Contents

1. The International Year of Rice 2004 International Workshop Overview

- Conference : The International Year of Rice 2004 International Workshop
- Date & Time : 2004. 5. 27 (Thu) 13:00 - 18:00
- Venue : aT Center, Conference Room Ⅰ,Ⅱ
- Hosted by : Ministry of Agriculture of Forestry Republic of Korea
- Organized by : Korea Rural Economic Institute
- Title : World Rice Industry under the WTO System

2. Program

Time	Title	Speaker
12:00-13:00	Registration	
13:00-13:30	Keynote Speech	Lee, Jung Hwan (President, KREI)
13:30-16:00	Session	Senior Officials
16:00-16:20	Coffee Break	
16:20-18:00	Discussion	All Participants

Lee, Jung Hwan

President, Korea Rural Economic Institute

- B.S. in Agronomy, 1972, Seoul National University, Seoul, Korea
- M.S. & Ph.D. in Agricultural Economics, Hokkaido University, Sapporo, Japan
- Visiting Scholar, Harvard University
- Director, Agricultural Outlook Center, Korea Rural Economic Institute
- Editor, Korean Journal of the Agricultural Economics
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- President, Korea Rural Economic Institute

Soft Landing on a New Plateau
For Korean Rice in the WTO

Lee, Jung-Hwan and Lim, Song-Soo[1]

I. Introduction

In the midst of the rapidly changing environment, the agricultural sector in Korea has to cope with a number of emerging challenges from domestic and external sources (Kang and Lim 2001). Among others, the Doha Development Agenda (DDA) and rice negotiations under the World Trade Organization (WTO) are a top priority. Given a relatively high level of border protection and market price support today, the outcomes of the trade negotiations are likely to bring about substantial impact on the agricultural sector (OECD 2003a; KREI 2004).

The high protection for agriculture, especially for rice can be explained by the fact that the self-sufficiency rate for cereals was no more than 30 percent in 2002 and the imperative for food security is of great concern to the country (MAF 2003a). But, a more fundamental cause of such protective measures rests upon the so-called structural adjustment problem of agriculture, a phenomenon that emerges from a certain stage of economic development (Lee 1998).

The agricultural adjustment problem comprises of three dimensions. The first one is how fast agricultural production can be switched to highly income-elastic and exportable products. In low income countries, agricultural growth is constrained mainly by supply-side factors and promoting agricultural production has been the principal issue in their development strategies. Constraint prevent agricultural growth switching over to demand-side factors as economic growth proceeds and thus agricultural production has received less attention in studies of agricultural adjustment. However, with a given non-agricultural growth rate, if a higher growth rate can be achieved in the agricultural sector, less would be the adjustment needed in the agricultural structure. If the production switch is successful enough to keep agricultural growth rate as high as that of the non-agricultural sector, agricultural adjustment problems might be reduced to a minimum.

The second is how fast labor force can be reallocated between sectors to comply with the growth difference between sectors. This dimension has been taken to be the core element of agricultural adjustment since the 1950s when Schultz defined it as the farm problem in a growing economy. But is the labor market effective and dependable as generally held to be? We

decompose the reallocation of labor into three elements-job change, natural causes including death and retirement, and new entrants. How do these factors work in the reallocation in a process of economic development? Low labor mobility from agriculture and a sharp reduction in new entrants to agriculture cause disparities in incomes and productivity between agricultural and non-agricultural sectors. As older farmers continuously accumulate in the agricultural sector, sufficient time should be warranted to settle the imbalance between the production and employment structure.

The third dimension is how fast ownership or operational management of farmland can be transferred to larger sized farms to match the decrease of agricultural labor force. Farmland transfer is concerned with both quantity and direction. If the quantity is small, with a given labor reallocation, mechanization cannot substitute for the decrease in labor force, at least without a decline in the efficiency of utilization of machinery. Given the quantity, the more land is transferred to the upper spectrum of farm size distribution, the more large farms can be created. If, on the other hand, land is allocated to small size farms to make them a little larger, fewer farms become large enough to be mechanized and viable full-time farms.

Protective measures are the policy instruments needed to secure the periods to complete structural adjustment. Developed countries have long enjoyed their agricultural adjustments through border protection and domestic support. But for Korea and other developing countries, it would not be possible to follow in their footsteps since WTO regulations limit tariffs and domestic support.

Korea has been criticized in the WTO for having high protective measures for its agricultural commodities. However, it should be noted that industrialization started in Korea more than one hundred years after other developed countries but has accomplished a drastic change in industrial structure. It is not fair and relevant to ignore the great differences in industrialization history and to take away the parachute that developed countries used for their soft landing. This consideration is relevant not only to Korea but also to other developing countries following Korea. Thus this rationale must be taken account of in the WTO negotiations and regulations.

II. Agricultural Problems in Economic Development

1. Transformation of the Industrial Structure

Korea has accomplished rapid economic growth since the early 1960s after the thorough destruction of the economy because of the Korean War. The spurt of economic growth was

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accompanied by a drastic change in the industrial structure. Agriculture's share of production declined sharply to 3.7 percent in 2002 from 45 percent in the early 1960s. At the same time, the share of the agricultural sector in employment decreased from more than 65 percent in the early 1960s to 9.0 percent by 2002. In the course of this rapid economic development, the agricultural sector has adjusted and transformed substantially to keep up with the pace of economic growth and changes in the international market for agricultural commodities.

Since Clark and Kuznets, it has been a fact that agriculture's share of both production and employment decreases with economic development. Figure 1 shows that how industrial structure has been transformed in five developed countries and Korea. We can find in this Figure that Britain and the Netherlands, which initiated industrialization and commercialization, proceeded first in the trend of decline in agricultural share, followed by the United States, France and Japan. Korea has followed suit since the beginning of economic growth. However, it is remarkable that the speed of decline has been much faster than that of any developed countries.

Figure 2 reveals that Korea passed the *first* transformation point in production structure, where the agricultural share began to be less than that of the service sector in 1965 and the *second* transformation point, where the agricultural share fell short of that of the manufacturing sector in 1973. While looking at the transformation of the employment structure, we note that Korea passed the *first* transformation point in 1978 and the *second* point in 1985, lagging twelve to thirteen years after transformation of the production structure.

It is worthwhile to note that the agricultural share of the production and employment structure recorded similar transformation points of about 40 percent at the *first* point and about 25 percent at the *second* point. After passing the second point, the agricultural share of production and employment continued to decline quickly to 16 and 7 percent respectively in 1991, and nine and four percent in 2002.

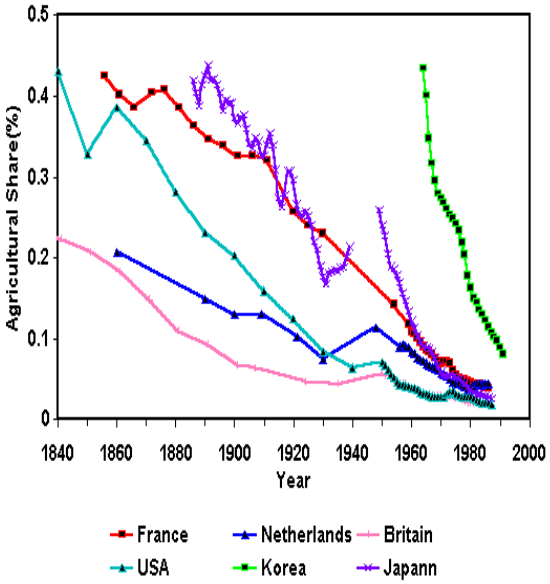
Table 1 shows the length of time for developed countries and Korea to reduce its agricultural share of production from 40 to 7 percent. The length of the time between 40 and 7 percent is 113 years for Britain, 165 years for the Netherlands, and about 100 years for other countries. As for Korea, the 40 percent of the first transformation point was reached in 1965 and the seven percent in 1991.

The length of time was only 26 years in Korea. In other words, the production structure in Korea changed three to seven times faster than that of developed countries. Equilibrium in productivity between sectors can be attained only if the employment structure adjusts as fast as the production structure changes. Since the production structure changed so quickly in Korea, the employment structure was also adjusted rapidly-to an extent that no other country has ever experienced.

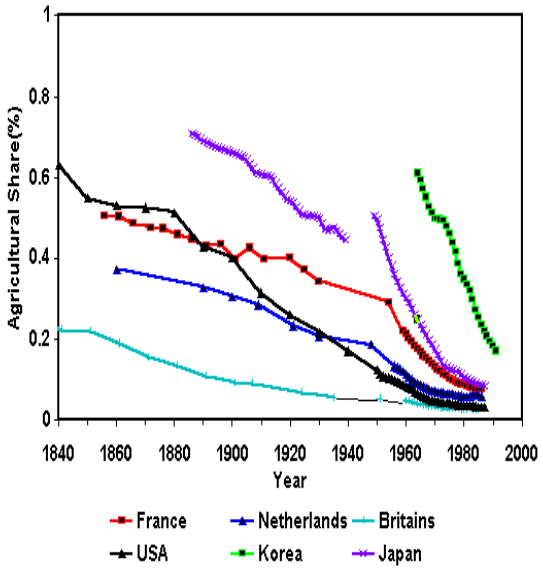
Table 2 shows how much earlier developed countries passed the points of 40 and 16 percent in agricultural share of employment. As mentioned in the previous section, the 40 percent is the *first* transformation point above, and the 16 percent is the 1991 level for Korea, lagging far behind from the developed countries.

Figure 1. Changes in Industrial Structure

<Production Share>



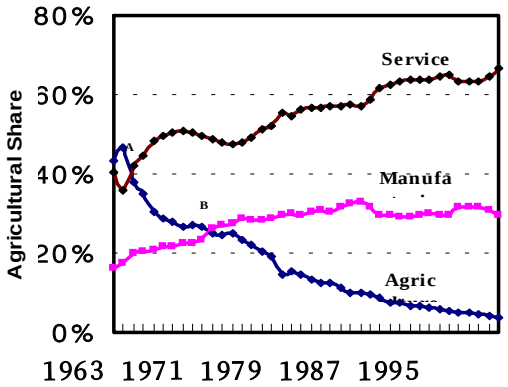
<Employment Share>



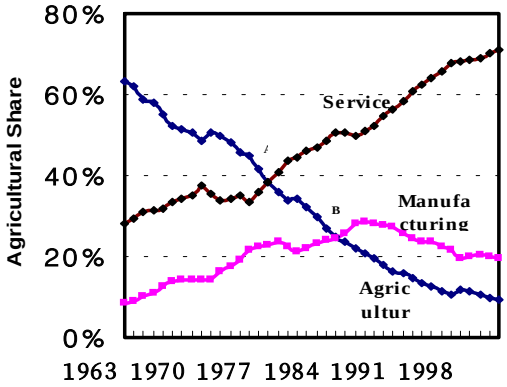
Source: Lee(1998, 24)

Figure 2. Transformation of Industrial Structure in Korea

<Production Structure>



<Employment Structure>



Source: EPB. *Annual Survey Report on the Economically Active Population Survey*. Bank of Korea, *National Account*.

Table 1. Year When Agricultural Share in Production Reached 40 and 7 Percent

Country	Year of 40%	Year of 7%	Time Length (years)
Britain	1788	1901	113
The Netherlands	around 1800	1965	165
Germany	1854	1950	96
U.S.A.	1866	1958	92
Denmark	1850	1969	119
France	1878	1972	94
Japan	1896	1969	73
Korea	1965	1991	26

Source: Lee (1998, 26)

Table 2 also indicates the length of the time between the 40 and 16 percent marks for agricultural share of employment. Length of the time was 40 95 years for developed countries, in contrast with only 14 years for Korea. In other words, the employment structure changed three to eight times faster in Korea than in developed countries.

Table 2. The Year When Agriculture's Employment Share Reached 40 and 16 Percent

Country	Agricultural Employment Share The Year of		Time Length (years)
	40%	16%	
Britain	before 1800	1868	more than 70
The Netherlands	1855	1950	95
Germany	1897	1957	60
U.S.	1900	1942	42
Denmark	1920	1962	42
France	1921	1965	44
Japan	around 1940	1971	about 31
Korea	1977	1991	14

Source: Lee (1998, 26)

2. Old Age Biased Structure of the Agricultural Labor Force

A decrease in agriculture's share in employment may be caused by three factors: job change, death and retirement, and allocation of new entrants. As for the job change, Table 3 gives the survey results along with some international data. During the sample period, the net rate of job change from agriculture to non-agriculture was 1.2 percent in Korea. However, the situation was not much different in developed countries. The results highlight that the net job change from agriculture to non-agriculture is strictly limited.

Note that the low rate can be partly attributed to the move-in from non-agriculture offsetting the move-out. The rate of the move-out was more than 2 percent, but it was offset by the move-in, resulting in a net rate for job change at around 1 percent. Such a situation was similar in developed countries. Why do they return to agriculture?

To answer the question, one has to understand the characteristics of the non-agricultural labor market. The non-agricultural labor market can be distinguished as both primary and secondary. Increases in schooling and experience lead to higher job positions and pay in the primary market but not in the secondary. These features made the primary labor market relatively closed to an external labor supply; by contrast the secondary one is open. As a result, most of the migrant labor from agriculture can have access only to the secondary market and thus is likely to return to agriculture once they are disappointed or laid-off.

However, note that not only the *net* rate but also the *gross* rate of job change is not high. The low rate is mainly due to negligible job mobility for the aged agricultural labor force. As shown in Table 4, the older the generation, the lower the rate of job change. The rate of job change is less than one percent for the age class of 55 and older.

Since net job mobility in the labor market was so low, most of the decrease in agricultural labor force can be attributed to natural factors such as retirement and death as shown in Table 5. In other words, the decrease of agricultural labor force may be mostly driven by a generation shift which is a long-run process.

Table 3. Rates of Job Change from Agriculture to Non-Agriculture

Unit: % pr annum

Country	Move-0ut	Move-In	Net-Out
Germany+	4.21	3.86	0.35
France+	3.48	2.38	1.10
The Netherlands+	2.23	0.26	1.97
Britain+	4.29	3.25	1.04
Denmark+	5.70	4.35	1.35
Japan*	0.64	0.78	-0.14
Korea**	2.10	0.89	1.21

Note: + denotes the average of 1972/1973, 1974/1975, and 1976/1977.

* denotes the average of 1959, 1962, 1965, 1968, 1971, 1974, 1977, 1979, 1982, and 1987.

** denotes the average of 1982/1983, 1985/1986, and 1988/1989.

Source: Lee (1998, 72)

As mentioned above, job change in agricultural labor force was strictly limited and thus was mostly ascribed to natural factors. Given low job mobility from agriculture, its share of total new entrants should have been much less than that of production so that agriculture's share in employment could be adjusted in tandem with a decrease in the production share. Furthermore, most of the non-agricultural labor force was provided by new entrants rather than by the agricultural sector.

Table 4. Rates of Job Change in Agricultural Labor Force by Age

Unit: % per annum

Age	Japan			Korea		
	1962	1974	1987	1982	1986	1988
15 ~ 19	5.26	3.87	3.96	3.96	4.55	6.77
20 ~ 24	3.50	3.06		3.25	4.78	5.71
25 ~ 29	1.87	1.14	1.63	4.27	6.28	4.34
30 ~ 34	1.18	0.90	1.43	3.24	3.58	3.42
35 ~ 39	0.98	0.65				
40 ~ 54		0.61	0.43	1.60	1.01	1.73
55 and older	0.19	0.17	0.20	0.68	0.57	0.61

Source: Korea-EPB, *Report on Employment Structure Survey.* Japan-Prime Minister's Office, *Labor Mobility Survey.*

Table 5. Sources of Decrease in the Agricultural Labor Force

Unit: %

Country	Job Change	Retirement and Death			Total
		Retirement	Death	Sum	
Korea	32.2	27.7	40.2	67.9	100
Japan	-5.2	73.0	32.2	105.2	100
Britain	21.0	n.a.	n.a.	79.0	100
Netherlands	45.2	n.a.	n.a.	54.8	100
Denmark	14.4	n.a.	n.a.	85.6	100
Germany	2.6	n.a.	n.a.	97.4	100
France	10.1	n.a.	n.a.	89.9	100

Note: 1. Job change denotes net job change.

2. Retirement includes joblessness.

3. Retirement and death for European countries was estimated combining the survey data on job changes and statistics on agricultural employment.

4. Korea: the average of 1982, 1986, and 1988.

Japan: the average of 1959 1987.

European countries: the average of 1973, 1975, and 1977.

Source: Lee (1998, 76)

The relation between agriculture's share in new entrants and in production was investigated through time series data of the seven developed countries and Korea. This result shows that agriculture's share in new entrants decreased 1.3 times faster than its production share. Meanwhile, agriculture's share in a generation changes very little once they get older than 30 years of age as implied by the low rate of job change. As a result, the age profile curve (APC) of the agricultural labor force, which shows agriculture's share in employment by age group, shifted in a biased manner, making the slope steeper year by year as presented in Figure 3 and now much more steeper than developed countries as shown in Figure 4.

Figure 3. Shifts in the Age Profile Curve of the Agricultural Labor Force in Korea

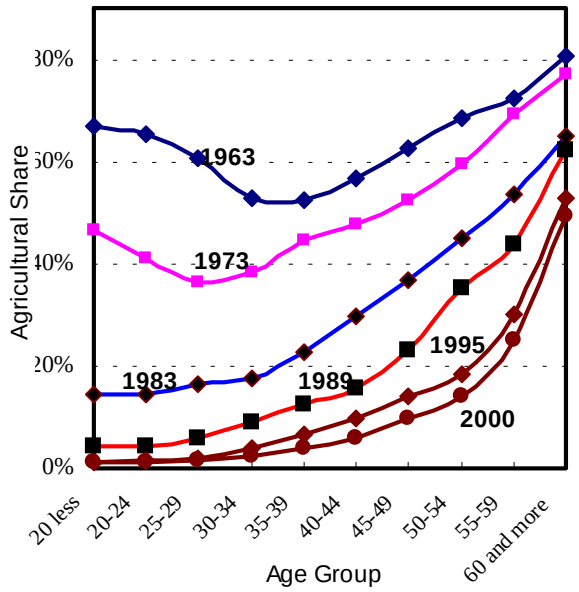
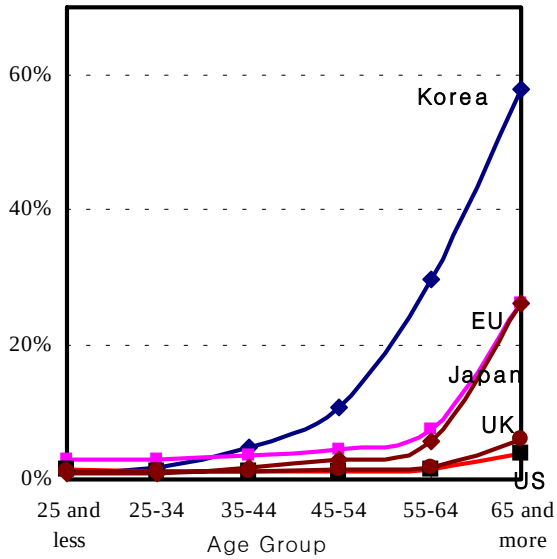


Figure 4. Comparison of the Age Profile Curves in 2001

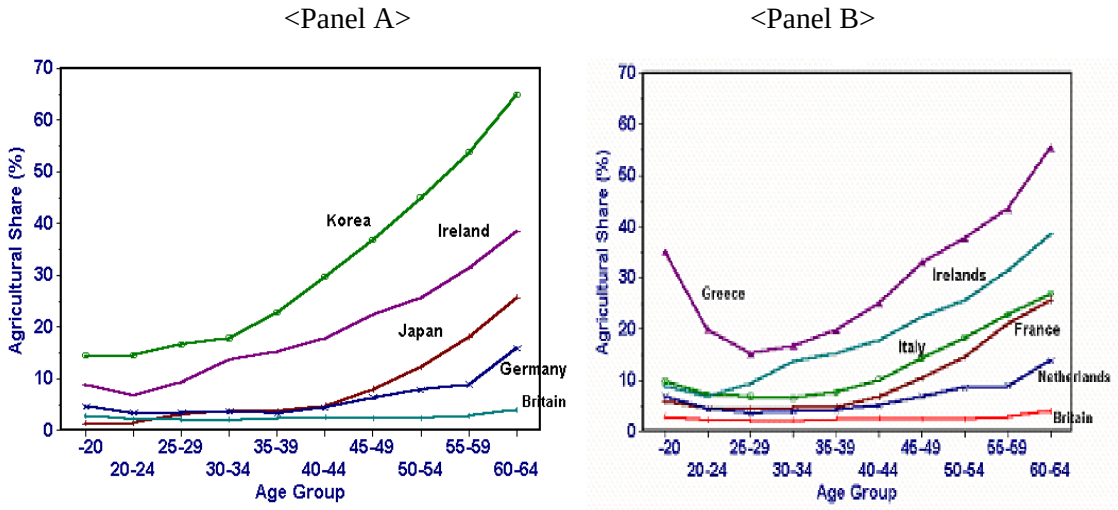


Source: Lim and Kim (2003)

rm operators are now over 40 years old in Korea, Even more surprising is that 51 percent of total ı other words, more than half of farm operators 960s when income per capita was more or less g jobs in the industrial sector. As the industrial ators were getting too old to take advantage of o fast for them to adjust to the new situation,

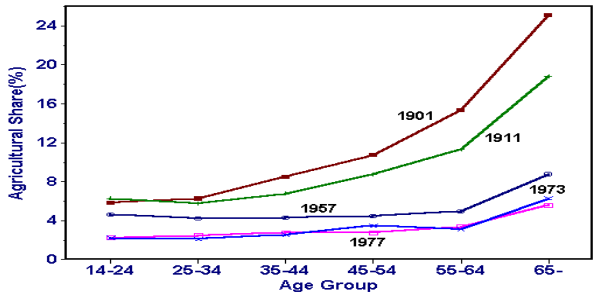
However, as shown in Figure 5 the age profile curves are steeper in Greece, Ireland, France, Germany, the Netherlands, and Britain in that order. This order corresponds to the order of agricultural share of production in such that Britain already reached the stage of a flat APC while the Netherlands is approaching that stage. Meanwhile, Figure 6 also shows that the APC of the agricultural labor force changed less year by year in Britain between 190l and 1977. The above observation leads us to anticipate that the old age-biased change of the agricultural labor force in Korea will gradually diminish and the APC will eventually become flat as generation shifts. As a matter of fact, the APC is already unchanging up to the 45 years old class, as shown in Figure 4. In addition, a cohort analysis says that about 65 percent of farm operators over 60 years old are to retire or pass away in 10 years. Given these considerations, it can be said that Korea may reach the state of developed countries in 10 to 20 years.

Figure 5. Age Profile Curves of the Agricultural Labor Force in 1975



Source: Lee (1998, 92)

Figure 6. Shifts in Age Profile Curves of the Agricultural Labor Force in Britain



Source: Lee (1998, 93)

III. Transformation in Korean Agriculture

1. The Uruguay Round Impacts

The UR Agreement on Agriculture has rendered a significant, specific and special impact on the agriculture sector in Korea. Most of all, market openness was symbolized by rice imports, from which is more than half of the total caloric intake under minimum market access (MMA). The MMA expanded from one percent of total domestic consumption in 1995 to four percent in 2004. As shown in Table 6, about 180,000 tons of rice was imported in 2003. Leading rice exporters include China, Thailand and the United States.

In accordance with paragraph 8 of Annex 5 of the Agreement on Agriculture, Korea is negotiating the import regime of rice with a view to continue the special treatment as set out in paragraph 7 of Annex 5. Nine countries requested to be part of the negotiations such as Australia, Canada, China, Egypt, India, Pakistan, Thailand and the United States. The negotiations are expected to be completed in 2004.

Table 6. Rice Import under the MMA Commitment

Year	MMA Commitment (M/T)	Exporting Countries	Import Quantity (M/T)
2001	128,268	China	63,000
		United States	27,000
		Australia	20,268
		Thailand	18,000
2002	153,921	China	95,421
		United States	36,000
		Thailand	22,500
2003	179,575	China	103,075
		United States	49,500
		Thailand	27,000

Note: Import quantities are based on the purchase contracts entered into in the year. All the imports during 2001-2003 correspond to the tariff line 1006-20-1000 (hulled/non-glutinous rice).

Source: WTO (2004)

As for domestic support, obligatory reduction of the aggregate measure of support (AMS) has been a binding constraint unlike the cases in most other countries. Public intervention through a rice procurement program must be scaled down every year since it accounts for over 90 percent of AMS use. As a consequence, the proportion of rice purchased by the government to total production dropped from 29 percent in 1995 to 16 percent in 2002.

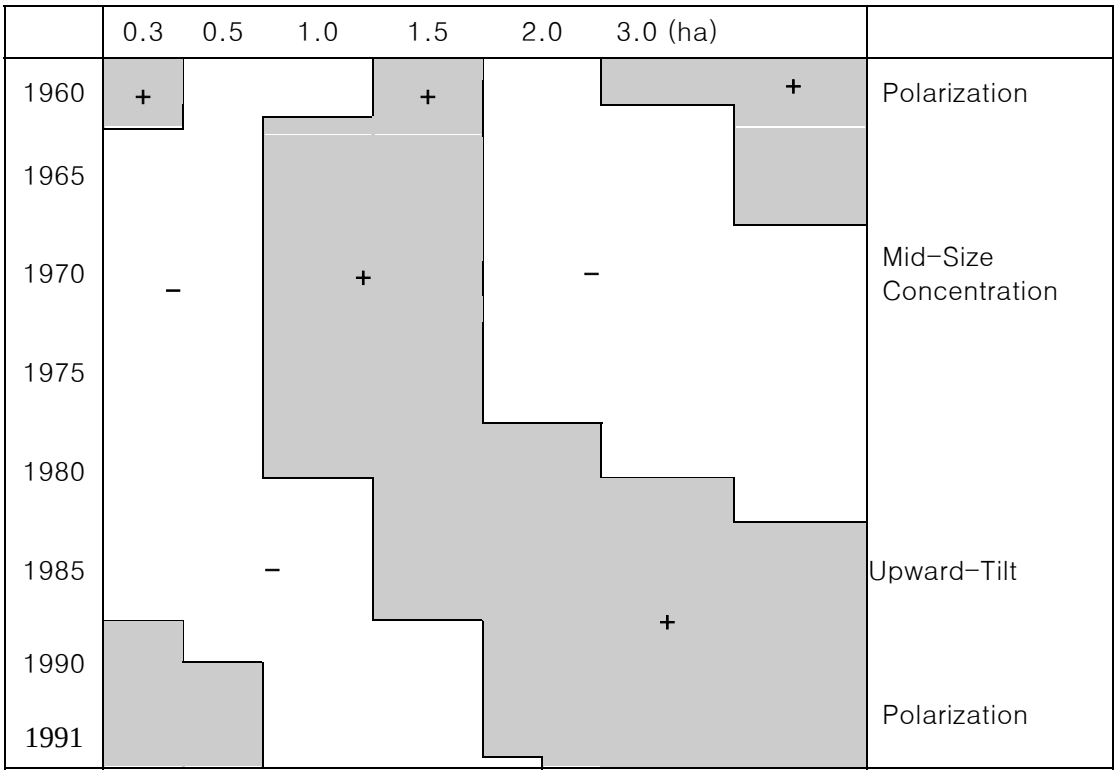
2. Structural Adjustment and Farmland Transfers

Further opening in domestic agricultural markets and stricter disciplines on domestic polices expedited structural adjustment in the country. Some of the ambitious agricultural reform programs include the Farmland Purchase Support Program, the Farmers' Retirement Program or the Direct Payment for Farm Size Enlargement, abolition of a 3-hectare ceiling on ownership of farmland, the Full-time Family Farm Fostering Program, the Corporate and Company Farm Fostering Program and the Education and Training Program. These programs aim to promote leading farmers with larger farms.

Another development is the growth of tenant farms. Since tenant farming was legalized in 1986, tenant farming has accounted for 44 percent of total farmland areas, and is becoming dominant. As the trend of tenant farming accelerated, land leasing has become dominant in farmland transfers. In the 1990s, as much as 83 percent of total farmland transfers depended on leasing.

As farmland transfers have been substantially activated, and leasing has largely expanded to play a dominant role in farmland transfers, farmland transfers led mainly by leasing have changed farm size distribution. Figure 7 indicates that polarization in the size distribution is occurring in rice farming.

Figure 7. Changes in the Distribution of Farm Sizes



Source: MAF, *Statistical Yearbook on Agriculture, Forest and Fishery*.

Here it is important to explore why this transformation of farm size distribution has taken place in the course of economic development. The Lewis model of development indicates that as the economy passes the turning point, agricultural wages rise so fast that farm mechanization takes place rapidly. It was the 1980s when farm mechanization raised rents that only large-sized farms could afford and the direction of land transfers shifted to large-sized farms. From the beginning of the 1990s, part-time opportunity increased and thus very small-sized farms began to increase, catching the part-time opportunity. This is the polarization now in progress in Korea

Farmland transfers to large-sized farms were strongly galvanized by the government in the 1990s and acreage share in large farms increased to a great extent. As for paddy farming, farms with less than 0.5 hectare account for 44 percent in total farm households and their share of farmland amounts to only 13 percent. On the other hand, 3.8 percent of rice farms with more than 3 hectares in size account for 20 percent of paddy field, more than three times larger than in 1990 (Table 7).

Table 7. Acreage Distribution by Farm Size

Unit: %

	1990		1995		2000	
	Household	Acreage	Household	Acreage	Household	Acreage
	1,508 (1,000)	1,194 (1,000 ha)	1,205 (1,000)	1,054 (1,000 ha)	1,078 (1,000)	999 (1,000 ha)
Total	100.0	100.0	100.0	100.0	100.0	100.0
0.5 ha and over	59.6	84.3	58.8	85.6	57.8	86.2
1.0 ha and over	25.7	53.1	27.4	59.4	27.2	61.6
1.5 ha and over	10.7	29.9	13.8	40.2	15.4	45.7
2.0 ha and over	4.7	16.9	7.4	27.6	8.4	32.3
3.0 ha and over	1.2	6.2	2.8	14.8	3.8	20.0

Source: MAF, *Census of Agriculture.*

As shown in Table 8, production costs decrease increasingly as farm size increases. Production in a small farm with less than 0.3 hectare costs 11 percent more than in a farm of one hectare and production in a farm of 5 hectares costs 15 percent less than in a farm of one hectare. It implies that in the future production costs will be reduced with rapidity as farm size expands.

Table 8. Farm Sizes and Production Costs

Farm Size (ha)	0.3	0.5	1.0	2.0	3.0	5.0	10.0
Cost Elasticity	0.924	0.917	0.907	0.897	0.892	0.880	0.875
Cost Index	111	106	100	93	90	85	78

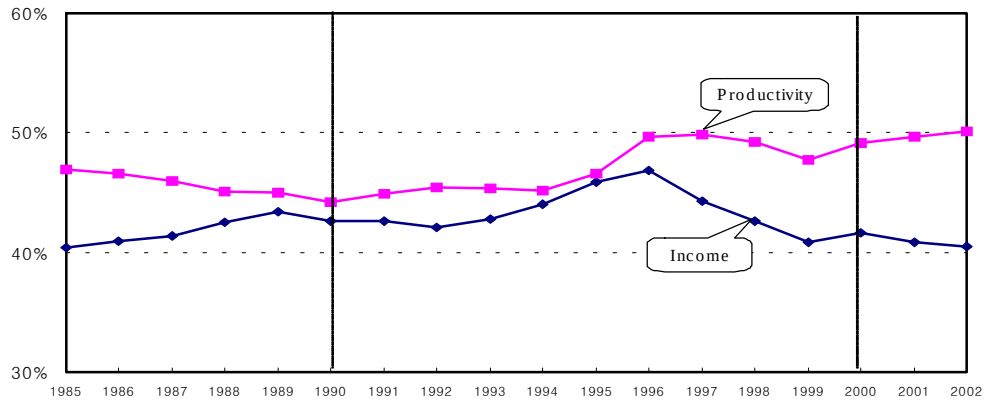
Source: Lee and Ahn (2002)

3. Gaps between Productivity and Farm Income

Increased investment and policy drives contributed to rapid growth in productivity. Since the beginning of the 1990s, the annual growth rate of agricultural fixed capital was at nine percent. Subsequently the agricultural growth rate, which had slowed downed to -0.6 percent in the late 1980s, recovered to 2.2 percent in the 1990s. However, the growth rate for the rice sector in the 1990s recorded -1.1 percent.

At the same time, rapid development of farmland transfers and labor-saving technologies enabled agricultural employment to be reduced 5.5 percent per annum and thus labor productivity increased by 7.7 percent per annum in the period, which was much higher than that of the non-agricultural sector. Consequently, productivity difference between agriculture and non-agriculture sectors shrank in the 1990s as shown in Figure 8. Agricultural productivity increased by up to 50 percent of the non-agricultural sector in 2002 from 44 percent in 1990.

Figure 8. Productivity and Income Ratios between Sectors



Source: BOK, *National Accounts*

A gain in farm incomes was not realized however by good performance from agricultural productivity. On the contrary, difference in incomes between farm and non-farm sectors expanded in the late 1990s. Due to production gains and imports, prices for farm products dropped by one percent per annum in real terms. While lowered prices for farm products meant benefits to consumers, farmers suffered from income losses. That is, real farm income decreased nearly 2 percent per annum in the period, a striking drop from the increase before the mid-1990s. Income per farm worker was about 47 percent of non-farm worker's in 1996 but further declined to 41 percent in 2002.

In addition to income differences between sectors, income disparity among farm households expanded remarkably to the extent that 33 percent of total farm households suffered from a persistent decrease in income in the last five years and five-tile income ratios increased up 7.1 in 2002 from 5.5 in 1994. It is important to know that a productivity gain accompanied by lower prices is a due process of improving competitiveness by reducing price gaps between domestic and imported commodities. In this situation, farmers should be provided with income subsidies for their soft landing process.

Without this compensatory income device, a great loss of farm income resulted in debt problems. At the end of 2002, the average debt per farm household was 19,898,000 won (about 15,900 US dollars). Since the debt-to-asset ratio remains at only 12 percent on average, it appears worrisome. However, about 22 percent of farm households suffer from both income losses and debt increased during the last five years and about 11 percent exceed 40 percent of the debt-to-asset ratio.

Farm debts have been a major issue in Korea. Farmers and farm communities argue that a large farm debt is a *prima facie* case of government policy failure.[2] Among others, they highlight that inappropriate policy measures and directions are to be blamed and thus debt burdens must be shared or pardoned by the government. Whenever the blame game begins, issues of farm debts grab political attention and the government is forced to introduce a series of debt relief measures. Basic policy instruments have been debt pardons and interest rate reduction.

IV. WTO Implications for Korean Rice

1. The Doha Development Agenda Impacts

The on-going trade negotiations under the Doha Development Agenda (DDA) will bring forth add-on challenges to farmers in Korea. An empirical exercise was conducted to estimate potential impacts on agriculture by the DDA. Table 9 summarizes two scenarios, a fast reduction scenario, applicable to *developed countries*, and a slow reduction case for *developing countries* on the basis of Harbinson's revised paper.[3] The quantitative model used is the KREI-ASMO, a sector-wide forecasting model developed and used by the Korea Rural Economic Institute. The model incorporates 26 commodities including rice.

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[2] In fact, farmers claim that actual level of farm debts is much larger than actual statistic figures.

[3] Harbinson is the chairman of the WTO agricultural negotiation committee and drafted the first and revised modality papers in February and March 2003, respectively.

Table 9. Scenarios for Policy Simulations

Fast Reduction Scenario				Slow Reduction Scenario			
Current Tariff (%)	Reduction Rate (%)		Period (year)	Current Tariff (%)	Reduction Rate (%)		Period (year)
	Average	Minimum			Average	Minimum	
> 90	60	45	5	> 120	40	30	10
15 ~ 90	50	35		60 ~ 120	35	25	
				20 ~ 60	30	20	
< 15	40	25		< 20	25	15	
				Special Products	10	5	

Source: WTO <http://www.wto.org/>

Table 10 shows farm income deficiency between 2000~2002 and 2010. The total deficient amount of income is 3,030 and 643 million US dollars respectively for the two scenarios. Surprisingly, the income deficiency is mostly ascribed to rice farming, which accounts for more than half of total agricultural income. The rice sector would need 3,128 billion won or 2,606 million US dollars to keep up with the income level in the period of 2000~2002 under the fast reduction scenario. In short, these results highlight that the income effect of the fast reduction scenario would be too much and a chief concern for Korea to moderate the speed of tariff reduction in the DDA negotiations.

Table 10. Deficient Amounts of Farm Income in 2010

Unit: 100 Million won (Million US dollar)

Product	Farm Income (2000~02)	Fast Reduction Scenario		Slow Reduction Scenario	
		Farm Income (2010)	Deficient Amount	Farm Income (2010)	Deficient Amount
Rice	82,059 (6,838)	50,784 (4,232)	31,275 (2,606)	76,339 (6,362)	5,720 (477)
Total	102,888 (8,574)	66,530 (5,544)	36,358 (3,030)	95,168 (7,931)	7,720 (643)

Note: 1. The exchange rate is assumed as 1,200 won per US dollar.

2. Figures are calculated by the fixed areas and yields in the period 2000~2002.

2. Decoupled Income Payments

The OECD (2003b) research suggests that agricultural incomes should be approached by targeted direct income payments to households with a requirement of decoupling from production. It warns that sector-wide price support is ineffective and increases domestic burdens on consumers and taxpayers. Concerned with societal demands, the OECD recommends they be addressed at the source by compensating social benefits or by charging social costs.

The above positive reform agenda should be applied to agriculture in Korea. Foremost, it should address the concerns of low income farm households. Note that farm household income in Korea amounts to only 75 percent of urban households, which could be aggravated by fast tariff reduction.

Some important policy implications can be drawn from the above results. First, a drastic cut in tariffs such as in the scenario applicable to *developed countries* is likely to require greatly increased direct payments. However, if the total amount of domestic support is reduced from current levels as assumed in the fast reduction scenario, room for the needed income support would be taken away. In other words, beyond the financial feasibility, direct payments would be barred substantially by the ceiling of domestic support unless a large part of the direct payments could be decoupled so that they could be categorized as the Green Box by WTO rules.[4]

Second, since critical adverse impacts of increased market access are likely to fall on a limited number of high tariff products, a counter-cyclical form of support such as the Blue Box direct payment should be warranted at least in the short or medium run. Up to now, Korea has not used any Blue Box support. As Table 11 highlights, Korea is an abecedarian in taking advantage of any direct payment. The direct payments level including the AMS, de minimis and the Blue Box amounts to only 444 US dollars per agricultural population in 2000, which is far less than those of most other countries. Albeit coupled to price levels income support for rice only appeared in 2002 for the first time.

Table 11. Direct Payments in Selected Countries

Unit: US dollars per agricultural population

Country	Year	AMS+de minimis+Blue Box (A)	(A)+Green Box
Australia	2000	148	983
Canada	1999	1,758	3,265
EU	1999	3,978	5,144
Iceland	2000	7,131	8,935
Japan	1999	1,639	6,679
New Zealand	2000	–	369
Norway	2001	8,982	10,926
U.S.A.	1999	3,784	11,532
Korea	2000	444	1,436

Source: WTO<http://www.wto.org/>

[4] Decoupled support refers to the direct payments that are based on clearly defined and fixed historical measures such that they do not influence current or future production decisions (Baffes and de Gorter 2003).

Among others, such a Blue Box-type of direct payment targeting rice farmers appears to be of great importance in the future. Its rationale can be summarized as follows. First, the vulnerability of rice farms to further market liberalization would be so great that specific and targeted policy response should be ensured. Rice means almost everything to farmers in the country. As of 2002, about 77 per cent of total farm households are engaged in rice farming and 37 percent of gross agricultural receipts come from rice (MAF 2003a). Rice income represents about 25 percent of average farm household income, which is much higher than in Japan's case, less than 5 percent.

Second, beyond its economic leverage, the rice sector weighs heavily in terms of political significance and public sentiment. Rice farming has been a traditional token of agriculture and much of Korea's heritage throughout history. People take for granted that rice farming is the backbone of agriculture. It is therefore important for the government to make efforts to lessen sector-specific financial stress in terms of Blue Box payments.

Finally, Blue Box payments are also useful to smooth the path of structural adjustment in the sector. Rice cultivation is favored by older farmers since they are accustomed to the farming environment and have ample experience. Less labor requirement for rice farming is another advantage. Since about 53 percent of farmers today are older than 60 years, a transitory policy measure such as the Blue Box would contribute to paving the way for the rice sector to embody structural adjustment smoothly and agreeably. The fact that the United States and the European Communities adopted Blue Box payments before introducing fully decoupled direct income payments sheds light on a positive role of the measure during the transitory periods.[5]

Granted that there would be a ceiling on the Blue Box and a sharp reduction in support it would be inevitable for the country to adopt additionally the Green Box-type policy instruments for farm income. Decoupled form of income support is a step into the right direction and can be accepted as a useful means to redress income loss arising from both reduction in coupled support and greater market openness. It should be noted however that fully decoupled and targeted income support can not be a panacea. Depending on the degree of decoupling, decoupled support may even constitute the wide range of mechanisms such as insurance, wealth and expectation effects (OECD 2000; OECD 2001). Further to which, a fully decoupled payment may have to take the form of transitional adjustment assistance for farmers to adopt free markets (Beard and Swinbank 2001).

Korea will have to resolve falling farm income issues sooner or later. It is therefore important to take advantage of flexibility and transition room in reduction of tariffs and

[5] The WTO member countries who have used the Blue Box at least once include the European Communities, the United States, Norway, Japan, the Slovak Republic, Iceland and Slovenia (UNCTAD 2003).

domestic support, at least during the soft landing period. From a policy perspective, a 10 year span from now on will determine if the country is able to make a soft landing, with the parachute that developed countries have used extensively, in agricultural polices against new international environments.

3. Multifunctionality

Korea put a value on the multifunctional roles of agriculture such as food security, cultural and historical heritage values, environmental services, rural viability and agricultural landscapes (OECD 2001b; Romstad et al. 2000). In particular, food security has been the most important objective in agricultural policies (Lim 2002; Kang and Lim 2002). Park and Kim (1999) shows that 73 percent and 48 percent of 1,000 people surveyed ranked the provision of stable food supplies and environment protection are the most important roles of agriculture, respectively in selecting two priorities. Employing a willingness-to-pay methodology Oh, Kim and Kang (2001) estimated the monetary value of multifunctionality as 4,336 billion won or 3.6 billion US dollars. Eom et al. (1993) presents a monetary estimate of public benefits provided by rice paddy fields as 10,409~13,437 billion won or 8.7~11.2 billion US dollars in terms of a replacement cost method.

A policy response to such a strong societal preference and demand for agricultural multifunctionality has been at most modest-except that the objective of food security has traditionally dealt with price support measures. It was not until 1999 that the government introduced a scheme for environmentally friendly farming.[6] In 2001, direct payments for rice paddy fields were set out to compensate multifunctional services primarily induced by reduced use of fertilizers and pesticides and maintenance of paddy field levees was regarded as an important element of water management (Lim 2003). Another type of direct payment was launched to support farms that complied with environmentally friendly farming. A new pilot agri-environmental measure for the livestock sector is being adopted in 2004 and begins to address the reduction of livestock wastes and control of animal numbers.

Environmentally friendly farming in Korea is more or less on the verge of an upwards trend. The limited number of environmental schemes and lack of capacity should not be a bottleneck for encompassing a variety of public goods jointly produced by farming. It is noteworthy that the European Union runs a number of second pillar measures such as rural development and agri-environmental programs promoting the so-called ‘the European Model of Agriculture’.

[6] Even before 1999, there were several policy measures to reduce agricultural pollution and livestock waste. However, 1999 was a milestone for the government when they began to effectively introduce an array of agri-environmental measures. Also note that the government proclaimed the year of 1998 as the

As long as the rule of Tinbergen is valid and acceptable, Korea needs to develop diverse policy instruments to embody the valued multiple features provided by farming activities.[7] One of them would be regional aids for areas with structural disadvantages whose rural viability is of great importance. Ways to preserve agricultural landscapes must be sought with non-governmental options such as market creation and voluntary provision. Greater attention should be given to the polluter-pays-principle as well as the provider-gets-principle that correct market failures and under-provision of public goods. For example, the former could be realized by introduction of environmental taxes on fertilizers and pesticides while the latter by paying farmers for the provision of non-commodity output exceeding the reference level or good farming practice.

4. Structural Adjustment

Making a move toward trade liberalization under the WTO has been an important binding pressure for the agricultural sectors to bear with structural adjustment. A series of large public investments have focused on agricultural restructuring and structural improvement. At the same time, farmers themselves played a pivotal role to advance farmland transfer and develop large-scaled capital intensive production systems.

Successful structural adjustment requires a complementary relationship among the markets, governments, and private sectors. Firstly, the government must seek to ensure orderly market functions and address market failures. Attempts by the government to control supply and demand tend to wind up with incurring social costs in many cases. Well established and functioning markets can be an effective driving force for structural adjustment. It is therefore time for the government to examine the possibility of abolishing the rice purchase scheme.

Secondly, entry barriers attached to farmland must be removed. Once deregulated, farmers would enjoy the freedom to rent or lease their farmland and exit agriculture. Farmland conversion to other purposes can be further facilitated with an abolishment or reduction of conversion fee, amounting to 20 percent of the land price, as far as such a conversion does not deteriorate the area's environment and landscape. Limits for farmland ownerships and investments by non-farmers must be released, as well.

The creation of a Farmland Bank will further assist farmland mobilization. Under the expectation that about 65 percent of the older farmers who are now over 60 years of age would retire from farming in 10 years, the Farmland Bank can play an important role as a facilitator.

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first of an era of environmentally friendly farming on November 1998.

[7] The rule of Tinbergen stipulates that that a government must have as many policy instruments as declared policy objectives (Tinbergen 1950).

The Bank may obtain farmland from farmers who retire or leave from farms and sell or rent it to other farmers. It also may participate in land development activities by converting marginal or abandoned farmland into land suitable for non-agricultural use then sell it.

Finally, the government should endeavor to explore new markets, establish efficient marketing systems and invest in information systems and technology development. Developing new markets call for market research, campaigns and promotions and new value-added products. Innovative marketing systems stem from well-functioning cooperatives and producers' organizations who want to develop local marketing centers. The monitoring and information system is a prerequisite to respond to rapidly changing consumers' demands and market dynamics. As a backbone of agricultural growth, the R&D investments contribute not only to technology improvement but also to new technologies such as new material and biotechnology.

V. Summary and Conclusion

Many developed as well as developing countries still suffer from income difference between the agriculture and non-agriculture sectors in spite of protection for agriculture. On the other hand, agricultural exporting countries argue that agricultural protection should be eliminated quickly in all countries. This is a critical dispute that causes much agony in trade negotiations.

International trade dispute triggered off some noteworthy assertions in both academic and policy-making circles. For example, agricultural protection is asserted to be a result of political negotiation between farmers and government against a background of declining resistance from consumers. According to the hypothesis, the adhesiveness and effectiveness of farmers' lobbying activities increase while consumers' concern against it declines as the agriculture sector shrinks along with the economic growth. As a result, 1ow income countries tax their agriculture while high income countries protect and subsidize their agriculture. Free trade advocacy has the aims of fairness and persuasion.

It is also argued that free trade can make a better opportunity for the agriculture sector in the importing countries. In the assertion, Denmark's and the Netherlands' approaches are contrasted with France's and Germany's policies adopted when agricultural commodities flooded into the European market at the end of 19th century. The Netherlands and Denmark took a free trade option while France and Germany adopted a protection policy. It was the crossroad, the assertion says, to divide the strong Dutch and Danish agriculture from the weak French and German agriculture of those days.

This assertion gives rise to the notion that many developed countries could have much stronger agriculture than what it is now if they had got rid of political trade in agricultural policy,

and thus agricultural protectionism earlier. And very naturally, this notion is extended to developing countries including Korea.

How fast can the agricultural market be opened without devastating consequences for protected farmers? Will the free trade option really make all happy? What policies, if any, might substitute for protection? In order to answer these questions, an understanding is needed of how fast the agriculture sector can be adjusted to keep up with the non-agricultural productivity growth and the change of the international market for agricultural commodities. This is the agricultural adjustment problem in a growing economy.

Agriculture failed in diversifying production to new income-elastic or exportable commodities. As a result, the agricultural growth rate dropped in the process of economic development. There are three paths in reallocating the labor force between sectors; job change, death and retirement of current labor force, and allocation of new entrants. Out of these three, the net rate of job change from agriculture to non-agriculture is only around one percent. Job change in agricultural labor force was so 1ow that most of the decreases in agricultural labor force can be attributed to natural factors such as retirement and death, and most of the non-agricultural labor force was supplied by new entrants rather than from the agriculture sector.

A common and fundamental agricultural problem arises from the fact that agricultural production and employment have been structured differently over the path of economic development. As economic development proceeds, shares of agricultural production and employment in the whole economy tend to decline. However, low job mobility from agricultural to non-agricultural sectors renders a skewed agricultural employment structure where older farmers are accumulated and thus its reduction must rely upon mostly natural factors such as death and retirement. Slower adjustment in agricultural employment widens a productivity gap as well as an income disparity between agricultural and non-agricultural sectors.

Facing this agricultural problem developed countries have tailored different policy instruments over the stages of economic development. In the early years of economic development agricultural protection and market price support were adopted to overcome lagging productivity in agriculture. Partly because of a positive influence by the growth of non-agricultural sectors, developed countries were able to enhance agricultural productivity during the course. When domestic policy disciplines set their ways through the trade agreements of the 1990s, developed countries managed to change their border protection and market price support regimes into various schemes of direct payment including the Blue Box type. Since they pursued structural adjustment in agriculture over a long period, policy transformation resulted in modest costs.

This is not the case for developing countries being inclusive of Korea. Prohibition of agricultural protection and domestic support by the WTO regulations is imposing substantial

costs on developing countries in the sense that they have to bear with drastic changes in agricultural structure in a relatively short period. As highlighted by the econometric analysis for Korea, the lagged productivity and the skewed form of demographic distribution in the agricultural sector would hardly lead the country to accommodate fast reduction of tariffs and domestic support.

This is why Korea needs room for policy flexibilities and adjustment periods in rice farming sector. As developed countries have enjoyed a privilege in adjusting their agricultural structure under border protection and domestic support for a long period in the past, Korea needs a period of transformation for its soft landing. It is therefore suggested that Korea have additional policy cushions for a period of 10 to 20 years with a slower reduction of protection and domestic support to be warranted under the WTO agreements. This would be a way to create a level playing field in the international trade regime.

Finally, the Korean case would be seen as exemplary for other developing countries of which agriculture heavily rely on a single production like rice. It underlines the emergence of the agricultural problem at a certain stage of economic development, such as accumulation of older farmers and productivity and income disparities between agricultural and non-agricultural sectors. To ensure a soft landing, they should be ready to exercise prudent policies with secured adjustment periods. It is not fair to take away the parachute which developed countries used for their soft landing for such a long time.

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The Australian Rice Industry

Good morning ladies and gentlemen, it gives me great pleasure to be able to speak to you today about the Australian rice industry, an industry who's achievements the Australian Government is very proud to promote.

History and Current Conditions

The Australian rice industry is an important part of the Australian agricultural and food manufacturing sector. Rice has been grown commercially in Australia for 80 years. The industry is also an important export earner and employer for southern NSW, creating approximately 8000 jobs. The average size of an Australian rice farm is around 400 hectares.

Rice was first grown in Australia in the early 1920's - near the townships of Leeton and Griffith in the New South Wales Riverina. Today the rice industry contributes to supporting 63 regional towns - most located in the temperate climate of southern NSW. There are approximately 2500 rice farms in Australia producing around 1.3 million tonnes of rice per year.

Over the last few years the industry has been severely interrupted by drought, which has affected much of eastern Australia. The rice industry is almost completely dependant on irrigation water for production and due to low rainfall levels irrigation entitlements were severely cut back.

This resulted in the massive production downturn for the 2002-03 harvest which was about 70% below the historical harvest average. Early figures for the latest harvest have the crop back up to 50% of the average and due to rising water storage levels it is anticipated that the 04-05 harvest should be close to average again (1.2-1.3mt).

Despite the drought Australia was still able to supply its domestic and core export markets due to high rice reserves from previous crops and some selective importation of quality rice.

Australian Rice Production

Year	99-00	00-01	01-02	02-03	03-04	04-05
Production (kt)	1,101	1,643	1,275	391	600 (approx)	1,200 (predicted)

Source: ABARE

Export Focused Industry

Under normal production conditions the majority of the rice produced in Australia is exported. Up to 40 million people eat Australian rice around the world each day in over 70 countries. Since the Australian rice industry cannot compete with the export volumes and low production costs of many of its competitors the industry has focused on creating the highest quality product allowing it to target profitable niche markets. In addition there is a strong emphasis on value adding and product branding making Sunrice, and its associated brands seen internationally as well known, trusted, and safe food products.

The Australian rice industry works closely with its consumers to ensure they receive the type of product they require. The industry has built up a number of stable core markets for its rice domestically and internationally, however it is always seeking to diversify into new markets.

The Australian rice industry operates without any Government production subsidies, or tariff protection, and is keen to see continual progress made on the reduction of subsidies and trade barriers for rice across the world.

The Path Ahead

The Australian rice industry invests close to A$20 million dollars every year into research and development (R&D) in areas such as irrigation, crop breeding, crop protection and product development. This is done in a partnership with the Australian Government which matches dollar for dollar the expenditure of farmers on R&D. The Australian Government has a long commitment to agricultural R&D and is particularly proud of the advances made within the rice industry. This commitment to R&D allows the industry to maintain the competitive advantage it enjoys over many other rice exporters and ensures inputs to production, such as water and fertilisers, are continually minimised.

This emphasis on research and development has enabled Australian rice growers to improved their water use efficiency by 60% in the past 10 years while at the same time increase their average yields to 9.7 tonnes per hectare, when the average yield for the rest of the world is 5.4 tonnes per hectare.

The industry is highly aware of its environmental responsibilities investing significantly in research aimed at reducing its environmental impact. Additionally, the rice industry is the first Australian agricultural industry to initiate a regional biodiversity plan and a greenhouse reduction strategy. The industry has also recently been short listed for the 2004 United Nations Association of Australia World Environment Day Awards.

International Year of Rice

The Australian Government and the Australian rice industry have worked closely with the FAO to promote the IYR domestically and internationally. The Department's representative in Rome, Mr Brett Hughes, is involved in the IYR working group, which will meet regularly throughout 2004, and attended the official IYR launch in Rome earlier this year.

In March, the rice industry held a IYR domestic launch at Parliament House in Canberra which was attended by many members of Parliament, industry leaders, media and government officials, including myself. The IYR and the rice industry is regarded so highly that the Deputy Prime Minister The Hon John Anderson MP hosted the launch.

Further, promotional activities are planned for the year.

Conclusion

In conclusion, I would finally like to thank the Korean Government and the seminar organisers for making it possible for me to speak today. It is always an honour to spread the message about the clean and green quality products that the Australian rice industry produces and I am enjoying my first visit to Seoul. Thankyou.

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Rice Industry in China

By Zhang Yahui

1. General information

Rice has been one of the most important grain foods in China since ancient times. At present, rice occupies about 30% of total planting area of grain crops, but produces more than 40% of grain from crops. For over 60% of Chinese population, rice is their staple food.

China ranks first worldwide in rice production and consumption. In the year of 2002, the sown area for and production of rice in China were about 28.2 million hectares and 174.54 million tons, accounting for about 20% and 30% of the global total, respectively. The rice yield per hectare was 6.2 tons, about 60% higher than the world average. The rice produced in China is mostly supplied to the domestic market with less than 2% for the world market.

2. Rice Production in China

2.1 Sown area and output

Just like in many other countries, rice industry in China has developed dramatically over the past 50 years. In 1950, sown area for paddy rice in China was 26.93 million hectares. In 1960, the number reached 32.27 million hectares with 16.5% increase over that of 1950. In 1975, the area was further expanded to 36.69 million hectares, hitting an all-time high. After then, the annual planting area of paddy rice in China was around 30 million hectares with limited fluctuation.

Over the past few years, there was temporal and structural surplus in grain production and the governments adjusted their policies to crop cultivation. The sown area for paddy rice had been decreased steadily mainly because of the sluggish market. In 2002, the number was curtailed to 28.36 million hectares, similar to the level in early 1950s.(see table 1)

As per the total rice output, it accounts for more than 40% of the national grain output and has increased steadily since 1950s with the only exception of slight decrease over the past 2 years because of abrupt decrease of sown area.

Table 1. Rice production in China

Year	Planting area (1000 ha)	Yield (kg/ha)	Production (10 000 ton)
1950	26930		
1960	32270		
1975	36690		
1985	33070	5097	16857
1990	33064	5726	18933
1991	32590	5640	18381
1992	32090	5803	18622
1993	30355	5854	17770
1994	30171	5831	17593
1995	30744	6025	18523
1996	31406	6212	19510
1997	31765	6319	20073
1998	31213	6366	19871
1999	31284	6345	19849
2000	29962	6272	18791
2001	28812	6163	17758
2002	28202	6189	17454

In China, paddy rice is cultivated extensively in more than 90% of provinces, autonomous regions and province-level municipalities. Among them, 18 were regarded as major producers. The rice planting regions were

classified as Southern and Northern parts. The rice planting area in Southern Region covered 26 million hectares and that in Northern Region amounted to 3 million hectares in late 1990s.

2.2 The most important grain food crop in China

Paddy rice has played a predominant role in China's food supply and national economy. Among the major crops, rice ranked first in planting area, yield and the proportion in total output of food crops. In the period from 1998 to 2002, the annual average sown area to paddy rice was 30.4 million hectares, and the production was 190.4 million tons, making up 27.6% and 39.3% of the total of grain crops, respectively.(table 2 and 3)

Table 2. Acreage sown to major grain crops 1996-2002

(1000 hectares)

Year	All grain crops	Paddy rice	Wheat	Corn	beans
1996	112548	31406	29611	24498	7471
1997	112912	31765	30057	23775	8346
1998	113787	31214	29774	25239	8500
1999	113161	31284	28855	25904	7762
2000	108463	29962	26653	23056	9307
2001	106080	28812	24664	24282	9482
2002	103891	28202	23908	24634	8720
Average	110120	30378	27646	24485	8513
%	100	27.6	25.1	22.2	7.7

Table 3. Output of major grain crops1996-2002

(10 000 tons)

Year	Total grain output	rice	Wheat	Corn
1996	50454	19510	11057	12747

1997	49417	20073	12329	10431
1998	51230	19871	10973	13295
1999	50839	19849	11388	12809
2000	46218	18791	9964	10600
2001	45264	17758	9387	11409
2002	45706	17454	9029	12131
Average	48447	19044	10590	11917
%	100	39.3	21.9	24.6

2.3 Preference shift in production

Due to the shortage of food supply in China before mid-1990, China regarded crop yields as the dominant target. As one of the major food crops, the main objectives of rice production were also to increase the per capita yield and total output.

With the improvement of integrated productivity of the crop industry after mid-1990, the aims of crop production in China were shifted to high quality, low cost, high efficiency and safety. More importance was attached to the production of high-quality rice products. In those major paddy rice planting regions, emphasis was paid to standardized, market-oriented and industrialized development of high-quality rice. In 2001, the planting area of high-quality paddy rice reached 13 million hectares with 10.5% increase to that of the previous year, accounting for 46% of national total.

2.4 Contribution of scientific research and technological innovation

Since 1950s, Chinese researchers have been working hard in the improvement of rice production, and their contribution to the development of rice industry is great, particularly in the area of rice breeding.

In late 1950s, Chinese scientists succeeded in breeding of dwarf rice varieties. In mid 1960s, the first group of semi-dwarf *Indica* varieties was extensively planted in China. The yield potential of these semi-dwarf varieties

was 30% higher than that of tall varieties. The release of semi-dwarf rice varieties resulted in the first breakthrough of rice yield increase in China.

In 1970s, Chinese rice researchers succeeded in utilization of heterosis in rice. The technology became the second breakthrough in rice breeding. In 1976, hybrid rice of *Indica* type was first planted in China at a large scale and the area for hybrid rice planting increased dramatically. In resent years, hybrid rice was planted in more than 15 million hectares each year in China. The yield was 15%-20% higher than the conventional pure-line varieties. The planting of hybrid rice represented the second breakthrough of rice yield in China.

To ensure the sustainable development of food production and provide technology for future rice improvement, Chinese scientists began to study super rice in mid 1990s. Now the breeding for super rice yielding 15 tons per hectare is underway and is hoped to give birth to third breakthrough of rice yield in the future.

2.5 The rice processing industry

To meet the demand of consumers for various rice products from both domestic and international markets, a lot of processing enterprises have been set up over the past decade, and the processing technology and the quality of domestic processing equipments have been progressively improved. The government encourages the development of so-called dragon-head enterprises and their cooperation with farmers and research institutes in order to realize the integration of scientific research, production, processing and market exploration, and maximize the profits of the whole rice industry. Nowadays, you can easily find in the market various processed rice products, such as instant rice, rice noodles, rice cake, pop rice, and materials for chemical industry as well.

3. Rice trade

Rice is next to maize as one of the most important food items exported by

China. Since 1960s, China has always been a net rice exporter with very few exceptions. From 1998 to 2003, the annual exportation of rice averaged at 2.65 million tons and the importation 250 thousand tons(table 4). In 1998, China exported a record high of 3.75 million tons of rice or 13.9 percent of the world total of 26.78 million tons. It was even 670 thousand tons more than the maize exportation in the same year.

Table4 Rice import and export 1998～2003

(10000 tons)

Year	Import	Export
1998	26	376
1999	19	272
2000	25	296
2001	29	187
2002	24	199
2003	26	259
Average	25	265

According to FAO statistics of 1998 to 2002, the annual average rice export of the world amounted to 26.37 million tons. Of witch, China's export accounts for about 10 %. In general, the destination of Chinese rice export stays stable and exported a fairly stable volume of rice to some fixed countries. Countries like Cote d'Ivoive, Indonesia, Cuba, Iraq, Malaysia and some other dozens of countries are the traditional markets for rice export. In addition, China also exports some quality Japonica rice to Japan, South Korea and some other countries

On the contrast, China imports a rather small quantity of rice from other countries, which stands steadily at about 20plus thousand tons or around 1%

of the world total. Rice imported from Thailand makes up a major part of the total imported.

4. Relevant policy adjustments

By the end of last century, China realized the goal in balancing its supply of and demand for grain food in general, with some surplus in good year. However, it was unexpectedly seen that the farmers faced the difficulty in selling their produces, including rice, at reasonable price. The market price went down constantly and the farmers became the victim. The grain production was even placed as the least profiting industry and many farmers turned to planting cash crops instead of paddy rice. Meanwhile, with the urbanization process in the country, large area of farmland used for paddy field was converted into other purposes. As the result, the planting area and total output of paddy rice decreased by 11.2%(3.56 million ha.) and 13%(26.19 million tons), respectively, from 1995 to 2002. The issue of grain production has been becoming one of the hot topics again. In order to ensure the food security of the country and to prevent the farmers' income from declining, the government has adopted a number of policies to help the country's grain production.

4.1 Lower the agriculture tax rate. At present, China is one of the few countries in the world that impose taxes on agriculture production. The government decided to phase out the agriculture tax by 1 percentage point each year starting from 2004 and derate it in five years.

4.2 Direct subsidies to rice farmers. Part of the grain risk fund used in the past years for grain circulation is now allocated to subsidize the rice producers directly.

4.3 Subsidies to the purchase of rice production machines and implements.

4.4 Increasing the special subsidies to the prevention and control of rice pests and diseases.

4.5 Strengthening scientific research, technical extension and farmers'

training programs.

4.6 Protection and stabilization of capital farmland by laws and regulations(*Basic Farmland Protection Regulations* and *the Land Administration Law)*.

5. Some judgments to recent development

Analysis of various sources shows that the demand for rice in China is relevantly stable this year. On the other hand, recovery in rice production has been expected because of the going up of the rice price in both the domestic and international markets, and the implementation of the government's supporting policies, which resulted in an increased sown area for paddy rice. Of course, the climate condition is also a very important factor that impacts the output heavily. In general, It seems OK so far.

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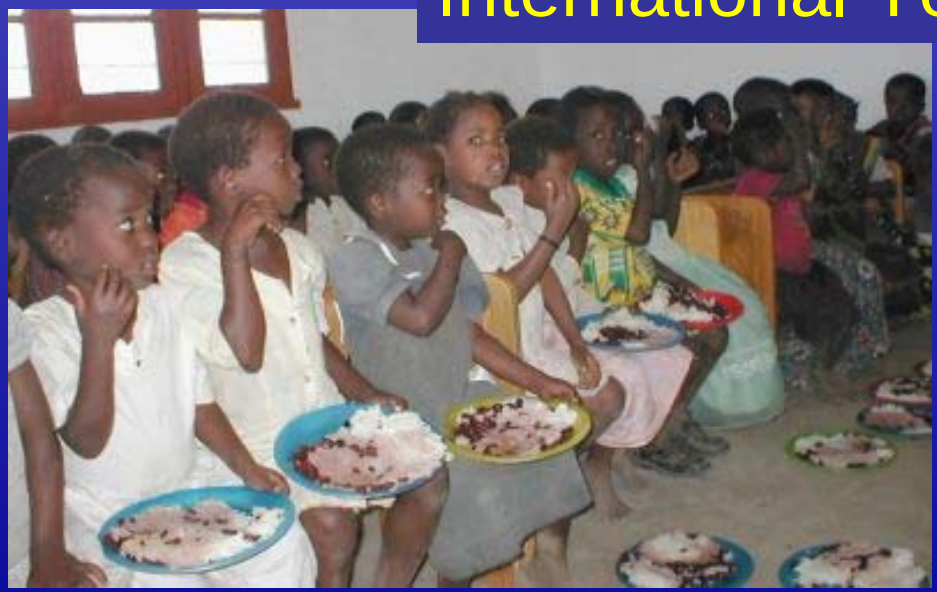
International Year of Rice 2004



Background

- Initiative for establishing IYR- 1999- IRRI
  - Growing concern of its members over an increasing number of issues facing rice development
- Pursued by FAO member countries – leading to the resolution 2/2001 – adopted at the 31st session of the FAO conf.
- On 16 December 2002 UNGA declared the year 2004 IYR (request by the PHI and co-sponsored by an additional 43 countries)

Importance of IYR

- The importance that member states are giving to sustainable rice development is reflected in a number of global initiatives:
  - 1992 Rio Summit – elaborated in Agenda 21 – SARD
  - Declaration on World Food Security Plan of Action in 1996
  - Millennium Declaration in 2000 - which calls for reduction of poverty and hunger

Role of FAO

- FAO act as the lead agency for the implementation of the IYR in collaboration with the UNDP; the CGIAR centers, national, regional and international agencies, NGOs and private sector.

Rice and Agric. System

- The UNGA declaration of the IYR not only emphasizes the importance of rice, but also points to the importance of agricultural system as a whole when addressing issues of global concern

Rice as a focal point

- interdependent relationships between
  - Agriculture
  - Culture
  - Nutrition
  - Resource management
  - Biodiversity
  - Economic policies
  - Science
  - Gender and labour issues

Rice is Life in Asia

- The Asian region produces and consumes more than 90 % of the world's rice

- Rice provides
  - more than a third of total dietary energy
  - Part time employment to over 300 million

Rice is Life in Asia

- Hundreds of millions of the poor spend half to three fourths of their income on rice
- More than 140,000 varieties of cultivated rice – diversity
- Three of the world's four most populous nations, China, India and Indonesia are rice-based societies

Rice and Culture

- The productivity of wetland rice crops enabled population growth and led to the development of society and civilization
- Both in present and ancient times, the intense labour needed to reclaim land for rice cultivation – terrace system – villages to work collaboratively
- Now cultivated in 113 countries, except Antarctica
- UNESCO-declared the terraces in Banawe- world cultural heritage

Rice and Nutrition

- Rice contains complex carbohydrates
- Rice protein – considered as one of the highest quality protein
- Other essential nutrients- thiamin (B1), riboflavin (B2), P, K
- Staple food for 17 countries in Asia and the Pacific region

Current Scenario and Approach

Population pressure
(e.g. 56 million / year in Asia)
↓
Increase production

Fragile resource base

Land degradation
Water scarcity

Declining farm income from rice

Rising cost of resources labour

→

Traditional path of production expansion at high cost?

Restructure the rice sector for sustainable cost-efficient production?

Global estimates of soil degradation (agricultural land)

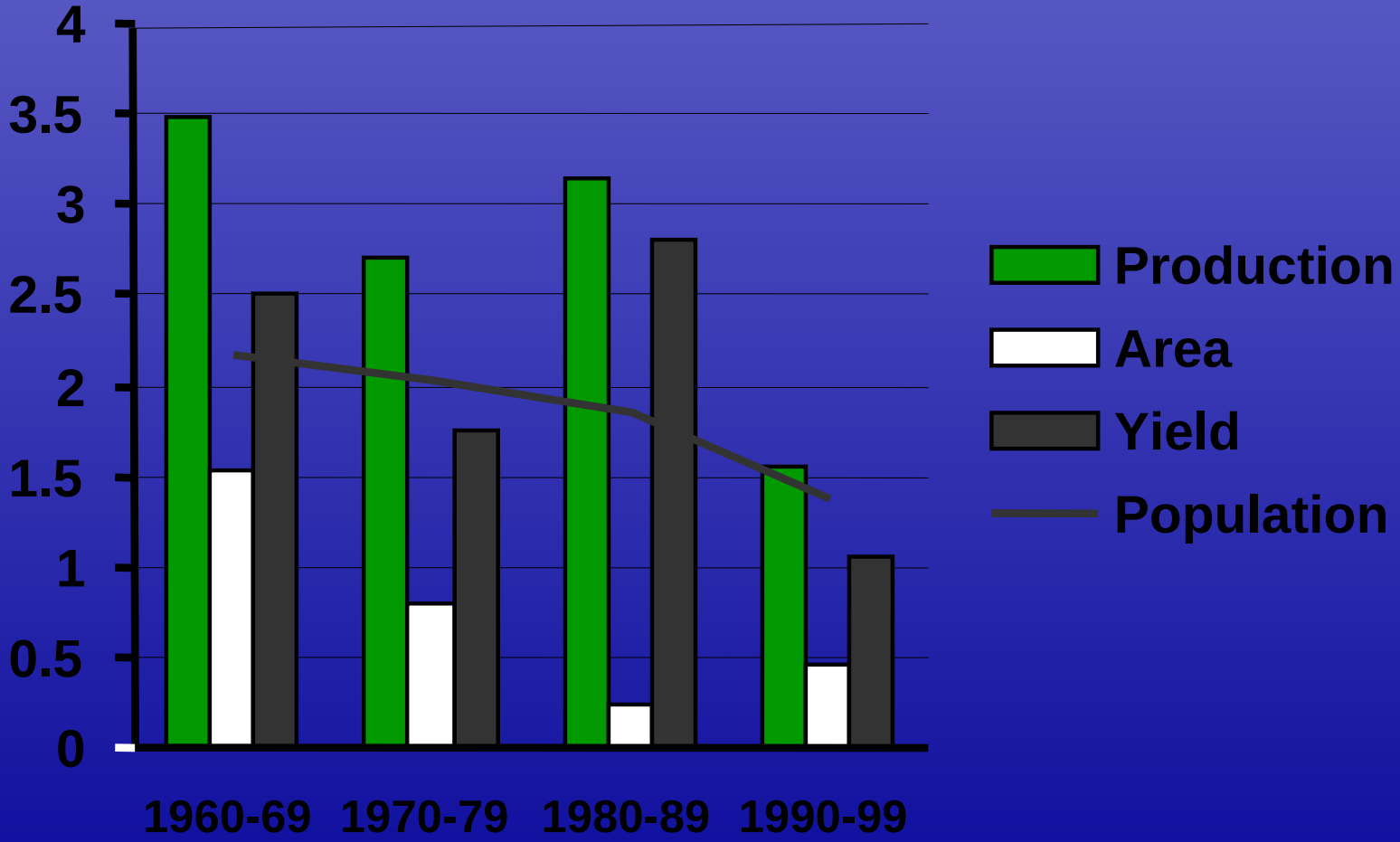
Region	Total	Degraded	Percent
	(million ha)		
Africa	187	121	65
S. America	142	64	45
C. America	38	28	74
Asia	536	206	38

(Source: Scherr, 1999)

Mega Trends in Rice Economy

- Domestic demand for rice is expected to top 770 m t by 2025
- About 80 % of the production gains from yield increases than area expansion
- yield growth will continue to slow down
- Significant decline in rice prices

World: Annual Rice Growth Rates (%)



Common Problems

- Land and environmental degradation
- No significant changes expected in rice irrigation expansion (1 %); pressure on rainfed systems
- Rice holding size getting smaller
- Post-harvest losses (10 – 37 %)
- Redistribution of agricultural production by age and gender

Major Challenge

- To meet the demand over next 30 years
  - Production needs to be increased
    - (538 to 770 m t; avg. yield 4 to 6 t/ha)
- Identify technologies for increasing yields with
  - Less land
  - Less water
  - Less labour
  - Less chemicals

IYR – Challenges and Opportunities

- Improving nutrition and food security
  - Complementary crops, livestock, fisheries within RBS
- Integrated management practices for efficient use of water, nutrients, crop residues, etc.
- Environmental protection (international agreements: UNCBD, UNFCC, etc.)
- The systems approach to post-harvest operations

IYR – Challenges and Opportunities

- Harnessing science, development, safety assessment and technology transfer (e.g. yield gap, IPM)
- Generating on-farm, off-farm and non-farm employment
- Capacity building- technology, marketing, trade issues, etc.
- Policy intervention in supporting research and technology development and adoption

Scarcity of Water

- Decreasing water quality
  - Salinity, chemical pollution
- Decreasing water resources
  - Falling ground water table
  - Silting of reservoirs
  - Increased competition form other sectors (urban and industrial)

By 2025, 2 m ha of irrigated dry-season rice and 13 m ha of irrigated wet-season rice in Asia will experience water scarcity

Urgent need to improve crop water productivity

Water Saving Technologies

Aim: More efficient use of water

Examples:

- Aerobic rice
- Alternate wetting and drying
- Raised bed cultivation
- Improved varieties

Effect of local water saving on overall water productivity at higher scale?

Fertilizer use efficiency

Inefficient use of fertilizer
-environmental hazard
-economic loss

Considerable N loss in wetland rice soils: 60 - 75 %

Main challenge : To identify fertilizer management practices to suit local soil and cultivation practices.

Factors to consider: more site specific information
nutrient supply and crop demand
multi-nutrient interactions
nutrient balance for cropping systems

Modification and Diversification of Rice-based Cropping Systems

Aim: Cost-effective sustainable production systems

Examples:

- Inclusion of economically important crops into the RBS
- Crop–livestock, crop–fishery farming systems
- Use of crops with superior resource use efficiency and adaptation to harsh environments

Inclusion of legumes
(e.g. Rice-wheat cropping system)

Rice ⟷ **Jul** – **Oct**

Wheat ⟷ **Nov** – **Mar**

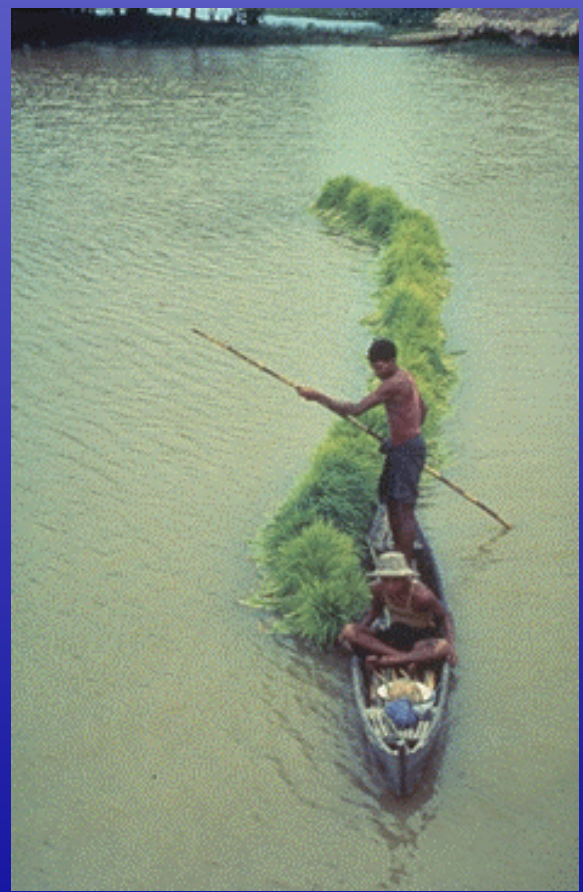
Legume ⟷ **Apr** – **Jun**

Main challenges:

- **Development and use of short duration / drought tolerant legumes**
- **Assessment of nutrient requirement and balance for the whole cropping system, not for a single crop**

Rice and Fish: Symbiosis

- Origins from 6.000 years ago in southeast Asia.
- A source of protein and carbohydrate for subsistence farmers managing rain fed systems.



Rice and Fish: Symbiosis

- The rice plant provides shade and insects for the fish, as well as organic matter that the fish can use

- The fish oxygenate the water and move the nutrients around, thereby benefiting the rice. They provide biological pest control, and *Azolla* spp. also fix nitrogen for the rice

- In addition, complex and diverse food webs of microbes, insects, predators, and cultivated plants and livestock provide benefits to one or both of the system's components.

Agroforestry

Integration of trees in upland rice farming systems

- Minimize soil erosion
- Improve nutrient and water management

Main Objectives

- The overall objective is to promote and help guide the efficient and sustainable development of rice in rice based production systems

- Increase public awareness on:
  - the contribution of RBS for food security, better nutrition, poverty alleviation and livelihood improvement
  - diversity and complexity of RBS, challenges and opportunities

Main Objectives

- Promote and provide technical support to ensure sustainable development of RBS at the global, regional, national and community level

- Promote the conservation and enhancement of rice based products for economic, social, cultural and human health aspects

Some of the main activities

- 2003
  - Jan: Establishment of Org. Committee
  - March: Est. of Intern. Working Group; Road map
  - Oct: Launch of web site: www.rice2004.org
  - Nov. IYR Donors Meeting
  - Workshops on aquaculture, gender issues, etc.

- 2004
  - Jan: Commemorative Symposium (JPN)
  - Feb: IYR-FAO Conference (HQ)
  - Presentations at national and inter. Meetings
  - Workshops on resource management

  Details : web site

Commitment

In achieving its objectives, the IYR is committed to a

- participatory
- consultative
- innovative and
- proactive approach.

Recommendations

- IYR to serve as a catalyst for information exchange and the initiation of medium and long-term programmes for sustainable rice development. Not an one year effort

- Effective collaboration of IYR committees at the National and Regional levels in achieving the objectives


Thank You

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RICE DEMAND AND SUPPLY, TRADE AND FUTURE PROSPECT IN INDONESIA

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ABSTRACT

Indonesia is one of the main rice producers in the world but almost all of the domestic production is allocated to meet the increasing demand due to population pressure. Rice is not only normal goods but also it also social, economy and politically sensitive. Without appropriate policy support and investment in irrigation system, rural economy infrastructure as well as technological break true then Indonesia is projected to the biggest net importing countries to the year of 2025. This article is discussed the balance between production and consumption, rice trade performance and future prospect of rice economy in Indonesia.

INTRODUCTION

Trade liberalization and global economic environment are among other consequences of GATT/*WTO (General Agreement on Tariff and Trade/World Trade Organization*). This strategic change in trade and world economy is supported by revolution on telecommunication, transportation, and information that has made the economy of each country globally integrated. Liberalization has made each country to open any necessary trade barrier and investment, and remove all type of protection, subsidy for its domestic economy. This combination is also made among countries enter into a borderless world community. Therefore, economic independence can only be developed through increasing economic self-resilience by increasing of competitive and comparative advantage (Solahuddin, 1999).

Agricultural commodities trade in Indonesia especially rice has also experienced phenomenal improvement in line with this substantial world trade environmental change. Within last three decades, with authority given by the government Bureau of Logistic (BULOG) has monopolized import for commodities such as rice, soybean, maize, and wheat. With this authority

BULOG could manage the schedule and import volume to secure national food stock and immediately release when supply is deficit. Therefore, price fluctuation in the world market will not significantly affect the domestic price of rice with coefficient variation less then 9.0 percent (Sudaryanto and Rachman, 2000).

There is phenomenal change in domestic rice trade that is from controlled market to free market so that domestic price of rice fluctuation is influenced by world price. In addition, domestic price fluctuation is also due to seasonal production effect as well exchange rate of local currency (Rupiah) mainly to US Dollar (Simatupang and Syafa'at, 1999).

On the other hand, experiences showed that instability of food supply especially rice has trigger the national chaos even tend to move toward criminal (Handewi, 2001). This has remained us how important is rice production for the Indonesian people that must well distributed at a reasonable price for end consumer.

According to Suryana et al., 2001 there are some interesting characteristic of rice in the world market such as: (1) 90 percent of rice production in the world is produced in Asia, (2) world rice market is a tin market that is between 4-5 percent from the total world production, (3) price of rice the most unstable price compared to other agricultural commodities, (4) 80 percent of world rice exporter is dominated by 6 countries such as Thailand, USA, Vietnam, Pakistan, China and Myanmar so that market move toward oligopolistic structure, (5) Indonesia is the biggest rice importer in the world now days, and (6) in most of Asian countries rice is treated as *wage goods* and or *political goods.* This implies that government will be in an unstable situation if price of rice also unstable and rice supply is limited.

The domestic price of rice in Indonesia tends to decline in line with the world price since year 2000. This has influenced the incentive for farmers to apply new technology that could affect the productivity and national production. The government of Indonesia (GOI) then responding through increasing of flood price of unhusked rice (paddy) since January 2001 and further corrected in January 2003. In fact the floor price introduced by GOI in 1998 was higher then

world market when price tend to decline. In order to avoid further decline of domestic price, GOI then imposed specific import tariff at Rp 430/kg (equivalent to 30% *ad valorem*) at exchange rate Rp 8500 per US Dollar.

Higher floor price policy than import price parity has increased rice import. Meanwhile, import tariff policy has stimulated importer to have "*moral hazard*" by smuggling rice with high price differences for their own benefit. The data available on rice import may no longer accurate due to these smuggling practices.

Based on above issues and problems, this paper is aimed to analyze rice production and consumption, rice trade, related policies such as floor price and tariff, and prospect of rice economy in Indonesia. Conclusion and policy implication will be elaborated at the end of this article.

RICE PRODUCTION AND CONSUMPTION IN INDONESIA

During the period 1995 – 2001 rice production in Indonesia about 31.96 million tons in average with the highest production of 33.22 million tons reached in 1996 and the lowest was in 1998 with production about 31.12 million tons (Table 1). In the same period, average rice consumption is recorded at 34.47 million tons, where the highest and the lowest consumption is in 1998 and 1997 that accounted of about 37.20 million tons and 31.61 million tons respectively. Increasing in consumption is predicted due to some factors such as: (1) population pressure that increase at the rate of about 1.6% per year, (2) rice consumption per capita remain high that is about 103 kg/year according to national social-economic survey (Suryana et al., 2001). The ideal rice consumption per capita in Indonesia is between 80-90 kg/year so that rice demand can be reduced at 14.4 – 288 percent.

Every year the domestic rice production always bellow its consumption, therefore the GOI must import from the world market to meet the increasing domestic consumption. In average, within period of 1995-2001 Indonesia imported rice about 2.5 million tons or 7.28 percent from the total consumption.

The highest volume of import was recorded in 1998 that is about 16.34 percent of the total consumption. This is mainly due to the domestic production at that year was sharply decline because of long drought of El Nino. In addition, there is prediction that the impact of El-Nino will also appear in 1999 so that people are try to stock rice for food security. The situation was getting worst due to economic crisis and politic instability. In this situation, with out special effort to increase domestic rice production then Indonesia will very much depend upon imported rice to meet its increasing consumption.

Consumption deficit actually will not benefit Indonesia if use world market as the main source of additional supply since rice in the world is marketed in a thin market. Thus, reduction of per capita consumption to 80-90 kg/year so that the total consumption will significantly decline that can be meet by the domestic production.

Table 1. Performance of rice production, consumption, and import 1995-2001 (000 ton)

Year	Production	Consumption	Import	
			Volume	% to Consumption
1995	32.334	35.348	3.014	8.53
1996	33.216	34.306	1.090	3.18
1997	31.206	31.612	406	1.28
1998	31.118	37.195	6.077	16.34
1999	32.148	36.331	4.183	11.51
2000	32.040	33.552	1.512	4.51
2001	31.651	32.951	1.300	3.95
Average	31.959	34.471	2.511	7.28

Source : K. Kariyasa, 2004

Meanwhile, during the period of 1990-1999 rice consumption per capita either in urban or rural area in Indonesia showed the declining trend (Table 2). This indicates that in aggregate there is income improvement so that people are not mainly depend on rice as their main staple food. Improvement in education level also helps people to have better understanding about more diversified diet and nutrition for their health that mentioned in the expected norm of consumption pattern.

However, population pressure that increase at 1.6 percent annually has made per capita consumption still high that is more than 100 kg/year. Meanwhile, the trend rice production tends to leveling-off. In other words, rice production grows at declining trend. This situation has pushed Indonesia as the net importing country and become the biggest importer in the world.

Table 2. Per capita rice consumption di Indonesia, 1990-1999

Year	Rural	Urban	Average
1990	125.6	120.7	123.4
1993	121.9	112.9	119.2
1996	120.9	108.8	113.8
1999	111.8	96.0	107.4
Average	120.1	109.6	116.0
r(%/yr)	-3.76	-7.29	-4.52

Source: Erwidodo and Ning Pribadi, 2003

Even though the volume is relatively small, rice is also used as raw material for food industry especially for intermideate product such as flour, nudle, etc. The data showed that the demand for rice in food industry is increasing recently as production capacity diversity of food processing industry expanded.

For example, the demand of rice as “intermediate input” has substantially increased during the period of 1990-1995 (Table 3). The share of rice demand for this “intermediate input” increased at 7.8 percent in 1995 and 15.6 percent in 1995. This indicates that the ratio between rice as intermediate input and direct human consumption has significantly increased that is from 1 to12 in 1990 become 1 to 5 in 1995 (Erwidodo and Ning, 2003).

Rice flour and instant nudle showed high demand prospect in the future and will the derive the demand for rice also increases especially from the sector of food industry. Rice based small scale food industry is expected to derive further the demand for rice increases substantially. This indicates that the people consumption can be leaded to more diversified pattern by utilizing intermideate

products mentioned above. Therefore, the per capita rice consumption will experience significant decline in the future.

Meanwhile, the demand for high quality rice from hotel and restorant also showed significant gowth during the period of 1995-1999. This is affected by the booming of tourism industry in Indonesia that need high quality standard of rice.

Table 3. Share of rice demand based on its utilization (%)

Type of Utilization	1990	1995	1999
1. Rice flour	0.6	1.0	1.1
2. Intermediate food	0.9	1.8	2.2
3. Hotel & Restaurant	4.8	8.5	10.0
4. Other intermediate demand	1.4	4.3	5.4
Total intermediate demand	7.8	15.6	18.8
6. Household consumption	92.0	78.5	73.2
7. End demand	92.2	84.4	81.2
Total demand	100	100	100

Source: Erwidodo and Ning Pribadi, 2003

Data in Table 4 shows that better off in income has caused significant change in demand for rice but with declining trend especially in urban area. This indicates that for most of people rice is still belong to normal goods. Meanwhile, income elasticities at urban and rural area tend to decline at 0.137 percent in average during the period of 1993-1999. On the other hand, price elasticities price shows that the demand for rice becomes lest elastic. In other words, Indonesian becomes more dependent to rice in their food staple. This implies that Indonesia must provide more rice in the future through increasing domestic production since rice market in the world is a tin market.

Tabel 4. Elastisitas Pendapatan dan Harga Permintaan Beras

Elasticity	1993	1996	1999	Trend (%)
Income				
• Urban	0.678	0.311	0.224	-0.137
• Rural	0.762	0.551	0.607	-0.029

Price				
• Urban	-0.727	-0.679	-0.370	-0.087
• Rural	-0.951	-0.529	-0.593	-0.054

Source: Erwidodo and Ning Pribadi, 2003

WORLD TRADE OF RICE

In the last decade, world rice production increased at 1.05 percent annually with production about 343.32 million tons in average. World production recorded at abotu 351.97 million ton in 1990 and increased to 392.82 million tons in 2001. Most of rice in the world is produced and consumed in Asia. Asian countries mostly keep their domestic production to support food security on a small part is exported (*Tsujii, 1998; Amang dan Sawit, 2001*). World rice production in 2002 is predicted to increase in line with better havest in the main rice producing countries such as Vietnam, Myanmar and Thailand.

Increasing in production has push the volume of rice traded in the world market. In the same period, the volume of rice traded increased twise in 2001 compared with volume in 1990. Rice traded increases from 12.8 million tons in 1990 increases to 20.4 million tons in 1996 and about 23.4 million tons in 2001 or an increase about 3.6 percent and 5.0 percent respectively (Tabel 5). However, this volume is reltively tin compared with soybean, maize and wheat with volume about 30 percent, 15 percent and 20 percent respectively (Amang and Sawit, 2001).

Tabel 5. Production and world rice trade (million ton)

Year	Production	World trade	(%)[a]

1990	351.973	12.804	3,64
1991	354.592	15.158	4,27
1992	355.629	15.625	4,39
1993	355.311	16.730	4,71
1994	364.482	21.922	6,01
1995	371.432	20.473	5,51
1996	380.157	20.155	5,30
1997	386.821	27.663	7,15
1998	394.082	26.726	6,78
1999	408.392	24.094	5,90
2000	396.894	24.718	6,23
2001	392.823	23.474	5,97
Average	343.317	20.795	5,49
r (%/yr)	(1,05)	(7,57)	

Source : Benny and Saktyanu, 2003
Note: a = percentage to world production

Among the main rice producing countries, China remain the biggest producer. In 2001 for example, China produce about 32.2 percent of the total rice production followed by India at about 23.3%. Meanwhile Indonesia, Vietnam, Thailand, and Myanmar produce about 8.3%, 5.2%, 4.3%, and 2.5% respectively. China and India remain become two major rice producing countries in the last decade. They contribute between 32-37 percent and 23-31 percent respectively. Their contribution to world rice production in the same period also stable with increasing ternd. Other countries like Vietnam, Thailand and Myanmar also showed semilar trend that is from 3,5 percent, 3,2 percent, and 2,2 percent in 1990 increased to 5,2 percent, 4,3 percent and 2,5 percent in 2001 (Table 6).

Table 6. Main rice producing countries, 1990 – 2001 (million ton)

Country	1990	1992	1994	1996	1998	1999	2000	2001
China	132.532	130.354	123.151	136.570	139.100	138.936	131.536	126.700
India	111.953	108.845	121.659	120.012	86.000	89.700	84.871	91.600
Indonesia	29.042	31.318	32.333	32.084	31.853	33.445	32.000	32.500
Vietnam	12.393	14.641	16.246	18.003	20.108	20.926	20.473	20.600
Thailand	11.347	13.145	14.124	13.662	15.589	16.500	16.830	16.830
Myanmar	7.943	7.772	9.280	9.000	9.280	9.860	10.771	9.860
USA	5.098	5.704	6.648	5.453	5.798	6.502	5.941	6.563
Pakistan	3.265	3.116	3.447	4.307	4.674	5.156	4.700	4.100
Egypt	2.122	2.427	2.830	2.989	2.645	3.787	3.900	3.422
Australia	563	683	813	894	974	787	1.259	1.000

Total	316.258 (89,9)	318.005 (89,4)	330.431 (90,7)	342.974 (90,2)	316.021 (80,2)	325.599 (79,7)	312.281 (78,7)	313.175 (79,7)
World	351.973	355.629	364.482	380.157	394.082	408.392	396.894	392.823

Source : Benny and Saktyanu, 2003
Note : Number in ( ) is percentage to world production.

However, the rice trade volume in the world market has declined at about 12 percent until 1999 compared to previous year. This is mainly due to some main importing countries especially Indonesia and Bangladesh reduced their import. On the other hand, performance of rice production in these countries also is getting better and further affect the volume of rice traded in the world market declining. In 2000 for example the volume of rice trade declined by 8 percent. Volume of rice traded relatively small that is about 12.8 million tons (3.6%) in 1990 tend increases to 23.4 million tons (5,9%) in 2001 or about 20.8 million tons (5,5%) of the total world production in average. Most of rice traded in the world market is exported by Thailand, Vietnam, USA, China, India and Pakistan. In 2001 for example, their share recorded about 29.8% for Thailand, Vietnam about 17%, and USA about 11,5%.. Meanwhile the share of China, India, and Pakistan is about 8.5%, 8.2%, and 6.4% respectively. In total, these six countries exported not les than 83 percent of the world rice trade. Within 5 years, Vietnam as the new comer in rice trade has move USA to the third from second position in term of rice volume exported to the world market.

In term of Indonesia, although this country is one of the main rice producer in the world but all its rice production is used to meet the domestic consumption. In contrast, Indonesia is also the main rice importing country even the biggest in the world. Economic crisis in 1997-1999, popolation pressure, long drought are among factors that push Indonesia into defficult situation in rice production and to meet the increasing consumption this country must import rice. Similarly, Myanmar also imported rice from the world market even though its domestic production quite high.

Due to factors mentioned above, volume of rice traded in the world market is fluctuated. Most of main rice producing countries keep their production to meet

their domestic consumtion for better food security. Recently, China as the biggest exporting country has slightly reduced its rice production and this will significantly affecting the world rice trade. This indicates that rice marketable surplus in the world will decline and availability of rice limited. In other words, rice is traded in a very thin market and this is succeptible for main importing country like Indonesia.

Indonesia, Nigeria, Iran, Iraq and Bangladesh are five main importing countries with share about 27 percent from the total volume of rice traded in the world market. Total import of these countries in 1990 is about 1.31 million tons (10,2%) and increased to 6.3 million tons (26,7%) in 2001 (Tabel 7). Meanwhile the demand for rice from African countries continously increases and reach a volume of 5 million tons or close to one-fifth of total rice trade. Strong demand also come from the Middle East countries that is from 1.5 million tons in 1970s to 3.6 million tons in 1990s (*Dillon et.al., 1999*).

Tabel 7. Main Exsporting and importing countries, 1990 – 2001 (million ton)

Country	1990	1992	1994	1997	1999	2000	2001
Exporter							
Thailand	3.988	4.971	5.943	6.367	6.549	7.200	7000
Vietnam	1.048	1.592	2.314	3.776	3.370	3.600	4.000
USA	2.331	2.515	3.322	2.755	2.804	2.599	2.692
China	689	1.431	32	3.734	2.951	1.800	2.000
Pakistan	1.274	918	1.660	2.099	2.104	2.357	1.500
India	505	560	891	2.134	2.752	1.449	1.936
Egypt	159	135	163	3.510	500	550	650
Australia	619	525	500	537	610	600	650
Myanmar	176	222	645	94	159	500	500
Total	10.789 (84,2)	12.869 (82,4)	15.470 (70,6)	25.006 (90,4)	21.799 (90,4)	20.655 (83,6)	20.928 (89,1)
Importer							
Indonesia	192	22	3.081	5.765	1.500	1.300	1.600
Nigeria	224	440	300	731	950	1.250	1.800
Iran	614	1.221	1.759	844	1.100	1.000	1.250
Iraq	268	647	99	630	1.247	1.000	1.000
Bangladesh	11	10	1.300	1.200	400	582	625
Total	1.309 (10,2)	2.340 (14,9)	6.539 (29,8)	9.170 (33,1)	5.197 (21,6)	5.132 (20,8)	6.275 (26,7)

Source : Benny and Saktyanu, 2003
Note : Number ( ) percentage to total world rice trade.

FLOOR PRICE AND IMPORT TARIFF POLICIES PERFORMANCE

Floor price policy on rice has been exercised by GOI since the planting season of 1969/70 and become the only policy exist until now among food crops in Indonesia. Formulas used to determine floor price is adjusted based on the situation at time when this policy is formulated. For example, at the beginning floor price of rough rice (paddy) is formulated according to Rumus *Tani* that is, price of paddy at storage quality is priced equal to the price of urea/kg. Since 1990s, floor price is determined based on three indicators such as: (1) production cost per hectare, (2) inflation rate, and (3) price of rice at world market (Sawit, 2001). The use of world price in the determination of floor price is considered effective for the benefit of farmers especially when price of rice in the world market increases. In other words, international price is used as opportunity cost and efficiency measure. Floor price that is determined based on this formula will move between FOB price in Bangkok and CIF since Indonesia is net importing country. Within the period of 1991-1997 for example, the floor price moves between 95 percent to 113 percent with respect to FOB price in Bangkok or about 109 percent in average. Floor price Rp 1660/kg in 1998 is significantly lower or about 61 percent of the FOB at about Rp 2725.3/kg (Kariyasa, 2004).

Actually, since July 1997 when Indonesia started in economic crisis, the floor price determined by GOI was not able to compete with the world price since Rupiah experienced a land sliding depreciation. In 1998, GOI increased floor price 4 times, however this price still bellow the world price. Since 1999, the floor price of rice at Rp 2310/kg, which is slightly higher than FOB price in Bangkok. This better-off position is also stimulated by more stable and appreciation of Rupiah to US Dollar (Amang and Sawit, 2001).

Furthermore, started in January 2000, floor price of paddy in Indonesia is between 42-63 percent higher than FOB price in Bangkok. However, to high floor price is also ineffective since the implementation is also difficult, high cost if

floor price must be implemented along the year. In addition this situation also stimulate smuggling of rice from the world market that illegally imported into Indonesia.

This situation indicates that during economic crisis (1997-1999), floor price is relatively more effective than after the crisis because the price disparity between floor price and world price very small. Indifferent price between domestic and world market will not significantly benefited the importer as well smuggler. After the economic crisis, the implementation of floor price on rice trade no longer effective since the domestic price is significantly higher than import price at FOB Bangkok. At present, volume of imported rice increases significantly and volume of 2.5 million tons excluded illegal import and in short period will affecting the domestic price. In addition, new floor price policy implemented since January 2001 based on President Decree No.8/2000 is also ineffective to improve price at farm level since domestic price still substantially higher than import price.

Ones again, GOI determine floor price policy that effectively implemented since January 2003 at a level of Rp. 2.730/kg in accordance with President Decree NO.9/2002. With exchange rate between Rp 8,500 to Rp 10,000 per one US Dollar then this floor price is between 51.67 – 78.13 percent higher than FOB price at US$ 180/ton. This price gap is higher than the gap compared to previous years. This implies that floor price policy implemented since January 2003 is also ineffective. Therefore, GOI should adjusted the floor price policy in a more dynamic measure or in combination with import tariff in order to be more effective.

For example, in order to make this new floor price policy more effective and closer to the import parity price, the CIF price is then calculated using formula CIF = FOB +7,5% included insurance and transportation cost. Therefore, GOI need to determine import tariff between Rp 795/kg (41 percent *ad valorem*) to Rp 1,085/kg (66 percent *ad valorem*), which is very high import tariff. This is not suitable for domestic rice trade as long as control and low enforcements at

field level relatively weak. This will stimulate illegal import and in fact relatively difficult to be controlled by the official at filed level.

This condition indicates that the latest floor price policy that determined by GOI since January 2003 will more difficult to be implemented compared to similar policy implemented in previous years. Otherwise, GOI should strengthen control and commitment of official at operational levels to put in jail all smugglers and any type of illegal importer. In other world GOI should also determines policy instrument for every policy implemented in relation to rice trade in Indonesia.

IMPORT TARIFF ALTERNATIVE TO SECURE FLOOR PRICE IN INDONESIA

GOI policy options to impose import tariff is considered as popular alternative to stimulate rice producer (farmers) to increase their production. However, this policy alternative must be carefully formulated and realistic for end consumer. The import tariff must in line with the world price trend and exchange rate of Rupiah to foreign currencies especially US Dollar. Taken into account of these factors into import tariff policy will help the domestic rice trade in a more balance position between supply and demand. Other policy, which is also considered important, is determination of floor price or *procurement price*. Combination of these alternative policies is expected to effective to protect domestic price as well as world price from declining trend (Rachman et al., 2001).

The result of import tariff simulation based on rough rice (paddy) floor price stated in President Decree No.9/2002 the effective floor price at farm level is Rp 1725/kg of milled quality paddy or equivalent to Rp 2730/kg of rice at exchange rate Rp 8500 per US Dollar. This is assumed that milled rice rendement not less than 63.2% percent (Table 8). Thus, the import tariff should be imposed by GOI in order to make price parities between domestic and world price is at about Rp 1133/kg (71,0%) if FOB price in Bangkok US$ 165/ton; and about Rp 988/kg (56,8%) if FOB price increase to US$ 180/ton and Rp 795/kg (41,1%) if FOB price in Bangkok further increase to US$ 200/ton.

Flexible import tariff in accordance with exchange rate of Rupiah to foreign currency is predected more effective in order to protect the interest of farmers. Floor price of rice at Rp 2.730/kg implemented by GOI since 2003 is to high for exchange rate at Rp 9.000 per US Dollar. In addition, world price will tend to decline so that implementation of floor price without taking into account world price will not effective. Other alternative policy may also effective is implementation of rough rice procurement price.

Table 8. Import tariff simulation based on FOB price in Bangkok and Rupiah exchange rate to US Dollar, 2004.

Exchange rate (Rp/US$)	FOB price in Bangkok (US$/ton)		
	US$ 165/ton	US$ 180/ton	US$ 200/ton
7500	1340 (105,2)	1279 (88,1)	1118 (69,3)
8000	1311 (92,4)	1182 (76,4)	1010 (58,7)
8500	1222 (81,1)	1085 (66,0)	903 (49,4)
9000	1133 (71,0)	988 (56,8)	795 (41,1)
11000	779 (39,9)	602 (28,3)	365 (15,4)

Note: * FOB = CIF + 7,5% for insurance and transportation cost
* Domestic price at Rp 2730/kg according to President Decree No.9/2002
* Number in () percentage to tariff

Source : K. Kariyasa, 2004

Meanwhile, imposed import tariff on rice is not becoming an inflator to the economy. For example, every 1 percent increase of import price will only increase the domestic price 0.04 percent so that import tariff at 30 percent will induce domestic price 1.2 percent an contributes to inflation about 0.07 percent (PPIP Badan Agribisnis, 1999). This indicates that imposing import tariff for rice will not significantly affect the inflation. This is also in line with research results conducted by Dawe (1999) that showed import tariff about 25 percent will not induce inflation, while import tariff 30 percent only increase domestic price of rice at 5 percent and induce inflation 0.32 percent.

PROSPECT OF RICE ECONOMY IN INDONESIA

Population pressure is one of among factors that will significantly push the demand for rice in an increasing trend. Rice in Indonesia is still belonging to normal goods with respect to income. Meanwhile, domestic production remain bellow its consumption and remain difficult to meet the increasing demand. This phenomenon can be seen from the projected data until year 2010 that shows without special effort and effective policy support then the domestic production will relatively difficult to be increased (Table 9).

Table 9. Projected production and demand for rice in Indonesia to year of 2010

Year	Production	Demand	Import	
			Volume	Percentage (%)
2002	30283326	32894975	2611649	7.94
2003	30586159	33040093	2453934	7.43
2004	30892021	33208261	2316240	6.97
2005	31423572	33290800	1867228	5.61
2006	31666935	33411950	1745015	5.22
2007	31910299	33533100	1622801	4.84
2008	32153662	33654249	1500588	4.46
2009	32397025	33775399	1378374	4.08
2010	32640388	33896549	1256160	3.71
Average	31550376	33411708	1861332	5.58

Source: Erwidodo, 2003 (improved)

In average, domestic production with the period of 2002-2010 is predicted about 31.6 million ton annually, while the demand is about 33.4 million tons annually. Therefore, there is a gap between production and demand at about 1.9 million tons or about 5.58 percent from the total demand annually.

Sombilla et al., (2001) reported that rice production in Asia would only increase at about 1.0 percent per year within the period of 1997-2025. Meanwhile, world rice production is projected to increase at 1.06 percent annually (Table 10). Rice production in South Asia will experiences an increase of 1.44 percent per

annum, while rice production in South East Asian region will increase at level of 1.32 percent per year.

The demand for rice in ASEAN region in 2025 is predicted to increase at 39 percent or about 1.19 percent annually. The contribution of Indonesia to the consumption in crease in ASEAN region is the highest that is about 40 percent followed by Vietnam at 22 percent, Myamar and Philippines at 15 percent and 10 percent respectively (Sombilla, 2001). Looking at the balance between production and demand, Indonesia, Philippines and Malaysia will be in deficit performance until 2025.

Table 10. Projected rice production and demand in Asia and World in the period of 1997-2025 (000 ton).

Country	Growth 1997-2025 (%)			Projected until 2025 (000 ton)		
	Area	Productivity	Production	Production	Demand	Net Trade
1. India	0.13	1.31	1.44	124709	124084	625
2. South Asia	0.12	1.32	1.44	165868	165401	467
3. Indonesia	0.12	0.95	1.07	44854	47825	-2971
4. Thailand	-0.08	0.66	0.58	17976	9261	8715
5. Philippines	0.19	1.19	1.38	10703	11167	-464
6. Vietnam	0.18	1.50	1.69	29508	21733	7775
7. Malaysia	-0.32	1.10	0.78	1737	2853	-1116
8. ASEAN	0.13	1.18	1.32	130762	114674	16088
9. China	-0.39	0.78	0.38	148663	149058	-395
10. Japan	-0.99	0.14	-0.85	6415	7807	-1392
Asia	0.00	1.00	1.00	450648	434290	16358
World	0.06	1.00	1.06	516514	516514	0

Source : Sombilla et al., (2001)

CONCLUSION AND POLICY IMPLICATION

World rice market is a thin market and Indonesia may not always relay on imported rice in order to meet it increasing domestic demand. Increasing domestic production is considered the best alternative since rice is a not only normal goods but also economic and politically sensitive. Combination alternative

policies such as: (1) flexible and specific import tariff, (2) selective inputs subsidy, (3) flexible floor price policy and (4) strengthen control and law enforcement is considered more suitable for rice economy in Indonesia.

This implies that to convert the deficit figure into surplus, break true is therefore needed in term of production technology and strong policy support in the aspect of investment and rehabilitation of irrigation system and rural economy infrastructure in short and medium term. Meanwhile in the long term, expansion of resource allocation especially to the less favorable areas with more efficient production technology as well as post harvest handling and marketing must be taken into account.

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Current Situation of Korean Rice Industry and the Rice Policy and Programs.

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Ⅰ. Korean rice industry and its Changes

Rice has continued to be important economic and cultural stand in Korean's life and history. Rice has been the staple food for all Koreans since it began to be cultivated in the Korean peninsula. In addition, the agricultural culture which was formed as we started to farm rice can still be considered as the root of Korean culture although its characteristic in our culture weakened relatively in the process of industrialization and westernization.

64% or 9.99 million ha. of Korean land is mountain and 18.5% or 1.85 million ha. is used for farming. Of it, rice farm field and dry field account for 11.3% (1.13 million ha.) and 7.2% (0.72 million ha.) respectively.

<Table 1. Korea's land and farm land>

(Unit : thousand hectare)

	Size of the total land	Farmland		Rice field		Dry field	
			percentage		percentage		percentage
1995	9,927	1,985	20.0	1,206	60.8	779	39.2
1997	9,937	1,924	19.4	1,163	60.4	761	39.6
1999	9,943	1,899	19.1	1,153	60.7	746	39.3
2001	9,954	1,876	18.8	1,146	61.1	730	38.9
2003	9,960	1,846	18.5	1,127	61.1	719	38.9

There are 1.26 millions of farmhouses in Korea and they account for 8.3% of the total households. The number of farmers is 3.53 millions, that is 7.4% of the total population. The number of the farmhouses decreased by 28.5% from 1.77 millions in 1990 to 1.26 millions in 2003. The agricultural population also declined by 47% from 6.66 millions in 1990 to 3.53 millions in 2003.

The absolute majority of the farmhouses are still engaged in rice farming although the percentage of the rice farmers decreased from 85% (1.20 million) in 1990 to 75% (0.95 million) in 2003.

<Table 2. Number of the farmhouse and the agricultural population>

(Unit : thousand households)

	Total number of households	Number of farm households	percentage	Total population	Agricultural population	percentage
1990	11,357	1,767	15.6	42,869	6,661	15.5
1995	12,961	1,501	11.6	45,093	4,851	10.8
1997	-	1,440	-	45,991	4,468	9.7
1999	-	1,382	-	46,617	4,210	9.0
2001	14,834	1,354	9.1	47,343	3,933	8.3
2003	15,298	1,264	8.3	47,925	3,530	7.4

The share of the rice industry in GDP, 545 trillion won(4.5 billion dollar) is 1.4%. The profit generated from the rice industry amounts to 20.5% of the farmhouse income and 50% of the agricultural income.

<Table 3. Farmhouse's income and its share of rice farming>

(Unit : thousand won)

year	Farmhouse's income (A)	Agricultural income (B)	Income from rice farming (C)	Comparison	
				C/A (%)	C/B (%)
1990	11,026	6,264	3,097	28.1	49.4
1995	21,803	10,469	3,984	18.3	38.1
1997	23,448	10,603	5,557	23.7	52.4
1999	22,323	10,566	5,316	23.8	50.3
2001	23,907	11,267	6,050	25.3	53.7
2003	26,543	10,825	5,450	20.5	50.3

The major characteristics of Korean rice industry are first, the scale of farming is small-sized, second, there are high rate of aged farmers and third, the production cost is considerably high. Although the number of full-time farmers is increasing, 43.5% are small scale farmers with less than 0.5 ha. farmland and 56.8% are aged over 60. The average production cost is 530 thousand won per 10a. Moreover, it is difficult for us to reduce the production cost as the share of land service cost and labor cost are high as 45% and 21.6% respectively.

Beginning with the launch of the WTO scheme, the role of the government in the rice distribution has decreased. Yet, 15% of the total rice produced in Korea are purchased and distributed through the government.

II. Changes in Korean Food Grain Policy

Food grain policy can not be free from other economic sectors and has been closely related with political, economic, social and cultural conditions. Particularly, in Korea, food grain policy is directly linked with rice policy because Koreans have had rice and because rice production amounts to more than 85% of the total crop production.

<Table 4. Rice Supply and Demand situation by year >

(Unit : thousand metric ton)

	1960	1970	1980	1990	2002
○ Supply	3,224	4,719	6,468	7,470	7,004
- Production	3,150	4,090	5,136	5,898	5,515
- Import	-	541	580	-	154
○ Demand	3,126	4,394	5,402	5,445	5,557
- Consumption	3,126	4,394	5,402	5,445	5,157
- Aid to North Korea	-	-	-	-	400
○ Stock	74	325	1,066	2,025	1,447

Let's look at the changes in the food grain policy, according to the times. Prior to the 60s, the food policy was focused on securing certain quantity of food to stabilize the national economy considering that the nation-wide public suffered from food shortage at that time. During this time, the government encouraged farmers to increase their production and tried to attract foreign aids (mostly wheat flour) inevitably. Also, the government enforced to conduct mandatory allocation in order to secure certain amount of food and released the government purchased rice which was already secured through the market control measures such as distribution or other similar ones.

In the 60s and 70s, realization of self supply of rice and other major crops was emerged as the most important policy task. Thus, the government introduced various policies to increase food production through the 3rd national economic development project started from 1972. In 1970, the dual price program, that is purchasing rice with high prices from rice farmers and to sell it to consumers with low prices was introduced. In order to produce high yield of rice at an early stage, the government promoted to cultivate a Tong-Il varieties and purchased back the most of them. As such the government aimed at increasing rice production, and thanks to such effort, we can finally meet the balance of supply-demand for ourselves after the late 70s.

From the 80s to the early 90s, problems emerged. The rice stock increased due to oversupply. Moreover, the private distribution system weakened, and the financial burden for the government increased. Accordingly, the government started to make reform to facilitate private distribution system at the early 90s, and the reform has been accelerating since the launch of the WTO system.

As a result of the UR negotiations, all agricultural markets have been liberalized. However, Korea was able to postpone the rice tariffication as the difficult situation of Korean agriculture as well as farmers' were recognized by other WTO members. Therefore, for 10 years from 95 to 2004, Korea is exempted from rice tariffication but accept the rice subject to MMA for this grace period.

<Table 5. MMA volume by year >

(unit : thousand metric ton)

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Import volume	51	64	77	90	103	103	128	154	180	205

Ⅲ. Overview of the reform in Korean rice industry

As the national economy grows, the share of the rice industry in the national economy and agriculture decreases. The internal conditions as well as external ones around the rice industry in Korea change as well. As a result, there are increasing needs for changes in the rice industry and in its policy. Most of all, we need to adjust our rice industry to the new market circumstances following the WTO negotiations on rice and the DDA negotiations. We also need to resolve issues such as decline of rice consumption and increase of demand for high quality and for safe agricultural products to stabilize the rice industry in the long term.

Currently, the average farmland size of rice farmers in Korea is 1.08 hectare. Despite the continuous effort to reform agricultural condition, we have not arrived at the satisfactory performance. It is that why old farmers delay to quit their business as they worry if they can not make living after retiring and because the price of the farm land is too expensive. The Korean government is planning to implement 「Support for retired aged farmers」 to encourage old farmers to retire. This scheme is to provide a certain amount of direct payment to retired farmers. The government will transfer the farm land from old farmers to young and capable farmers.

<Table 6. Rice farm households by size of cultivate land >

(Unit : thousand households)

Year	Rice farm households	Less than 0.5ha	0.5~less than 1.0ha	1.0~less than 2.0ha	2.0~less than 3.0ha	3.0ha and over
1990	1,508 (100%)	609 (40.3)	512 (34.0)	316 (21.0)	53 (3.5)	18 (1.2)
1995	1,205 (100%)	496 (41.2)	379 (31.4)	241 (20.0)	56 (4.6)	34 (2.8)
1997	1,143 (100%)	477 (41.7)	357 (31.2)	221 (19.3)	53 (4.6)	35 (3.1)
1999	1,064 (100%)	487 (46.0)	316 (29.7)	187 (17.5)	40 (3.8)	32 (3.0)
2001	1,054 (100%)	462 (43.8)	313 (29.6)	193 (18.3)	46 (4.4)	40 (3.8)
2003	945 (100%)	415 (43.9)	274 (29.0)	168 (17.7)	44 (4.7)	44 (4.7)

After the launch of the WTO system, the Korean government, like other members, has been reducing AMS. Consequently, the government purchasing rice which has been occupied large portion of the rice produced has decreased greatly and will decrease further after the WTO/DDA negotiations. However, the private distribution function has not been evolved enough to make up for the decrease of the government role. Concerning all these conditions, the Korean government is trying to boost up innovating of management of RPC(Rice Processing Complex), a center of the distribution from the production site.

<Table 7. Government purchasing of rice>

(Unit : thousand metric ton)

Year	Total production (A)	Government purchasing quantity (B)	B/A
1990	5,528	1,203	21.5
1995	4,695	1,375	29.3
1997	5,449	1,224	22.5
1999	5,263	875	16.6
2001	5,515	828	15.0
2003	4,451	750	16.9

From the perspective of rice farmers, their difficulties can not but increase if market liberalization is accelerated after the negotiations on rice and the DDA negotiations because the absolute income of farmers is small as Korea's rice agriculture is small scale. Korea's basic policy to stabilize farmhouse income is aiming at implementing various types of direct payment schemes rather than using previous price supporting systems. Accordingly, in 2001, the government introduced 「Direct payment for paddy field」 to promote public benefits of rice farming and environment-friendly farming and 「Direct payment for rice income stabilization」 to compensate 80% of losses if rice prices drop in the following year of 2002.

We acknowledge that it is important to create public consensus on the significance of rice when changing the entire policy direction of rice. Otherwise, problems such as resistance from farmers and inequality between other sectors can occur. In order to make such problems smooth, we will first make the public consensus by collecting opinions of farmers, consumers and experts through discussions and change the policy direction based on the consensus.

Frisco M. Malabanan

Director, GMA Rice Program, Department of Agriculture

- Doctor of Philosophy & Master of Science, Agronomy, University of the Philippines at Los Banos, College, Laguna
- National Rice Seed Program Coordinator, Agrikulturang MakaMasa Rice Program, Department of Agriculture

RICE SITUATION AND OUTLOOK: The Philippine Rice Industry

Frisco M. Malabanan[1]

Overview

Rice in the Philippines is cultivated in 2.8 million hectares (M ha). However, the crop is harvested from some 4.0 M ha in two seasons, where 2.5 M ha are irrigated (1.25 M ha planted twice a year; 1.2 M ha, rainfed; and 0.14 M ha, upland).

Rice contributes an average of 15.5% of the country's gross value-added (GVA) in agriculture, 13% to the consumer price index, 3.5% to the gross domestic product (GDP), and 3.3% to the gross national product (GNP). As the country's staple food, rice accounts for 35% of the average calorie intake of the population (now about 82 M) to as high as 60-65% for households in the lowest income quartile. Average annual rice consumption level in the country has today been placed at 103 kilograms per capita. In recent years, rice sufficiency had been synonymous to food security. Labor absorption by the rice industry is highest among the agriculture subsectors, involving 11.5 M farmers and family members. In addition, close to three-fourths of farm household income is derived from rice farming and related activities.

The rice industry has been performing well in increasing productivity, except

Particulars	Where we were 3 years ago			Where we are now	Where we will be in 18 mos.
	2000	2001	2002	2003	2004
Production, mmt	12.39	12.95	13.27	13.50	14.98-15.48
Area, mha	4.04	4.06	4.04	4.00	4.07
Ave. yield, mt/ha	3.07	3.19	3.28	3.50	3.80
Level of sufficiency,%	88	89	90	91	97-100
Farmers' income, P/ha	10,743	11,883	12,738	14,012	17,678
CS utilization in irrigated areas, %	35-50		61	70	80

Table 1. Overview of the Rice Industry

some years when the El Niño phenomenon and other natural calamities and man-made factors hit the country. Over the past decade, production has steadily increased.

[1] Program Director, Ginintuang Masaganang Ani Rice Program, Department of Agriculture
Chief Science Research Specialist, Philippine Rice Research Institute (PhilRice)
Maligaya, Science City of Muñoz 3119, Nueva Ecija, Philippines

In 1991, the country harvested 9.67 M mt. In 1995, production reached the 10.54 M mt mark, significantly increasing to 11.28 M mt the following year. However, it dropped to 8.55 M mt in 1998 in view of the occurrence of El Niño. Nevertheless, production soared to 11.78 M mt the following year and further went up to 12.39 M mt in 2000.

Notwithstanding the steady increases in production, the Philippines has remained a net importer of rice, as reflected by the figures in the past decade. In 1990, the country imported 620,795 mt of rice. Imports went down to as low as 198,864 mt in 1995 but again soared to 862,380 mt in 1996 and up to a record high of 2.1 M mt in 1998 because of the occurrence of the El Niño. However, imports dropped to 781,717 in 1999. Import figure, on the average, was 800,000 to 1,000,000 mt per year.

In preparation for free trade policy spearheaded by the World Trade Organization, the Philippines is now aiming to be more competitive and efficient in rice production. Hybrid rice technology was further promoted and implemented, together with other cost-reducing and production-maximizing technologies. This year, the country intend to produce 15.00Mmt of palay, bringing the Filpinos to its rice-sufficient state.

Why price of rice in the Philippines is high?

Price of rice in the Philippines is highest among its neighbors. On the average, a ton of rice in the Asian market amounts to $427.00, which about 80 percent higher than the average price. In China, price of rice is only $229.00 per ton, while Thailand's rice amounts to only $205.00 per ton (USDA FAS, 2004).

In order to trace the reason for the soaring price of rice in the Philippines, certain factors shall be considered. First, the supply of rice in the Philippines is relatively low vis-à-vis the local demand, thus making the price of rice to soar significantly. In 2003, the Philippines has experienced to attain a 91 percent sufficiency in rice by producing 13.50Mmt. Even though the figure was recorded to be the highest rice production in history, still much of the requirements have not been met. Increase in population still overcomes the increase in rice production.

Another factor is the cost of rice production in the country. In the study conducted by Moya in 2001, it was found out that the total cost of rice production per hectare per year amounted to $888, or 29 percent higher than the average price among its neighboring countries. Bulk of the cost was being consumed to hired labor, amounting to 47 percent.

Postharvest losses also contribute significantly to high rice prices. To date, 14.84 percent of the total production was being wasted, 30 percent of this was attributed to drying, because of the poor postharvest facilities in the country.

Price of rice in the Philippines is high also because of the numerous levels of the rice marketing chain. As observed, profit marketing margins are decomposed to farmers, millers, agents, viajeros, wholesalers and retailers. Of the total price of rice, 49 percent goes to the producer, 12 percent to the miller and 17 percent to the retailer.

Apparently, overhead cost accumulates as the product transfer from one level to another in the marketing chain, thus making price of rice significantly high when it reaches the consumers.

Rice consumption is relatively high in the Philippines. This factor greatly affects rice because it pulls up the demand and eventually the price assuming supply is constant. In 2003, the Philippines was third in terms of rice consumption among its neighbors (USDA). Also, the per capita consumption of rice in the country is one of the highest is Asian region, amounting to 103 kilos per year.

Although it can be said that rice farm productivity in the country is at par with its neighbors and even higher than Thailand and India, production is still one of the lowest in Asia because of the limited area in the Philippines. In fact, harvested area has decreased from 2001 to 2003 by 1.45 percent. With this, the supply of rice cannot cope with the very high demand for rice; as a result, price of rice has risen.

Population growth rate is very high in the Philippines. It even rises at a faster pace than the local rice production. On the basis of estimated growth rate of population, the projected demand for rice in the Philippines is about 15.57 million metric tons in 2025, just enough to feed 107 million Filipinos. Thus, the country has to produce 65 percent more rice than what it produces today**.**

The Ginintuang Masaganang Ani (GMA) – Rice Program

With aim to close the import gap, the Department of Agriculture, under the Arroyo administration, established the Ginintuang Masaganang Ani – Rice Program in 2000. And just as early as 2001, the Program has attained a total palay production of 12.95mt, a level 4.52 percent higher than the previous. And even with the decrease of 1.45 percent in area devoted to rice production from 2001 to 2003, the program has managed to produce a record high of 13.50mt of palay. This year, the program intend to produce 15..00Mmt of palay, which will eventually bring the nation to rice self-sufficiency.

GOALS

The GMA Rice Program is envisioned to help increase rice yields and farmers' income, achieve greater food sufficiency in the country, and generate additional employment in the agricultural sector.

OBJECTIVES

1. To attain a total *palay* production of 14.98 to 15.48 M mt in CY 2004.
2. To increase yield of *palay* by 9% per year (2003 to 2004).
3. To increase farmers' income by at least 10% per year.
4. To reduce postharvest losses by at least 1% per year.
5. To generate more jobs particularly in hybrid and inbred rice seed production and cultivation.

STRATEGIES

General Appropriations Act (GAA) Resources

1. Plant certified and hybrid seeds in 1.0 M ha and 0.8 M ha irrigated areas during the wet and dry cropping seasons, respectively.
2. Provide location specific interventions to farmers who will buy certified and hybrid seeds and soil amelioration in selected areas.
3. Provide appropriate farm equipment to farmers/farmers' organizations/cooperatives.
4. Support R&D to improve productivity and farmers' income.
5. Expand Farmers' Field Schools following Integrated Pest Management (IPM) approach and revitalize the national extension system.
6. Establish technology demonstrations for every rice growing municipalities.
7. Strengthen the local seed industry by encouraging small farmers to do seed business.
8. Provide marketing support to rice farmers through the National Food Authority (NFA).

Private Sector/Government Financing Institutions (GFIs)

9. Actively engage the private sector and GFIs to provide credit access for production loans, including seeds, fertilizer, irrigation fees, postharvest facilities, and marketing.
10. Engage the private sector in technology promotion (training of trainers and farmers, techno-demo, field days, etc.)
11. Enable NFA to procure up to 10% of domestic palay production in surplus areas and during the main harvest season.
12. Continue dialogue with millers and traders.

Local Government Units (LGUs)

13. Promote existing models of LGU agricultural program linkages up to marketing with DA, the private sector, and GFIs.
14. Promote counterparting schemes and increased exposure beyond LGU extension workers (*i.e*., internal revenue allocations (IRA) for agriculture)

State Colleges/Universities (SCUs)

15. Engage SCUs in active extension, entrepreneurship education, and technology promotion work.

Thrust of the Program

Hybrid Rice Commercialization Program (HRCP)

Since hybrid rice is still unpopular to rice farmers, President Gloria Macapagal Arroyo declared the implementation of the Hybrid Rice Commercialization Program (HRCP) to further promote the widespread use of hybrid rice seeds, enhance farmers' productivity and income, and generate employment to rural areas in the country.

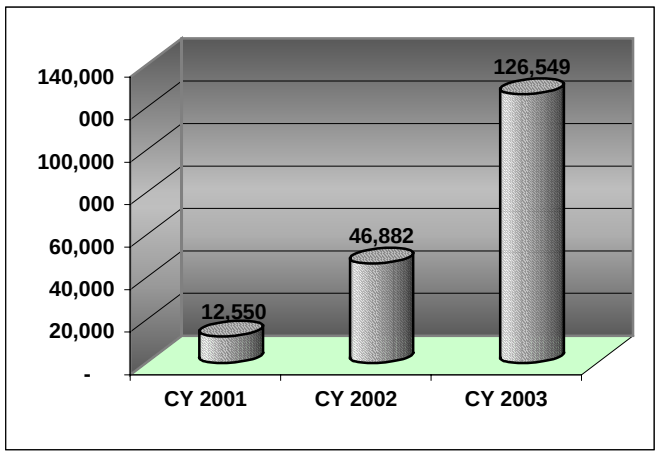

Figure 1. Area Planted to Hybrid Rice

To further promote hybrid seed utilization in the country, the program initiated the 50:50 scheme, wherein farmers are entitled to a 50 percent discount per bag. Instead of paying P2,400/bag, farmers are now paying only P1,200/bag; this scheme has encouraged them to use hybrid seeds in lieu of inbred seeds.

Surprisingly, the Program has brought significant development in hybrid rice seed utilization in the country at its early stage. In fact, from merely 12,550 hectares in 2001, area planted to hybrid seeds has expanded to 46,882 hectares in 2002 and boosted to more than 125,000 hectares in 2003 (Figure 1).

The program has also brought farmers increase in yield and income, as attested by the farmers themselves. Actual yield of 12.95 mt/ha was attained by Mr. Ernesto Pablo, Sr. of Brgy. Sto. Nino, Rizal, Occidental Mindoro. In his production, he earned a net income of more than Php 120,000.

Significant developments were also attained in hybrid rice seed industry. The area for seed production is continuously increasing. Current seed production area expanded to 4,000 ha, as compared to merely 1,200 ha during the wet cropping season of 2002. Seedgrowers productivity was enhanced using modern technologies. From just 335 kg/ha in 2002, average yield of these seedgrowers increased to 550 kg/ha in last year. These developments increased income to seedgrowers and assets of cooperatives.

Promotion and Intensification of Certified Inbred Seeds (CS)

The inbred rice seed component of the GMA Rice Program undertakes the following:

- produce and distribute breeder, foundation, and registered seeds to members of the national rice seed production network and local seed growers to ensure availability, accessibility, and affordability of CS at the farm level;

- procure CS from seed growers and distribute them at 50% discount to masterlisted farmer-beneficiaries in target irrigated and rainfed-lowland areas;
- establish, when needed, technology demonstration farms that will showcase the latest package of technologies, use the newly released varieties for irrigated areas and for other environments; and
- stock buffer seeds to ensure availability of registered and certified seeds in calamity-stricken areas.

At present, total area with CS utilization has reached to more than 1million hectares, of which 60 percent are planted without the subsidy offered by the government. Hence, the goal of the CS program – to demonstrate to the farmers the potential benefit of CS – has been attained, and the subsidy will eventually be phased-out.

Location Specific Interventions

As part of the regular crop management interventions of the GMA Rice program, farmers are being assisted on some problems that are location specific. Aside from the seed distribution, farmers are also being given some inputs on soil nutrient management. Some of these are zinc sulfate given to farmers with areas that are zinc-deficient. Soil analyses were also being conducted to ensure accurate fertilizer application in the area. In pest control, bactericides were distributed to farmers with problems on Bacterial Leaf Blight. Biological control of rice black bug (RBB) in infested and highly vulnerable areas was strengthened through the establishment of additional *Metarhizium* laboratories, provision of maintenance support to existing laboratories, distribution of light traps, and incorporation of topics on management and control of RBB in the Farmers' Field School (FFS) training.

Research and Development

Following the mandate of the Agriculture and Fisheries Modernization Act (AFMA), the rice R&D component will be multidisciplinary and collaborative aimed at developing appropriate technologies that will not only improve productivity but also protect the environment, reduce cost of production, and improve product quality and value-added scheme for global competitiveness. The research agenda are directed to the following:

- Inbred R&D Program;
- Hybrid R&D Program;
- Biotechnology; and
- Comprehensive Irrigation Research and Development Umbrella Program.

Training and Extension

Extension of technology and the program management know-how are being imparted through the following courses:

- Inbred Seed Growers' Training Course;
- Hybrid Rice Training Courses for Seed Growers, Seed Inspectors, and Agricultural Technologists;

- Farmers' Field School (FFS) in every rice-growing municipality and season-long courses such as Rice Specialists Training (RST) and Training of Trainers;
- Technical briefings for masterlisted farmer-beneficiaries; and
- Refresher courses on rice production.

Incentive allowances were provided to LGU-based agricultural extensionists for their continuous collaboration and assistance in the implementation of the rice program. The LGU agricultural extensionists entitled to receive incentive allowance are the provincial agriculturists, city and municipal agriculturists, and agricultural technicians. Granting of incentive allowances shall be based on performance.

Information Support

Information support services includes the following:

- National Information Network;
- National surveys, data generation, cost and return analysis from palay production, and capital formation;
- Support activity to Geographic Information System, digitizing of Strategic Agriculture and Fisheries Development Zone maps and characterization and classification of rice areas; and
- Information campaign through print, broadcast, and media relations.

Policy Issues

The World Trade Organization[2]

The World Trade Organization came into being in 1995. One of the youngest of the international organizations, the WTO is the successor to the General Agreement on Tariffs and Trade (GATT) established in the wake of the Second World War.

The main objective of the WTO is to help trade flow smoothly, freely, fairly and predictably. It does it by (1) administering trade agreements, (2) acting as a forum for trade negotiations, (3) settling trade disputes, (4) reviewing national trade policies, (5) assisting developing countries in trade policy issues, through technical assistance and training programmes, and (6) cooperating with other international organizations.

In 2000, new talks started in agriculture and services. These have now been incorporated into a broader agenda launched at the fourth WTO Ministerial Conference in Doha, Qatar, in November 2001.

The work programme, the Doha Development Agenda (DDA), adds negotiations and other work of non-agricultural tariffs, trade and environment, WTO rules such as anti-dumping and subsidies, investment, competition policy, trade facilitation, transparency in government procurement, intellectual property, and a range of issues raised by developing countries as difficulties they face in implementing the present WTO agreements.

[2] All WTO data have been sourced out from the www.wto.org

The deadline for the negotiations is 1 January 2005.

Lifting of Quantitative Restrictions (QR) on Rice

As a compliance to the WTO, the Philippines has implemented the Republic Act (RA) No. 8178 also known as Agricultural Tariffication Act. The said law lifted the quantitative restrictions (QRs) on all agricultural products except rice and replaced these with tariffs.

However, the Rice QR will expire by the end-June 2005, thus posting threats to local rice producers. Without Rice QR, there will be low domestic prices of paddy rice for Filipino farmers and household income for rice farmers is expected to decrease significantly.

Realizing these threats, the Department of Agriculture (DA) has formally notified the WTO of its intention to enter negotiation for the extension of QR. While such negotiations are being conducted, the DA will continue to evaluate the possibility of rice QR to expire. This includes the imposition of tariff on rice and requisite differential measures commensurate to the implied drop in protection from QR to tariffs.

Plans and Prospects for CY 2004

The Government, through the GMA Rice Program, is focused on attaining rice self-sufficiency in late 2004 or early 2005. With the target of 1.8 Mha, of which 600,000 ha are devoted to hybrid rice seed cultivation, the production of hybrid rice in these areas will significantly increase the national rice production, thereby attaining the 15.48 million mt target.

In order to combat the rising of prices due to numerous levels in the marketing chain, the program has promoted a more efficient marketing flow by introducing the Hybrid Rice Movers. These movers maybe traders, millers, seed growers or even input suppliers. These individuals will supply hybrid seeds and other inputs to the farmers and the mover will buy their produce in return. Eventually, the farmers' produce will then distribute milled rice to the institutional buyers, thereby eliminating several levels in the marketing chain. Prices will then be competitive be both for the producers, the consumers and the movers.

Also, with the technological advancement in the rice sector, labor generation in the rural sector is seen to increase by more than 90,000 jobs in this year. In addition, farmers income is seen to increase from P15,000 to more than 31,000/ha with the use of the new technologies.

Given these prospects, proper funding and support are very much needed from the government. However, with the limited fund coming from the government, with the guidance and leadership of the Secretary of Agriculture, the GMA Rice Program shall make use of this existing resource towards achieving higher productivity and self-sufficiency.

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A Brief Overview of Rice Situation in Thailand

Presented by : Mr.Thawach Theetaratkul
Office of Agricutural Economics
Ministry of Agriculture and Cooperatives

1. Introduction

Rice is one of the most important crops in Thailand. It is not only a staple for domestic consumption, but also a leading export commodity and a major foreign exchange earner. Rice can be grown in all regions over the country, depending largely on water supply and labor availability, and can be cultivated two or three timees a year in irrigated areas in the Central plain.

Rice in Thailand can be classified by season into two types, namely Wet - season/ Major rice and Dry - season /Second rice. Wet-season rice is photoperiod sensitive while dry -season rice is photoperiod insensitive. Main rice producing areas are in the Central region, followed by the Northeast, North and South, respectively

2. Production

2.1 Wet-season rice

In crop year 2003/04, total planted area was about 57.67 million rais slightly increased from 56.91 million rais in 2002/03. About 0.76 million rais Total output increased 2.28 million tons from year 2002/03 with the current average yield 363 kgs per rai, a noticeable increased from 345 kgs/rai in 2002/03. Northeast region is the major production area for the wet-season rice which occupied as high as 46.32 of the total paddy planted area for the 2003/04 crop year (Figure 1).

2.2 Dry-season rice

In 2004, total planted area was 8.46 million rais with total output of 5.72 million tons, and an average yield of 676 kgs/rai (Table 2). Central region is the major paddy production area which occupied as high as 63.11% of the total dry-season planted area in year 2004 (Figure 2).

3. Exports

Thailand has long been the world's leading rice exporter. Its export ranged from 5.46 to 7.34 million tons rice with the values increased form 50.7 to 76.68 billion bath during the 1996 - 2003 period (Table3). Average world market share of Thai rice is around 32% U.S.A., PRC of China, Singapore, Hong Kong, Indonesia, Senegal and Nigeria are Thailand's major rice exporting countries (Table 4). As Thiland's rice trade is currently liberalized, the export can be done by requesting an export permit from the Foreign Trade Department, Ministry of Commerce. In compliance with the WTO Agreement, Thailand has to open her market, and already imports about 400 tons of rice in 2003.

4. Price

The price of rice is based primarily on the export trade situation, the domestic demand and the production situation, which altogether act collectively to determine the farmprice received by farmers and the Bangkok Wholesale prices, respectively.

4.1 Farm Price

There was price increase in Jasmin Paddy Rice from 6,737 baht per ton in 1999 to 8,872 baht per ton in 2004 the price is higher in 2004 due to the government price intervention and increase in demand. For paddy rice 5%, the price was 5,579 baht per ton in 1999 and decreas to 5,540 baht per ton in 2004 (Table 5).

4.2 Bangkok Wholesale Price

The price of paddy rice 5% from 8,583 baht per ton in 1999 to 8,000 baht per ton in 2004.

4.3 F.O.B Price

Due to the higher world price in 2004, the price of white rice 5% and Thai Jasmin rice increased from 8,402 and 8,732 baht per ton , and from 18,732 to 22,120 baht per ton during 2003-2004, respectively.

5. Farmers' Incomes

Most Thai Farmers grow paddy for home consumption and sales if having some marketable surplus. Due to a relatively high production cost but variable farm prices of paddy, an average net return from paddy farming was therefore quite fluctuating during the past ten years.Farmers even found to have some positives and negative earnings during the wet-season 1999/00 to 2003/4 crop year. And this is why the Thai governments have always to implement the paddy/rice price stabilization programs to help maintaining farmers' incomes from paddy growing. The farm price and income's situation has been much better for dry-season rice growing. Farmers get relatively better farm-price received and net returns per cropped area for their dry-season paddy (Table 6 and 7).

6. Balance Sheet of Paddy in Thailand

Averaging over the 5-year period (1998/99-2002/03) the supply and demand condition of paddy production in Thailand could be briefly summarized as following (Table 8).

6.1 Supply

- Production : total annual available supply of paddy was averaging at 29.7 million tons per year (or equivalently, to 21.28 million tons rice) of 84.4% or 26.28 million tons was from domestic production.
- Beginning stock : the amount of paddy left over from domestic consumption and export which was carried over as a beginning stock was averaging at 4.78 million tons paddy (or 3 million tons rice per annum) during the 1998/99-2002/03 period.

6.2 Demand

- Domestic consumption : About 47.40 % of total available paddy supply per annum (13.60 million tons paddy or 9.23 million tons rice) was domestically consumed as stable food, 37.82% or around 7 million tons rice, was export annually to earn foreign exchanges.

- Ending stock : an average of 4.24 million tons paddy per annum (3.2 million tons rice) or 14.78% of total supply per annum was currently ending stock of rice in Thailand.

7. Policies

Being an important food crop for Thai people, an economic cash crop for millions of Thai farm families and also generated a larger share of Thailand's foreign exchange earnings from export. Thai governments both past and present have formulated and launched various policies and programs to uplift productivity and incomes of paddy farmers. The price and income stabilization programs have been Implemented through, for example, the government's price guaranteed and buying programs conducted regularly every year by relevant government offices. In addition, The governments by MOAC has launched the following development measures to help increase productivity, efficiency and competitiveness of rice farming sector.

7.1 Production

(1) To develop a good seed variety of paddy
(2) To promote uses of biological and organic fertilizer in rice production so as to decrease costs
(3) To improve an irrigation system for paddy farming
(4) To promote production of organic and non - toxic rice and improve its standard including inspector and control system
(5) To register rice farmers so as to control area planted of rice production
(6) To transfer technology in rice production processing as well as marketing to the farmer organization

7.2 Processing

(1) To increase management capacity to entrepreneur, rice exporters and retailers

(2) To promote rice processing by developing new technology and enhance researches in processing to increase value-added of rice products

(3) To commercialize R&D results and good processing to the rice processing sectors

7.3 Marketing Policy

(7.3.1) Domestic market

(1) to stabilize price of rice by launching the “Rice Mortgage Scheme” in order to assure the price of paddy rice when there is excess supply in the domestic market

(2) to utilize E-commerce system, forward market, and central market, to enhance direct sale in rice/rice products

(3) to enable Contract Farming between farmer organization and rice mills and exporters

(4) to create brand name of Thai rice and its standard certification to authorized by the Bank of Thailand. In domestic rice trade

(5) to ensure warehouse receipt and Domestic Letter of Credit (DLC), authorized by the Bank of Thailand ,in domestic rice trade

(7.3.2) International market

(1) to establish strategic alliance between Thai exporters and trade partners to have market power when negotiation required not forming a cantle!

(2) to promote uses of Information Technology (IT) between exporters and importers

(3) to create logo, certification mask, and brand name of Thai rice/rice products to make its awareness and identity

(4) to participate in both bilateral and multilateral negotiation to reduce/eliminate trade barriers in rice/rice products

(5) to accelerate export in rice in G-to-G lever, and expand new market using trade and trade and financial mechanism

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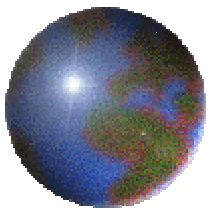


US Rice Situation and Outlook

US Department of Agriculture

Foreign Agricultural Service

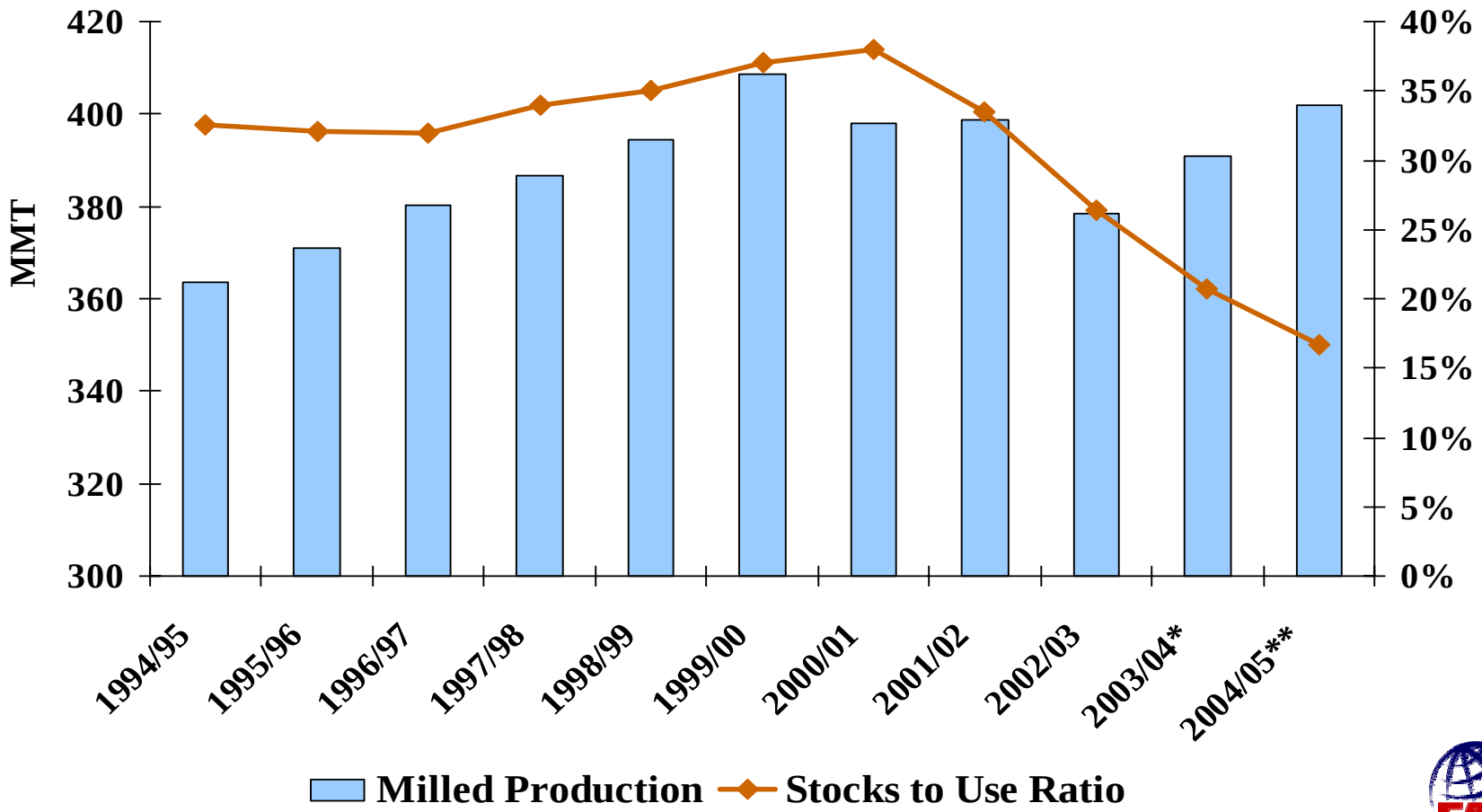
Overview

- Brief summary of global situation
  - Supply/Demand
  - Prices
- U.S. situation and outlook
  - Overview of rice production in USA
  - Forecasts for 2004/05
  - Composition of exports

Global Outlook: Market Forces 2004/05

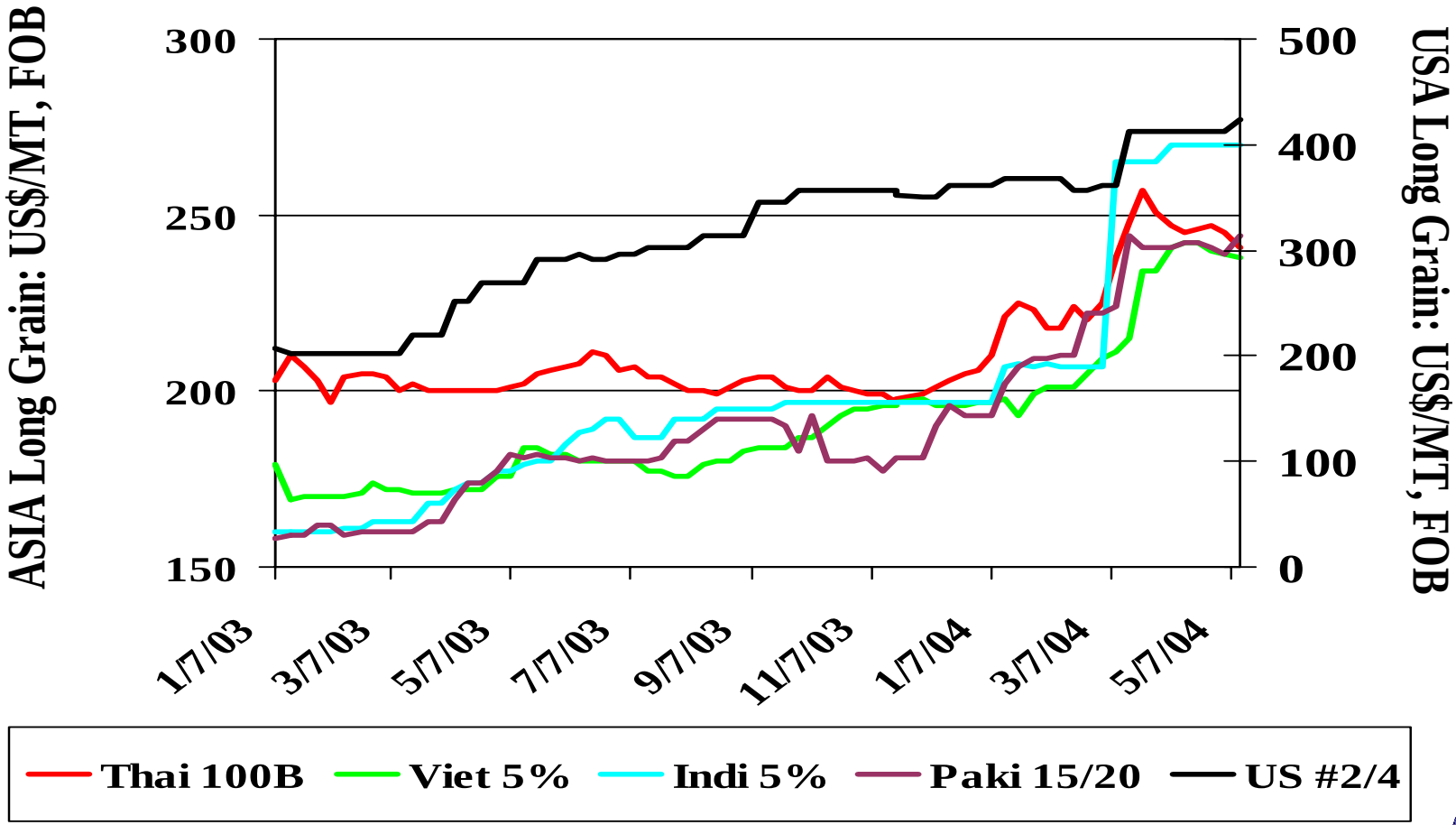
- ***Supply***:
  - Global consumption outpaces production
  - Global stocks tight in major supplying countries
- ***Demand***:
  - Strong demand in key markets
    - China
    - Iraq
    - Indonesia

Global Supplies: Stock/Use Plunges



* Estimate **Forecast

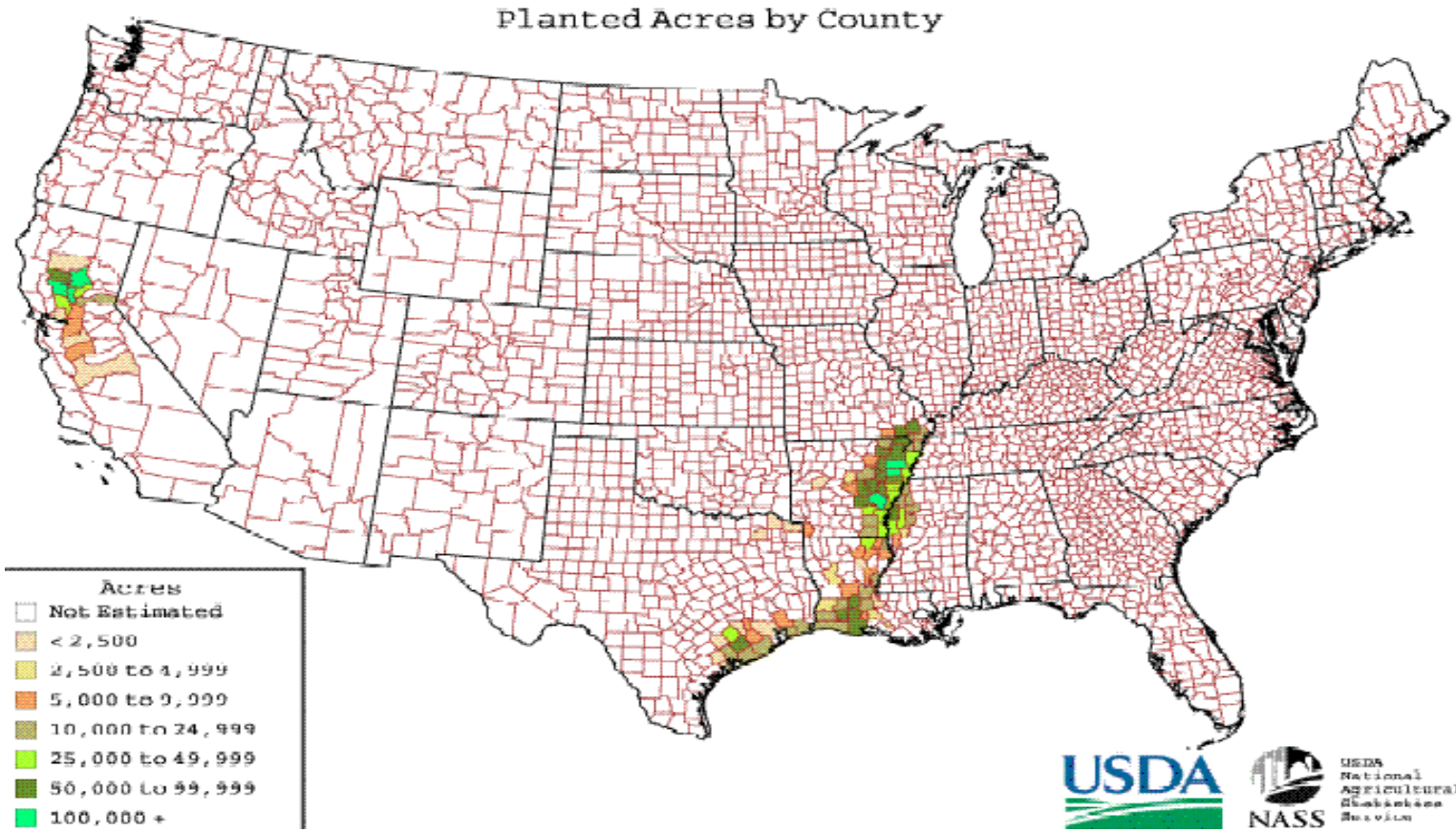
Global Prices: Prices Surge in 2004



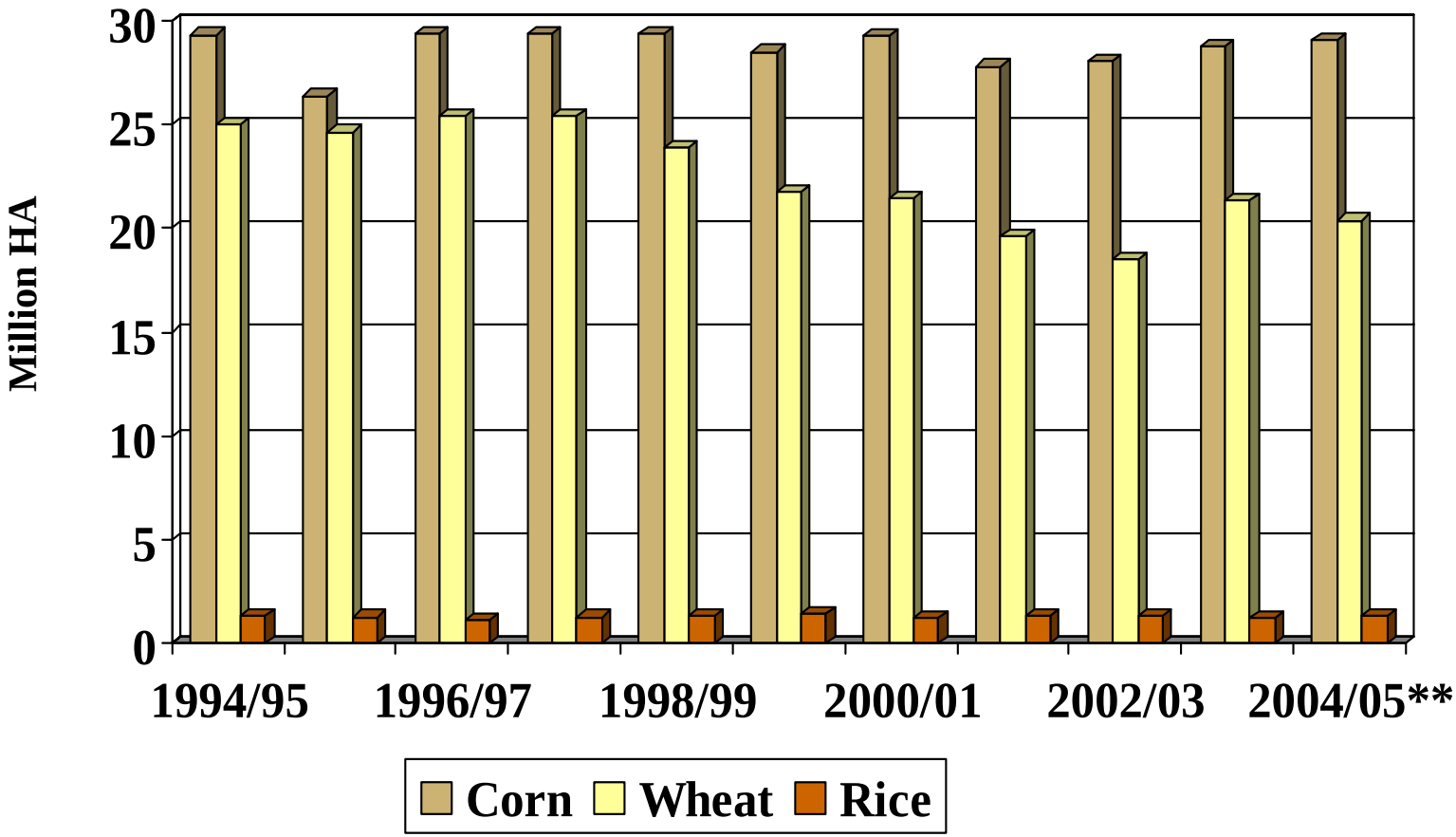
U.S. Situation and Outlook

- Rice relative to other crops
- Forecasts for 2004/05
- Main markets
- Composition of exports

U.S. Production Areas

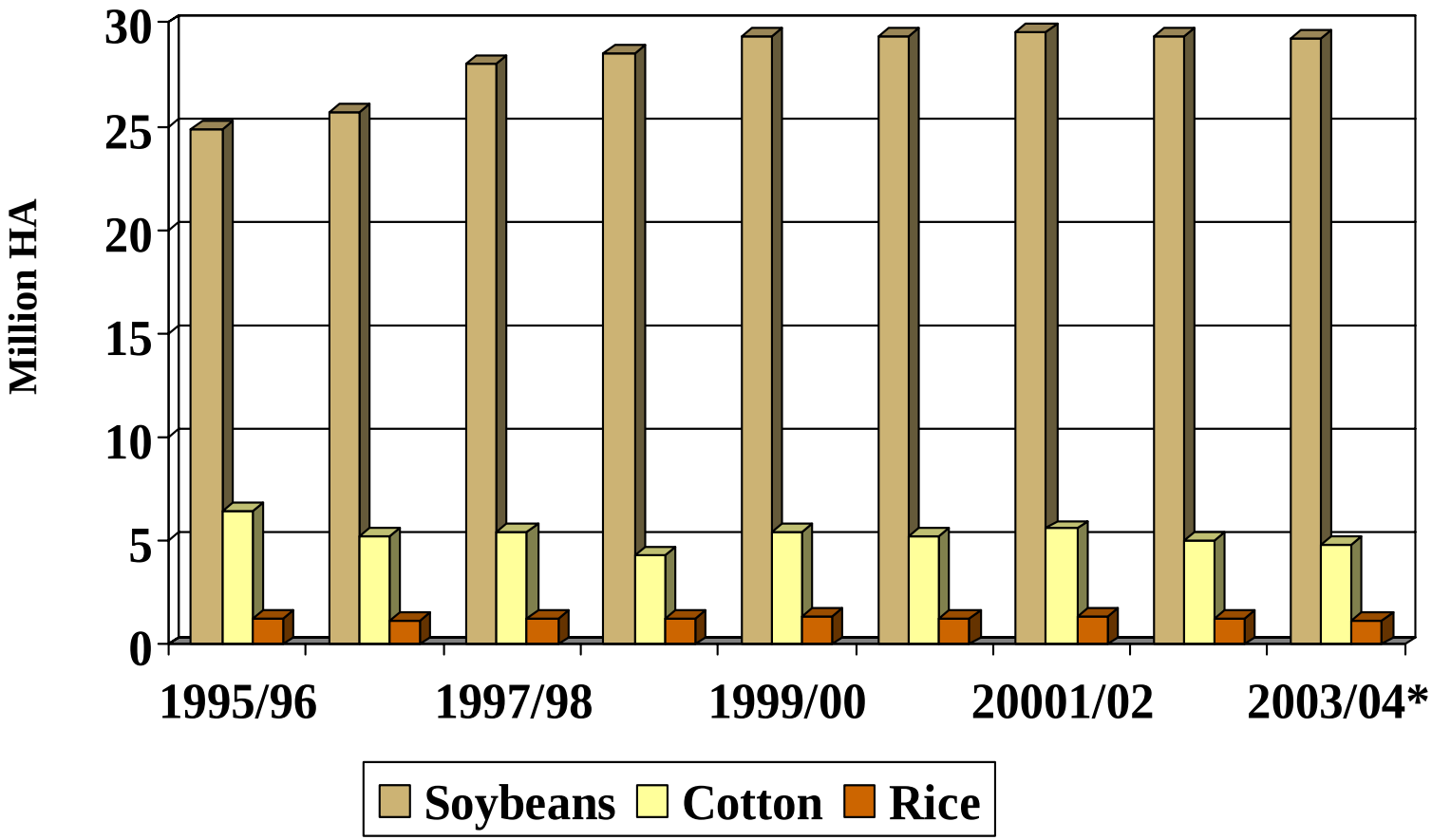


Rice Area vs. Other Grains



* Estimate **Forecast

Rice Area vs. Cotton and Soybeans

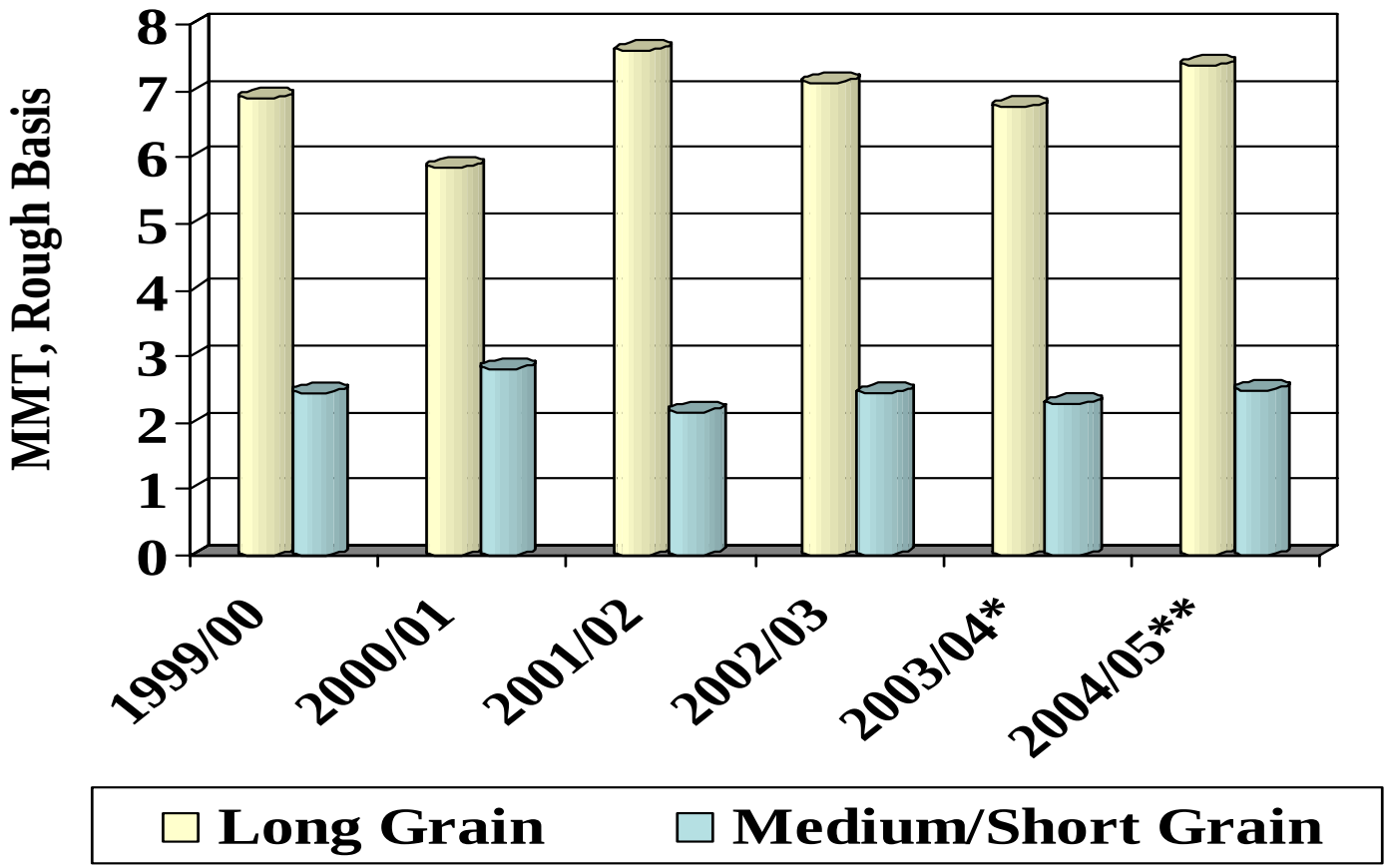


* Estimate **Forecast

U.S. Forecasts 2004/05

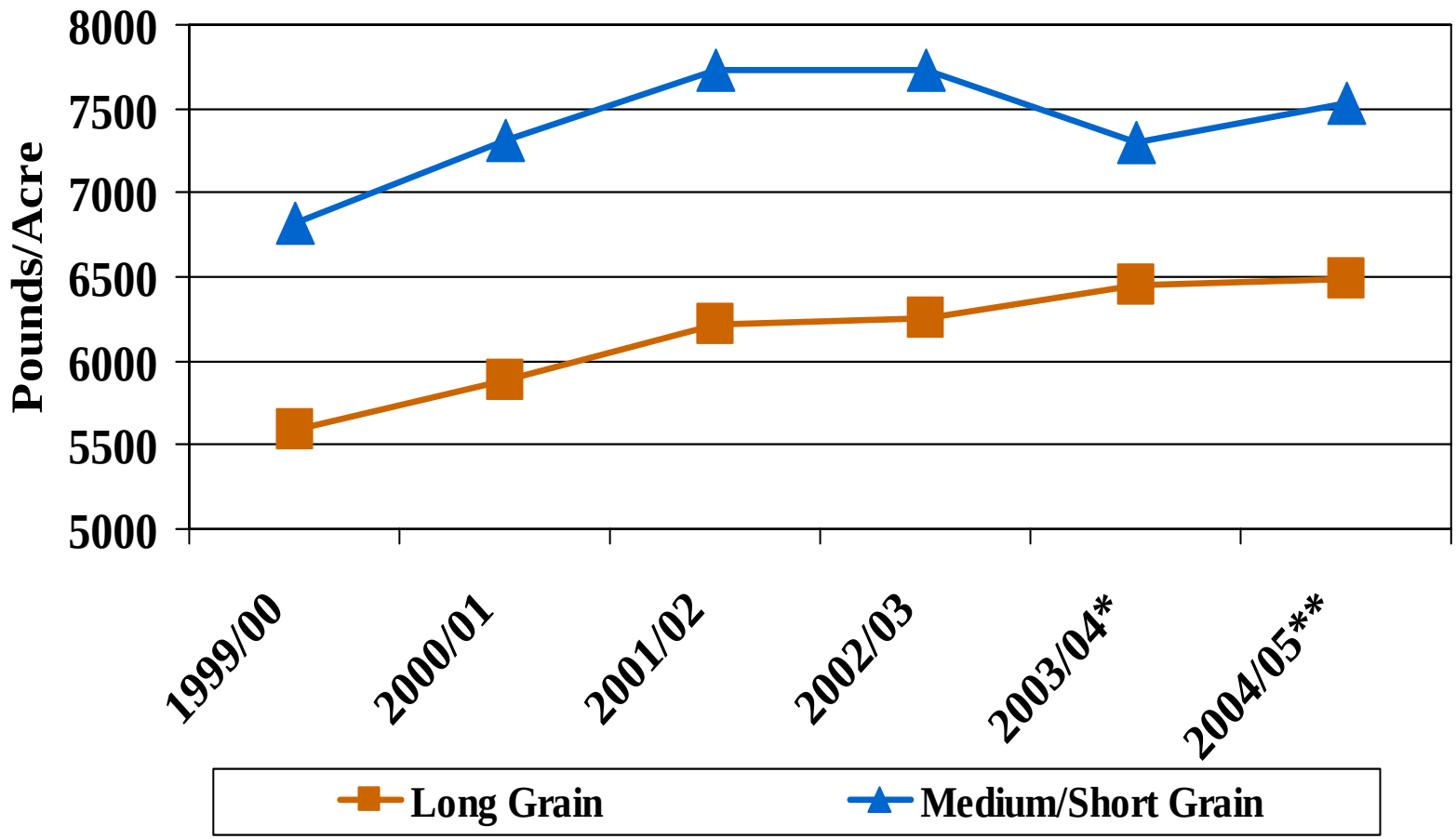
- Record yields, record production
- Replenish stocks
- Prices firm
- Near-record exports

Production Forecast Up in 2004/05



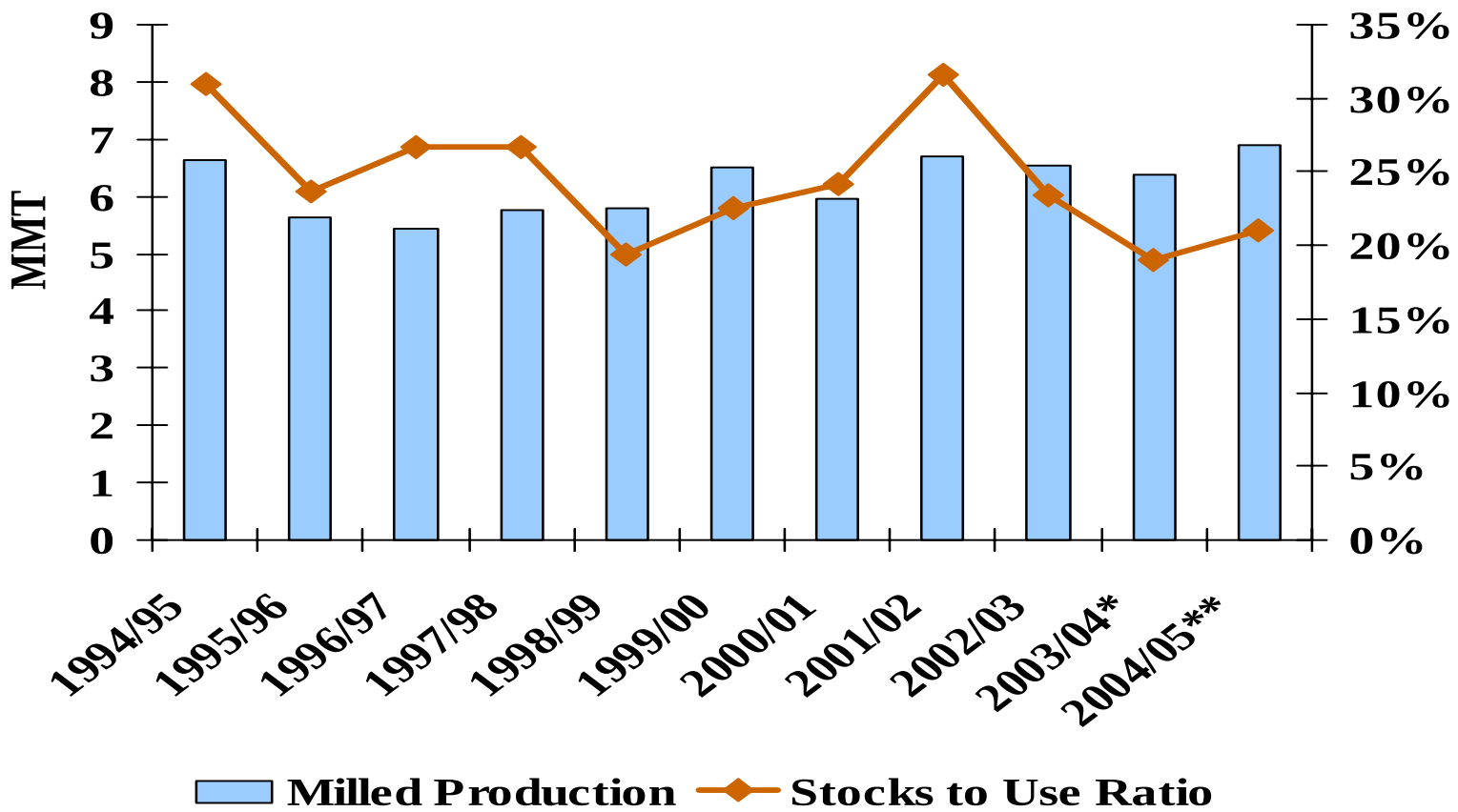
* Estimate **Forecast

Yields Forecast Up in 2004/05



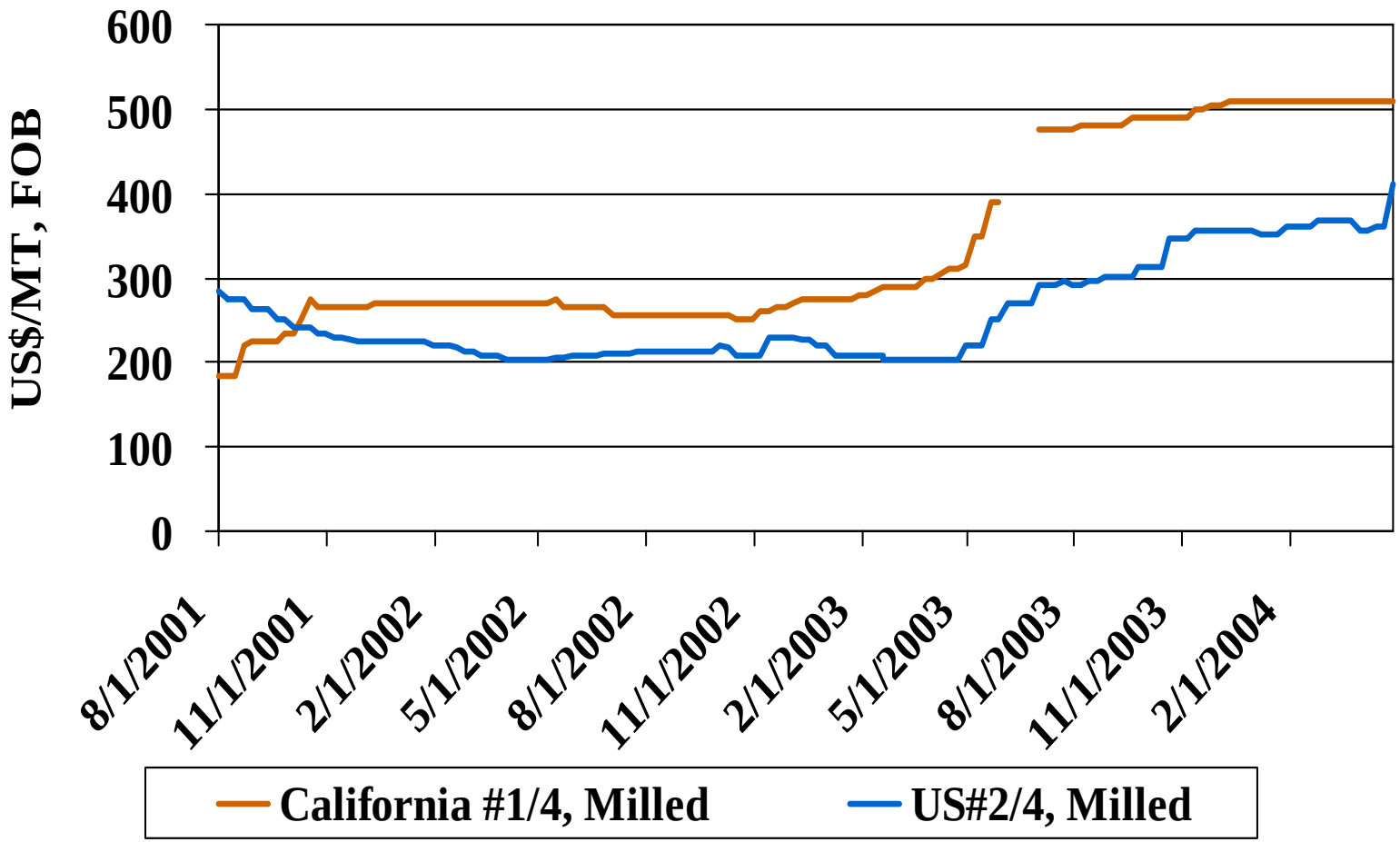
* Estimate **Forecast

Stocks-to-Use Forecast Up in 2004/05



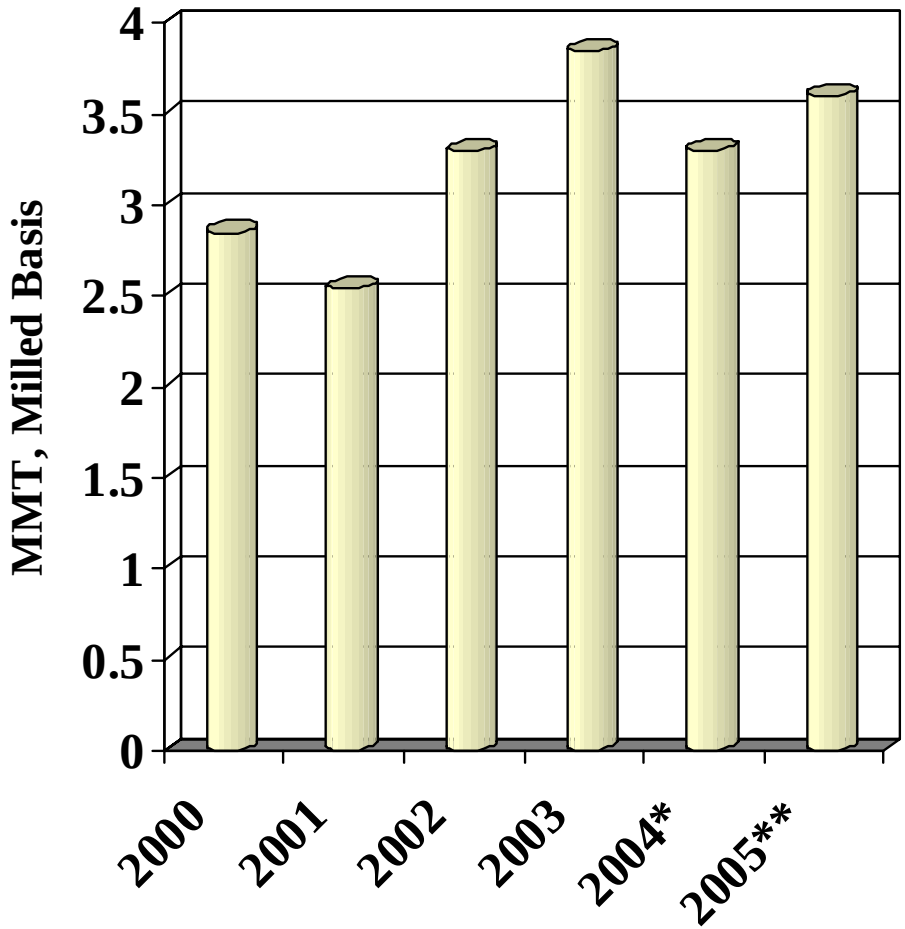
* Estimate **Forecast

U.S. Prices Trend Up



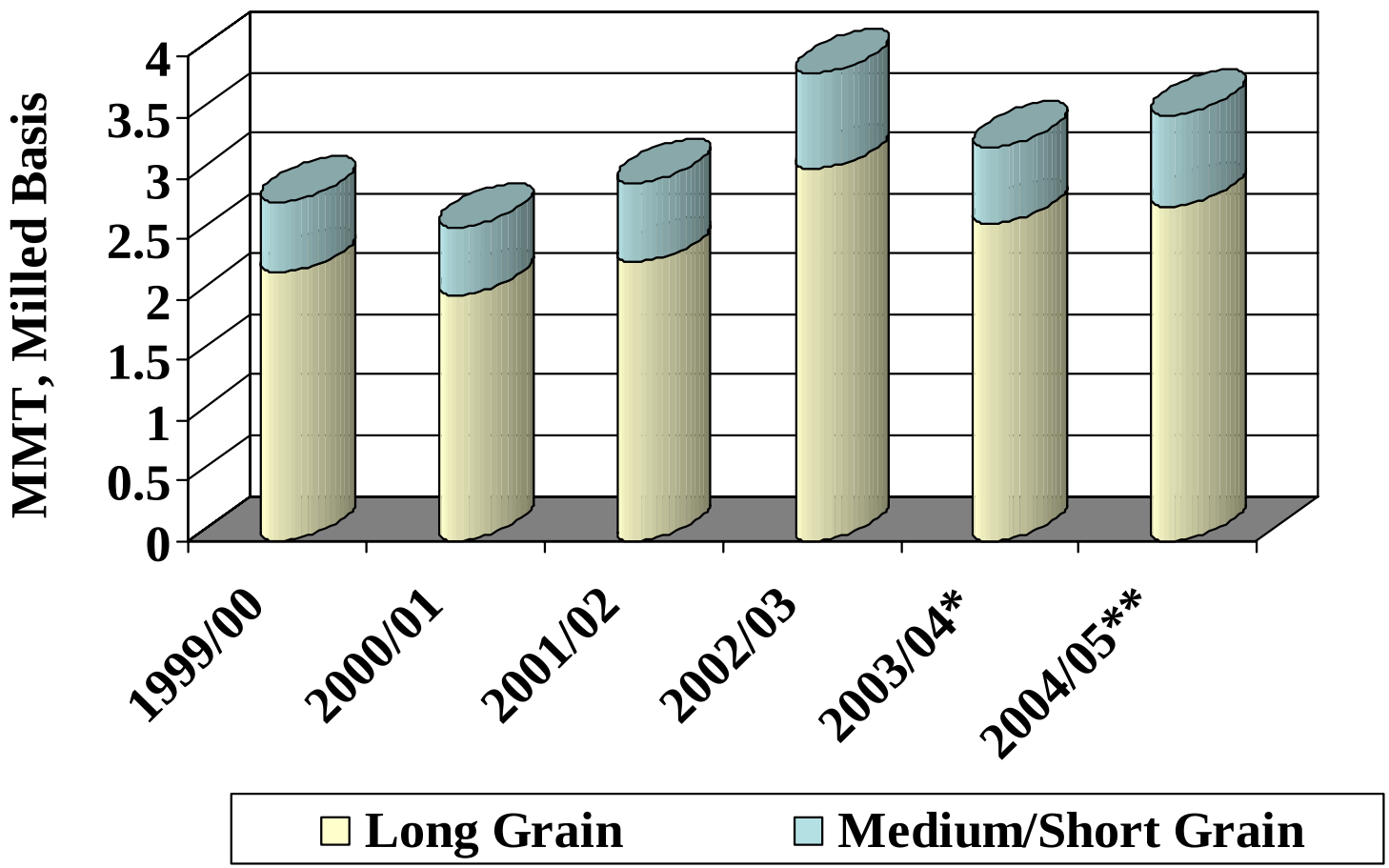
Near-record Export Forecast 2005

- US exports are estimated at 3.6 MMT in 2005 mostly based on exports to the Western Hemisphere



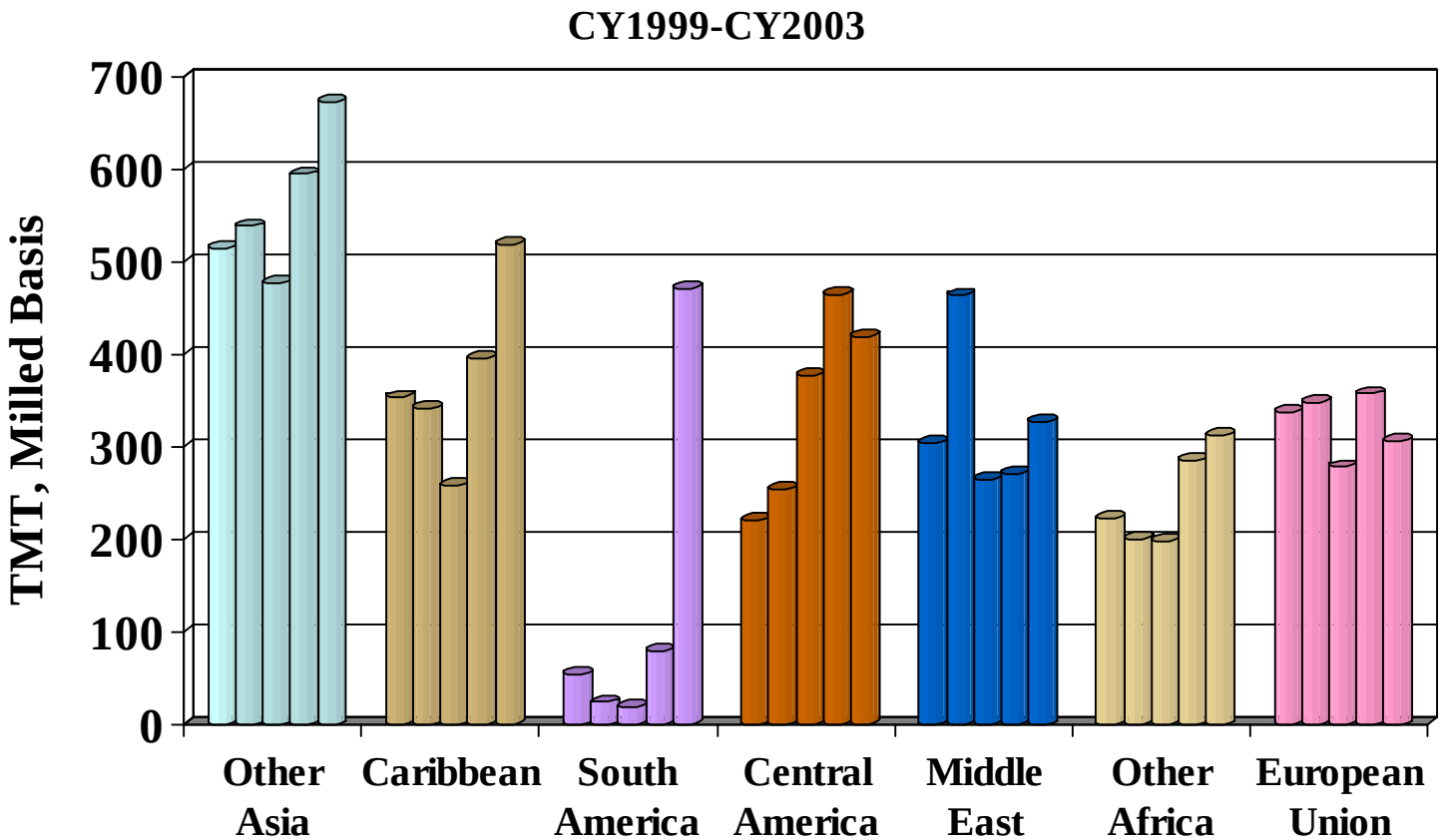
* Estimate **Forecast

Export Forecast by Type

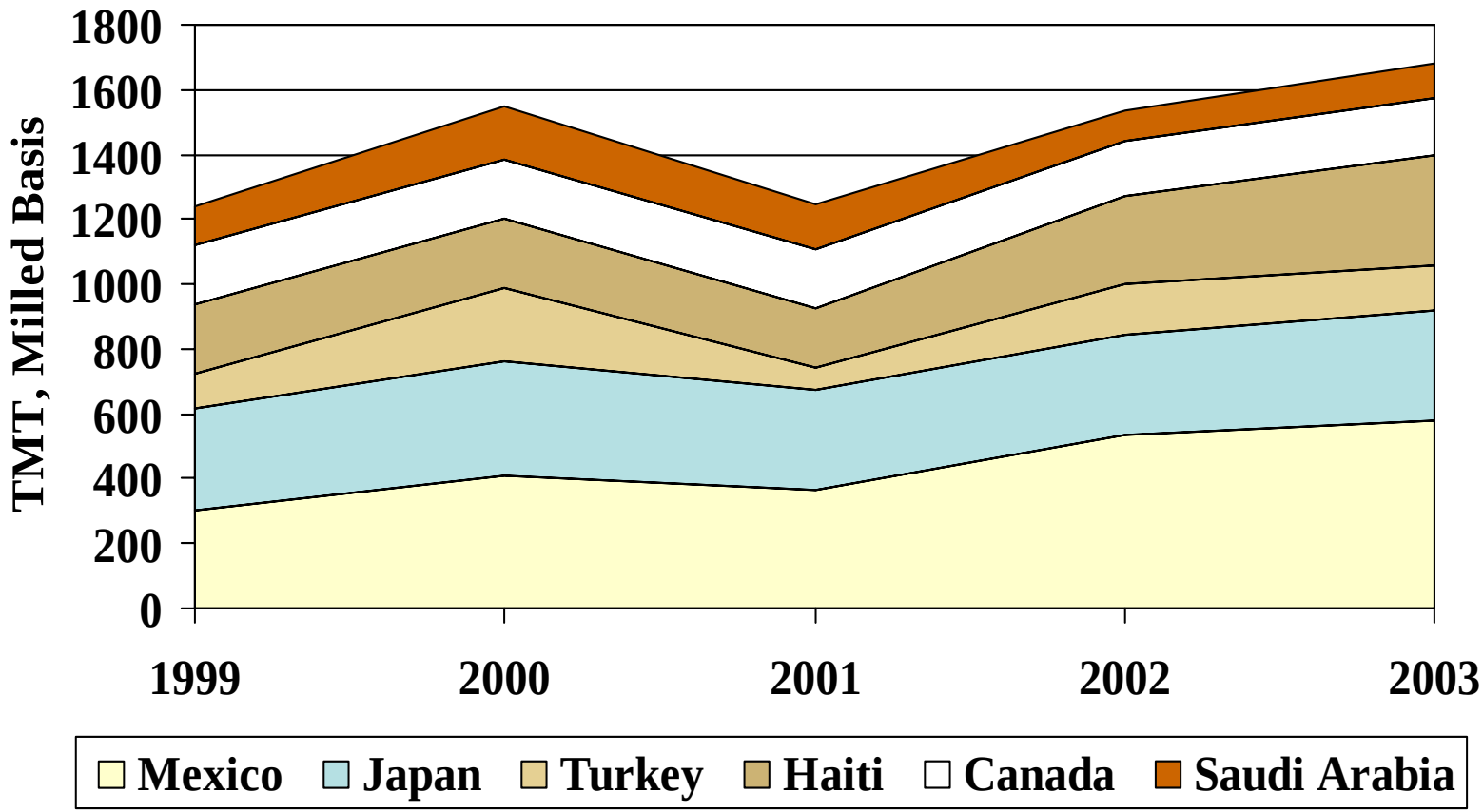


* Estimate **Forecast

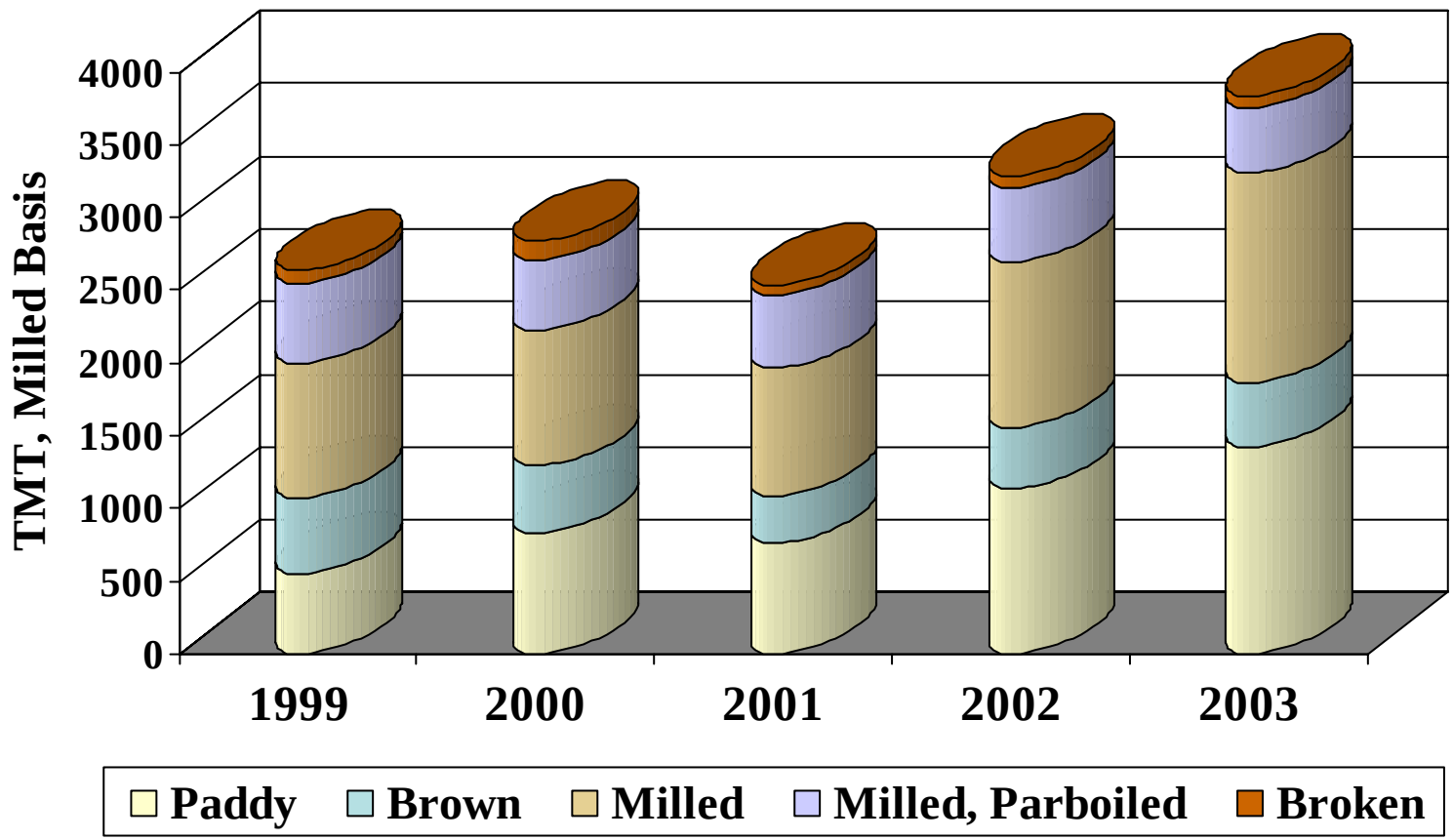
Export Composition: Top Regions



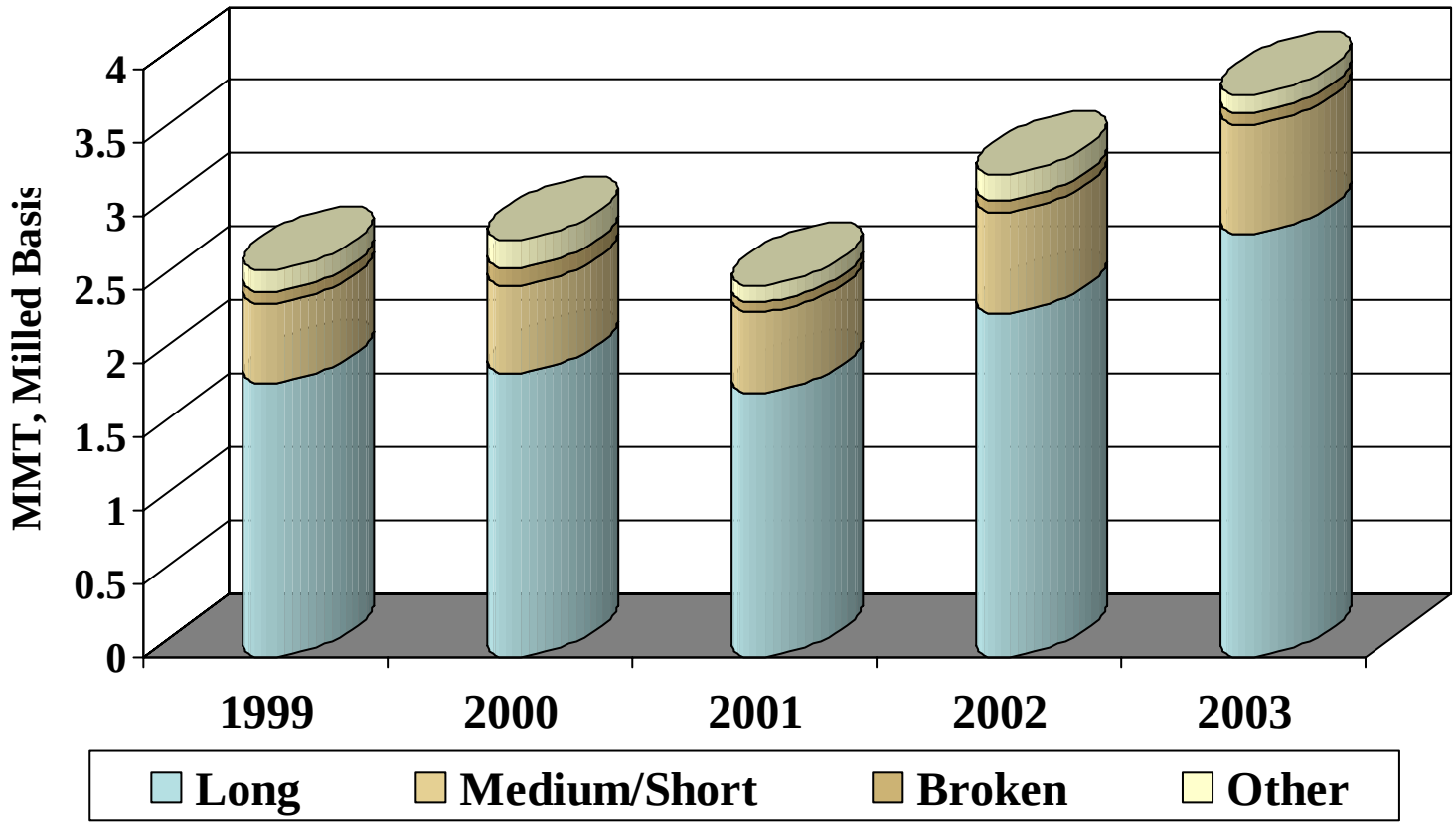
Export Composition : Top Markets



Export Composition: Type

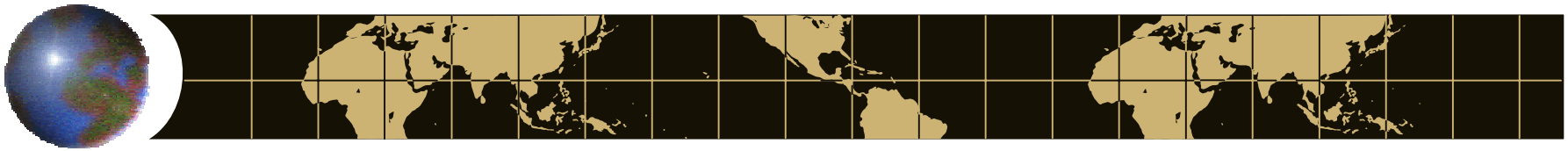


Export Composition: Grain



US Rice Summary

- Produces both indica and japonic;
- Reliable supplier of high quality rice
- Ability to supply most types and forms of rice to suit a variety of import demand



Useful Government Websites

- Foreign Agricultural Service
  - www.fas.usda.gov
- Economic Research Service
  - www.ers.usda.gov
- Farm Service Agency
  - www.fsa.usda.gov