Value Chain Analysis of Rice in Rupandehi District
(September 2010)

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Executive Summary

A value chain study on rice was conducted in Rupandehi district in connection with the RiU project. The overall objective of the study was to know the comprehensive performance of rice sub-sector through the value chain analysis. Information was gathered through FGDs, key informant interviews, informal discussions, stakeholders' workshop and secondary sources.

Rice is the most important cereal crop in Nepal contributing largely to food security and rural economy. Rice is the number one crop in the district which is grown in 72,500 ha area. In the year 2009, total production of rice in the district was 280,575 tons with a productivity of 3.87 tons per ha. It is estimated that 233,575 tons of rice is used by producers for home consumption and the remaining goes to market for sale.

Rice is mainly grown as the main season crop. In broadly speaking, three types of rice (fine, coarse and aromatic) are grown and available in the market. Majority of farmers grow both fine and coarse rice whereas, aromatic rice is very negligible. Fine rice varieties are suitable for lowlands whereas coarse varieties for uplands. Fine rice has better taste and higher price compared to coarse rice whereas coarse rice has advantage of higher milling and rice recovery percentage.

A large number of market actors are involved in rice value chain playing different roles in input supply, production, collection, processing/milling, wholesaling and retailing. The same actors were found to be involved in both the fine and coarse rice value chain. A total of 76,000 farm households were rice growers in the district out of which 52,000 farm households used to sell some amount of rice in the market.

Obviously, rice is traded in large volume but no exact data are available to depict the demand and supply situation in the domestic and outside markets. The demand of fine and coarse rice is almost in equal proportion whereas demand of aromatic rice is about 5 percent of the total market demand. Annually, about 47,000 tons of rice comes to market from domestic production which is far below the market demand. It is estimated that large volume of rice grains exceeding 47,000 tons is imported from India to fulfill the market demand.

The rice value chain is characterized by informal and less developed market systems. A strong vertical and horizontal linkage among the key actors was not found mainly due to lack of mutual understanding and poor functional relationship. The large scale collectors, large millers and wholesalers were found to dominate the rice supply chain. Demand of rice grains is increasing every year in the market. There are unusual price fluctuations and market distortion due to import of low cost and inferior quality rice from India.

November to January is the peak time of rice transaction between farmers and collectors. Large scale collectors store rice/paddy for six to nine months to catch high market price at scarce season. Rice processing by millers involves de-husking, polishing, grading and packaging. The quality of rice grains from large millers is better than small millers due to better grading facility.

There is low profit margin to market actors in rice business when compared to other high value agricultural commodities. Market actors are involved in rice business because there is low risk and enormous market outlets. The profit margin in rice business at different functions from collection to retailing ranges from Rs. 0.5 to 3.0 per kg of rice. The rice millers have a higher margin per kg of rice compared to other market actors. Farmers do not calculate profit margin but they say that the cost of production is high cost and straw is the profit from rice business.

Demand of rice grain is increasing every year, and there is import of rice grains from India because domestic rice is inadequate in the market. Indian rice is cheaper than Nepalese rice but of low quality. Domestic rice products cannot compete with Indian low price rice which results into price fluctuations and market distortion due to malpractice of mixing some low quality rice with good quality products.

There is good access of farmers to agro-vets and fertilizer dealers but improved seeds and fertilizers are always in short supply. The other overwhelming issue and bitter truth is the poor quality of improved seeds and fertilizers in the input market. Farmers mention that the productivity and profitability of rice is low due to inadequate use of technologies and high cost of inputs and laborers. There are also a number of other constraints in rice value chain to promote the sub-sector as a viable business enterprise.

Effective and efficient extension services from government and non-government organizations are required to increase productivity and profitability of rice by pushing up package of improved technologies in the farming community. The input supply system should be strengthened to ensure the availability of quality improved seeds, fertilizers and irrigation in the community. The government, non-government and private sectors should closely coordinate and collaborate for delivering services in a consolidated way for desirable and sustainable outcomes. Provisions should be made for smallholder farmers and small traders for subsidies and grants on agricultural inputs, tools, equipment, and electricity. A good understanding and cooperation among market actors is the most essential factor for effective rice value chain through better coordination and functional linkages.

List of acronyms

ASC	Agriculture Service Centre
CARIAD	Centre for Advanced Research in International Agricultural Development
CBSP	Community Based Seed Production
CCI	Chamber of Commerce and Industry
CEAPRED	Centre for Agriculture Policy Research and Development
DADO	District Agriculture Development Office
DDC	District Development Committee
FGD	Focus Group Discussion
FORWARD	Forum for Rural Welfare and Agricultural Reform for Development
ha	Hectare
IDE	International Development Enterprise
kg	Kilogram
NEA	Nepal Electricity Authority
NGO	Non Governmental Organization
NWRP	National Wheat Research Program
NSC	National Seed Company
RiU	Research into Use
RSL	Regional Seed Laboratory
UK	United Kingdom
USAID	United States Agency for International Development
VDC	Village Development Committee
WFP	World Food Program

Acknowledgements

1. Introduction

1.1 Background

Rice (*Oryza sativa* L.) is the most important cereal crop in Nepal contributing largely to food security and rural economy. It is grown in Terai, mid-hills and high-hills covering a total area of about 1.55 million ha (CBS, 2003). The crop contributes half of total cereal production in the country of which more than 70 percent of rice is produced in the Terai area. However, rice production has stagnated over the past five years, growing merely at 0.2 percent per annum. Average rice yield is 2.56 tons/ha which is low compared to neighbouring countries (FAO/WFP 2007). Thus there is a big gap between potential and actual rice grain yields in farm levels. The yield gaps in Terai and mid-hill conditions are about 1.8 to 2.2 t/ha, which indicate a great potential for increasing rice production in the country (MOAC, 2007). Lack of irrigation, improved seeds and technologies are known to be the main constraints to increasing rice production at the farm level.

Use of improved varieties is the most important factor for increasing the crop productivity and production. It is proven fact that up to 25 percent more yields can be harvested easily by using improved seeds. The demand of improved seed is very high in Nepal which has not been fulfilled by supply sources within the country. The formal seed production and supply system in Nepal is still very poor. It has been reported that formal systems supply only 3 to 5 percent seeds of the national requirements (Khadka et al., 2009). Farmers are compelled to use either own saved crop seeds or seeds exchanged from farmers to farmers. In this context, RiU project entitled "Participatory Crop Improvement in South Asia" was initiated in Nepal from the year 2008. The focus of RiU project is to strengthen the seed business which will ultimately help in scaling up/out of improved rice and legume varieties to wider farming community.

1.2 The study area

Rupandehi district is located in the western development region of Nepal. It is a Terai district with an area of 1,360 square km but some area extends up to the hills. The altitudinal range varies from 100m to 1219m above the sea level. According to population census 2058 (B.S.), population of the district is 7,08,419 with a total of 1,17,856 households. About 94,285 households (81 percent of the total households) are dependent in agriculture for their livelihoods. The district headquarters is Bhairahawa which is one of the biggest markets of Nepal bordering to India.

Total cultivable land in Rupandehi district is 85,122 ha which comes to be 60.2 percent of the total land area. Major crops grown in the district are rice, wheat, maize, potato, oilseeds, pulses and vegetables. Rice is the most important crop in the district grown in an area of 72,500 ha. In the year 2009 (2065/66 B S), total production of rice in the district was 280,575 tons with a productivity of 3.87 tons per ha (DADO, 2009). It is estimated that 233,575 tons rice was used by producers for home consumption and the remaining 47,000 tons of rice was marketed through different channels.

Rice is mainly grown in a rice-wheat pattern and as the main season crop. Transplanting is done in June/July and crop is harvested in October/November. The crop is grown in three

main domains (land types) which are; upland, medium land and low land. Among the rice produced and marketed in the district, there is fine, coarse and aromatic rice. Majority of farmers grow both fine and coarse rice whereas, aromatic rice is very negligible. The commonly grown fine rice varieties are Gorakhnath, Sawa, Masuli and Malasiya. Similarly, the popular coarse rice varieties are Radha-4, Sarju-52 and Sabitri. Aromatic rice varieties are Kala Neemak, Sunaulo Sugandha and Pusa Basmati. Fine rice is generally used for consumption as rice grains and coarse rice for making beaten rice and also for rice grains. Fine and coarse rice are equally important with high production and market potentials. Majority of farmers grow both the fine and coarse rice varieties because they have the following specific advantages:

Fine rice

1. Fine rice is medium to long duration in maturity. Lowland which does not dry up earlier at rice harvesting is suitable for fine rice.

2. Fine rice is liked by most of the farmers for consumption as staple food due to its good taste.

3. The market price of fine rice is higher than coarse rice.

Coarse rice

1. Coarse rice varieties are short duration rice. Early rice provides opportunity to sow winter crops in time with no loss of moisture.

2. Coarse rice varieties favor upland and are suitable in rainfed conditions.

3. Milling percentage of coarse rice is higher than fine rice.

1.3 Objectives of the study

The overall objective of the study was to know the comprehensive performance of rice sub-sector through the value chain analysis. The specific objectives are:

- To prepare rice value chain maps and identify different functions, key actors and their relationships in the value chain
- To assess major gaps and find out leverage points in the entire value chain
- To find out constraints, opportunities and interventions for the promotion of rice sub-sector

1.4 Limitation of the study

The study had the following limitations:

- The field study was conducted by RiU field based staff who do not have ample experience in value chain analysis.
- There was limited resource (time and money) to conduct detailed value chain study separately for fine, coarse and aromatic rice in the district.

2. Study Methodology

2.1   Site selection

In Rupandehi district, three VDCs were selected to represent three different domains; upland, medium land and lowland. In each VDC, two sites were selected for the field study. VDCs and sites were selected in consultation of stakeholders related with the rice sub-sector. Large millers, wholesalers and retailers were visited at different market places outside the selected VDCs. The selected VDCs and sites are as follows:

Table-1: Selected VDCs and sites for the study.

S N	VDCs	Ward No.	Domain
1	Hatee Bangai	2	Upland
		6	Upland
2	Saurah Pharsatikar	4	Medium land
		7	Medium land
3	Semlar	1	Lowland
		6	Lowland

2.2 Data collection

Formats and checklists were prepared in advance to collect information from different market actors. Therefore, different sets of checklists were prepared for farmers, local traders, rice millers/processors, wholesalers and retailers. For the data collection at producer level, two FGDs were done per selected VDC one each for fine and coarse rice. On average, 15-20 farmers were invited in each FGD. In inviting farmers, consideration was given to select rice producing and selling farmers.

It was not possible to collect information from other market actors using the FGD. Information was collected by taking interviews with individual market actors. Name of collectors/local traders were identified from rice producer/sellers through village level FGDs. Similarly, name of processors/millers were identified from collectors/local traders and name of the wholesalers and retailers from rice processors/millers. All these market actors were visited at their destinations and interviews were taken using the checklists. Informal discussions were also held with some other farmers, agro-vets, rice collectors, millers, wholesalers and retailers to gather and validate information. Additional information was gathered from secondary sources and cross-checked with primary information.

2.3 Stakeholders' value chain workshop

A workshop was held with the participation of key market actors and organizations involved in the rice value chain. Participation was from farmers, agro-vets, rice collectors/traders, millers, wholesalers, retailers and representatives from DADO, Rupandehi; NWRP, Bhairahawa; RSL, Bhairahawa; CCI, Butwal, NSC, Butwal and FORWARD. The findings of the value chain study collected from field study were shared in the workshop and suggestions were collected from key market actors. The value chain maps of fine and coarse rice were shared and major market channels were verified by the

workshop. Major gaps in rice value chain were identified and possible solutions were suggested. The workshop also served as a forum to share about pertinent problems faced by different market actors which helped to develop mutual understanding for better relationship among market actors for smooth functioning of the rice value chain.

2.4 Data analysis

Data on rice prices and commodity amounts are presented in range form because they fluctuate over time within a year. Therefore, average data is not suitable because it does not show the trend or pattern to reflect market dynamics. Cross checking of data was done to increase the validity of the data. Qualitative data of the study was summarized and presented in a descriptive form in the report.

3. Findings of the study

3.1 Rice value chain actors

There are many actors in rice value chain which play different roles in product marketing from input supply to production, collection, processing/milling, wholesaling, retailing and ultimately to consumers. The same actors are involved in both the fine and coarse rice value chain. This section describes on each actor's roles and responsibilities in rice value chain.

Input suppliers

In rice value chain, agro-vets, agricultural tool dealers, fertilizer dealers and financial institutions are the major input suppliers. They supply inputs and also provide technical advice to farmers on application methods. There are 237 agro-vets, 10 agricultural tools dealers, 27 fertilizers dealers and 50 financial institutions in the district.

Producers

Farmers are the producers of rice in the district. There are about 76,000 farm households in the district who grow fine and coarse rice. They get inputs required for rice production from local level input suppliers. About 52,000 households sell their products as paddy to collectors. About 75 percent of rice as paddy is sold to small scale collectors and remaining 25 percent is sold to large scale collectors. There is no linkage and association among the producer farmers. If they unite, they can collect huge amount of rice at one place and they can bargain with the collectors and they can get higher price. They lack storage facilities. If they have storage facilities, they can store it for about 6-7 months and can sell at higher price in July/August.

Collectors (small scale/large scale)

Most of the small scale collectors are also primary producers. Around 350 small scale collectors from different VDCs are involved in collection of rice from villages. They are mostly involved in collection, drying, winnowing and storage. Of the total amount they collect, about 50 percent of rice is sold to large scale collectors, 25 percent to large millers and about 25 percent rice to small mill holders. There are about 120 large scale collectors

who collect rice from small scale collectors and sometimes also from primary producers. They sell their rice to large millers.

Rice millers (small and large)

There are about 35 large millers and 100 small millers in the district involved in processing of both fine and coarse rice. They complete different functions like collection, de-husking, grading, packaging and labeling. After completing these functions, large millers sell to wholesalers where as small millers sell to wholesalers and retailers. There are also about 35 *chiura/bhuja* mills in the district that prepares *chiura/bhuja* from coarse rice and sells to wholesalers and retailers.

Wholesalers

In the district, about 150 wholesalers of milled rice are found. They buy milled rice from large millers and sell it to retailers within the district and outside markets.

Retailers

In the district, about 1000 retailers of milled rice are found. Retailing shops buy milled rice from wholesalers and small millers and sell it to consumers. The functions of retailers are weighing and retailing.

3.2 Overview and analysis of the rice value chain

Rice in Rupandehi district is the number one cereal crop and also an important commercial commodity. Farmers grow both the fine and coarse rice and it is difficult and also not practical to segregate farm households into fine and coarse rice growing farmers. About 52,000 households sell at least some amount of rice after fulfilling their home consumption whereas, 24,000 households use rice solely for their home consumption. There is no exact data available on rice quantities to depict the demand and supply situation in the domestic and outside markets. The demand of fine and coarse rice is almost equal in the market whereas demand of aromatic rice is about 5 percent of the total market demand. The middle class people are consumers of fine rice whereas low income people mostly consume coarse rice. Out of total market demand of rice grains in the district, it was estimated that about 60 percent comes from domestic production whereas 40 percent comes from India. The amount of rice that comes to market from domestic production is about 47,000 tons per year which is far below to meet the market demand. It is estimated that a large amount of rice grains is imported from India annually. Indian rice is consumed in Rupandehi district itself and also goes to other hilly districts. Rice from other Terai districts also come to Rupandehi district. Rice from Rupandehi is marketed to outside markets particularly to Pokhara, Kathmandu and other hilly districts.

Functions
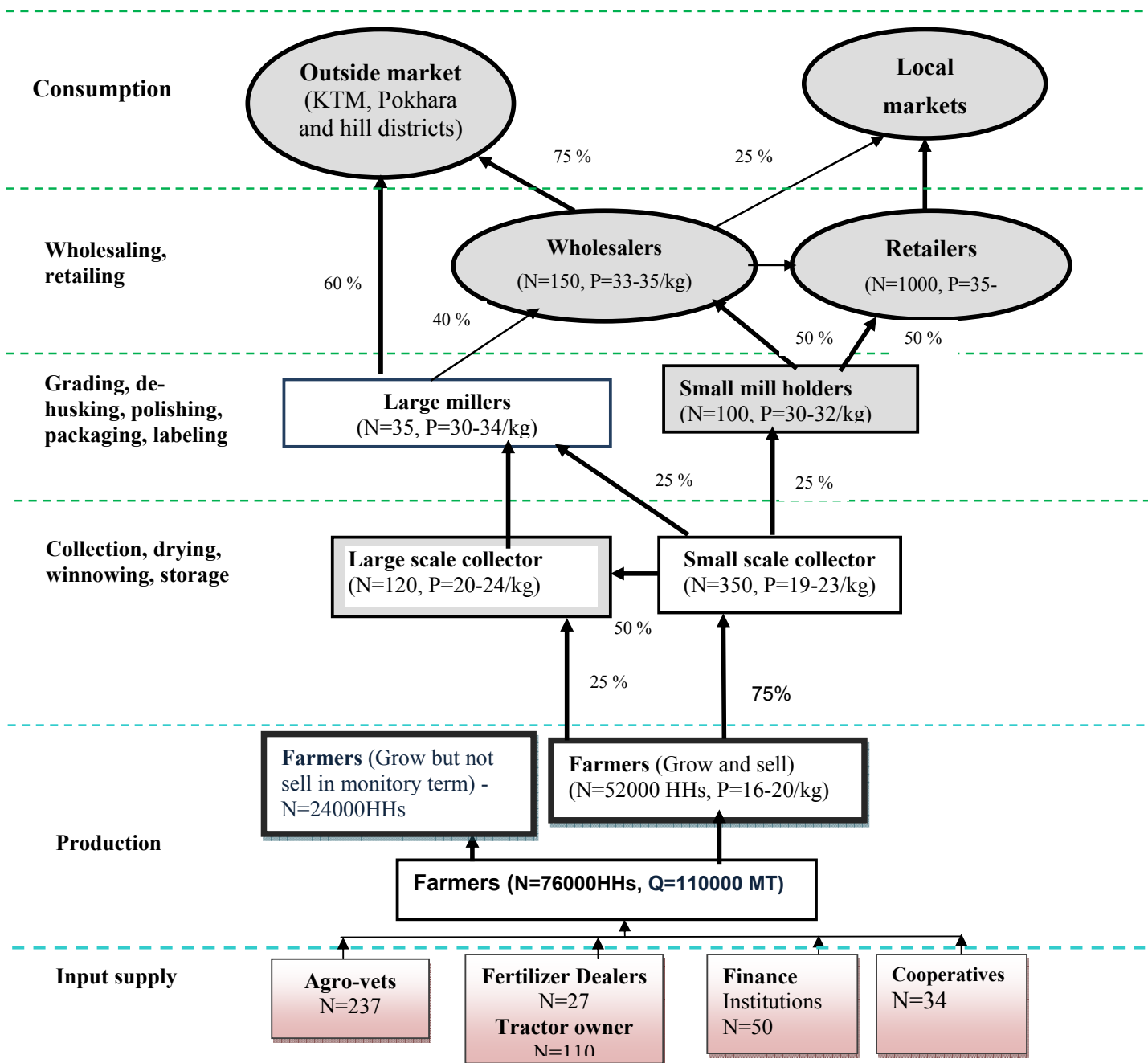
Figure-1: Value chain map of fine rice in Rupandehi district

Functions

Consumption

Outside market (KTM, Pokhara and hill districts)

Local markets

75 %

25 %

60 %

Wholesaling, retailing

Wholesalers (N=150, P=25-

Retailers (N=1000, P=28-

Wholesalers (N=150, P=36-

40 %

50 %   50 %

50 %   50 %

Grading, de-husking, polishing, packaging, labeling

Large millers (N=35, P=20-24/kg)

Small millers (N=100, P=20-22/kg)

Chiura/Bhuja mill (N=82, P=30-32/kg)

10 %   15 %   25 %

Collection, drying, winnowing, storage

Large scale of collector (N=120, P=14-18/kg)

Small scale collector (N=350, P=16-18/kg)

50 %

25 %   75%

Production

Farmers (Grow but not sell in monitory term) - N=24000HHs

Farmers (Grow and sell) (N=52000 HHs, P=14-16/kg)

Farmers (N=76000HHs, Q=110000 MT)

Input supply

Agrovets N=237

Fertilizer Dealers N=27 Tractor owner N=110

Finance Institutions N=50

Cooperatives N=34

Figure-2: Value chain map of coarse rice in Rupandehi district

The value chain maps of fine and coarse rice in Figures 1 and 2 depict the major functions, actors and their relationship in rice marketing. The rice value chain is characterized by informal and poorly developed market systems. A large number of market actors are involved in the value chain. Rice in the value chain is marketed as raw product (paddy) up

to the millers. After milling or processing it is marketed as rice grains and goes to consumers as the final product. As the product goes through a series of functions and different market channels, there is 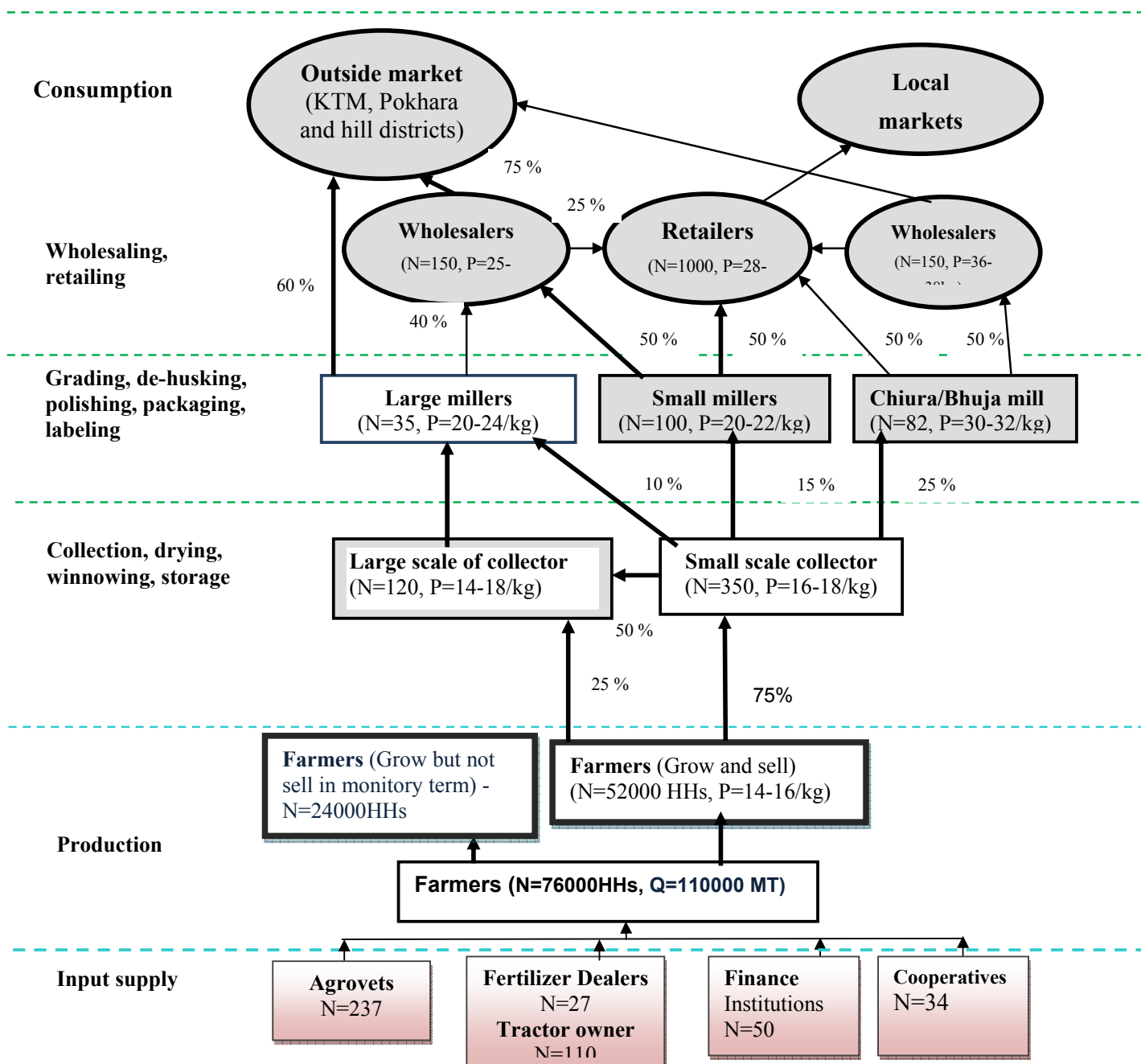not a strong vertical and horizontal linkage among the key actors. This is mainly because of lack of mutual understanding and poor functional linkages among the key market actors

The large scale collectors, large millers and wholesalers are found to dominate the rice supply chain. They play key role in pricing of both rice and rice grains because they can hold in large amounts and supply is in their grip. Producers, small collectors, small millers and retailers compete with each other to make the profit in their favor. The private input service providers are there in the village levels but improved variety seeds and fertilizers are increasingly in short supply. There is no quality control mechanism and farmers always complain about poor quality of seeds and fertilizers. To fulfill rice seed demand, agro-vets bring hybrid seeds from India and farmers are compelled to buy costly seeds and grow hybrid varieties. Similarly, some local traders and farmers are compelled to bring large quantities of chemical fertilizers illegally from India.

Farmers start selling rice from threshing floor because they have storage problem.If farmers can store rice for three to six months, they would get higer price. Farmers get payments for rice at the time of selling. Some collectors also give 50 percent payments to farmers in advance and remaining 50 percent at selling time. Most of the large scale collectors also own rice mill.

Rice millers do their business throughout the year. They simply do de-husking, polishing, grading and packaging. Rice millers put rice grains in different sizes of sacks which are generally labeled with the name of the rice mill. The price fixed by large millers is more for small scale buyer and less for large scale buyer. But the small millers do not have this price flexibility because of low business volume. Furthermore, the quality of rice grains from large millers is better than small millers due to better grading facility. Therefore, small millers cannot compete with large millers in the rice market. In general, there is no proper grading system and consumers complain about more proportion of broken rice grains in the final product.

The wholesalers and retailers do their business throughout the year. Demand of rice grains is increasing every year, and there is huge demand of fine and coarse rice from Kathmandu, Pokhara and hilly districts. To meet this demand, there is import of rice grains from India because domestic rice is inadequate in the market. Indian rice is cheaper than Nepalese rice but of low quality. As majority of consumers prefer cheaper products, Nepalese rice cannot compete with Indian rice and there is problem for the promotion of good quality domestic rice products in the market. Furthermore, there is also the malpractice of mixing some low quality rice with good quality products.

3.3 Seasonal market variability and price trends

Harvesting and threshing of rice take place between November and January. This is the peak time of rice transaction between farmers and collectors. The small collectors generally do not hold rice for long period and sell until June/July. Majority of large scale collectors store rice for six to nine months to get high price in the scarce season. They sell some amount to rice millers in June/July and the remaining until September/October.

The cross border marketing of rice has a big influence in the value chain. Rice as paddy goes to India from Nepal in December/January whereas its import as rice grains takes place thoroughout the year. Out the total rice import from India, large quantities are imported from June/July to October/November which is the scarce season. As the rice stock with large collectors and millers start diminishing, rice grain prices in the market start increasing from May and remain higher until October (Figure-3). There are also unusual price fluctuations due to the flush of rice import from India which makes some market distortion.
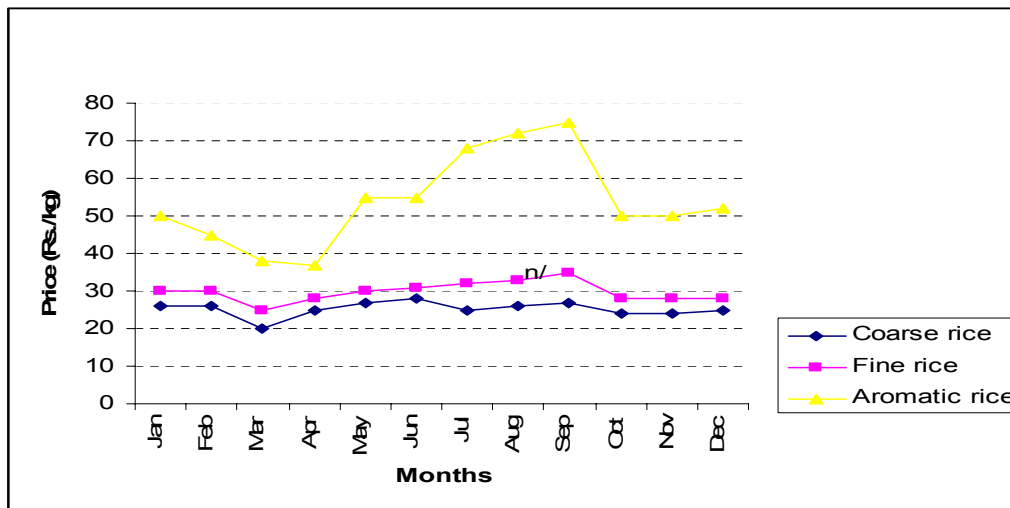

Figure-3: Seasonal variation of rice prices in the market (Source: DADO, 2009).

3.4 Profitability of the rice business

There is low profit margin to market actors in rice business if compared to high value agricultural commodities like vegetables and fruits. Farmers mention that the productivity and profitability of rice is low but they are compelled to grow this crop as there are no other options. The reason with farmers is that the cost of inputs and laborers in recent years has almost been doubled but there has been nominal increment in farm gate price of rice. Generally, farmers do not calculate profit margin. They say that the cost of production is equal to the income from rice and whatever the profit is only the straw.

The net margin from the business for collectors is Rs. 0.5 to 1.0 per kg of rice. The small millers have a margin of Rs. 1.0 to 1.5 per kg whereas large millers have a bit higher margin of Rs. 2.0 to 3.0 per kg of rice. Wholesalers get a margin ranging from Rs. 0.5 to 1.5 per kg and retailers with a margin Rs. of 0.5 to 1.0 per kg of rice. In case of large volume business, there is practice of mixing lower quality product without any sign of recognition, so there is no loss although the margin is low. It is learned that market actors are involved in rice business for several years even with low margin because there is low risk with a number of market outlets.

A simple calculation on net profit from rice production, and processing was done during the field study. On the basis of oral information, the profit margin is as follows:

Table-2: Benefit-cost analysis of rice (coarse) production by farmers.

S.N.	Particulars	Quantity	Rate (Rs)	Total (Rs)
	A) Expenditures			
1	Seed (kg)	50	30	1500
2	Compost for nursery (kg)	300	2	600
3	Fertilizers for nursery (kg)	6	40	240
4	Nursery raising (mandays)	10	200	2000
5	Ploughing (tractor in hrs)	3	720	2160
6	Puddling and leveling (tractor in hrs)	5	720	3600
7	Transplanting (mandays)	30	200	6000
8	Urea (kg)	90	30	2700
9	DAP (kg)	90	40	3600
10	Muriate of Potash (kg)	30	28	840
11	Pesticides (ml)	500	3	1500
12	Weeding (mandays)	30	200	6000
13	Irrigation (hrs)	10	250	2500
14	Harvesting cutting, threshing labor and pulling (mandays)	40	200	8000
15	Threshing and storage (tractor in hrs)	4	720	2880
16	Land rent (1 mon/katha)	30	780	23400
	Total cost			**67520**
	B) Income			
1	Total rice production (quintals)	42	1600	67200
2	Straw (Rs/katha)	30	250	7500
	Total Income			**74700**
	Net profit			**7180**

Table-3: Benefit-cost analysis of rice processing by millers.

S N	Description	Fine rice (NRs)	Coarse rice (NRs)
	A) Cost per kg of rice		
	Buying cost	20.0	15.0
	Weighing, transportation, load, unload, sacks, storage etc.	1.0	1.0
	Cost of machine, depreciation, cost of space, milling, electricity, labor etc.	2.5	2.5
	Weight loss	2.5	2.5
	Interest of input money	1.0	1.0
	Total cost	**27.0**	**22.0**
	B) Benefit per kg of rice		
	Selling price	27.0	21.0
	Benefit from byproducts (husk and bran)	3.0	3.0
	Total income	**30.0**	**24.0**
	Net profit per kg (A-B)	**3.0**	**2.0**

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3.5 Major markets of rice value chain

There is increasing demand of rice within the district and from other hilly districts. Major domestic and outside markets for rice are shown in the Table below.

Table-4: Major markets for rice within and outside the district.

S.N.	Within the district	Outside the district
1.	Butwal	Pokhara
2.	Bhairahawa	Kathmandu
3.	Lumbini	Tansen
4.	Devdaha	Tamghas
5.	Murgia	Sandhikharka
6.	Manigram	Pyuthan
7.	Saljhandi	Rolpa
8.	Suryapura	Gorkha
9.	Majhgawa	Lamjung
10.	Semara Marchawar	

3.6 Supporting organizations in rice value chain

A number of public and private organizations are providing support for the promotion of rice in Rupandehi district. Most of the organizations are focusing their support to increase the productivity and production of rice at farm level. The following are the major service providing organizations:

Government and non-government organisations

DADO, NARC, NEA, CCI, WFP/USAID, FORWARD, CEAPRED, IDE Nepal, local NGOs and cooperatives are the major service providers in Rupandehi district. They support the value chain actors in different aspects such as technology dissemination, infrastructure development, electricity, policy and marketing. Farmers complain that technical and other supports are inadequate. Furthermore, there is lack of coordination and collaboration among service providing organisations for consolidated efforts to promote rice in a value chain approach.

Financial institutions

There are more than 50 financial institutions providing services in Rupandehi district. Financial institutions provide loan to farmers and traders involved in rice business. The interest rate ranges from 12 to 24 percent per year.

3.6 Major constraints, opportunities and potential interventions

Major constraints and opportunities in rice value chain were identifies through FGDs and stakeholders workshop. In the district, several issues were found in fine rice value chain. Major constraints and opportunities were categorized into seven major aspects. Some of the major constraints were high cost of rice production, less number of collection centers and storage facilities in villages, lack of proper grading and packaging system,

unorganized farmers for the business, lack of market information system, and short-term loan with early pay-back system. There are also opportunities to improve the performance of rice business by strengthening the value chain. Based on the constraints and opportunities, potential interventions were identified in consultation with key stakeholders. The table below provides details of constraints, opportunities and interventions.

Table-5: Major constraints, opportunities and potential interventions in rice value chain.

Category of constraints	Constraints	Opportunities	Interventions
Technology/product development	• Low rice productivity and high cost of production due to small scale production and lack of improved machineries (i.e. no improved package of practices, no use of rice planter, combined harvester etc.) • Poor grading and packaging of milled rice for quality improvement (small millers) • De-husking and packaging is inadequate and there is no value addition practice for milled rice. • No enterpreneurship skills of farmers, traders and millers for calculation of production cost and profit	• Service providers (DADO, DDC, CCI and NGOs) are available • Productivity of rice per unit area can be increased • Processing technologies are available • No need of large amount of investment and skill in processing and packaging	• Training to farmers on improved technologies and create awareness for mechanization to reduce production cost. • Create awareness and provide technologies to millers for high quality milling, grading, packaging and labeling • Organize training on value addition i.e. grading technique, packaging and post harvesting handling and marketing their products in local level • Provide training to farmers, traders and millers about business plan
Marketing	• Lack of market information at producers and collectors level. • There is no organized marketing system in rice like vegetables and other cash commodities • There is high price fluctuation • Influence of Indian out dated cheap priced rice	• Demand of rice is increasing with growth of market centre both in size and number • Value addition can be done • Organized marketing potential	• Organize interaction meetings between producers and traders • Strengthen existing cooperatives for group marketing • Develop market information system at local levels • Facilitate to provide subsidies in agricultural inputs to farmers so that Nepalese rice can compete with Indian produce
Management and organization	• Price fixing is done by the traders and not by farmers or government so that farmers get low price • Less organized producers (farmers) • Inadequate bargaining capacity of the farmers	• Supporting organization are there for lobbying and advocacy • Cooperatives are there to organize farmers	• Advocacy and lobbying to fix minimum support price by the government • Organize farmer groups into associations to work for the benefit of farmers • Promote cooperative marketing and facilitate

Category of constraints	Constraints	Opportunities	Interventions
	due to low amount of rice to sell		to deal with large volume marketing
Policy	• Free import of low quality rice at cheaper rates from loose border of India • Lack of agricultural insurance provision if the crop is destroyed from natural disasters (hailstorm, prolonged drought, flash floods, disease/insect havoc etc.) • Lack of strong government policies about production planning, storage, distribution and marketing	• Supporting organization are there for lobbying and advocacy for favorable policy	• Workshops and campaigns to check free entry of rice products from India • Facilitate to establish agricultural insurance through farmers groups and cooperatives • Preparation of policies and plans by government authorities and facilitation for implementation to fulfill the gap between demand and supply
Infrastructure	• Inadequate storage facilities at producer level (with storage facilities, farmers can store rice for 6-7 months and can fetch higher price in July-August) • Lack of market information center at production sites • Inadequate irrigation facility for increased rice production (lack of dams, canals, micro-irrigation i.e. boring etc.) • Lack of grading machine at farmer's level. If proper grading is done, they can get higher price • Poor village road for transportation (roads are not even graveled and transportation cost is high) • Lack of means of transportation to handle bulky commodity with collectors	• Service providers (DADO, DDC, CCI and NGOs) are available	• Provide supports by government and other development agencies to make storage facilities at village levels • Establish market information center to provide information to collectors and producers • Provide supports to make irrigation facilities (such as dams, canals etc) and subsidy on micro-irrigation • Priorities by local agencies (VDCs, DDCs, DADOs) for the improvement of rural roads to improve the access to market and services
Finance	• Interest rate is very high in comparison with Indian systems	• Large number of financial institutions are available	• Make aware farmers on importance of financial institutions

Category of constraints	Constraints	Opportunities	Interventions
	• Mortgage (*Dhito*) is needed for loan sanction. • Long process for credit sanction and no provision of loan for less than six month period • Higher interest rate for short duration (apply for small collectors)		• Workshop among farmers, traders and finance institutions to facilitate for short duration loan with cheaper interest rates • Facilitate to incorporate loan provision for poor and Dalit farmers
Input supply	• Inadequate supply of quality seeds and fertilizers at cultivation time • Inadequate technical support to farmers for improved rice production • Inadequate skilled labor for milling, grading, packaging	• Availability of private service providers (input suppliers) even in the villages	• Workshop among farmers, development agencies and input suppliers to facilitate for supply of quality fertilizers and seeds in time • Support for quality seed production by CBSP groups and cooperatives for supply of improved seeds • Intensive training to leader farmers to produce as technical local service providers in the community • Training to existing rice mill workers on quality processing and value addition of rice

4. Conclusion and recommendations

4.1 Conclusion

Based on the study and analysis of rice value chain, following conclusion can be drawn:

- Rice is the number one crop in the district both in terms of area and production. It is also the most important commercial sub-sector with increasing market demand in large volumes.

- Fine and coarse rice are equally important for farmers as both of them have specific advantages. There is no perfect competition between these two products in the market but they complement to meet the increasing market demand of different categories of consumers.

- The importance of aromatic rice cannot be ignored but the scope for business promotion is much lower compared to fine and coarse rice.

- Among the key market actors, large collectors, large millers and wholesalers have dominating role in pricing and supply of rice in the market. The rice value chain does not seem to be strong enough due to poor vertical and horizontal linkages among the key actors

- There is import of rice from India which is cheaper but of poor quality. Nepalese rice products cannot compete with low priced Indian rice. As a result, there is market distortion and unhealthy competition among traders due to malpractice of mixing some poor quality rice with good products.

- There is low profit margin in rice business when compared to other high value agricultural commodities. The risk in rice business is also low because of large market outlets and non-perishable nature of the product.

- The supply situation of improved variety seeds and chemical fertilizers is far below the demand of farmers. There are now growing concerns about the poor quality of seeds and fertilizers due to ineffective quality control mechanism.

- There are number of constraints and also opportunities to improve the performance rice sub-sector as a viable business enterprise. Consolidated efforts from public and private sectors are required to interven the gaps in the value chain for desirable outcomes.

4.2 Recommendations

Potential interventions suggested above under each category of constraints are the specific recommendations for improvements in the rice value chain. The summary of recommendations at broad level is described hereunder.

Improved productivity and profitability

Due emphasis should be given to improve the productivity and profitability of rice crop at farm level to promote as commercial business enterprise. Effective and efficient extension services from government and non-government sectors are required to support farmers to increase productivity through adoption of package of improved technologies including the optimum use of agricultural inputs. Farmers need to reduce the cost of production through optimization of production inputs and use of improved machineries so that Nepalese rice can compete with low price Indian rice in the open market.

Input supply system

Both the formal and informal systems of input supply should be well organized to provide farmers with agricultural inputs in time and needy amounts. Quality control mechanism should be effectively implemented by concerned government authorities to ensure the quality of inputs from suppliers.

Realistic and up to date database system

The concerned government agencies should develop a mechanism to gather realistic and up to date database on rice which includes both the qualitative and quantitative information to rightly understand and analyze the value chain. Planning and implementation of the field activities should be based on the realistic information. .

Coordination and collaboration among supporting stakeholders

The government, non-government and private sectors in the district and local levels should closely coordinate and collaborate for delivering services in a consolidated way to improve the performance of the whole sub-sector instead of working in isolation and piece-meal basis.

Improved policy environment

There should be massive reformulation and implementation of government policies to to make farmers and client friendly for commercialization of agricultural business. Provisions should be made to support smallholder farmers and small traders for subsidies and grants on agricultural inputs, tools, equipment, and electricity. Policies should strongly support smallholders for easy access to credit with low interest rate to promote the business.

Organizational strengthening and effective value chain

Farmers should be organized into associations and cooperatives for collective efforts in commercial rice production and marketing. Coordination and functional linkages among market actors should be strengthened for vertical and horizontal integration which make the value chain effective. Coordination meetings and interaction workshops should be organized among stakeholders to develop mutual understanding for trustworthy and sustainable business.

5. References

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Annexes

Annex-1: List of Input suppliers

S.N	Value chain Participants/Actors	Function
1	Input suppliers	Inputs
	Fertilizer dealers	Chemical Fertilizers
	Tractor owner	Tractor
	Agro-vets	Seed
	Agriculture Development Bank	Finance

Annex-2: List of farmers (primary producer)/Traders (Middleman) involved in the value chain of fine rice in Rupandehi
Hattibangai

SN	Name of Collectors/ farmers	Type W/D/WD/O	Address	Qty prod. (Q)	Buyers	Price (Rs./kg)
			Hattibangai			
1	Chinku Yadav	Madhesi male	Hattibangai, 6	35	Jalim Baniya	16/kg
2	Mangal Prasad Yadhav	Madhesi male	Hattibangai, 6	60-70	Ram Prasad Bhoj	17/kg
3	Praladh Yadav	Madhesi male	Hattibangai, 6	60-70	Ram Prasad Bhoj	16/kg
4	Sukhram Gupta	Madhesi male	Hattibangai, 6	10	Subash Baniya	16/kg
5	Gaya Prasad Pandey	Madhesi male	Hattibangai, 6	10	Subash Baniya	17/kg
6	Pitamber Prasad Chaudhary	Adibashi	Hattibangai, 6	30	Jalim Baniya	17/kg
7	Shiva Pujan Mallaha	Madhesi male	Hattibangai, 6	25	Ram Prasad Bhoj	16/kg
8	Radheshyam kurmi	Adibashi	Hattibangai, 2	15	Jalim Baniya	16/kg
9	Surya Prasad Lamichhane	Others	Pharsatikar,4	11	Bhabishwor Khanal	16/kg
10	Pandav Bahadur Malla	Others	Pharsatikar,4	75	Gaj Bahadur Shrestha	17/kg
11	Jaisraj Chaudhary	Adibashi	Pharsatikar,4	60	Bhim Bahadur Basnet	17/kg
12	Mohani lal Basyal	Others	Pharsatikar,4	17	Gaj Bahadur Shrestha	17/kg
13	Puran Bahadur Tharu	Adibashi	Pharsatikar,4	20	Bhim Bahadur Basnet	16/kg
			Semlar			
14	Taranath Kandel	Others	Semlar,5	20	Self miller	
15	Dambar Bahadur Katharia	Adibashi	Semlar,6	35	Surendra Agrahari	16/kg
16	Ramnath Sharma	Others	Semlar,6	10	Taranath Kandel	17/kg
17	Bhumi Raj Upadhyay	Others	Semlar,6	3	Tilak Sapkota	16/kg
18	Shakti Prasad Upadhayay	Others	Semlar,6	10	Tilak Sapkota	17/kg

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SN	Name of Collectors/ farmers	Type W/D/WD/O	Address	Qty prod. (Q)	Buyers	Price (Rs./kg)
19	Buddhi Dhakal	Others	Semlar,2	20	Tilak Sapkota	16/kg
20	Krishna Prasad Upadhyay	Others	Semlar,2	6	Surendra Agrahari	16/kg
21	Surya Bahadur Shrestha	Janajati	Semlar,3	150	Large collectors of Butwal	17/kg
22	Rajendraman Shrestha	Janajati	Semlar,1	100	Large collectors of Butwal	17/kg
23	Pradeepman Shrestha	Janajati	Semlar,1	50	Large collectors of Butwal	16/kg
24	Saradman Simanggaij	Janajati	Semlar,1	150	Large collectors of Butwal	16/kg
25	Khem Prasad Bhusal	Others	Semlar,2	12	Tilak Sapkota	16/kg
26	Krishna Bahadur Karki	Others	Semlar,6	12	Tilak Sapkota	17/kg

Annex-3: Major market centre of this value chain

Markets	Buyers (Name and Address)	Quantity (Quintals)	Buying Price/unit	Selling Price/unit
Collector cum small millers	**Semlar**			
	Tilak Sapkota	1800	16-20/kg	20-24/kg
	Taranath Kandel	400-500	16-20/kg	20-24/kg
	Hattibangai			
	Ram Prasad Bhoj	100-150	16-20/kg	20-24/kg
Collector/trador	**Hattibangai**			
	1. Subash Baniya	400-500	16-20/kg	20-24/kg
	2. Jalim Baniya	500-600	16-20/kg	20-24/kg
	Pharsatikar			
	1. Bhabishwor Khanal	400-500	16-20/kg	20-24/kg
	2. Gaj Bahadur Shrestha	1400-1500	16-20/kg	20-24/kg
	3. Bhim Bahadur Basnet	400-500	16-20/kg	20-24/kg
	Semlar			
	Surendra Agrahari	300	16-20/kg	20-24/kg
Large millers	1. Aryal rice mill	800-1000	16-20/kg	20-24/kg
	2. Sita rice mill	25000	16-20/kg	20-24/kg
	3. Pashupati rice mill	1200	16-20/kg	20-24/kg
	4. Siddhartha rice mill	4000	16-20/kg	20-24/kg
	5. Regmi rice mill	5250	16-20/kg	20-24/kg

Annex-4: Financial institutions of Rupandehi district that provide finance support for the development of selected value chain

S.N.	Name of Bank	Number of branches
1.	Nepal Rastra Bank	1
2.	Rastriya Banijya Bank	2
3.	Nepal Bank Limited	3
4.	Nabil Bank Limited	2
5.	Nepal Credit and Commerce Bank Limited	3
6.	Bank of Kathmandu Limited	1
7.	Nepal Bangladesh Bank Limited	1
8.	Everest Bank Limited	2
9.	Lumbini Bank Limited	1
10.	Standard Chartered Bank Nepal Limited	2
11.	Himalayan Bank Limited	2
12.	Nepal SBI Bank Limited	2
13.	Machhapuchhre Bank Limited	1
14.	Nepal Investment Bank Limited	2
15.	Agriculture Development Bank	10
16.	Siddhartha Development Bank	1
17.	Paschhimanchal Development Bank	2
18.	Bhrikuti Development Bank	2
19.	Tinau Development Financial Organization Limited	1
20.	Sewa Development Bank Limited	1
21.	Paschhimanchal Finance Company	1
22.	Siddhartha Finance Company	1
23.	Butwal Finance Company	1
24.	Everest Finance Company	1
25.	Nepal Express Financial Organization Limited	1
26.	Paschhimanchal Rural Development Bank	1
27.	Nirdhan Utthan Bank Limited	1
28.	Chhimek Development Bank Limited	1
	GRAND TOTAL	**50**