farmers	Working Capital (WC) Fixed Capital (FC) Household Budget (HB)	Self Financing Friends and relatives, commodity based per-finance and credit providers, Arthi, and input stockist	Informal Money Lenders, FMIs and ZTB	Non
Processors	Working Capital (WC) Fixed Capital (FC)	Pre-financing from Exporter	Commercial Banks	Low
Whole salers/Exporters	Working Capital (WC) Fixed Capital (FC)	Pre-financing from Exporter	Commercial Banks, MFIs	Very Low

Other than production risk discussed in section 3.6, farmer face marketing risk that relates to the inability to sell on time, in right quantities and or at an acceptable quality standard. Fixed contracts throughout the chain help to stabilize turnover, especially when dependence upon one market can be avoided. Also product standard and certification can reduce risk.

The second is the price risk which can be due to fluctuation in market prices due over or under production. These risks are borne by producers/farmers or by chain actor, depending upon the type of contract used.

Enabling Environment

Policies and Regulation

The government provides support to selected crops under guaranteed minimum price (GMP), set with support of APCOM (renamed Agricultural Policy Institute) based on a number of factors such as domestic and world demand and supply of rice, cost of production, price of competing crops and detailed calculation of import and export parity prices.

Trading Corporation of Pakistan (TCP), a state-owned corporations presently only operate as an arm, which helps governments in meeting shortage and keep buffer stocks of essential commodities. At times TCP intervene in rice markets, REAP has a longstanding view that they often distort a well functioning rice market affecting negatively the export performance.

The SME Policy (2007) emphasizes the supportive role of the Government in facilitating the market-based growth of SMEs and identifies as key actions (i) market-based access to finance, skills, and entrepreneurship development; (ii) reduction of bureaucracy; and (iii) easier entry into the formal economy.

Punjab and Sindh marketing system is still deeply tied up with out-dated Agricultural Produce Markets Act (1939), which regulates the purchase and sale of agricultural produce, and restricts wholesale transactions in agricultural commodities to regulated markets and permits wholesale trade only through these notified markets. Reforms are being enacted to change these laws, but progress is slow

Institutions

Public Sector

The following institutions play an important role in supporting the rice subsector:

Federal Ministry of Food Security; Pakistan Agriculture Research Council; National agriculture Research Council; Rice Research Institute, Dehirk, Sindh; Agriculture Research Station , DG Khan; Dawood Seed cooperation; Plant Genetic Research Lab; Punjab Seed Cooperation; Rice Research Institute , Kala Shah Kaku; Seed Testing Laboratory Sahiwal ; Seed Testin Lab Hyderabad; and Sindh Seed Cooperation

Research and Development Institutes

- National Agricultural Research Centre, Park Road, P.O. NIH, Postal Code 45500, Islamabad.
- Rice Research Institute, Kala Shah Kaku, Lahore Punjab. Postal Code No. 39020. Phone No.(042)290368. Fax:042-290361
- Rice Research Institute, Dokri, Distt. Larkana, Sindh. Postal code =77080 PhoneNo.07443-409 Nuclear Institute for Agriculture & Biology (NIAB), Jang Road, PO. Box.128, Faisalabad.Phone No.041-654221-30 Fax: 041 - 619724

- Atomic Energy Agricultural Research Centre, Tandojam, Sindh. Phone:40478
- Agri. Research Station, Mingora, Swat, NWFP Postal Code. 19130 Phone: 0536-812284 Agri. Research Institute, D.I.Khan. Phone: 0529-711946
- Federal Ministry of Food, Agriculture and Livestock G-9/4 Mauve Area Islamabad Phone: (051) 858657 Fax: (92-51) 857509
- Pakistan Agricultural Research Council, National Agricultural Research Centre P.O. Box 1031
- Rice Research Institute, Dokri, Sind
- National Agricultural Research Centre, P.O. NIH, Park Road, Islamabad, Pakistan.
- National Accreditation Council - Provides international certification e.g EurepGAP
- Agricultural University of Faisalabad - Undertakes post-harvest research

Associations

Rice Exporter Association; Farmers Organization; Basmati Growers Association, 2005; Farmers Association 1992; Agribusiness Forum ASF/USAID (2012)

Infrastructure

Energy and water shortage are limiting rice industry to be competitive. There is urgent need to provide storage facilities at micro, meso and macro levels, The physical access to markets is also restrained due to lack of rural roads and farm-to-market roads. have opened considerable opportunities for the agribusiness, both in terms of developing a knowledge based agriculture economy and in improving their linkages with the market.

Services

Rice producer have low and variable access to private and public services with limited public knowledge of new techniques Infrastructure, roads, ports, storage facilities are the domain of public sector, where processing, storage and transport is largely provided by private sector.

Information management services do exist but their use for agriculture is very limited Following are service provider supporting rice production and marketing in Punjab Director General Agriculture Punjab (Extension & Agriculture); Rice Research Institute, Kala Shah Kaku ; Ayub Agricultural Research Institute; Microfinance institution ; PASSCO Pakistan Storage and Supplies Corporation; Punjab Seed Corporation; Rice Exporters Association of Pakistan; University of Agriculture Faisalabad; Trading Corporation of Pakistan ;Zarai Taraqiati Bank Limited

Conclusions and Recommendations

Identified Issues:



1. Production: lack of quality seed with short duration and high yielding variety; outdated nursery planting that use intensive labor and water; lack of storage at farm and community levels



2. Harvesting and Processing: Post harvest losses ; Harvesting technology not suited for rice, high % of broken rice, lack of dryers, outdated processing machinery; mixing varieties



3. Marketing & Competitiveness: Small rice farmer caught in vicious cycle low appetite for risk leading to low investment in productivity, market orientation, value addition and profitability along the chain; dominate Arthi role



4. Enabling Environments: Need to link small farmers to credit and market, inadequate developed market information systems

Proposed Actions:



1. Production: Develop short duration variety; Promote direct seed planting; Adopting GAP; Enhancing water productivity



2. Harvesting : Harvesting machinery suitable for rice cultivation: Provide Training on harvesting and post-harvesting practices;



3. Marketing & Competitiveness: Support storage at farm level; create producer groups or promote contract farms, developing financial product for storage; Business Management Skills; Market Access,



4. Enabling Environments: Reforming the Mandis; formalize informal credit; commodity future, IT based information data creation and sharing.

Bibliography

Abdel-Aziz Ibrahim. Supply Chain Analysis Of Rice In Egypt, (The Commodity Chain Analysis Methodology), FAO, 2004

Agriculture Policy Institute, 2008-09, Rice Paddy Analysis for 2008-09, July , 2008, Ministry of Food and Agriculture and Livestock, Government of Pakistan,

Anne Thomson. Commodity Chain Analysis. An Introduction to Methodology and Use for Economic Policy Analysis. FAO, 1998.

FAO, Agricultural Statistics Data Base (FAOSTAT).B.D.Shukla, Project Coordinator, AICRP on Post Harvest Technology, Central Institute of Agricultural Engineering, Bhopal-462 018, India

FAO, (1997) 'Wholesale Markets in African Cities. Diagnosis, Role, Advantages, and Elements for further Study and Development' [accessed 05 Jan 2009]
http://www.fao.org/documents/pub_dett.asp?pub_id=61420&lang=en

Fabien Talleg , Louis Bockel , Commodity Chain Analysis, Financial Analysis

Agricultural Policy Support Service, Policy Assistance Division, Food and Agriculture Organization of the United Nations, FAO, Rome, Italy

Govt of Sindh, PND, Ushering Structural Transformation in Sindh; Government of Sindh's Program for Grant of State Land to Poor Landless Haris, ILO, Bonded labour_in agriculture: _a rapid assessment_in Sindh and Balochistan,_

Pakistan ISBN 92-2-115484-X Special Action Programme to _Combat Forced Labour

E. D Smith, A.M. Khushk, and M. Stockbridge, Case Studies of Corruption in Agricultural Markets in Sindh Province, Pakistan, and Implications for Market Liberalization, Journal of International Food and Agribusiness Marketing, pp. 19-42, 1999.

Badrudin, M Afzal and M. Bhutta, Water and Its use in Agriculture: A perspective for Pakistan , April 1999

Makro Cash & Carry, trading as Makro-Habib Pakistan Limited. Personal communications (pers comm) in April 2009 with Category Manager (Fresh Food). www.makropakistan.com

Ministry of Food, Agriculture and Livestock, 2008. Agricultural Statistics of Pakistan 2006-2007. Capacity Building of Economic Wing Project, Ministry of Food and Agriculture (published under

Ministry of Food, Agriculture and Livestock), Government of Pakistan

Ministry of Food, Agriculture and Livestock, 2008-09. Rice paddy Policy Analysis for 2008-09, API. Government of Pakistan

Oxfam , Rice For Local And Export Markets, Sub Sector And Value Chain Analysis

Shinyanga Tanzania, May 2008, Oxfam Gb Tanzania Programme, And Conducted By Match Maker Associates Limited (Mma)

Planning and Development Department, Government of Sindh. 2007. Sindh Vision 2030: Aspiring Towards a Healthy, Productive & Prosperous Nation. Karachi. The draft is being finalized currently.

Safal, Fruit & Vegetable Unit, Delhi, India. (July 2009), <http://www.safalindia.com/companyprofile.htm>

Small and Medium Enterprise Development Authority, 2007 -Feasibility Study, Rice Husking & Polishing Unit, Government of Pakistan, www.smeda.org.pk

Smith, L.E.D. Khushk, A.M. Stockbridge M. Case Studies of Corruption in Agricultural Markets in Sindh Province, Pakistan and Implications for Market Liberalization. Journal of International

Food & Agribusiness Marketing, Vol. 11(1) 1999. 19-42.

Sushil Pandey, Humnath Bhandari, Economics of Hybrid Rice: Issues and Opportunities, International Rice Institute

World Bank 2008. India Taking Agriculture to the Market, Agriculture and Rural Development Unit, South Asia Sustainable Development Department , South Asia Region, October 17, 2008 Document of the World Bank , Report No. 35953-IN

Rice Reasearch Institute, kala Shah Kaku, 2010, Rice Rearch: Step towards Green Revolution