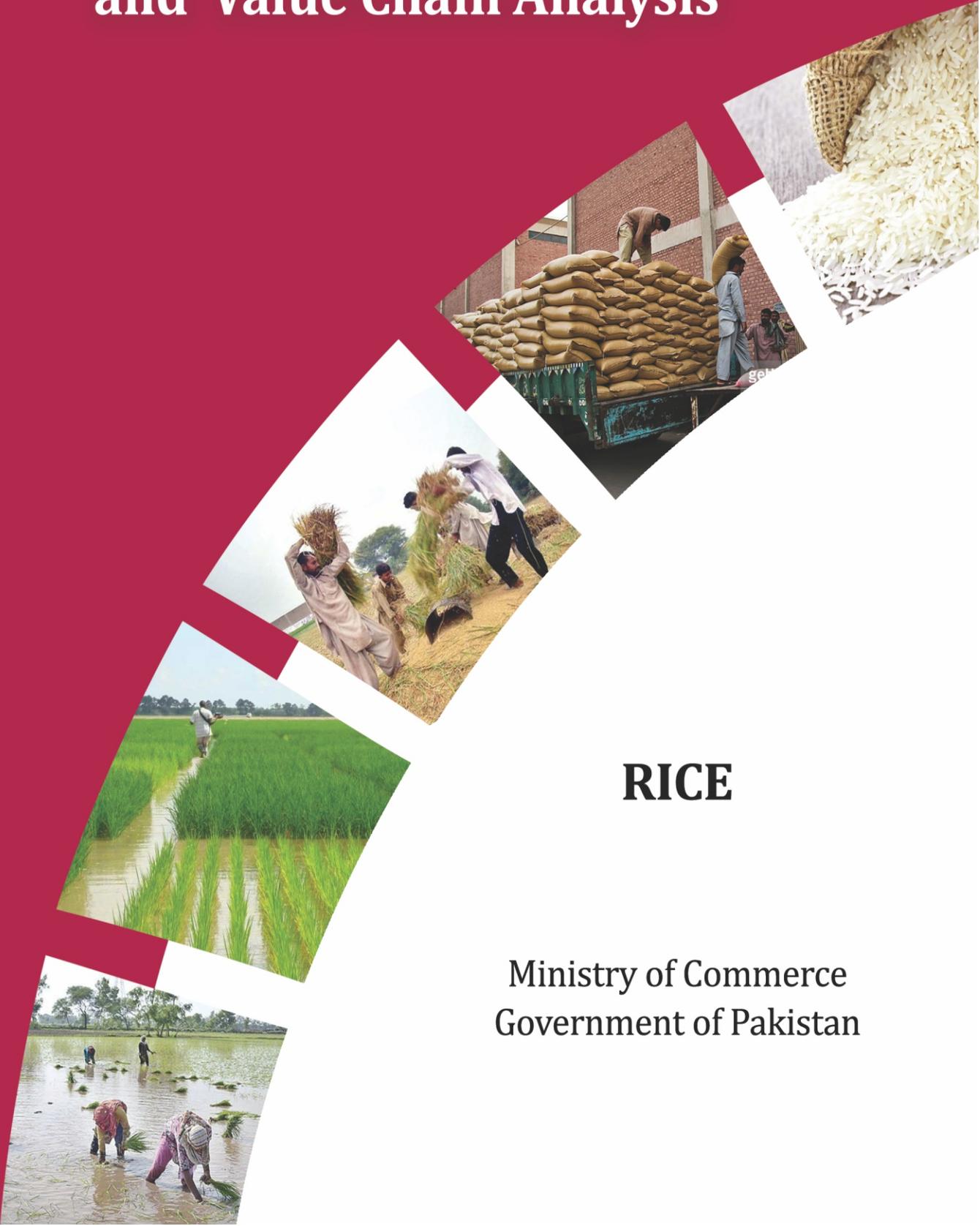




Trade Development Authority of Pakistan

Sectoral Competitiveness and Value Chain Analysis



RICE

Ministry of Commerce
Government of Pakistan

Disclaimer:

This report was jointly prepared by the Trade Development Authority of Pakistan (TDAP) and European Union (EU) funded Trade Related Technical Assistance (TRTA II) programme, implemented by UNIDO in association with ITC and WIPO.

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Rice Value Chain Analysis in Pakistan

April 2016

Acknowledgments

This study was carried out as part of the European Union funded Trade Related Technical Assistance Programme (TRTA II) Programme, implemented by UNIDO in association with International Trade Centre (ITC) and World Intellectual Property Organization (WIPO). This initiative was led in collaboration with Trade Development Authority of Pakistan.

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Preface



The era of import substitution is in the past. Today's world is shaped by trade integration--the ability of countries and companies to be part of an ever-expanding Global Value Chain (GVC). These GVCs are governing features of global trade linking developing, emerging, and developed economies. Through GVCs, industrial nations connect as part of a huge economic chain focusing on specialization and high value addition in order to ensure maximum economic benefit.

Firms take advantage of this specialization and try to optimize production processes by locating various stages of their business across different sites. They therefore, manufacture goods wherever the necessary skills and materials are available at competitive costs and quality. The past decades have witnessed a strong trend towards this international dispersion of value chain activities such as design, production, marketing, distribution, etc. The result is a chain of production crossing borders throughout the globe.

GVCs make a strong contribution to international development. The level of participation in GVCs is associated with stronger levels of GDP per capita growth. They have a direct impact on the economy and employment as well as creating opportunities for national development. Global Value Chains can also be an important mechanism to enhance productive capacity by increasing the rate of adoption of technology and through workforce skill development, they can help build the foundations for long-term industrial upgrading.

Pakistan's trade policies need to be formulated to ensure that our country is strategically placed within this global chain. The higher the placement, the higher the value addition provided and, so the higher the amount of revenue generated. Such interconnectivity however necessitates an open, predictable, transparent trade and investment regime. It is also necessary to highlight complementary policy agendas that leverage engagement in Global Value Chains into more inclusive growth and employment strategies.

To keep abreast of market trends and to motivate companies to restructure their operations internationally through outsourcing of activities involves developing a Global Value Chain Analysis for almost every product. Sadly, there is a dearth of good research in Pakistan, especially in this increasingly important area. Although Pakistan does have the expertise and ability to be firmly integrated in several fast growing sectors, data and focus is lacking.

Keeping this point in mind, the Trade Development Authority, in collaboration with UNIDO, under the EU funded Trade Related Technical Assistance (TRTA II) program, has developed value chain analysis for four products that have the ability to raise Pakistan's exports at a fast rate. They are; Gems and Jewelry, Leather gloves, Rice and Readymade garments.

Rice is one of the most important export commodities of Pakistan. It ranks as second amongst the staple food grain crops in Pakistan and it has been a major source of foreign exchange earnings. Each year, Pakistan produces an average of approximately 6 million tonnes and, together with the rest of the South Asia; is responsible for supplying 25% of the world's paddy rice output.

To add value to this sector necessitates introduction of new technologies in the rice supply chain, from paddy, husking, and removal of foreign elements, grading, polishing storage, warehousing, and packaging. Quality assurances, conformity with quality, hygiene standards branding and research for evolving new, high-yielding rice seeds, will directly benefit growers and ensure higher entry in the Global Value Chain.

TDAP's report is the beginning of a series of research studies focused towards export enhancement. It is time that Pakistan becomes an important sector in Global Value Chains. It is time that we maximize national profit through highest value addition in the resources that our country is blessed with!

Rabiya Javeri Agha
Secretary
Trade Development Authority of Pakistan (TDAP)

Foreword



The Global Value Chain (GVC) initiative was launched under the EU funded Trade Related Technical Assistance (TRTA II) programme in collaboration with Trade Development Authority of Pakistan (TDAP) with the aim to assess the sectoral competitiveness and value chain analysis of the four selected sectors; Rice, Gems and Jewelry, Readymade garments and Leather gloves.

The TRTA II programme is funded by the European Union (EU), implemented by United Nations Industrial Development Organization (UNIDO) in collaboration with International Trade Centre (ITC) and the World Intellectual Property Organization (WIPO). This programme aims at strengthening the capacities of Pakistan to participate in the international trade. The overall objective of the Programme is to support economic integration of Pakistan into the global and regional economy.

A two week training on 'Sectoral Competitiveness and Value Chain Analysis' was held in Vienna, Austria. The training was attended by officials from Trade Development Authority of Pakistan (TDAP) and United Nations Industrial Development Organization (UNIDO). The central objective of the training was to guide professionals to independently carry out value chain analysis in different sectors.

TDAP selected four sectors; Rice, Gems & Jewelry, Leather gloves and Readymade Garments to conduct value chain analysis. These export sectors are vital for the economy of Pakistan. They contribute around 20 percent to the export of the country. In recent years, exports share of Pakistan in the global markets has registered a decline, which can be attributed to quality and production constraints in the domestic production value chain. High prices, production constraints and quality constraints have led to reduced market share for Pakistan's exports products. It is imperative for Pakistan to take steps to strengthen the local production value chain to boost its exports and remain competitive in the international market.

This has been possible with the continued support of the European Union that has funded the TRTA II programme.

S. M. Muneer
Chief Executive
Trade Development Authority of Pakistan (TDAP)

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List of Acronyms

EU:	European Union
FAO:	Food and Agriculture Organization
FTA:	Free Trade Agreements
GDP:	Gross Domestic Product
GMP:	Good Manufacturing Practices
HS:	Harmonized System
ITC:	International Trade Centre
MENA:	Middle East Northern Africa
REAP:	Rice Exporters Association of Pakistan
SPS:	Sanitary and Phytosanitary
SSA:	Sub Saharan Africa
TDAP:	Trade Development Authority of Pakistan
TRTA:	Trade Related Technical Assistance
UNIDO:	United Nations Industrial Development Organization
VFA:	Vietnam Food Association

Executive Summary

Rice exports are vital for the economy of Pakistan. They contribute around 0.7 percent to the Gross Domestic Product (GDP) and constitute the third biggest source of export earnings for the country. Pakistan exports more than 50 percent of its total rice production and is the third biggest global exporter of rice. The two main rice varieties exported from Pakistan are Basmati and IRRI.

In recent years, exports share of Pakistan in the global rice market has registered a decline, which can be attributed to quality and production constraints in the domestic rice value chain. Pakistan's share of rice exports declined from \$2.2 billion in 2010 to \$2.1 billion in 2014. High prices, production constraints and quality constraints have led to reduced market share for Pakistan's rice exports. It is imperative for Pakistan to take steps to strengthen the local rice value chain in order to boost its rice exports and remain competitive in the international market.

This report analyzes the rice value chain in Pakistan with the aim of identifying the value capture opportunities in the sector, attractive international markets for locally produced rice, and the key constraints in the rice value chain and possible solutions to address these issues. Four rice products including paddy rice, brown rice, milled rice, and broken rice were selected for the analysis. The tools used in the analysis included: value chain mapping, value distribution analysis, world and regional dynamism analysis, value chain performance evaluation, and attractive markets identification.

The value chain mapping exercise identified that the rice value chain in Pakistan is short and highly disconnected. Most of the actors involved in the rice value chain perform their duties in isolation. Knowledge sharing mechanisms and advisory services are nearly non-existent. The lack of coordination between direct actors (farmers and millers) and indirect actors

(research institutes and government) has resulted in limited innovation in farming practices, milling activities and development of new varieties. It is mainly due to this lack of coordination that Pakistan has been unable to improve its productivity in the last few years.

The value distribution analysis for the selected products revealed that as the level of processing increases, the export unit value increases. Milled rice was identified as the product with the highest export unit value and profit margins.

The world and regional dynamism analysis of the rice sector indicated that the world demand for milled rice is quite significant and has witnessed consistent growth over the years. The annual average growth rate of milled rice was the highest amongst the growth rates of all selected rice products, rendering milled rice a highly dynamic product i.e. it's world demand is increasing rapidly over time.

The regional market share and regional growth rates identified the main importing and exporting regions of the selected rice products. The world's top rice importers are located in Asia, Middle East and Africa. China is one of the major importers of rice and its import accounts for a quarter of the global trade in rice. Recent years have seen a rise in rice demand in the African and the Middle Eastern countries as well. Rice exporters are mainly concentrated in East Asia and South Asia. Developing countries such as Thailand, Pakistan and Vietnam are the world's top rice exporters, while developed countries such as the United States and Russia export paddy rice to Latin America and East Asia for further processing.

The value chain performance indicates that Pakistan is one of the most competitive exporters of milled rice, broken rice and brown rice. The export competitive performance analysis revealed that Pakistan exports high value added products within the rice value chain. Pakistan's export performance is compared with

regional competitors such as Thailand, India, Vietnam and Cambodia. India was identified as the regional benchmark for Pakistan due to the close proximity, similar weather conditions and cultivation of similar rice varieties in both countries. Vietnam and Cambodia were identified as Pakistan's future competitors due to their sustained improvement in export performance.

Attractive markets analysis indicates that the top importers for semi/wholly milled rice for the varieties produced in Pakistan are China, Kenya, Saudi Arabia, UAE, United Kingdom, Malaysia and Oman. Pakistan mainly exports to countries falling in the big markets-low price and small markets-low price categories. It is important for Pakistan to target countries falling in the big market-high price and small market-high price categories. Therefore, the countries that have been identified as attractive markets for Pakistan are Saudi Arabia (big market-high price), France, Germany, Kuwait, and United Kingdom (small market-high price).

There are several key factors that are affecting the competitiveness of the rice sector in Pakistan. The country has been unable to develop and introduce new varieties of rice in the international market due to poor research and development infrastructure. The limited public sector intervention in the rice sector has also affected Pakistan's competitiveness. The country's exports face tough competition from Thailand and India which greatly benefit from government price support and subsidies. Moreover, millers and exporters have to deal with inconsistent supply of paddy rice, price instability, high costs of production and limited storage facilities.

In order to improve the export performance of the rice sector, it is imperative to improve the research and development infrastructure in the country. Technological improvements ought to be carried out in terms of process and product up gradation. New products such as parboiled rice

should be exported to markets such as Saudi Arabia and United States. Moreover, rice exporters need to adopt aggressive marketing and branding strategies to increase their market share.

Introduction

The rice sector in Pakistan is extremely important in terms of export earnings, domestic employment, rural development, and poverty reduction. Rice exports contribute around 0.7 percent to the Gross Domestic Product (GDP) of Pakistan and account for 3.2 percent in the value addition of the agriculture sector. Over the years Pakistan has lost a significant share in the global rice market owing to quality and production constraints. The value of Pakistan's rice exports fell from \$2.2 billion to \$2.1 billion between 2010-2104. Moreover, the total quantity exported by Pakistan also reduced from 42 million tons to 37 million tons from 2010 to 2014. The rice value chain needs to be strengthened for Pakistan to remain competitive in the international market.

This report aims to analyze the rice value chain in Pakistan. The rice value chain is described as a full range of activities, stages and actors that are directly or indirectly involved in the production process of rice (Morris & Kaplansky, 2002). Rice Value Chain Analysis will provide a holistic view of the global and local rice industry, by examining the significance and performance of all relevant actors, technologies, standards, regulations, products, processes, and markets (Gireff & Stark). This analysis will also identify the key constraints in the rice value chain in Pakistan and make recommendations to address these constraints by introducing measures such as policy reform, infrastructural investment and institutional change.

The first section of this report will compile and assess the information with respect to the rice sector in Pakistan. The second section will map the main characteristics such as the processes and products involved, the main actors, governance and value distribution of the rice value chain in Pakistan. The third section of the report will assess the global and regional trends of the rice value chain. The fourth section presents the performance of the value chain by identifying and examining the opportunities and the constraints within the mapped value chain. The final section of the report will identify the policy and institutional issues affecting the competitiveness of the rice value chain and provide recommendations accordingly.

Scope and Methodology:

The global economy is increasingly structured around Global Value Chains (GVCs), whereby the production of goods and services takes place in a global setting, divided in a number of stages spread across different countries. Each firm, producer and worker is integrated in the global economy and global value chain, and is most likely affected by global events.

Value chain analysis is a tool that enables industrialists and policy makers to identify industrial value capture opportunities. It also helps public and private sector stakeholders to devise strategies for business growth, such as improvement in the quality of product, process up gradation, engagement in new activities or participation in new value chains. This methodology is particularly useful for policy makers to identify the priority sectors where government efforts such as policy regulation, direct intervention, provision of information and budgets ought to focus. The identification of value added products and the market analysis is beneficial for the private sector, as it identifies the potential attractive markets, the gaps local firms face and possible solutions to overcome them. Most importantly it points out the winners and losers in the chain therefore signaling towards lucrative investment opportunities. This methodology has been adopted by a range of institutions and governments in order to understand global industries and to guide the formulation of new programs and policies so that countries can insert themselves in the most strategic component of the value chain and achieve economic development.

This report has adopted the UNIDO value chain methodological approach. This methodology is set to understand the rice value chain through mapping which identifies the processes, actors and linkages. The value distribution analysis for the selected products reveals the export unit value and identifies the product that generates the highest revenue. The global and regional analysis employs two tools to assess dynamism; annual average growth rates and global demand. The Export Competitiveness Index (ECI) is calculated to assess the performance of Pakistan and benchmark its performance with other countries. The import dependency index calculated, identifies the attractive markets according to the market size and the prices. The results of the quantitative analysis are complemented by industry insight obtained through published reports, surveys and group discussions carried out with exporters, associations and industrialists.

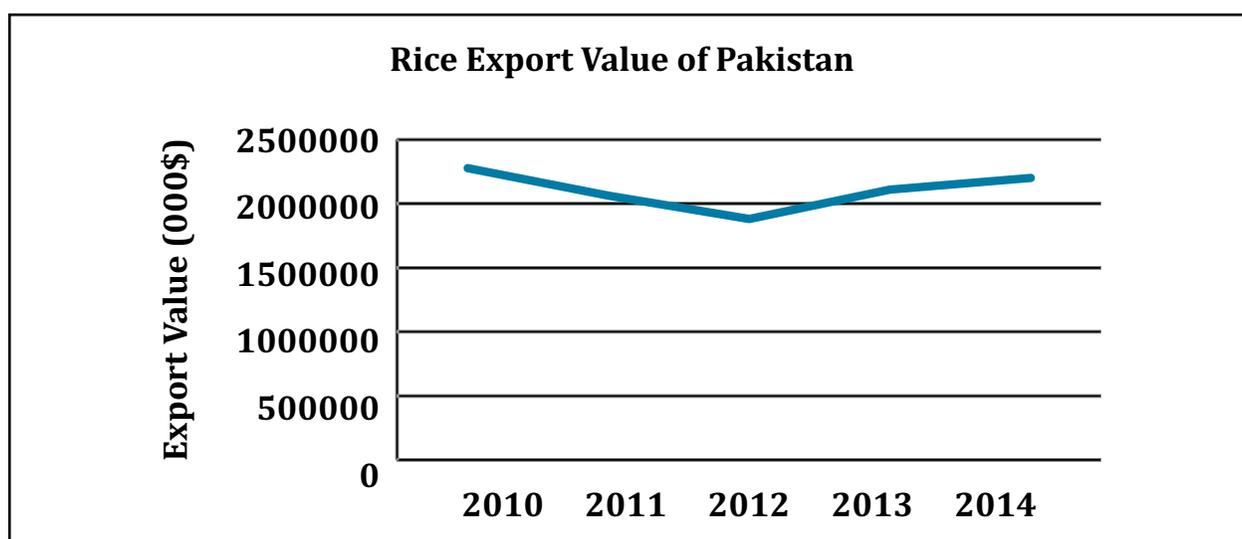
Rice Value Chain Overview

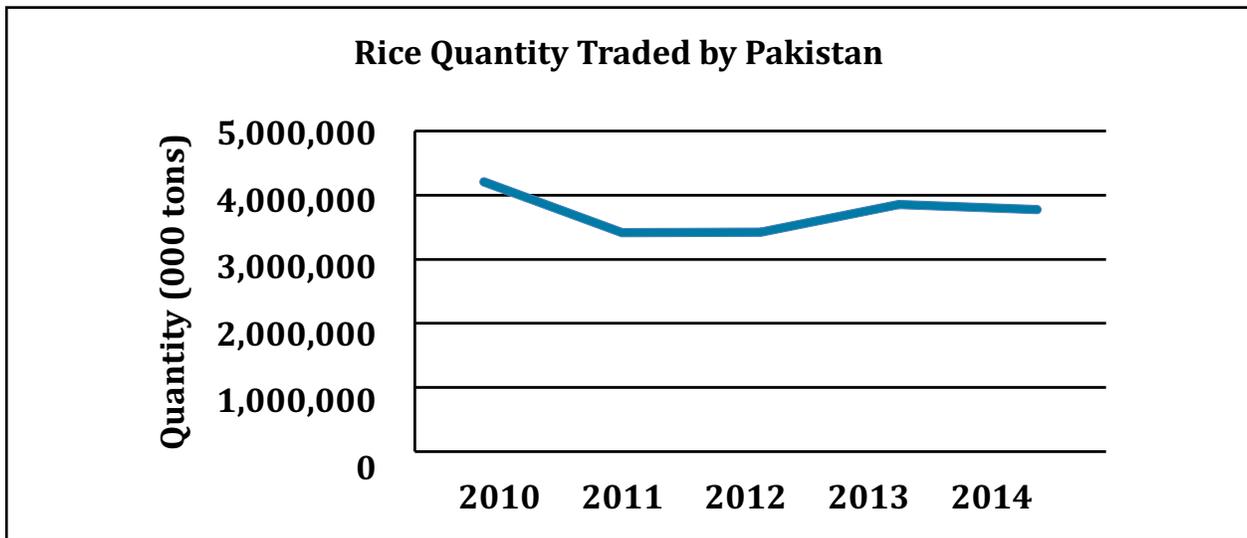
Pakistan is an agrarian economy and depends heavily on agricultural activities for driving its economic growth. A few agricultural products namely rice, cotton, and wheat dominate the country's narrow export base, making them crucial to its economy and foreign exchange earnings. It is necessary for Pakistan to develop its competitiveness in these agricultural sectors in order to grow its exports and increase its share in the global market and stimulate economic growth.

The rice sector in Pakistan contributes to export earnings, domestic employment, rural development and poverty reduction. Falling just below cotton and textiles, it is the third biggest source of export earnings for Pakistan. According to the statistics issued by Economic Survey of Pakistan (2014-15), rice contributes around 0.7 percent to the Gross Domestic Product (GDP) of Pakistan and accounts for 3.2 percent in the value addition of the agriculture sector. Rice production for the year 2014-2015 totaled at 7,005,000 tons, registering a growth of around 3 percent compared to the production in the previous year (GOP, 2014-2015). During this year Pakistan exported 42 million kilograms of rice worth around \$2.2 billion. In 2014, 67 percent of the total rice produce of Pakistan was exported, an increase of 14 percentage points from the previous year whereby 53 percent of the total production was exported. In 2013, 57 percent of the total rice production of the country was exported. These statistics indicate that Pakistan is continuously increasing its rice exports as a percentage of its production (USDA).

Rice is primarily cultivated in the alluvial plains of Punjab and Sindh. Both these provinces significantly contribute to the production of rice that is locally consumed and internationally traded. The two main varieties of rice exported by Pakistan are Basmati and IRRI. The total area under rice cultivation is 2,891,000 hectares (FAO). Some of the important rice producing districts in Pakistan are Gujranwala, Sheikhpura, Sialkot, Okara, Hafizabad, Sukkur, Larkana, Nawabshah, Mandi Bahaudin and Jhang.

Over the years, Pakistan has lost a significant share in the global rice market due to quality and production constraints. The graphs below indicate that Pakistan's rice export value saw a significant decrease in 2012. Similarly, the quantity of rice exported by Pakistan has also reduced between 2010-2014. However, in 2014 the country was able to increase the rice exports. The rice value chain needs to be strengthened for Pakistan to maintain its status as one of the world's leading suppliers of rice and to meet the rising international demand of rice.





This value chain analysis report will identify the areas where Pakistan can add value along the global rice value chain. The four products selected for the purpose of this value chain analysis fall under the HS Code 1006 and are indicated in the table below:

Table 1: Rice Products and HS codes

HS Code	Product Description
100610	Rice in the husk (paddy or rough)
100620	Husked Rice (brown rice)
100630	Rice, semi milled or wholly milled
100640	Broken Rice

The aforementioned rice products and sub-products are further classified according to the stages of production in Table 2. The classification of these products is necessary for mapping and identifying the processes in the value chain.

Table 2: Classification of Rice products according to stage of production

Stage of Production	Rice Product
Primary	Rice in the husk (paddy/rough)
Semi-processed	Husked Rice (Brown Rice)
Processed	Milled Rice, Broken Rice

Rice in the husk, or paddy rice, is at the primary stage of production when the farmer harvests the rice from the land. Husked rice or brown rice is the semi-processed form of rice after the external non-edible husk has been removed. Semi-milled or wholly milled rice is the rice that has been polished after completely removing the husk and the bran layer. Broken rice is a by-product of milled rice.

The international demand for rice and its products is quite dynamic, primarily because it is a staple food in many countries, especially in the East Asian and African regions. Due to the issue of food security attached to rice, trade for rice is limited and the largest producers of rice are not necessarily its

largest exporters. Moreover, most of the rice producing countries are also the main consumers of rice, which results in strict controls on rice exports in these countries. Major Rice exporters of the world include Vietnam, Thailand, Cambodia and India. Historically Pakistan has been one of the leading suppliers of rice in the world. According to the statistics issued by the International Trade Centre (ITC), Pakistan's exports of rice represent around 8.5% of the world exports (International Trade Centre), making it one of the top five global rice exporters.

According to FAO statistics, the annual global production of paddy rice is around 715 million tons and the annual global production of milled rice is 480 million tons (2014). An important characteristic of the rice sector is the geographical concentration of its production in Asia. 90% of the rice production occurs in Asian countries namely China, India, Pakistan Vietnam, Thailand, Indonesia and Cambodia. China and India account for about one third of the global rice economy, making them the largest producers and consumers of rice in the world. In 2014, China produced 0.14 billion tons of milled rice and India produced 0.10 billion tons of milled rice. On the other hand, rice production in Pakistan totaled 70 million tons of milled rice.

Other major rice producing countries include the United States, Brazil, Nigeria and Egypt. Production of rice in African countries has also increased in recent years. Over the years, the global production of rice has witnessed an upward trajectory. This can mainly be attributed to the mechanization of the agriculture sector in the developing countries, and the introduction of new seed varieties that require fewer resources and adapt to the varying geographical conditions of the producing countries.

Table 3: Milled Rice Production and Exports

MILLED RICE PRODUCTION AND EXPORTS (in 000s Tons)					
		2013		2014	
	Country	Export	Production	Export	Production
	Grand Total	43,113	476,492	42,250	476,236
1	CHINA	393	142,530	300	144,560
2	INDIA	10,907	106,646	10,800	104,800
3	INDONESIA		36,300		35,560
4	BANGLADESH		34,390	25	34,500
5	VIETNAM	6,325	28,161	6,605	28,234
6	THAILAND	10,969	20,460	9,779	18,750
7	BURKINA FASO		12,157		12,826
8	PHILIPPINES		11,858		11,915
9	BRAZIL	852	8,300	895	8,465
10	JAPAN	63	7,937	75	7,842
11	PAKISTAN	3,600	6,798	4,000	7,005
12	USA	2,998	6,117	3,468	7,106

13	CAMBODIA	1,000	4,725	1,100	4,700
14	SOUTH KOREA	2	4,230	2	4,241
15	EGYPT	600	4,750	250	4,530

Table 3 shows the production and export data for milled rice in major countries. The major suppliers of milled rice in the world market are Thailand, India, Cambodia, United States and Pakistan. It is evident that China is the world's biggest producer of rice but its rice exports are minimal. The data suggests that Pakistan, Thailand and United States are the only countries that export nearly half of their produce to the global market.

Rice Value Chain Mapping

This value chain mapping exercise covers three fundamental aspects of the rice production process. The first aspect defines the processes that are involved in the transformation of rice from raw material to the final product. The second aspect identifies the chain actors, for example the processing firms, suppliers, service providers, and institutional players. The third aspect identifies the linkages and relationships between the participating actors in the rice value chain.

Processes:

Figure 1: Rice Value Chain process

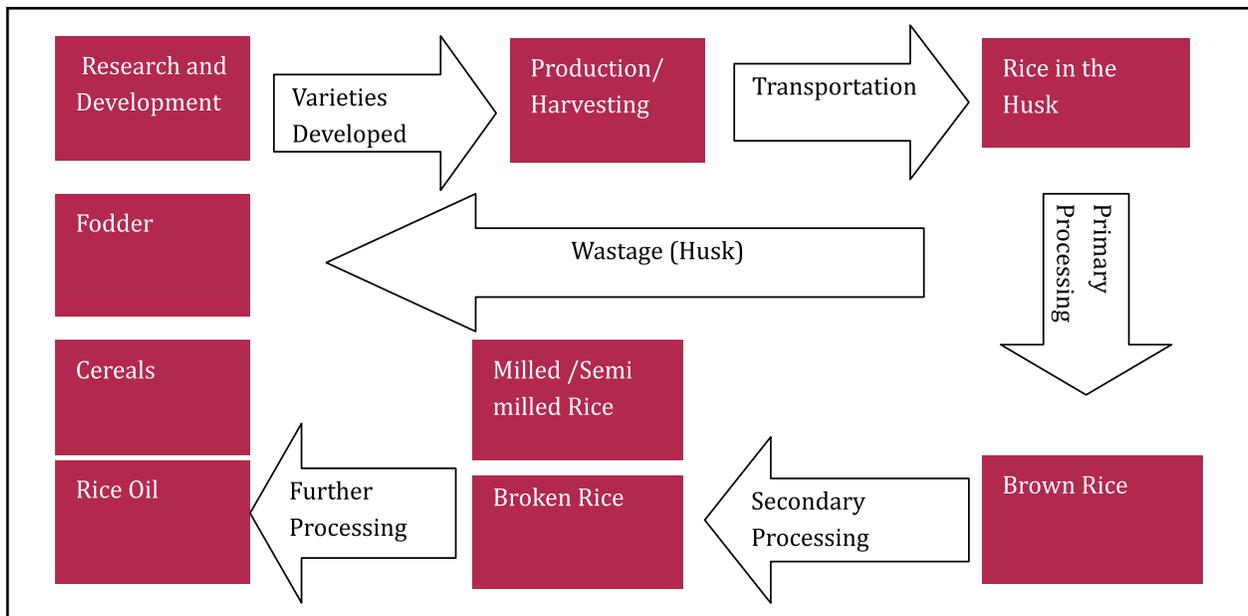


Figure 1 highlights the various stages of production in a rice value chain. It begins with the research and development of new rice varieties, seeds, and fertilizers, and supplements for plant nutrition, disease control, and plant protection. The rice research institutes are responsible for developing resistant varieties of Basmati and IRRI rice (two main types of rice grown in Pakistan) that can adapt to the geographical and climatic conditions of Sindh and Punjab. These varieties are distributed to the farmers who cultivate rice and ensure adequate provision of fertilizers, pesticides, and irrigation to the rice crop. The crop is harvested by the local farmers and rice paddy is transported to the miller for processing.

At the mill, the paddy rice undergoes various stages of processing. The level of moisture in paddy rice in Pakistan is around 30-32 percent whereas ideally it should be around 20-22 percent. Therefore, in the primary processing stage, the paddy rice is dried and the outer most layer of the rice is removed; at this point in the process the product is called husked or brown rice. In the secondary stage of processing, the husk of the rice is removed and the rice is polished, producing the semi or the wholly milled type of rice. A by-product of this process is the broken rice, which is also in great demand in the local and international markets due to its low price. Further processing of rice leads to the production of high-value added goods such as flour rice, cereals, rice oil and fodder.

Actors:

The direct actors involved in the rice value chain in Pakistan are the rice producers/farmers, the wholesalers, and the millers. Small-scale farmers usually cultivate rice on 1-6 acres of land and large-

scale growers cultivate rice on 25-50 acres of land. A majority of farmers focus on fulfilling the domestic demand for rice and therefore lack the good practices required to grow rice that caters to the international standards. Farmers do not receive adequate information and advisory services regarding inputs such as high yielding varieties, fertilizers, pesticides and processes. According to market sources, farmers incur heavy losses during harvesting and the percentage of the broken rice is constantly on the rise. Moreover, the farmers do not get any assistance from the government in the form of price support.

The role of the 'agent' or the 'wholesaler' is to mainly collect the paddy rice from the growers and transport it to the millers. In some cases, the agent or the wholesaler also takes on the role of a sheller. A sheller removes the shell from the paddy rice and supplies the product to the millers for further processing. The wholesalers have been heavily criticized for hoarding the rice supplies and setting the rate at which rice is traded in the domestic market.

The rice millers in the rice value chain are mainly responsible for cleaning, drying, husking and polishing the rice. There are numerous medium-scale millers in Pakistan but only a few large-scale millers like Guard Rice. The millers obtain the raw material from Pakistan but the machinery required for milling is imported from countries like China. Rice mills are capital intensive and employ skilled labor for the operation of machines. Female labour participation is limited to packaging operations. Rice millers supply rice in the domestic and international markets, thus in most cases the millers also take on to the role of the exporter.

Government institutes and public sector universities are conducting research and development exercises in the rice sector. Agriculture University Faisalabad and the Rice Research Institutes at Kala Shah Kaku and Dokri (Sindh) are actively carrying out research. However, the research being carried out by these institutes is not feasible at the commercial level.

The Trade Development Authority of Pakistan (TDAP) is a public sector organization under the Ministry of Commerce mandated to work for Pakistan's integration in global trade. It assists rice exporters by organizing trade fairs and international expos aimed at facilitating rice exporters' access to potential markets. TDAP also regulates the tariff rate quotas issued under bilateral and multilateral trade agreements. TDAP announces the availability of these quotas at spaced intervals to ensure their optimal utilization by the exporters. Other than this, public sector support for the rice sector is limited. Despite rice being an essential commodity for local consumption and one of the highest income generators of foreign exchange for the country, price subsidies and price regulation for farmers, millers or exporters are non-existent.

The Rice Exporters Association of Pakistan (REAP) is a private association which provides certification and accreditation to its members. The association also facilitates exporters' access to buyers by organizing and participating in various trade fairs. The exporters at REAP are eager to participate in research and development activities in the rice sector.

Linkages:

Paddy rice from the producers reaches the millers through various channels. Two major channels were identified in the rice value chain in Pakistan. The first channel is direct, whereby the millers purchase paddy rice directly from the farmers. When this direct relationship is in place, millers are able to engage with the farmers during the cultivation of rice, provide them information and link them to advisory services about increasing the yield of rice. The second channel, which is the indirect channel, is the widely prevalent mechanism of trading rice in the local markets in Pakistan. This indirect method

involves an intermediary- a wholesaler- who acts as a link between the farmer and the miller. The wholesaler buys paddy rice from the farmers and sells it to the millers. The exchange between the wholesaler and the miller takes place in a makeshift wholesale market in a central location of the town and is referred to as a Mandi in the local language. Millers process the paddy rice into final products such as husked rice, parboiled rice, and wholly/semi milled rice and supply them to the domestic and international markets. The wholesalers or the agents were identified as the most influential actors in the domestic value chain, who determine the price and quantity of rice being traded.

Governance:

Governance in the value chain primarily refers to the formal and informal systems of coordination between the factors of production and the actors in the value chain. It basically identifies the global power relations between the firms participating in the value chain.

Due to the issue of food security attached to staple food items, rice trade in many countries is regulated by the government. Policy makers in countries such as Thailand, China and Vietnam control rice trade flow to ensure stability of prices in the domestic rice market. Their state agencies intervene to regulate rice trade and often time's import and export rice through government-to-government (G-G) contracts. The extent of the hold of the governments in rice trade was evident during the 2007-08 rice crisis when exporting countries such as India and Vietnam enforced a ban on the export of rice, and importing countries such as the Philippines, Indonesia and Nigeria faced domestic food security issues (Mohanty, 2010). In Pakistan, TDAP advertises the government-to-government contracts and informs the private millers and exporters regarding the available export quota.

Pakistan, Uruguay and Australia are the only countries that follow a market-oriented policy in the rice sector. The price of rice in these countries is determined solely by the interplay of the forces of demand and supply in the domestic and international market.

There are no major multinationals in the global rice market that control the supply of rice. The local value chain mirrors this feature and there are no multinationals operating in the rice sector in Pakistan.

Value Distribution

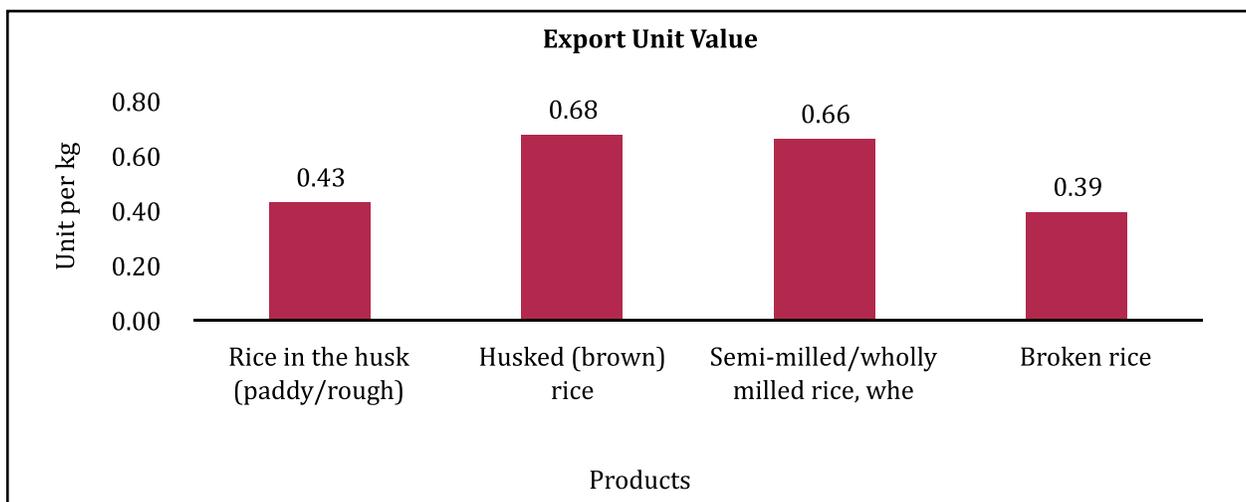
The 'value distribution' indicator analyses the level of revenues and profits captured by the rice as it moves along various stages of processing. By identifying the stages where most value is created and profits are maximized, this section of the value chain analysis helps to identify the 'winners' and the 'losers' in the rice value chain in Pakistan.

Export Unit Value:

In an agro-food industry, value is added to a product as the level of processing increases¹. The rice value chain follows this traditional approach and the price of processed rice is significantly higher than the price of primary rice. This study identified semi-milled/wholly milled rice as the product in the rice value chain that has the highest export unit value and the highest profit margin.

The export unit values of rice products at different stages of processing give an insight into the value added at each stage of processing. The graph in Figure 2. indicates the unit value of four rice products that can be categorized as rough, semi-processed and processed. It is evident that as the level of processing increases, the export unit value of the product increases simultaneously. As we move from the primary processed product i.e. rice in the husk to the secondary processed product i.e. semi-milled/wholly milled rice, we witness an increase of \$0.23 per kg in the export unit value. It is interesting to note that the export unit value of brown rice is slightly more than that of wholly/semi-milled rice. This can be attributed to the growing health consciousness among consumers, which has led to an increase in the demand for brown rice. Typically, the value of the by-product in any given value chain is significantly low. This holds true for broken rice as well, which has the lowest export unit value in the rice value chain.

Figure 2: Export Unit Value of Rice Products



Employment Trends:

Rice plantations in the rural areas of Sindh and Punjab generate seasonal employment for the locals. During the plantation and harvesting season, the sector employs skilled labor who have appropriate knowledge of sowing and harvesting the crop. This stage in the rice value chain has a significant rate of female participation. At the milling stage the employment trends change. The sector becomes capital intensive and employs skilled labor, usually male, to operate the machinery used for the milling process. Female participation is limited to activities such as packing. There are no specialized institutions to train workers for the rice fields and rice mills; therefore, the sector faces an acute

¹ This may not be true for every commodity.

shortage of trained labor.

Raw Materials:

The two types of rice varieties cultivated widely in Pakistan are Basmati and IRRI (non-Basmati) rice. The seeds of these varieties are provided locally to the farmers. The machinery used for husking, parboiling and polishing the rice is imported from China, Germany and India and is available in the local market.

FDI:

Foreign Direct Investment in the rice sector in Pakistan is minimal. A few companies funded by the Middle Eastern countries are operating in the milling sector but other sectors have been unable to attract foreign business. This study identified research and development, and milling as the two parts of the value chain that have the potential to attract investment.

Global and Regional Dynamics

Rice is a staple food in some of the most populous regions of the world but surprisingly the world trade in rice accounts for only 8.84 percent of the global rice consumption (FAO). The lack of trade in rice has been associated with domestic sanctions to ensure local food security; the largest consumers of rice such as India and China are self-sufficient and they have adopted protectionist measures to ensure domestic food security. Therefore, the world's top producers i.e. India and China are not the world's top exporters of rice.

The export market of rice is highly concentrated. The top five rice exporters account for more than half of the global rice trade. Global top suppliers of rice include Thailand, India, Pakistan and Vietnam. India emerged as one of the top exporters of rice after the Indian government removed the protectionist restriction on the exports of rice.

On the demand side, the market for rice is geographically fragmented. The top rice importers are located in Asia, Middle East and Africa. China is one of the major importers of rice and its import accounts for a quarter of the total trade. Demand for rice is rapidly rising in African countries such as Nigeria. A rapid increase in the demand for rice products has also been seen in the Middle Eastern countries.

Product wise, the global trade for rice is clustered around two main products: fragrant rice and non-fragrant rice. The fragrant rice includes the basmati and jasmine rice. Basmati rice is mainly produced and exported by India and Pakistan. It is highly demanded in the European Union and the Middle Eastern countries. With the Indian government lifting the ban from the exports of rice, India has become the leading exporter of basmati rice. Jasmine rice is mainly grown in the East Asian countries such as Thailand, Vietnam and Cambodia and is highly demanded in the United States, China, Senegal and Ghana. All major exporters are involved in the export of the non-fragrant rice to destinations in Africa and the Middle East (Mohanty, 2010).

World Dynamism:

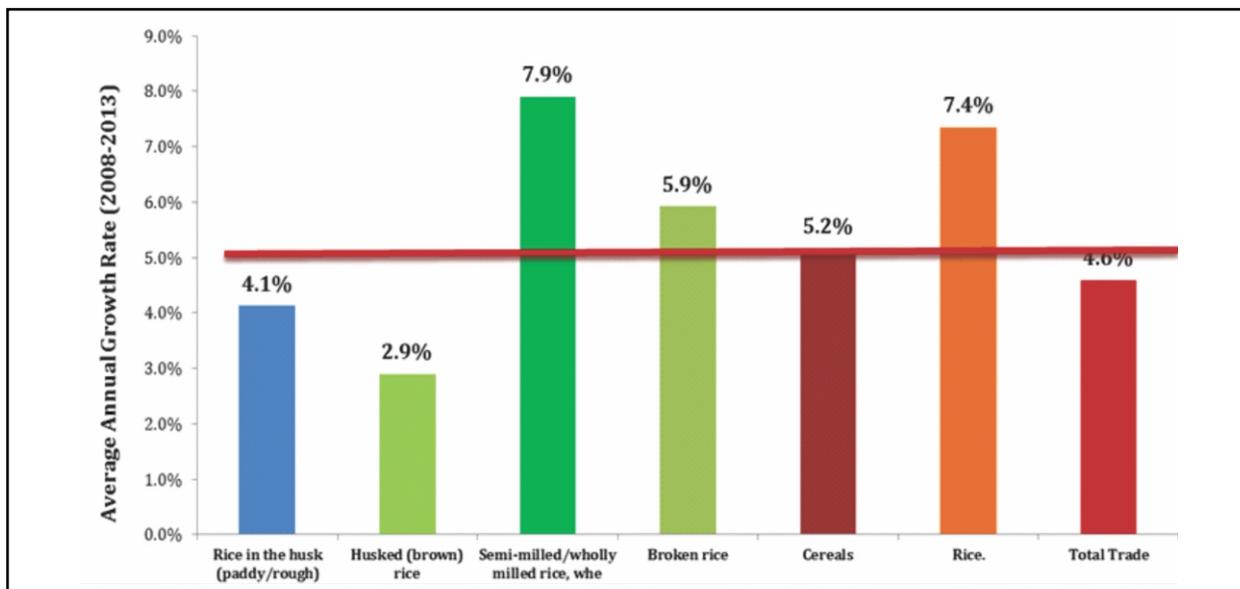
The indicator for world dynamism identifies whether the sector has an impressive growth rate and is highly demanded in the global market. This methodology employs two tools to assess world dynamism: annual average growth rates and global demand.

The annual average growth rate of the product is analyzed over a period of time. The graph below indicates the annual average growth rates of the rice products (rice in the husk, husked rice, semi/wholly milled rice and broken rice), total rice value chain (contains all four products of rice), cereals, and the world total trade of agricultural and manufacturing sector between the years 2008-2014. The graph indicates that over the course of five years, trade in cereals grew at a rate of 5.2 percent, as opposed to the world total trade which grew at a rate of 4.6 percent, making cereals a dynamic sector for which the world demand is rapidly increasing. The annual average growth rates of the four products of rice and the total rice value chain have been benchmarked with the broader category of cereals. It is evident that the annual average growth rate of the total rice value chain is greater than cereals, indicating that within the category of cereals the rice value chain is a dynamic sector. Further interpretation of the graph below highlights that semi/wholly milled rice with an annual average growth rate of 7.9 percent and broken rice with an annual average growth rate of 5.9 percent are the two products which are rising above the annual average growth rate of cereals and the total world trade. These statistics entail that these two products are in great demand in the global market. Paddy rice and brown rice are growing well below the annual average growth rate of cereals

and the total world trade, making them 'static products' which essentially means that world demand for these products is decreasing or growing at a lower rate than the sector.

The aforementioned findings suggest that the rice sector is growing at an impressive rate and the global demand for rice is increasing rapidly through time.

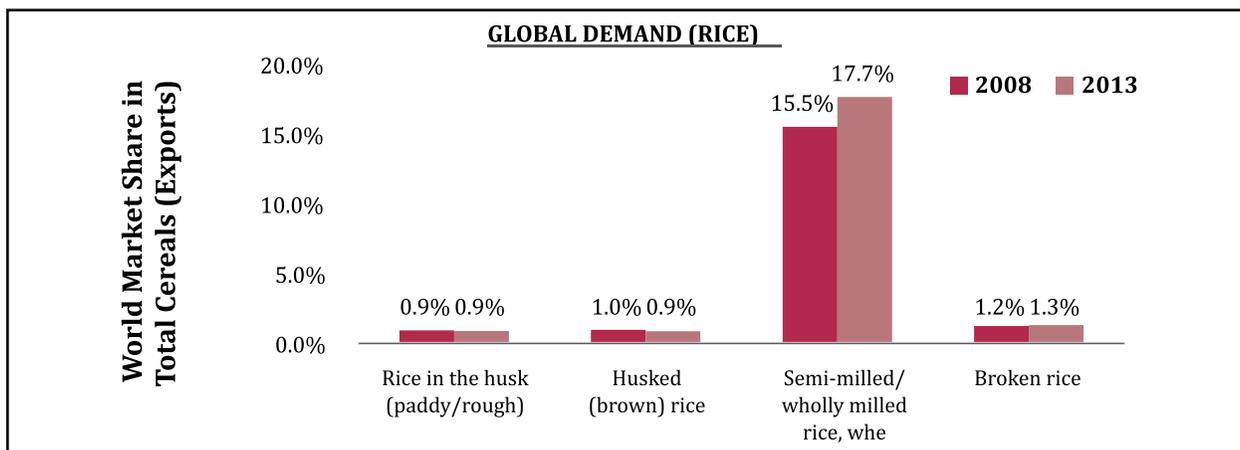
Figure 3: World Dynamism



Another indicator that has been employed to measure the global trend is the world market share of the product. This indicator measures the importance of the product in world total trade. Comparing the trends across the years allows determining if the product has gained or lost significance. For the purpose of this study, we have assessed the market share of the four selected rice products as a percentage of the world market share of cereals.

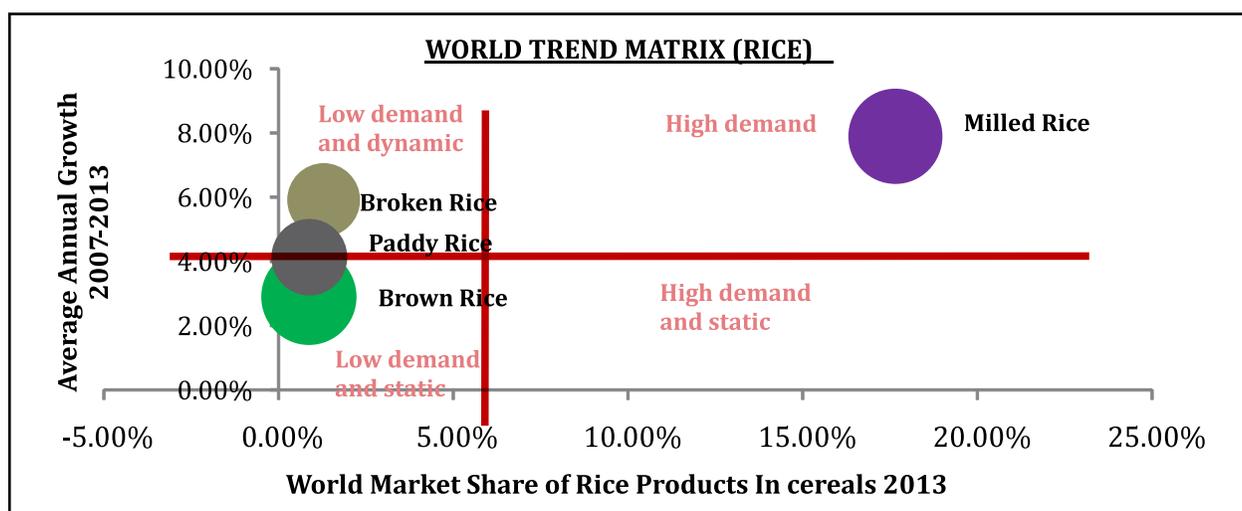
The graph below highlights the world market share of rice products as a percentage of the world market share of cereals. It is evident that the world market share of semi/wholly milled rice (which is also the final product of the rice value chain) has increased in the period from 2008 - 2013. The demand for semi-milled/wholly milled rice was around 14 percent in 2008 which increased to 18 percent in 2013. The market share of the other three products selected for the rice value chain forms a marginal proportion of the world market share of cereals and has remained stagnant over the years.

Figure 4: Global Demand for Rice Products



The world trend matrix classifies the export products according to their world market share and annual average growth rate. The size of the bubble represents the unit value for each of the rice products. It is evident from the graph that the semi/wholly milled category of rice has the highest world market share which is growing above the average of the cereal sector. Therefore, milled rice falls in the champion category i.e. it is the most dynamic and demanded product within the cereal sector. The world market share of broken rice and paddy rice is also growing above the average growth rate of the cereal sector market share, however the world market share of these products is not significant and it has remained stagnant over the years. The growth rate of brown rice is below the average of the sector, which means the demand for brown rice is growing but at a lower rate than that of the sector, therefore it is considered as a static product.

Figure 5: World Trend Matrix



Rice Trade Trends in Different Regions of the World:

Regional trends indicate the geographical concentration of the imports, exports, and demand for a product. Regional trends can be measured using two indicators: the regional market share and the regional growth rate. The market share identifies the major importing and exporting regions of each product and the regional growth rate indicates growth patterns in each region.

The graph in Figure 6 shows the regional share in the exports of paddy rice (rice in the husk) in 2008 and 2013. USA and Canada are the major suppliers of paddy rice. In 2008 their share in world rice trade accounted for over 80 percent but fell to 60 percent in 2013. The paddy rice is being further processed in Mexico and Venezuela hence the exports are high from the Latin American region as well. As is evident in the chart below, over time, Latin America and South Asia have significantly increased their share in the exports of paddy rice.

Figure 6: Major Exporting Regions of Paddy Rice

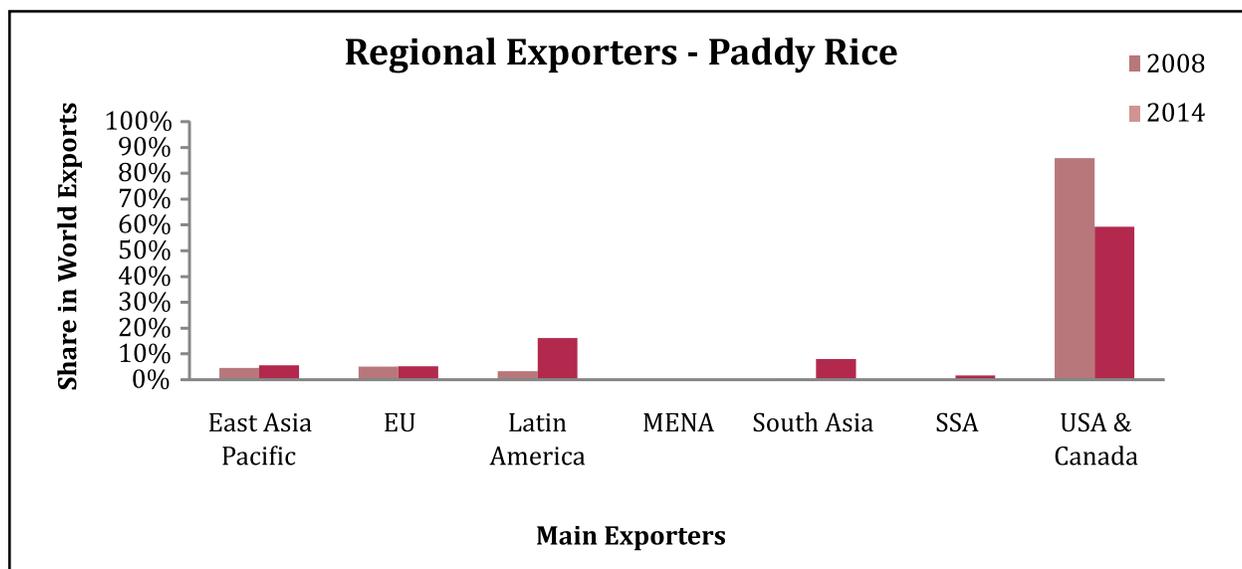


Figure 7 shows each region's share in the world exports of brown rice. East Asia Pacific, European Union, Latin America, and the United States and Canada are the main exporters of brown rice. In 2013, East Asia Pacific, EU and USA decreased the exports of brown rice whereas Latin America and South Asia increased it.

Figure 7: Major Exporting Regions of Brown Rice

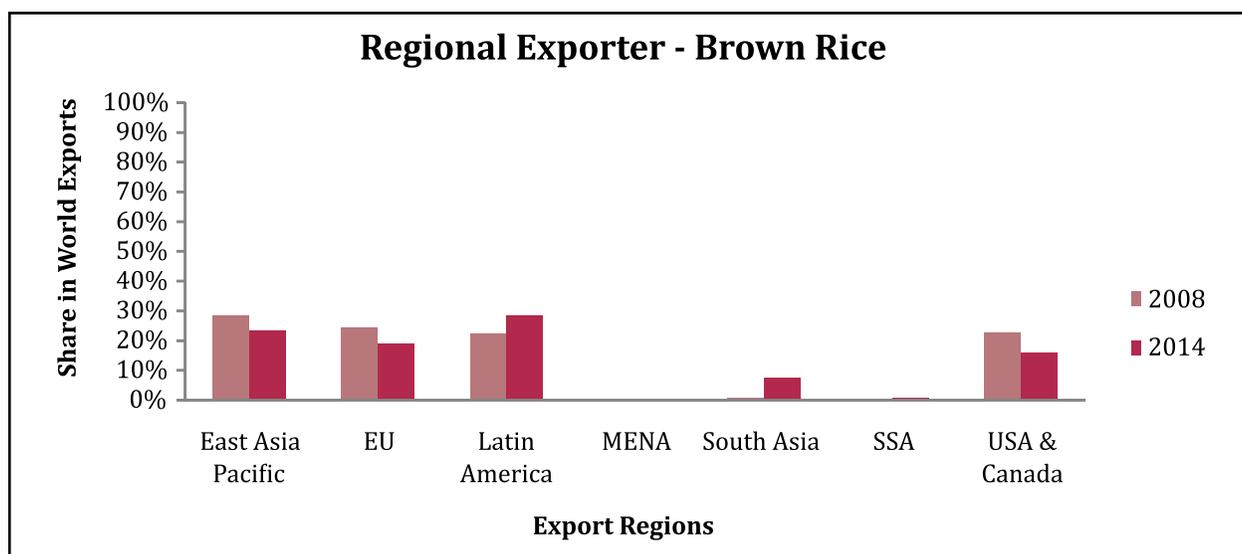
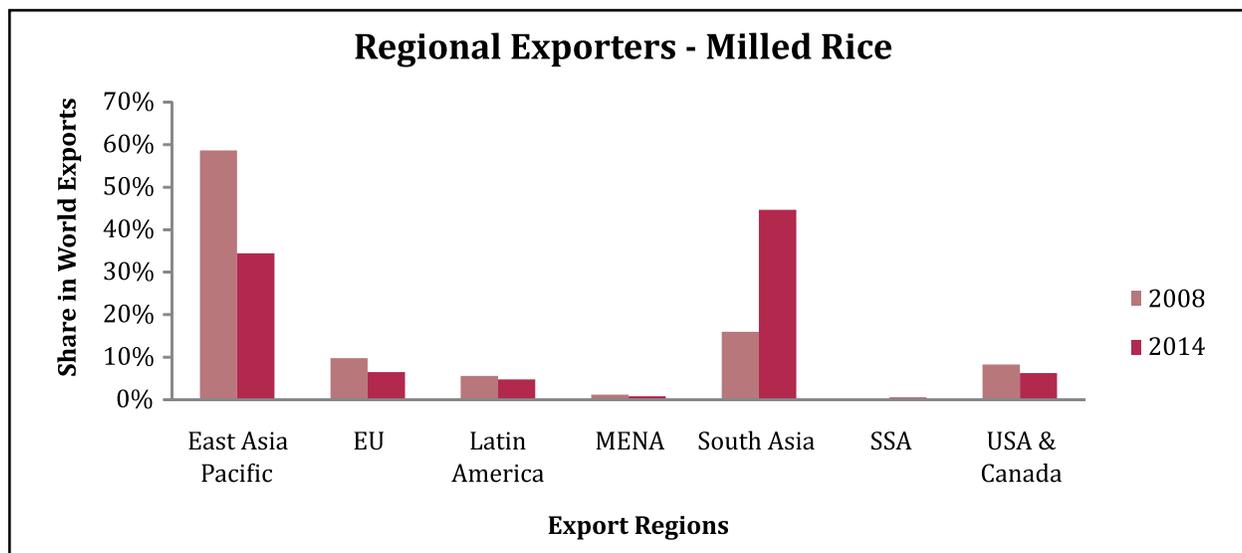


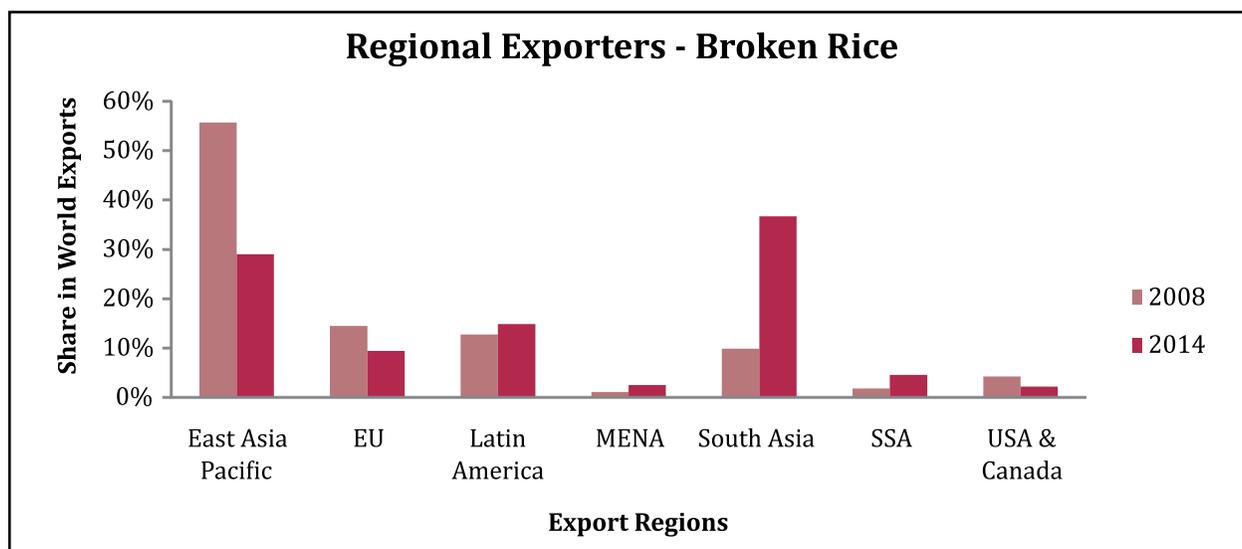
Figure 8 shows the major exporters of milled rice. South Asia and East Asia are the world's major suppliers of semi/wholly milled rice. This particular category of rice accounts for around 80 percent of the world total exports of rice. The share of East Asia Pacific decreased significantly between 2008 and 2013, falling from 60 percent to 25 percent, while the share of South Asia increased from 17 percent to 43 percent during the same time. South Asian and East Asian countries participate in high value addition activities and export the final product.

Figure 8: Major Exporting Regions of Milled Rice



The main exporting regions of broken rice are South Asia and East Asia, primarily because broken rice is a by-product of semi/wholly milled rice.

Figure 9: Major Exporting Regions of Broken Rice



Identifying the main importing regions for the product helps to assess the geographical concentration of the major markets for each product.

The main importing region for rice in the husk or paddy rice is Latin America where the paddy rice is further processed into semi/wholly milled rice. This particular trend verifies the aforementioned assertion that USA exports paddy rice to Latin America for further processing. Imports of paddy rice increased in South Asia, Middle East, and North Africa between 2008 and 2014, primarily because these regions have specialized in the production of semi/wholly milled rice.

Figure 10: Major Importing Regions of Paddy Rice

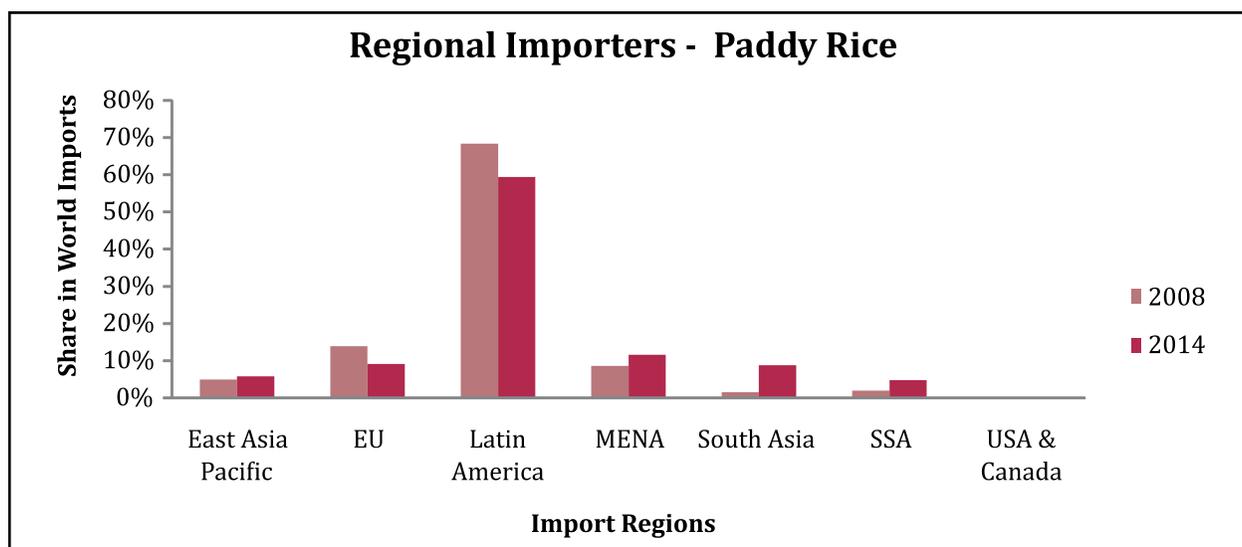
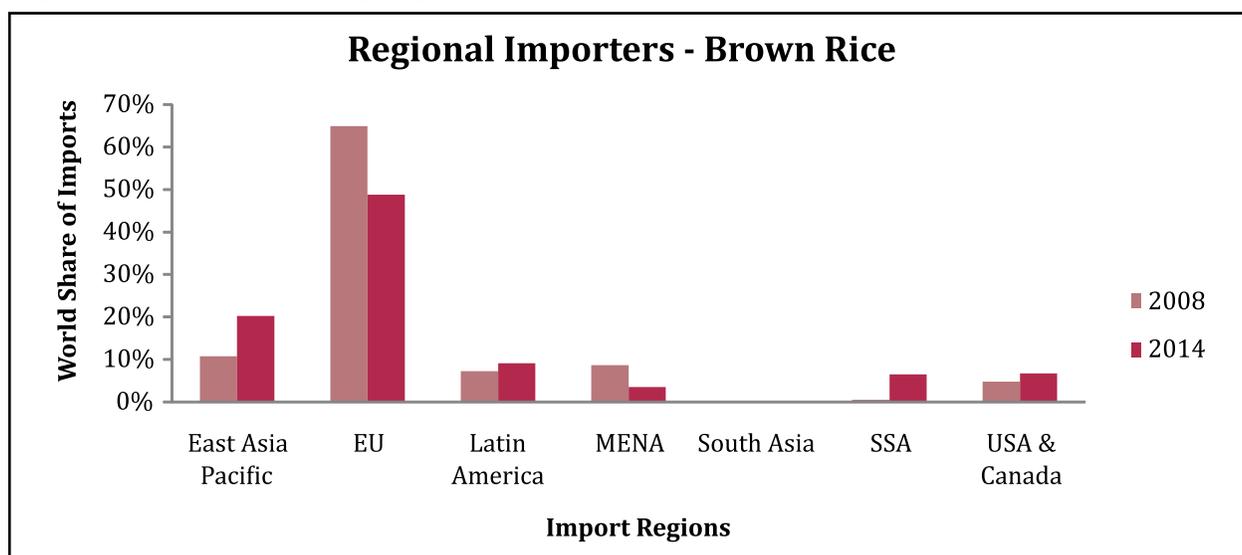


Figure 11 shows the major markets for brown rice. European Union, East Asia Pacific, and the United States and Canada are the major importing regions of husked or brown rice. It is evident that EU is the largest importing region of brown rice however, EU's imports as a share of total world imports of brown rice decreased from 64 percent to 49 percent between 2000 and 2014. Between 2008 and 2014, the imports of husked rice increased in East Asia, Latin America and Sub-Saharan Africa.

Figure 11: Major Importing Regions of Brown Rice



The market for semi/wholly milled rice is evenly distributed across the world. Within the rice value chain, semi/wholly milled rice is the fastest growing and most highly demanded product. Middle East Northern Africa has the highest world market share of imports for milled rice, followed by East Asia Pacific, European Union and Sub Saharan Africa. The increase in imports of milled rice in South Asia was due to rice shortage in 2007.

Figure 12: Major Importing Regions of Milled Rice

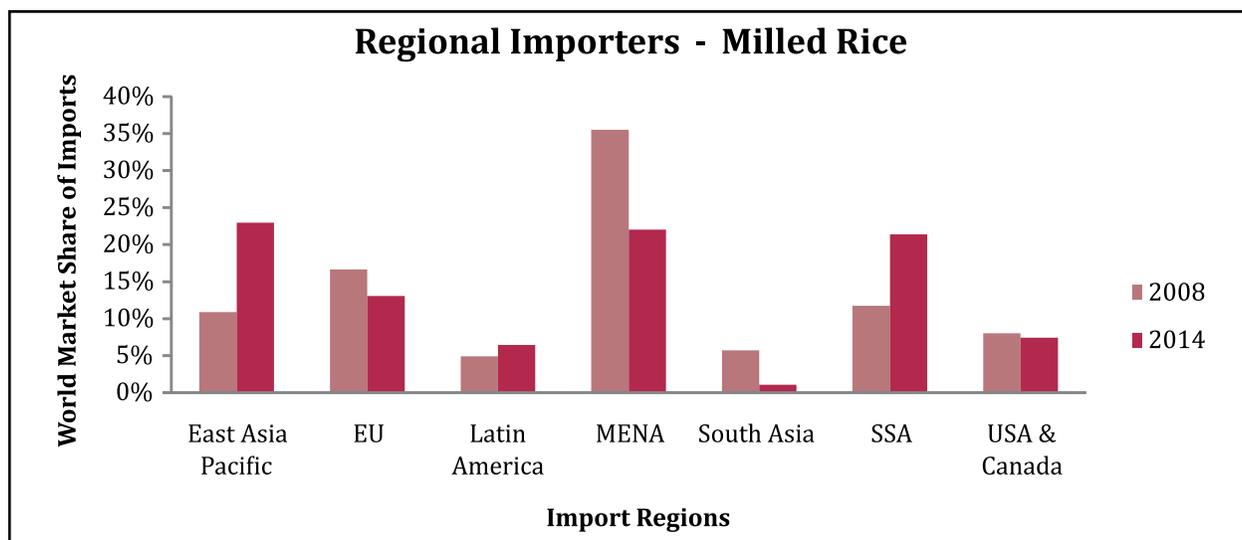
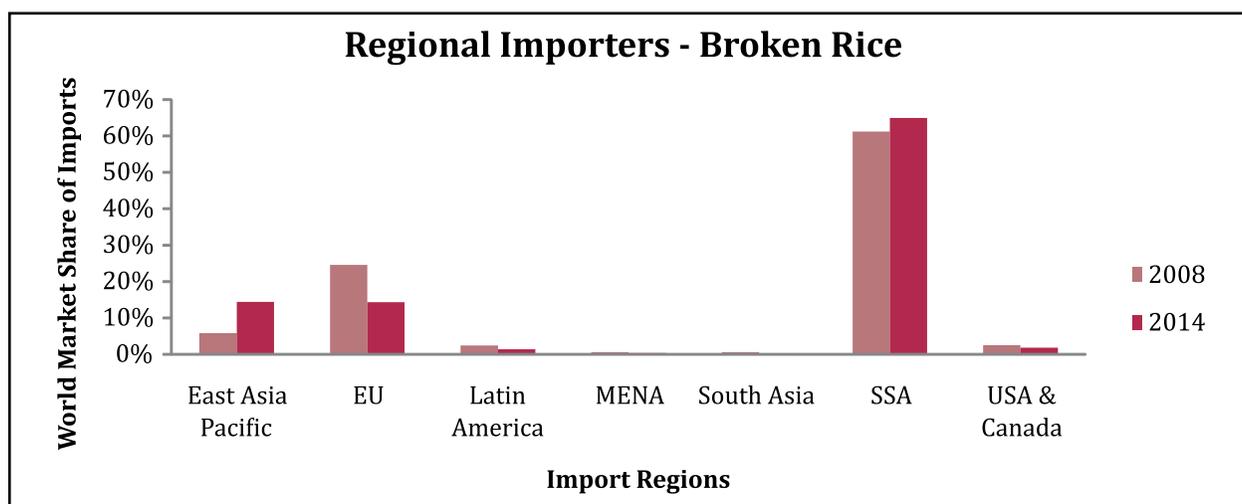


Figure 13 shows the importers of broken rice segregated by region. Broken rice is a by-product of milled rice and mostly demanded by countries for further processing in products such as cereals and flour etc. It is also used for consumption in East Asia and South Asia. Sub Saharan Africa has the highest share of imports for broken rice followed by EU and East Asia.

Figure 13: Major Importing Regions of Broken Rice



Annual average growth rate measures the growth rate of exports or imports. The growth trends are instrumental in deciphering the demand trends in the international market and to make future sales projections.

Figure 14 below compares the export growth rate of different rice products in the major rice exporting regions. Exports from South Asia and Sub Saharan Africa have grown tremendously between 2008 and 2014. These two regions are exporting all the products included in the rice value chain. The slow exports growth witnessed in East Asia is mainly because the region produces rice for domestic consumption. After the 2007-08 rice crisis, many rice-consuming countries have become reluctant to depend on imported rice and have rolled out measures to improve self-sufficiency. Many rice-importing countries have initiated programs to expand their rice production and reduce their dependence on foreign rice (Mohanty, 2010).

Figure 14: Average Annual Growth Rate of Exports in Different Regions

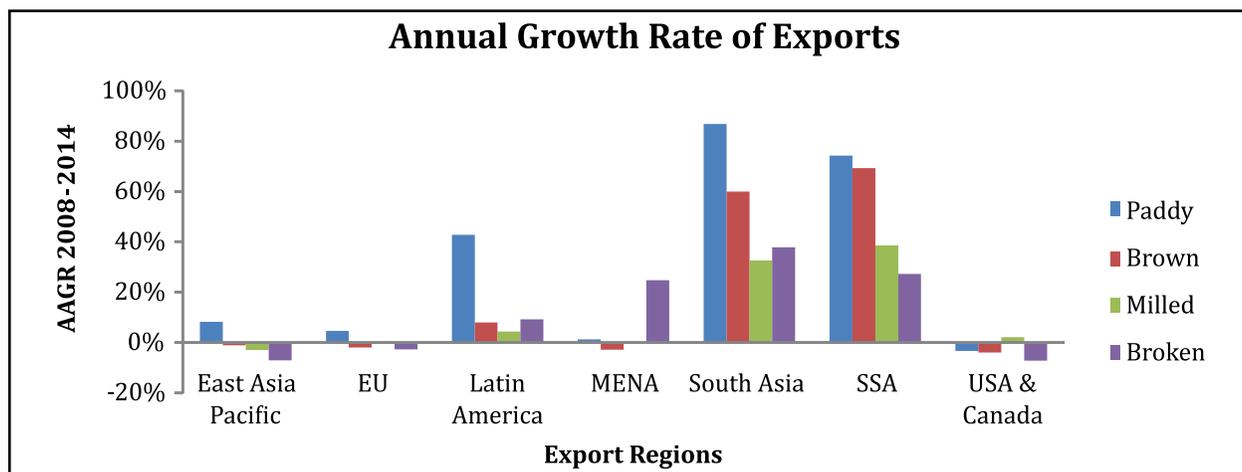
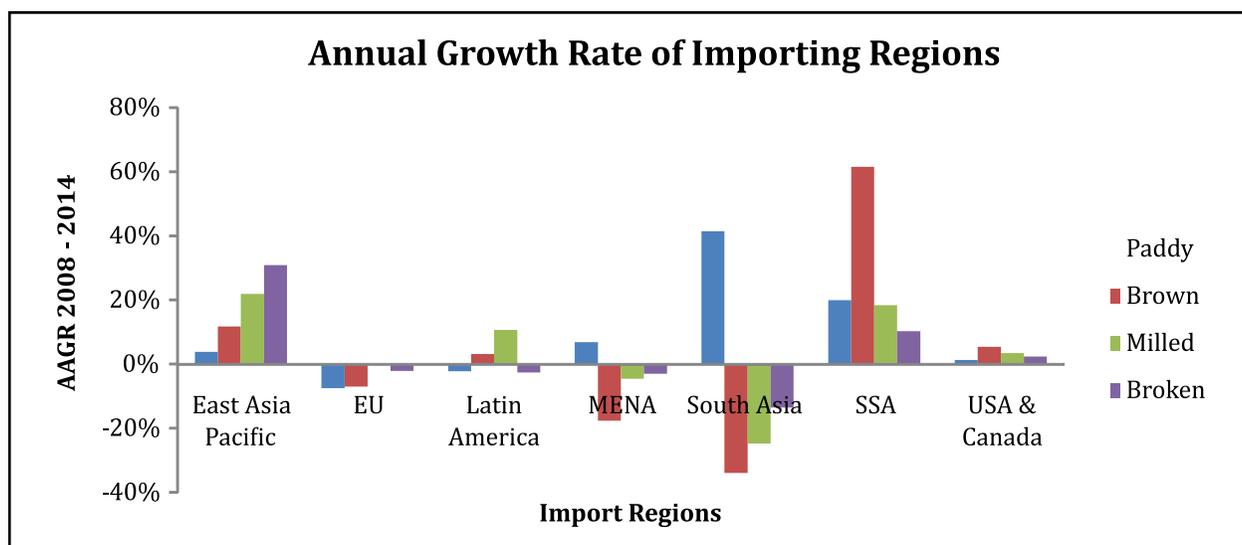


Figure 15 below shows the import growth rates of the different products in the rice value chain segregated by region. The import of paddy rice and brown rice in South Asia and Middle East North Africa is negative because these regions are primarily rice exporters. They import paddy rice to further process it. It is evident that the East Asian countries, Sub-Saharan African countries and the Latin America Caribbean countries highly demand milled or wholly milled rice. The rising popularity of rice in many parts of Africa and the Middle East is likely to contribute significantly to the uptrend in rice trade. Rice consumption in Sub Saharan Africa is expected to grow much faster than in any other region of the world. Broken rice imports grew significantly in East Asia because broken rice is being further processed into products such as flour by the East Asian millers.

Figure 15: Average Annual Growth Rate of Imports in Different Regions



Rice Value Chain Performance

This section of the report will analyze the performance of Pakistan's rice value chain in comparison with the top exporters in the global rice market. The export competitiveness index analyzes the international dynamics of the value chain to evaluate the export competitiveness of the country at each stage and benchmark its performance with other countries.

The table below shows the rankings of the ten countries with the highest export competitiveness index for rice in the husk (paddy rice) in 2008 and 2014. United States is the most competitive country in the world that exports the rice in the husk (paddy rice) to the world. The United States is a major supplier of paddy rice to Latin America where it is further processed. Developed countries such as the United States and Russia are ranked quite high in the competitive index. India jumped from 15th to 5th position between 2008 and 2014.

Table 4: Export Competitive Index of Paddy Rice

Countries	ECI PADDY RICE		RANK	
	2014	2008	2014	2008
United States	0.52	1	1	1
Suriname	0.52	0.51	2	2
Uruguay	0.1	0.2	3	4
Brazil	0.09	0.01	4	16
India	0.07	0.01	5	15
China	0.04	0.03	6	10
Paraguay	0.03	0.33	7	3
Russia	0.02	0	8	26
Bulgaria	0.02	0.09	9	6
Greece	0.02	0.16	10	5

Table 5 shows the export competitiveness rankings of the countries exporting brown rice. Guyana is the most competitive country in the world to export brown rice. Developed countries such as the United States, Italy, and Australia and Spain export brown rice. Between 2008 and 2014, Pakistan climbed 13 positions and became the 5th most competitive country to export brown rice.

Table 5: Export Competitive Index of Brown Rice

Countries	ECI BROWN RICE		RANK	
	2014	2008	2014	2008
Guyana	0.92	0.62	1	1
China	0.5	0.17	2	6
United States	0.5	0.51	3	2
Spain	0.2	0.13	4	7
Pakistan	0.19	0.01	5	18
Paraguay	0.19	0.01	6	20
Thailand	0.18	0.46	7	3
Italy	0.17	0.25	8	5
Uruguay	0.15	0.42	9	4
Australia	0.13	0.01	10	19

Table 6 shows the export competitiveness index of milled rice, the part of the value chain with the highest trading value, in 2008 and 2014. The world competence of producing milled rice is geographically concentrated in East Asian and South Asian countries. Cambodia and India have significantly improved their ranking in this particular category. India emerged as a global player after it uplifted the ban on exports of rice in late 2011. Thailand lost most of its market to India in 2012; later, in 2014, Thailand stopped the rice-pledging scheme and regained the majority of markets lost to India. Pakistan has been able to maintain its ranking in the exports of semi/wholly milled category of rice.

Table 6: Export Competitive Index of Milled Rice

Countries	ECI MILLED RICE		RANK	
	2014	2008	2014	2008
Uruguay	0.527	0.53	1	2
India	0.525	0.232	2	6
Thailand	0.501	0.925	3	1
Vietnam	0.31	0.435	4	3
Pakistan	0.156	0.291	5	5
Guyana	0.115	0.385	6	4
Suriname	0.108	0.214	7	7
United States	0.104	0.133	8	8
Belgium	0.098	0.117	9	10
Cambodia	0.086	0.001	10	23

Table 7 shows the export competitiveness index for broken rice. It is evident that the countries that dominate the export of milled rice are also competitive exporters of broken rice. As mentioned earlier, broken rice is a by-product of milled rice; therefore, the composition of competitive exporting countries for both products is similar.

Table 7: Export Competitive Index of Broken Rice

Reporter Name	ECI BROKEN RICE		RANK	
	2014	2008	2014	2008
Guyana	0.6	0.51	1	2
Thailand	0.53	0.84	2	1
India	0.45	0	3	26
Pakistan	0.37	0.13	4	5
Vietnam	0.14	0.11	5	6
Brazil	0.14	0.08	6	8
Belgium	0.11	0.28	7	4
Uruguay	0.08	0.4	8	3
Senegal	0.07	0.05	9	12
Egypt	0.06	0.01	10	18
United States	0.05	0.05	11	11

The rice sector in Pakistan contributes significantly to the GDP and foreign exchange earnings of the country. The export competitiveness indicator shows favorable positioning for Pakistan in the categories of husked rice, semi/wholly milled rice, and broken rice. Being an agrarian economy, Pakistan is highly dependent on the exports of primary products such as rice, wheat and cotton to drive economic and GDP per capita growth. Thus it is essential for Pakistan to maintain its competitiveness in these sectors. For the export performance comparison of milled rice in the rice value chain, Uruguay was selected as an international model, India as a regional benchmark and Cambodia and Vietnam as future competitors.

The graph in Figure 16 shows the export performance of milled rice for Cambodia, Belgium, Pakistan, Guyana, and India. The graph shows that the share of milled rice in the total exports of Pakistan has decreased, highlighting that Pakistan has decreased its dependency on milled rice as a source of foreign exchange earnings. It further indicates that Pakistan has slightly decreased the percentage share of milled rice in the total rice value chain (includes paddy rice, brown rice, milled rice and broken rice). Lastly, the export per capita (represented by the bubble size) of Pakistan has also decreased between 2008 and 2014. The competitive performance of Guyana indicates that it has increased its dependency on milled rice and downgraded in the rice value chain. Moreover, the export per capita for Guyana has also increased significantly. Belgium seems to have maintained its position over the years. The competitive performance of India and Cambodia is discussed and analyzed when comparing the regional performance.

Figure 16: Export Competitive Performance

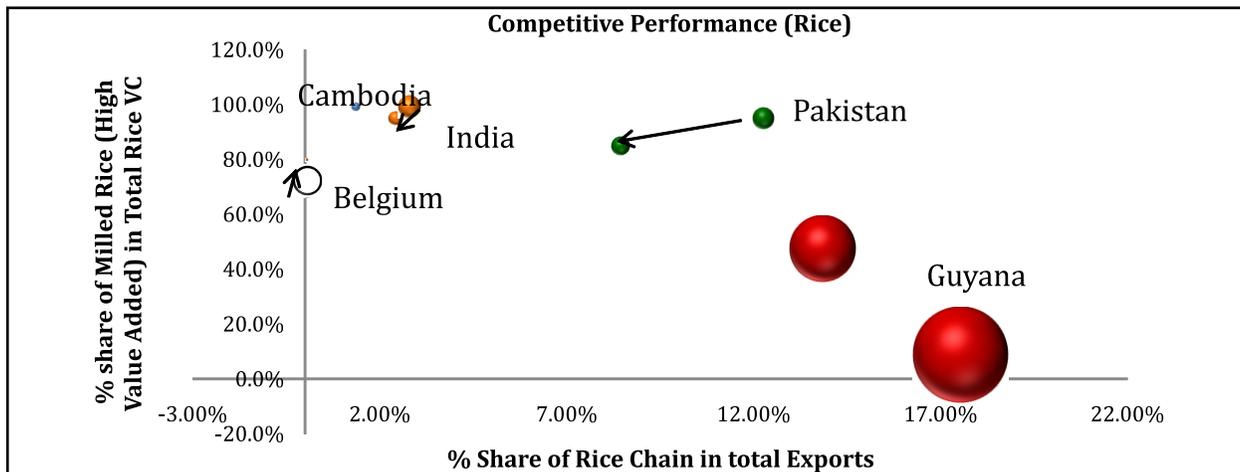
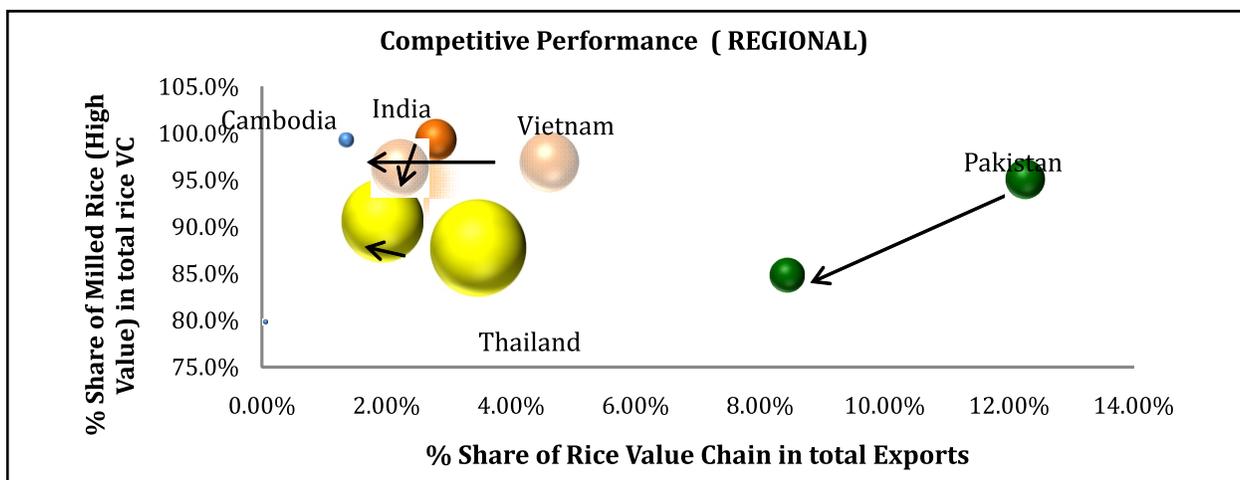


Figure 17 compares Pakistan's performance with its regional competitors namely Thailand, Cambodia, India and Vietnam. Thailand is one of the largest global exporters of rice. The competitive performance of Thailand indicates that over the years, it has decreased the share of rice in its total exports and upgraded in the rice value chain, which essentially means that Thailand is now concentrating on the exports of high value added products of rice in the value chain. Moreover, the export per capita (represented by the bubble size) of rice has decreased. Similarly, Vietnam has decreased its dependency on exports of rice. It has maintained its position in the rice value chain and the export per capita. India has decreased its dependency on rice in its total exports and decreased the percentage share of milled rice in the total value chain. Export per capita of India has fallen significantly over the years. Cambodia has emerged as a strong competitor recently. It has increased the percentage share of rice in total exports and is concentrating on the exports of high value added products such as semi/wholly milled rice. The export per capita of Cambodia has also significantly increased.

Figure 17: Regional Competitive Performance



Pakistan, Uruguay and Australia are the only countries that have maintained a market-oriented policy for the trade of rice (Organization, 2014). Based on the similar market mechanisms of both countries, Uruguay was selected as an international role model for Pakistan. Uruguay has a market-oriented policy in the rice sector where the forces of demand and supply determine the price of the commodity. Uruguay concentrates on the export of high value added products such as milled rice. The linkages and

governance patterns in the rice value chain in Uruguay are short and highly interactive. Farmers are linked directly with the rice millers/exporters, which ensures constant exchange of information between the two parties. Moreover, Uruguay has invested in the research and development of the rice sector. They encourage the use of modern machinery, good agricultural practices, improvement in seed quality, water management and appropriate use of fertilizers. Additionally, the farmers are directly linked with the researchers, which ensures that knowledge exchange and advisory services required for a good harvest take place between the two parties. The country follows strict production and milling standards to ensure consistent quality in the international market.

India has been identified as the regional benchmark for Pakistan due to its close proximity, similar weather conditions and cultivation of similar rice varieties. Indian exporters ventured into the global rice market in 2011 when the Indian government removed the ban on trading basmati and non-basmati rice in the global market. This had great implications for the international market as the price of rice decreased significantly. India has heavily invested in the research and development of the rice sector. The country has been lauded for producing and supplying high yielding varieties of rice that can be grown using minimal resources. In the past 5 years the global trade of basmati has grown from 1 million to 4 million tons, with India capturing almost all the market expansion while Pakistan's market share declined from 50 percent to less than 20 percent during the same period (Mohanty, 2010). India has been able to target these markets through strategic marketing and branding techniques. Marketing and branding has allowed Indian exporters to capture more value as they have upgraded within the rice value chain and are providing an additional service to the importers. The government of India provides considerable assistance to the rice producers and exporters. Government interventions such as grain procurement, price supports, export subsidies, rice premium, rice reserve requirements, export quota, direct purchase by state agencies and crop price guarantees have assisted rice growers and exporters in India. Such interventions by the Indian government have enabled it to become one of the biggest exporters of rice in a considerably short span of time.

Vietnam and Cambodia have been identified as future competitors of Pakistan. The competitive performance graph indicates that Cambodia has increased its share of rice in the total exports and the export per capita. Vietnam has been an old player in the global trade for rice. Both Vietnam and Cambodia specialize in the production and export of fragrant varieties of rice that are highly demanded in the European Union, East Asia and North America. These countries have also been able to capture new markets such as Philippines and Indonesia. The rice sector in both these countries is characterized by government interventions such as price supports and subsidies. Majority of rice exports in Vietnam are made through state-owned trading enterprises (50 percent share), particularly by the Vietnam Food Association (VFA). VFA buys rice from farmers to keep the price of rice stable and also to prevent rice importers from haggling for prices too low during the harvest season (Ricepedia).

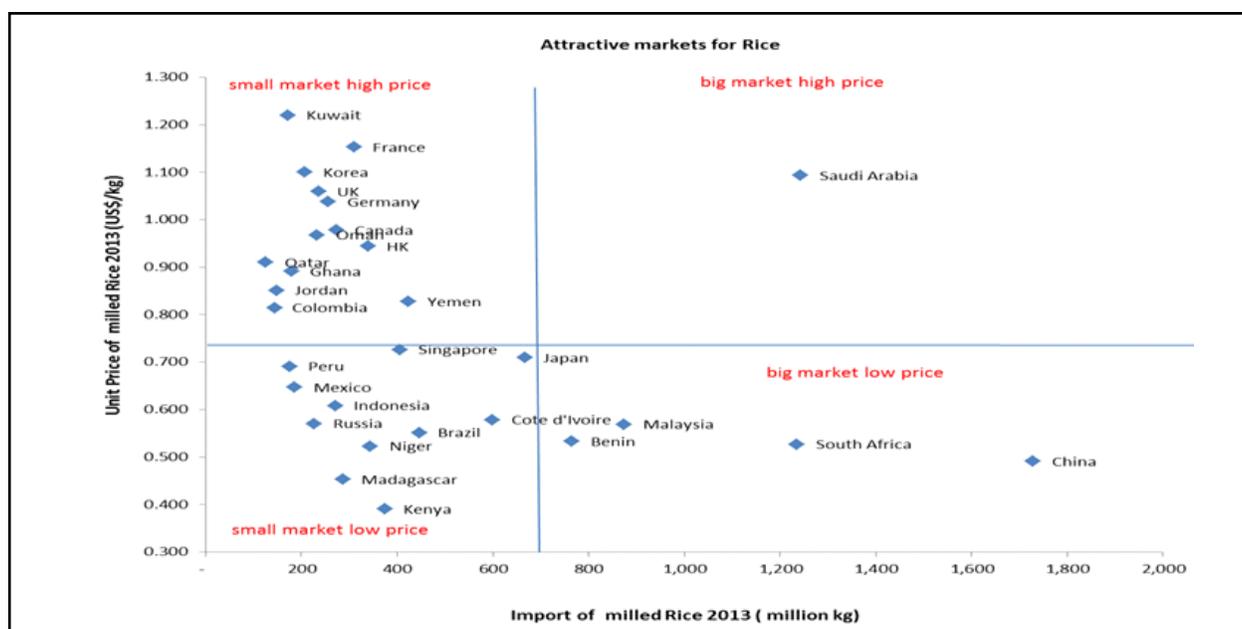
The rice sector in Pakistan functions on market-oriented principles. The price of rice in the domestic and international market is determined by its demand and supply in the respective markets. Government intervention and assistance in the rice sector has been limited. Unlike India, Thailand and Vietnam, Pakistan does not have any support prices for the exports of rice. Most of the investment in the rice sector comes from individuals in the private sector. The private sector has made significant investment in state of the art processing machineries and is expanding into research and development as well. Pakistan ought to focus on marketing techniques such as branding and packaging and capture value in the rice value chain. The poor research and development infrastructure has not allowed Pakistan to develop new varieties. Without such development, the country cannot develop and market new brands in the international market.

Value Capture Opportunities

The rationale for identifying attractive markets is to incentivize enterprises to improve their productivity and guide their production to the external market. The import dependency index identifies attractive markets according to the market size and prices.

The graph in Figure 18 identifies the attractive markets for semi/wholly milled rice; the markets are classified according to size and price paid for the product. The top importers for semi/wholly milled rice for the variety produced in Pakistan are China, Kenya, Saudi Arabia, UAE, United Kingdom, Malaysia and Oman. Our analysis indicates that Pakistan mainly exports to big markets-low price and small markets-low price categories. In order to increase its exports earnings, Pakistan must target countries falling in the big market-high price and small market-high price categories. Therefore, the countries that have been identified as the attractive markets for Pakistan are Saudi Arabia (big market-high price) France, Germany, Kuwait and United Kingdom (small market-high price).

Figure 18: Attractive Markets for Milled Rice



Saudi Arabia is the only market that falls in the big market-high price category. In 2014, Saudi Arabia's total imports of milled rice were valued at \$1.3 billion. Despite the free market regime in Saudi Arabia, Pakistan has been unable to capture a significant market share in the country, which stands at a modest 9.1 percent at present. India's competitive prices and aggressive marketing strategies have enabled it to grab a larger share of the rice market in Saudi Arabia, and currently Indian rice makes up about 73 percent of the total rice imports of the Arab country. The significant price gap between the Basmati rice from Pakistan and the Basmati rice from India has played a major role in skewing the exports in favor of India. In 2015, the Basmati rice from Pakistan was quoted at \$950-\$1100/ ton in the international market whereas the Indian Basmati rice was priced in the range of \$720- \$850/ ton (Zaidi, 2016). The higher prices of the Basmati from Pakistan have been attributed to increased costs of inputs and absence of any government support to the rice sector. Thus, it is essential for Pakistan to lower its cost of production and adopt aggressive marketing strategy to capture a greater market share in Saudi Arabia.

France, Germany and the United Kingdom fall in the category of small market and high price. Pakistan's

rice export to these countries is minimal at present. The main exporter and competitor of rice in this region is Italy, which has a competitive advantage over Pakistan due to its membership in the European Union that gives the country's exporters easy access to these markets in terms of quota and duties. For Pakistan, the major competitors of milled rice in these countries are India and Thailand, mainly because they are producing similar varieties of rice and have similar market access conditions. France, Germany and the UK have stringent SPS measures for imports from Pakistan, India and Thailand. In order to capture the market in these countries, Pakistan should focus on exporting value added, processed products such as cereals and prepared foods.

Middle Eastern countries import rice in abundance. Most of Pakistan's rice exports are also concentrated in this region. Pakistan's rice exports have mostly been targeted towards countries such as Qatar and Kuwait that fall in the small market-high price category. However, Pakistan has been unable to grab a significant market share in this region. Rice exports from India currently constitute 91% of the total rice imports of Kuwait whereas Pakistan has been able to secure a meager 4.1 percent share in this market. Following the example of India, Pakistan needs to take significant measures to supply rice at competitive prices and focus on branding and marketing techniques to increase the overall market share.

Before the imposition of economic sanctions on Iran by the United Nations Security Council and the USA, Iran was one of the largest rice importers in the world. It imports around 11 percent of the world's rice worth \$2.5 billion (Rizvi, 2015). Before imposition of sanctions on Iran, Pakistan was the largest exporter of rice to Iran which it has lost to India. According to the International Trade Centre, the demand for rice in Iran has doubled during 2012-13 and in the last five years, import of rice grew more than 35 percent (ITC). With the economic sanctions having been lifted, Iran is emerging as one of the largest markets for Basmati rice again. It is necessary for Pakistan to regain its market share in Iran to boost the foreign exchange earnings from rice. The two issues holding back the Pakistani exporters are the lack of a banking mechanism between Pakistan and Iran and an inability to meet the standards set by Iran for the export of rice. At present, talks regarding a currency swap agreement and certification to Good Manufacturing Practices (GMP) are underway between the Iranian and Pakistani authorities (Zaidi, 2016). The exporters are hopeful that if these issues are resolved, the exports of Basmati will soar.

Value Capture Constraints

This section of the report aims to identify and analyze the shortcomings and bottlenecks in the processes, actors and institutions participating in the rice value chain in Pakistan.

Research and Development:

A notable weakness was identified in the backward linkage of the rice value chain: research and development activities are limited or non-existent in the rice sector. It is essential for the public and private sector to invest monetary and technical resources in building the capacity and expertise of the existing research organizations for Pakistan to be able to introduce new brands and new varieties of rice in the international market. There is some research activity being carried out in the private sector, funded by the millers and exporters, but the over arching research bodies are largely inefficient when it comes to the development of seeds and farming techniques.

Moreover, the poor exchange of information between the research institutes and farmers affects crop yields and productivity. The disconnect between the farmer and the researchers has led to great loss in productivity, as the farmers are not aware of the good agricultural practices required to ensure increased crop yields. Inadequate information and poor advisory services have led to post-harvest losses resulting in lower quantities of rice available for domestic consumption and trade.

Raw Material:

Pakistani farmers mainly cultivate one variety of rice- the Super Basmati, which accounts for 70 percent of the total basmati production of Punjab. New varieties of rice were introduced but the adoption has been slow, as farmers do not have access to certified seeds or the knowledge regarding their cultivation. As a result, millers have access to very limited varieties of rice. Since 1997 no new basmati seed has been introduced in the market. Meanwhile, the Indians came up with five new varieties in the last 10 years. Pakistan launched a long grain Basmati 385 variety in the 1980s which was a major success in terms of yield. In the 1990s, another high-yield and longer grain variety, called Super Basmati, was introduced, but after being in use for around two decades, these varieties have lost much of their potency and their yields have declined drastically (Bokhari, 2015).

The rice plantations in Pakistan incur heavy losses due to early harvest by the farmers, affecting the supply of the paddy rice in the domestic market. Moreover, instability in the prices of paddy rice has a significant impact on the profit margins of the millers. Another important concern for the millers is the lack of production data available to them; insufficient knowledge of the crop affects the decision making of the millers.

Government Support:

Pakistan faces tough competition from countries like Thailand and India, which benefit from government interventions such as price support, subsidies, rice premium and crop guarantees. Due to the market determination of prices, Pakistan is unable to compete with the exports from India. Moreover, the government has been inefficient in providing support to the research and development activities in the rice sector.

Exporters/Millers:

Lack of government assistance to the rice sector has resulted in high costs of production for the millers and exporters who are facing tough competition from India in terms of pricing. The cost of production in Pakistan has increased mainly due to the rising cost of inputs such as fertilizers, high-yielding

varieties and electricity. Therefore, the Pakistani rice is not able to compete with the Indian rice in the international market. Millers and exporters are also constrained by the unreliable supply of paddy rice which affects the exports of milled rice, limited storage facilities, and the lack of information sharing mechanisms between farmers, wholesalers, and millers.

Lack of Branding and Marketing:

Rice millers and exporters are reluctant to invest and launch their brands in the international market. Pakistan exports most of its rice without any proper packaging and branding, losing out on millions of dollars every year by not exploiting the potential of branded rice exports. Market intelligence revealed that leading branded basmati rice exporters in India are earning a premium of approximately \$500 per ton on branded basmati rice. In FY14, Pakistan exported 733,860 tons of basmati rice worth \$846 million out of which only around 70,000 tons were branded — not even 10% of the total basmati exports (Zaidi, 2016).

Energy:

The prevailing energy crisis in Pakistan is seriously affecting the efficiency and output of the rice mills. Power outages reduce the milled rice output and more importantly inflate the cost of production. As a result, Pakistan is unable to supply its rice products to the international market at competitive prices.

Conclusion/Recommendations

The rice sector in Pakistan remains valuable in terms of its contribution to foreign exchange earnings, GDP, employment and in ensuring domestic food security. Within the global value chain of rice, Pakistan is engaged in high value addition activities. The country mostly exports semi/wholly milled rice which captures the highest value in the international market. Pakistan, along with India and Thailand, is one of the major suppliers of rice in the global market. However, due to production and quality constraints, Pakistan is losing its place in the global rice market. It has become uncompetitive in terms of price and quality. Countries such as India, Thailand and Vietnam have adopted aggressive marketing techniques and are carrying out research to maintain their competitiveness in the international rice market.

Based on the findings of the value chain analysis, this report recommends the following measures to enhance the competitiveness and productivity of the rice sector in Pakistan:

- Investment in agriculture research and development is imperative to improving the rice crop productivity and to ensure a constant supply of paddy rice to the rice millers. R&D institutes should develop new high yielding and resistant rice varieties to alleviate the problem of low productivity. Moreover, there is a need to carry out research to develop seeds that will allow the farmers to produce two crops of rice in a year. R&D institutes should also work on developing rice varieties that take into account taste preferences, geographical conditions, and market requirements.
- Value chain actors need to work in close collaboration to improve the performance of the rice sector, especially with regards to the following:
 1. Exchange of information between R&D institutes and farmers is essential for the former to understand farming issues and provide informed counsel about addressing them. R&D institutes can only develop new varieties of seeds if they have the information about plantation constraints faced by the farmer. Varieties should be selected based on good yield potential, crop duration, resistance to diseases, suitable for flood prone areas and nutritional benefits.
 2. Rice exporters ought to carry out international market research to determine the preferences of the consumer. If there is communication between the exporters and the R&D institutes, the institutes will be able divert monetary and non-monetary resources into developing new varieties that take into account taste preferences and market requirements identified by the market research. This will allow the exporters to have a range of products to target different markets.
 3. The government should launch training and advisory programs aimed at farmers' capacity building. There is a need for training on good farming practices regarding plantations, pest control, irrigation, and harvesting. Knowledge sharing with farmers will significantly reduce planting, harvesting and post-harvesting losses that are incurred by the rice sector.
- The industry should adopt a brand-based approach for the export of rice. There is immense potential for value addition in the rice value chain in post processing activities such as packaging and marketing. The exporters ought to invest in market research to gauge consumer product and price preference to develop marketing and branding campaigns aimed at the international consumers.

- In recent years, parboiled rice has gained immensely popularity in Europe, Saudi Arabia, South Africa and North America. It derives its popularity not only by the fact of improved nutritional value but also by its superior cooking and processing properties. Saudi Arabia and USA are big markets for Basmati parboiled rice where this variety enjoys 70 percent of the rice market share. To capitalize on this trend and capture these lucrative markets, rice millers should streamline their operations and standardize their procedures to be able to cater to the demand for high quality parboiled rice.
- The government should facilitate bi-lateral trade agreements with Iran, as it is the biggest global importer of rice. The government should facilitate rice exporters to obtain the required certification of GMP and organize trade fairs for the Iranian market.

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