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RDI Reform Design and Implementation

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Rice Sub-Sector Maps for the 1996/1997 Marketing Season

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RDI Acronyms List

ACRONYM	*DESCRIPTION*
AC	Agricultural Census
ACDI	Agricultural Cooperative Development Institute
AERI	Agriculture Engineering Research Institute
AHD	Aswan High Dam
AIC	Agricultural and Irrigation Committee of the People's Assembly
ALCOTEXA	Alexandria Cotton Exporters Association
APRP	Agricultural Policy Reform Program
ARC	Agriculture Research Center
ATUT	Agricultural Technology Utilization & Transfer Program
AY	Agricultural Year Locator (October 1st to September 30th of the following year)
BOD	Board of Directors
CAGA	Central Administration for Governorates Affairs
CAPMAS	Central Agency for Public Mobilization & Statistics
CAPQ	Central Administration for Plant Quarantine, MALR
CASC	Central Administration for Seed Certification
CASP	Central Administration for Seed Production
CAWD	Central Administration for Water Distribution
CBE	Central Bank of Egypt
CIDA	Canadian International Development Agency
CIF	Cost, Freight and Insurance
CIPE	Center for International Private Enterprise
CMA	Capital Market Authority
Co.	Company
CODEX	Code of Food Standards developed by an international commission in 1962
COP	Chief of Party
CSPP	Egyptian-German Cotton Sector Promotion Program
CTS	Cargill Technical Services
DA	Development Associates, Inc.
DAI/B	Development Alternatives, Inc./Bethesda
DEPRA	Development Economic Policy Reform Analysis
EAO	Egyptian Agriculture Organization

ACRONYM	*DESCRIPTION*
EEA	Egyptian Exporters Association/ExpoLink
EEPC	Egyptian Export Promotion Center
ELS	Extra Long Staple Cotton
EMIPAC	Egyptian Marketing Agricultural Company
ERSAP	Economic Reform and Structural Adjustment Program
ESAS	Egyptian Seed Association
ESAs	Employee Shareholder's Association
ESOPs	Employees Stock Ownership Program
EU	European Union
FAO	Food and Agricultural Organization of the United Nations
FDIs	Foreign Direct Investments
Fed.	Feddan = 4200 square meter
FIHC	Food Industries Holding company
FOB	Free on Board
FSR	Food Security Research Unit
FY	Fiscal Year
GA	General Assembly
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GOE	Government of Egypt
GTZ	German Technical Assistance Agency
HC	Holding Company
HEIA	Horticultural Export Improvement Association
IDA	International Development Association
IFC	International Financial Cooperation
IPPC	International Plant Protection Convention
IPO	Initial Public Offering
IIMI	International Irrigation Management Institute
IR	Intermediate Results
ITC	International Trade Center
JETRO	Japan Export Trade Organization
Kg.	Kilogram
Kt.	Kentar

ACRONYM	*DESCRIPTION*
Libra	Pound of 0.45359 kilogram, also abbreviated as lb.
LE	Egyptian Pound
LK	Lint Kentar of cotton, 50 kgs.
LOE	Level of Effort
LS	Long Staple cotton
MALR	Ministry of Agriculture & Land Reclamation
MENA	Middle East North Africa
MEIC	Ministry of Economy & International Cooperation
MIMW	Ministry of Industry & Mineral Wealth
MT	Metric Ton
MOF	Ministry of Finance
MoTS	Ministry of Trade & Supply
MPE	Ministry of Public Enterprises
MPWWR	Ministry of Public Works & Water Resources
MLS	Medium-Long Staple cotton
MVE	Monitoring, Verification & Evaluation Unit
NARS	National Agriculture Research Center
NBE	National Bank of Egypt
NCF	National Consulting Firm
NFPA	National Food Processor Association
NGO	Non-Governmental Organization
O & M	Operation & Maintenance
OSAF	Office for Studies And Finance
OVR	Office of Variety Testing & Registration
PA	People's Assembly
PBDAC	Principal Bank for Development and Agricultural Credit
PEO	Public Enterprise Office
P&L	Privatization & Liberalization
PIDP	Partnership In Development Project
PMU	Project Management Unit
PPC	Program Planning Committee
PRA	Participatory Rapid Appraisal
PU	Purdue University

ACRONYM	*DESCRIPTION*
PVP	Plant Variety Protection
RETD	Real Estate Tax Department
RDI	Reform, Design & Implementation Unit
ROW	Rest of the World
SCC	Sugar Crops Council
SCRI	Sugar Crops Research Institute
SIIC	Sugar and Integrated Industries Company
SK	Seed Kentar of cotton (157.5 kgs.)
SPC	Seed Privatization Committee
SS	Short Staple cotton
STTA	Short Term Technical Assistance
SWG	Sugarcane Working Group
TA	Technical Assistance
TAMIS	Technical & Administrative Management Information System
TAT	Technical Assistance Team
TF	Task Forces
TO	Training Officer
TOR	Terms of Reference
TNA	Training Needs Assessment
TRG	Training Resources Group
TSG	The Services Group
UIT	Unified Income Tax
UMD	University of Maryland
USAID	United States Agency for International Development
US$	United States Dollar
USPMA	U.S. Produce Marketing Association
USDA	U.S. Department of Agriculture
VAT	Value Added Tax
WB	World Bank
WTO	World Trade Organization
WUA	Water User Association

Executive Summary
Conclusions and Recommendations

It might be useful to deal with the rice industry in Egypt as one integrated "rice system" with the following major components :

- Farm supply sector including inputs needed to produce rice,
- farming sector activities where decisions determining cropping patterns including rice areas and varieties are made,
- post harvest operations and activities encompassing paddy rice marketing, rice milling and processing and white rice marketing at both domestic and international fronts. Figure (1) pictures the system and its components.

The success or failure of this rice system, therefore, is a function of the integrity and coordination of the aforementioned three sub-systems. Before nationalization (before the 1960s) and even during government intervention and under public sector management (1984 - 1991), the Egyptian rice system has proven to be well integrated and has operated efficiently. In both periods, the general trends of area, yield and annual production has tended to increase reflecting adequate incentive for farmers in terms of relative profitability of the rice rotation. Farmers area supply response became even stronger during the sixties due to both the establishment of the Aswan high dam increasing water supply for rice and the generation of new higher yielding varieties by the rice breeders of the Ministry of Agriculture whose programs are well integrated into production and milling activities. In addition, under public sector management, milling companies were upgraded and modernized through the introduction of the modern, more efficient Japanese rice milling technology, using rubber rolls instead of stone shellers.

The generally increasing exports of Egyptian rice found their way to several Middle Eastern countries, the Gulf, and the European and Asian markets. Rice with low and high rates of broken was exported. Quantities exported reached unprecedented rates during the second half of the sixties where about 800 thousand tons were exported in the 1967/68 season.

Because of the very low and fixed consumer prices in Egypt following the Government policy to provide inexpensive staple food, the per capita and total consumption of rice in the domestic market roared on the expense of Egyptian exportable rice.

Starting in 1986 and especially in 1991/92 rice liberalization policies eliminated crop area controls, price controls of both paddy and white rice, compulsory delivery of paddy rice, marketing regulations and input pricing.

With the significant changes in the Egyptian economy towards market driven forces, profitability became the major incentive of farmers and business firms throughout the economy. The initial drive in such an economy comes from the final consumer's market demands and price signals indicating end users' preferences. These signals trigger a series of backward derived demands on the outputs of the farm supply sector activities including: milled rice, paddy rice, and farm inputs needed to produce rice satisfying the ultimate consumer demand. This becomes like an automatic marketing system.

A basic requirement for the smooth operation of this automatic marketing system in the rice sub-sector depends on the existence of a conducive competitive environment in the rice market. For all market participants-public and private organizations- to perform effectively during the transition phase from a government-controlled system to a free market, the availability and implementation/delivery of the following market services are required:

Market-News System and Outlook Service

This involves the collection, analysis, and dissemination of complete, accurate and timely market news reducing risks and costs of marketing. The lack of this service causes the increase in rice marketing risk, cost, and consequently prices of rice and eventually lack of competitiveness and opportunities in the international markets.

The market share of private sector traders in both paddy and milled rice and the market share of private rice millers have been significantly increasing over time. However, the lack of relevant market information on rice prices and quantities demanded and supplied caused marketing costs to increase and Egyptian rice price levels became less competitive on the international market.

Official Grading and Standardization Systems

This involves the inspection and enforcement of quality control measures for both domestically and internationally traded Egyptian rice.

The lack of clear, well defined and enforced grades, standards and quality control measures deprived the market of a common language facilitating market communications among participants, reducing marketing costs, facilitating settlements of disputes, and helping to protect the image of Egyptian rice in world markets.

Enforceable Code of Ethics

These aim at protecting market participants and restraining trade against the public interest.

Producers, Processors and Traders Associations and Cooperatives
These organizations are capable of generating considerable market information and building useful communication channels with GOE and other entities.

Vertical Integration of Agencies
Such integration will enable companies to benefit from integrated large scale marketing.

Competition Policies
These are needed to detect and address monopolistic exploitation of consumers in rice.

Technical Assistance to Market Players
This can take the form of training programs for Egyptian traders, processors, and exporters to expose them to efficient marketing management techniques under free market conditions.

Market Research Programs
These programs are directed to help the authorities monitor domestic and international market activities and enable participants on both fronts to cope with prospective problems.

Idle Capacity of Public Rice Mills
Some creative solutions should be developed to address the huge unused capacity in the public milling sector.

A careful observer of the rice sub-sector can conclude that many of these measures are not in place. In that sense, the above mentioned issues represent a package of necessary policy measures to address the current instability of the rice markets in Egypt. Recently, a group of growers, private and public sector millers, traders and exporters initiated efforts to coordinate their activities with the public milling sector through an umbrella organization. The Egyptian rice union/association, currently being established, will be providing many of the elements of the marketing services package.

Introduction

Rice is one of Egypt's most important staple foods along with wheat and beans. Progress has been made over the last few years in implementing reforms in the Egyptian economy and, in particular, the agricultural sector. Wailes discusses three recent stages of change in terms of rice production in Egypt[1]. He labels the period from 1965 - 86 a "pre-reform period" during which there was a large area expansion in rice, major technological change, (increase in yields from crop breeding), and increased use of machinery. The period from 1986 - 89 he calls a "first reform stage" in which use of inputs were liberalized and crops other than rice and cotton were liberalized. In the second stage of reform, beginning in 1990, rice marketing was liberalized.

All mandatory delivery quotas for rice, storage and transportation restraints, and many limitations on private mill operations were eliminated. Also, the minimum export price on rice was eliminated in 1992. Additional freedom in export pricing was given in 1993.

These reforms of the rice market have contributed to a significant increase in rice production. The number of feddans planted to rice remained fairly stable from 1970 through 1989. Policy reforms have induced higher procurement prices which encouraged a significant increase in cultivated area from 983 thousand feddans in 1989 to 1,227 thousand feddans in 1996. This was accompanied by steadily increasing yields to about 3.42 tons per feddan in 1996, among the highest yields in the world.

On the other hand, the ninetees have witnessed a serious lack of coordination in the market channels from production to milling to marketing. This has led to a market dis-equilibrium characterized by high paddy prices. The rice sub-sector, though almost fully liberalized, is not operating as efficiently as it could be. The sub-sector analysis using sub-sector maps helps identify these constraints with the ultimate aim of developing strategies for the rice sub-sector within the desired agricultural policy reforms of the Egyptian economy.

Study Approach

- Conduct a limited survey of small rice mills, old and new commercial mills to identify their existing number, capacities, cost structure and pricing and distribution pattern during 1996/97 marketing year. Nine

[1] University of Arkansas, Fayetteville," Impacts of Agricultural Policy Reforms on Rice Production, Milling, Marketing, and Trade in Egypt", University of Arkansas, PBDAC, MALR/USAID, March 1995.

private mills were surveyed in Sharkeya, Beheira, Dakahleya and Kafr El-Sheikh governorates to collect data required for developing the sub-sector maps and industry diagnostic.

- Conduct a limited survey of public mills to identify their capacities, cost structure, and progress with the privatization process. Seven public milling companies were surveyed during the period May 18 - June 14, 1997. The surveyed public mills were in Dakahleya Governorate (Dekerns), Kafr El-Sheikh Governorate (Fewa), Gharbeya Governorate (El-Nasr), Dakahleya Governorate (Abu-El-Fotouh), Kafr El-Sheikh Governorate (El-Nasr), Alexandria Governorate (Semouha) and Behera Governorate (Abu-Homos).

  - Draw on the data gathered by the MVE unit of APRP as part of their study of several rice benchmarks.

- Conduct interviews with rice producers, traders, millers, and exporters to identify growth opportunities and constraints affecting the marketing channels.

1996-97 Production and Consumption

The 1996 Egyptian rice crop with 1.4 million feddans and an average yield of 3.42 tons/feddan gave total production of 4.788 million metric tons (MMT) of paddy rice. The planted rice area increased between 1980 and 1995 by 44 percent and yields increased 36 percent during the same period increasing rice production from 2.38 MMT in 1980 to 4.788 MMT in 1996, or 101 percent in 16 years.

Rice has become increasingly important in the Egyptian diet. Total consumption of rice in Egypt has rapidly increased in the late 1960s and early 1970s. During the late 1970s and 1980s consumption was relatively stable between 1.4 MMT and 1.6 MMT. Since 1988 total domestic use has increased from approximately 1.4 MMT to 2.5 MMT by 1994 (10% annual increase). This represented an increase in per capita consumption from 27.2 kg in 1988 to 43 kg by 1996. The 1996 population estimate for Egypt is 60.6 million. The current population growth rate is estimated at 2.2% per annum. Using these estimates, the total white rice consumption requirement for Egypt in 1996-97 is 2.66 MMT of white rice.

Post harvest losses in storage, transportation and mechanical losses are estimated at 5 percent[1]. This represents 0.239MMT of paddy rice. At the

[1] Rihan M., H., Nasr, and others, economic Feasibility Study for Handling and Storage of Grain Crops In Egypt, PBDAC/ SIT/ World Bank Project, 1991.

1996 production level of 4.788 MMT and an average milling rate of 67% the amount of white rice available is 3.2MMT. (A milling rate as low as 60 percent can be expected for export rice to obtain better quality with low percent brokens. (Grade 1 = less than 3% broken). For domestic sales the percentage of broken rice can be as high as 15 percent which means that the milling rate will be higher, close to 68%. Thus, it appears that there is sufficient rice to export approximately 0.54MMT in the 1996-97 season.

Private buyers bought almost all of the rice that producers sold in 1996. Bidding for rice was vigorous and the paddy rice price was bid up to LE 850/ton compared to a purchase price offered by the public mills of only LE 550. The paddy price was bid up so high that exports became relatively unprofitable. A considerable quantity of the rice, some say 30 percent, is still held by small private buyers who are waiting for a good price. Some exporters have commented that a lot of this stored rice was stored in plastic bags at too high humidity and is spoiling in storage. Some poor quality rice has been offered for sale recently at LE 600/ton. If some speculators get tired of holding it, the price will likely decline and then exports late in the season may expand.

Disposition of Paddy Rice

By Producers

Based on 5 years of survey data of rice producers the percentage of the rice production going to the farm rice workers in 1996-97 is estimated at 6 percent [Table (1)]. This represents payment for farm labor used in rice production. The share kept for family use dropped with the cancellation of mandatory delivery quotas. During the three years after cancellation of these quotas, 1992-94, the average share kept for family use was 23.5 percent. With increasing yields the share needed to meet family consumption will decline, hence retention for family use is estimated at 19 percent for food and 1 percent for seed. This 20 percent of production is not sold as paddy rice. It is all milled in small village mills or farmers own mills and then goes direct to consumers (stays in the family). Very little of it is sold as white rice. (Regardless, all goes from the village miller direct to consumers).

By Private Dealers

Our estimates indicate that about 70 percent of the produced paddy rice in 1996 (3.35MMT) was sold by producers to private dealers. Many agricultural people say that the majority of these dealers are large rice producers. (This is also true for fertilizer and cotton).

In the 1993-94 study the average purchases of paddy rice per dealer was 122 tons. In 1994-95 the average per dealer was 142 tons. Based on these estimates the total number of private dealers in 1996 would have been 22,700 to 26,500. This is an unreasonably high estimate. There are at most 2000 villages in the rice growing areas (2,467 villages reported in Lower Egypt in 1995 by CAPMAS) and it is highly unlikely that there would be 11-13 dealers per village. Also, it is expected that these dealers under-report their volumes by a large fraction for taxation reasons. Thus, a more realistic estimate is 4 dealers per village and 8,000 dealers in total with an average volume in 1996 of 418 tons/dealer. There is a wide range in estimates of the volume of these dealers, from 50 tons to several thousand tons. Some of these dealers buy also from other dealers, they sell to dealers in other areas, mostly non-rice producing areas, and many deal in white rice. Many dealers have their paddy rice milled in the village mills and then sell to consumers, dealers in other areas, or to retail stores.

Surveys were conducted of dealers for three years [Table (2)]. These data show that a lot of paddy is sold between dealers. Most of these transactions represent sales by dealers in rice producing areas to dealers in rice deficit areas. These transfers between dealers are not shown in the rice sub-sector maps.

Eventually, all rice purchased by dealers goes to the mills but 'which type of mills?' The data in Table (3) shows a very different story in each survey year. The only thing clear is that it is not milled in public mills. The flows shown in the sub-sector maps are based primarily on milling capacities.

The percent of paddy rice which the private dealers retain, mill and sell as white rice varied considerably between the survey years. The average for the 3 years was 20 percent. This estimate does not determine the pattern of rice flows, only the ownership.

In drawing the sub-sector maps it was assumed that all paddy rice that private dealers deliver to village mills is retained by the dealers and all paddy rice they deliver to the commercial mills is sold to them. This of course is not true but it is not too far off and makes things a lot simpler.

Table (4) presents data from three survey years on the disposition of white rice by dealers, divided between consumers, retailers, and wholesalers. These results varied considerably between years. In general, over time there was a shift from selling to consumers to selling to dealers. Thus, in the sub-sector maps it will be assumed that white rice sales by dealers are only 20 percent direct to consumers (20 percent of the paddy delivered to village mills). Thus, 29.1 percent of the rice (80% of 36.4%) is milled by village mills for private dealers and then sold by the dealers to wholesalers or retailers. And, 29.7 percent of the paddy rice is sold to commercial mills who mill it and sell it to wholesalers or retailers, except what they use for export.

In the 1993-94 survey, 55 percent of the white rice sold by new commercial mills was sold at the wholesale level and 45 percent at the retail level, direct to consumers. However, this pattern is not expected to prevail with the new commercial mills. More of their output is expected to go to wholesalers and retailers and less to consumers. In the maps none of the rice milled by commercial millers goes direct to consumers. This of course is a simple assumption but with the increase of so many new commercial mills in the last two years the old estimates are useless. Again this is probably close.

Rice Milling Industry Structure

Public Sector Mills
Capacities, Procurement and Operating Rates

The structure of rice marketing is highly dependent upon the structure of the milling industry. For many years the milling sector consisted of two major components and a minor one. One major component was the public mills which are large in capacity/mill. The public sector consists of 52 mills with a total annual milling capacity of 1.13MMT/year (average 22,600 tons/mill/year and 221 milling days/year.) The 52 public mills are housed in 52 public sector milling companies located in the 5 rice producing governorates: North Rice Mills Company, Alexandria Mills Company, El-Behera Mills Company, Kafr-El-Sheikh Mills Company, El-Sharkeya Mills Company, Gharbeya Mills Company. This is in addition to the Rice Marketing Company in Cairo.

Each of the surveyed public milling companies operates from 4 to 7 mills. Their maximum capacity ranges from 3.97 ton/hour to 10.8 ton/hour. This translates into 91 to 23 ton per day or 35 to 65 thousand tons per year per mill [Table (5)].

After removing all restrictions on rice production and trading (second phase of reform, 1990), the voluntary government procurement price for public sector companies was increased from LE 362 in 1989 to LE 550 per ton in 1996. The market price was considerably above that level, about LE 850 per ton in 1996. As a result, a significantly lower percentage of the crop was sold to government mills in 1996.

Table (6) shows a serious decline in the volume of paddy rice procured by public millers from 1.087 MMT or 47% of production in 1985/86 to 0.95 MMT or less than 10% of production in and 1996/97.

Basically, the public sector was not competitive in price. Table (7) below shows a comparison of prices paid for paddy rice in recent years by the two sectors:

As a result, in 1995/96 the public mills milled only 0.338 MMT tons of paddy rice that had been purchased by the GOE (7% of the crop) and milled 215,000 tons on a custom service basis for the private sector. As previously mentioned, the public sector was offering LE 550/ton in 1996 and the private dealers were paying LE 850.

The reduced procurement over the years led to less utilization of public mill capacity and consequently to increased average milling cost/ton. Table (8) shows the declining operating rates of the surveyed public mills which, on average, did not exceed 43.1% during the period 1991/92 - 1995/96.

Milling Charges

Milling charges received by public companies ranged between LE 146/ton to LE 232/ton) in 1995/96 [table (9)]. It shows a rapid increase in the milling charges received by the public mills of 97 to 131 percent in 1995/96 compared to 1994/95. On average, the milling charges increased from LE 130/ton in 93/1994 to LE 160/ton in 95/1996 with an annual growth rate amounting to 10%. This compares with LE 15-50/ton for all types of private mills. This resulted in a sharp drop in operating rates to only 5% of their capacities in 1996.

The survey results showed that the reasons for the relatively high public milling cost were:

- the high labor cost due to excessive administrative labor burden. The survey results showed that labor cost/ton ranged between a minimum of LE 30/ton to LE 118/ton, representing about 15 to 59 percent of the cost of milling one ton of paddy.
- the poor quality of the paddy received by public mills from cooperatives
- the high financing charges resulting from excess and overdue debts.
- high maintenance and depreciation cost.
- the high transport cost due to the long distances of transporting paddy rice to the mills.
- the high storage cost due to limited storage spaces and long time of storage at the mills sites.

Table (10) indicates that public milling companies realized considerable losses of LE 124 millions in 1995/96. The Rice Marketing Company was an exception with a profit of LE 1.9 million in the same year. Most losses of public companies were realized in the last two years.

Valuation

Table (11) shows the asset based (as compared to profit or cash flow based) market valuations of selected public mills conducted by a team of specialists of accountants assigned by the Holding Company for Rice and Flour Mills. The following can be summarized from the table:

- Average value of a public mill ranged between LE 9.5 millions and LE 33 millions depending on the age of the mill. These included the values of land, buildings, equipment, transportation fleet and other assets.

- Land is the single largest component of the asset value of a mill since as it ranged from 31.4 percent to 84 percent of total value of the mill.

- The value of buildings and construction ranged between 12 percent to 46% of total mill asset value. On the other hand, the value of equipment and machinery is relatively low since it ranges between 5.6% to 37% of the total value of the mill.

With the extremely low margins that rice mills currently generate, the high real estate value of the land becomes an impediment to a speedy privatization process, especially that GOE requires that the investor maintains the rice milling line of business.

Private Village Mills

Private mills are divided into small village and commercial mills. As for private mills there are 3,588 small privately owned village stone mills licensed in 1996/97 in addition to 2,001 small unlicensed mills. Those mills are low technology and inefficient but their milling costs have still been lower than that of both public and commercial mills. In between the small village mills and the public mills are some 147 commercial mills with much larger capacity and mainly for export.

The old small, single pass village mills have, on average, a milling capacity of 1-2 MT/12 hr/day [Table (12)]. These mills normally operate only 10 -12 hr/day and a variable number of months per year. In other words, the length of their operating day and season varies. Data on operations of these mills for five recent years are available. The obvious conclusion is that output/mill/month, or per season, has been rising in recent years, particularly since 1994 when purchases by the public mills began to decline.

Some rice farmers have small mills that are powered with their tractor which they position in the fields, and move from village to village. These mills are

included in the category of village mills since the quality of the product, the capacity, and the ownership structure is similar to that of village mills.

A sample survey of 36 privately owned small village, old, and new commercial mills was conducted in Sharkaya, Behera, Dakahleya and Kafr El Sheikh governorates. Results of this survey are reflected in tables (1) to (4) and table (13).

At full capacity utilization, as defined as 8 hours per day, 300 days per year, the average milling capacity is calculated at 600 tons per year for village mills. The surveyed mills were in operation for 10 months in 1996/97. Meanwhile, the surveyed capacity of the commercial mills ranged between 15-100 tons/day depending on the size, type and age.

In the surveyed governerates, farmers supplied 72 percent of the paddy to be milled (for their own use), wholesalers supplied 12 percent, wholesalers from other governorates supplied 2 percent and the rest 14 percent was supplied by retailers.

The average price paid for paddy rice was LE 850/MT. The average price received for milled rice was LE 1,275/MT. Average milling rate for the small village mills is estimated at 60 percent. Estimated average milling cost is LE 10/MT. Average margin for the small village mills is LE 20/MT.

Recently many new village mills have been built. They are being constructed in the local villages at an investment cost of only LE 1,500 for the mill and LE 15,000 for the electric motor and the other equipment. The current estimated number is 5,588 since there are 3 - 7 of these in each village in the rice growing areas. The new mills are assumed to operate at close to one full day for about two months of the year and at very low capacity the rest of the year (6 tons/day for 55 days + 1 ton/day for 280 days = (600-610 tons). (This implies about 1/2 ton/hr of maximum capacity).

The estimated total quantity milled by this category of mills was only about 0.79 MMT in 1993 and 1.14 MMT in 1994 but is estimated at 3.352 MMT/year in 1996/97.

In 1994-95 these mills received 69 percent of their rice from farmers and 31 percent from dealers. In 1993/94 the average village mill purchased 47 percent of the rice that it milled. The Tranche VI report (1992-93) indicates that only 11 percent of these mills gave storage space for rice but the average capacity per mill was 5 tons.

Most observations currently are that these village mills do not buy rice but mill for a fee of about LE 30/ton of paddy. Some mill managers convince customers to give them all of the by-product in exchange for milling. This is a great deal for the miller since with a milling rate of 65 percent there would be

350 kg of by-product per ton of paddy. The by-product is worth LE 300/ton so he would be getting paid about LE 105/ton milled.

In many cases, these rice mills are operated by the same firms that operate the small village wheat flour mills, but at different seasons of the year.

Old Private Commercial Mills

The second category of mills are called "commercial", also called "scrubbers" which were also in existence prior to liberalization of the rice markets. The number of old commercial mills has been variously listed as 30-40 and their average quantity milled per season is as follows:

1992 = 341 tons/mills
1993 = 381 tons/mill
1994 = 659 tons/mill

The total quantity of paddy rice milled by this group of mills was only about 12,000 tons in 1992 and 23,000 tons in 1994. This represented less than 0.3 percent of the paddy rice produced in 1992 and 0.6 percent in 1994. This group may operate more hours/day and/or more months/year but total milling capacity of this group, by definition, is not increasing in numbers. Estimated tonnage per mill in 1996-97 is 900 tons. Additions to the commercial sector are in the "New" sector.

Data was collected for twelve old private commercial mills. These were established before 1992 and they are 20 years old. Average designed milling capacity of these mills is 2400 tons/year per mill. These mills were in operation for 10 months for the year 1996/97. These mills, unlike the new commercial mills, are relatively less dependent upon wholesalers, but more on farmers and retailers.

The average milling rate for these mills is estimated at 65 percent. Estimated average milling cost is LE 20/ton. Average margin for the old commercial mills is estimated at LE 20/ton.

New Private Commercial Mills

In recent years a new category of mills has appeared which we call the "New" commercial mills. This group has appeared as a result of the permission granted to the private sector to engage in exports in 1992. The village mills and old commercial mills produce a high percentage of broken rice (11-15%). In 1993-94, 215,000 tons of paddy (144,000 tons of white rice) were milled in public mills on a custom basis for private export. In 1995-96 at least two public mills (perhaps more) were leased for the full season by private firms.

In 1996-97 no public mills were leased by the private sector but some rice was milled in public mills on a custom basis for the private sector. Our estimate on this is 10,000 tons.(0.02%).

Many new small mills have been imported in the last 2-3 years. The European and Japanese design produce export quality rice but many Chinese mills that have been imported produce up to 20% broken (non-exportable). The capacity of these mills range from about 3 to 10 tons/hr. However, the number of these new mills, and hence the capacity of the sector, is very hard to estimate. The Social Fund for Development has been financing small mills but no data are available on numbers.

Most private exports now have their own small mills. For example, El-Mabrouk has a mill that will do 5 tons/hour and 120 tons per day. It will be used to mill 38,000 tons this season. It cost LE 2 million two years ago and requires a work force of 50 for 24 hr/day operation. Mecca Mokaramma has a Chinese mill that requires 23 workers and mills 100 tons/day. There are many mills ranging from 3-9 tons/hour. Based on the number of new mills registered in Dakahleya governorate, we estimate a total for Egypt of 10 new commercial mills with average annual capacity of 40 thousand tons/year for a total of 400 thousand tons.

For simplicity it is assumed that all rice milled by the commercial mills is purchased by the mills from private dealers. They no doubt mill some quantities for a fee but these are probably small amounts. It is also assumed that commercial mills do not deliver any rice directly to consumers. This is also a simplifying assumption but it is expected that very little would go from these commercial dealers to consumers. But also, we have wholesalers or retailers so these two groups have to be treated as one in these maps.

The twelve mills surveyed were established in 1993. The average designed milling capacity of these mills ranges from 9-30 thousand tons/year. These mills operated 10 months in 1996/97 compared to 8 months in the year 1995/96.

The average price paid for paddy rice was LE 850/ton. The average price received for milled rice was LE 1,300/ton. Sales of rice by-products was estimated to average LE 300/ton in 1996/97. These mills have a high milling rate of 70 percent. Estimated average milling cost is LE 35/ton. Average estimated margin for the new commercial mills is LE 30/ton.

Milling Charges

Milling charges of about LE 30 were reported for village mills, except those mills that kept all of the by-products. Rates reported cover a wide range. For commercial mills the rates reported varied from LE 80 up to LE 130.

Probably, the high rates apply to white rice. Also, charges for milling for export would likely be higher since a better mill is required.

Assessment Of Potential Milling Capacities By Governorate

Table (14) summarizes the survey results on the rice milling capacities by governerate as follows:

- Total national excess capacity in rice milling is assessed at 1.8MMT or 40% in 1996/97 which exceeds the maximum milling capacity of public mills in the same year.
- The situation is worst in Kafr El Sheikh and Sharkeya where milling capacity is 47% and 44% in excess of production respectively.
- One may conclude that extensive integration/liquidation is anticipated in the rice sub-sector over the coming few years.

Privatization of the Public Mills:

The Chairman of the Rice and Flour Mills Holding Company has recently announced ambitious plans for privatization of the public rice mills. Some mills have already been put up for bids. We heard in the field of two bids for one mill. They want to sell 17 mills by June 1997 and will offer 33 mills for sale by Dec. 1997. The mills will be sold by the end of 1998. He had a privatization plan which basically was a schedule of what mills will be put up for sale on what dates. Buyers must retain all workers but are required to pay them only the base salaries, which represents 60 percent of their monthly pay, but no bonuses or other benefits. Private rice dealers have remarked that the land with these mills is very valuable and so the mills may sell only for the land with the mills being scrapped.

The privatization report lists 33 working mills in the 5 public sector milling companies.

The privatization report shows 6630 workers in these five public milling companies with an annual labor cost of LE 35.2 million. Total long term debt of the 5 companies is LE 365 M. We have no information on what they will do with the debt.

These mills have capacities averaging about 3,000 tons per month. A 5 ton/hour mill can mill that amount in 25 days at 24 hrs/day. Hence these are of a size that a large private exporter could use, and they produce high quality rice. New mills of this size are available for LE 2-3 M.

The public sector has been too slow in putting these up for sale. Most of the potential buyers (private traders/exporters) have already acquired their own rice mills.. The GOE would have had many more buyers 3 years ago than

now. Now each buyer can bid on only one mill. There is now in Egypt enough milling capacity in the private sector without the public mills. This capacity was not here 3 years ago.

Mill Labor Costs and Privatization

Village mills are one man operations where at a rate of LE 10/day, a man can mill 2 tons. These mills run only a few hours per day most of the year, thus a labor cost of LE 5/ton is estimated.

El-Mabrouk has a labor cost of about LE 6.30/ton. The data obtained from El-Faranna indicate a labor cost of LE 21/ton but when operating at about 1/3rd of capacity. At full capacity he would have labor costs of about LE 7/ton. Mecca Mokaramma has an average labor cost for milling of LE 23/ton but he is also under capacity. At capacity his labor cost would be about LE 4/ton.

The small new mills that are included in the sub-sector maps are assumed to be run by three men. Annual labor costs for these three men would be about LE 15,000 (LE 5000 each) with average output of 3,965 tons or LE 3.78/ton.

In the public mills the data reported indicates average annual labor cost per mill of the 33 mills of LE 1.06 M/mill/year for 201 workers. This is LE 5,273/worker/annum. Even with average output of 22,600 tons/year, the labor cost is LE 46.90/ton.

Using these estimates, a labor cost for milling in the private sector is estimated at LE 3.12/ton or a total of about LE 14M for the private sector. Total 1996-97 labor costs for the public sector amounted to about LE 3.497 millions in the year of 96/1997 with an average of LE 35/ton in the same year (total actual capacity about 100 thousand ton).

Mill Investment

Very little data is available on investments. The new village mills which are built in the villages sell LE 3,000/mill (LE 5/ton/yr). The small commercial mills of 3,965 tons/year output cost LE 45,000 (LE 11.4/ton/year). The larger European mills with a capacity of 5-9 tons/hr and output of 35,000 ton/year are available for LE2-3 M. (LE 57/ton/year).

Total investment in the private sector mills is estimated at LE 52 M, but this is a very rough and crude estimate. The Holding Company for Rice and Flour Mills has indicated that the book value of all public rice mills in June 1996 amounted by LE 840 million.

Rice Exports

Following a record export level of 772 thousand MT in 1968, Egypt's rice exports declined precipitously through the early 1970's, then stabilized at an average of 150 thousand MT during the late 1970's . Exports reached a low of 16 thousand MT in 1984, but trended up to 250 thousand MT by 1993. Exports reached 200 thousand MT from the 1996 crop. Thus, despite a rapid growth in rice production, Egypt's domestic use has kept pace, limiting further increase in exports.

Public sector mills were the main source of export-quality rice till 1989. Exports by the private sector were permitted beginning with the 1991-92 year. In that first season there were 20 private and 7 public exporting firms. Private exporters have become more important since then. In 1995-96 there were about 70 private exporters and 6 public exporters. It is estimated that at least 80 percent of rice exports are now handled by private traders. They concentrate their sales in nearby Middle East and African countries as compared to the export markets served by the public trading company.

Most, but not all private exporters have their own rice mill. Those who want to export rice purchase a European or Japanese mill which will give good quality milled rice. These mills have a capacity of 6-9 tons per hour and will mill 30-35,000 tons per year, plenty for most exporters. The biggest exporter in 1995-96, Wakalex, exported 67,000 tons. He has no mill but he custom hires other private millers to mill for him.

There were several different estimates received for exports for 1995-96 which varied between 350,000 and 400,000 tons. Everyone in the trade expects lower exports in 1996-97 than 1995-96 because local private buyers have pushed the price of paddy rice up so high that it does not now pay to export. Export prices reported for 1996-97 range from $385 to $430, depending upon grade and country buying but about $410 would be an average. (This is FOB Alex.=LE1,400/ton).

For export, the milling percentage is lower than for domestic sales since the broken percentage must be lower. It also varies with variety but an average milling rate of 60 percent for export is appropriate. Milling costs for export for this season are estimated at LE 90/ton of paddy at private millers and up to LE 220/ton at public mills.

Thus we have the following calculations for exporting rice at current prices: Paddy rice = LE850/ton, milling +LE90 = LE 940/ton. With a milling rate of 60%, 1.67 tons of paddy give one ton of white = LE1567. With an export price of LE1400 the exporter would be losing LE167/ton. Or, with an export price of LE1400 one could only pay LE750 for paddy - LE90 for milling or a total of LE840 (1400/1,67 = 838).

Actual exports to the end of February were about 8000 tons by the public sector and 75,000 tons by the private sector. Obviously some exporters have bought paddy for LE750. However, if paddy rice prices decline, exports will expand.

Total exports may be anywhere from 150,000 to 300,000 depending upon the price of paddy the rest of the season. Previously, I estimated that 381,000 tons of paddy are available for export, assuming 2.65 M. tons of white rice needed for domestic consumers and 5 percent loss of paddy. Many reports have been received of polypropylene bags. Losses in 1996-97 are more likely to be higher than 5 percent than they are below 5 percent. With a loss estimate of 5.5 percent there would be only 335,000 tons of paddy available for producing exportable rice. (The writer will use a figure of 200,000 tons of white = 335,000 tons of paddy).

Privatization of Rice Seed[1]

The normal seeding rate for rice is 1/2 ardeb (60 kg) per feddan. All production of certified rice seed was under the supervision of the Central Administration for Seed Production (CASP) of the MALR until recent years.

The CASP procedure is to select rice producers, usually large growers, with whom they have contracts plus a bonus for purity and another bonus for multiplication. For instance in 1995 the contract seed growers were paid LE 66/ardeb base price plus LE 6 and LE 6 for the two bonuses for a total of LE 78. This price is LE 0.608/kg or 608/ton. This was a good price in 1995 when the market price was LE 550/ton but was not attractive in 1996. Thus these farmers tend to deliver only half of their rice production to CASP and the rest they sell on the market, possibly even to private sector seed dealers.

Certified seed for planting, after processing, was sold to farmers in 1996 for LE 90/ardeb. This price has been increased from LE 90/ardeb in 1993 purposely to encourage private dealers to produce seed.

Privatization of rice seed is occurring rather rapidly. In 1992-93 all of the certified rice seed, 4,753.8 tons, was produced and distributed by the CASP. In 1993-94 the private sector furnished about 10 percent of the certified seed. By 1996 the private sector share had increased to about 20 percent.

The 1994-95 rice study reported that 38 percent of the rise seed was obtained from the farmers' own previous crop and 14 percent from other farmers. Thus, it is estimated that 50 percent of the total seed requirement is from farm use and 50 percent is certified seed purchased from private dealers or CASP.

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[1] Seed is often measured in ardeb. An ardeb of rice equals 120 kg.

There are no available data to confirm this estimate.

ANNEX [A]

RICE SUB-SECTOR TABLES

⇒ Table (1) : Disposition of Paddy Rice by Producers
⇒ Table (2) : Disposition of Paddy Rice purchased by Private Dealers
⇒ Table (3) : Milling of Paddy Rice by Rice Dealers
⇒ Table (4) : Destination of White Rice by Dealers
⇒ Table (5) : The Design Capacity of Surveyed Public Mill
⇒ Table (6) : changes in Public Sector Procurement of Paddy Rice
⇒ Table (7) : Comparison of Paddy Rice Procurement Prices
⇒ Table (8) : Paddy Rice Quantities Processed by surveyed Public Mills and Percentage to Design Capacity
⇒ Table (9) : Changes in Milling Charges of the Surveyed Public Mills
⇒ Table (10) : Profits and Losses of the Public Rice Mills
⇒ Table (11) :Total Market Values of Surveyed Public Rice Mills
⇒ Table (12) : Operating Characteristics of Small Village Mills
⇒ Table (13) : Major findings of the Private Mills Sample Survey
⇒ Table (14) : Rice Milling capacities by Governorates

Table (1)
Disposition of Paddy Rice by Producers

	Percent of Paddy Rice produced				
Year	**1991**	**1990**	**1992**	**1993**	**1994**
To farm workers	10.2	8.6	4.7	6.7	5.6
Family consumption	40.9	32.6	20.5	27.2	22.8
Private sector	28.9	20.6	49.9	57.6	71.2
Public sector	20.0	38.2	24.9	8.4	0.5
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

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Table (2)
Disposition of Paddy Rice Purchased by Private Dealers

Method of Sale	Market Year		
Sold as paddy	59	70	68
Milled	20	11	28
Stored	20	18	3
Kept for own use	1	1	1
Sold to public mills	0	1	0

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Table (3)
Milling of Paddy Rice by Rice Dealers

Type of mill	Market Season (in %)		
	1992-93	1993-94	1994-95
Village	98	25	62
Commercial	1	75	26
Own	1	In Comm.	12

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Table (4)
Destination of White Rice Milled by Dealers

Destination	Market Season (in %)		
	1992-93	1993-94	1994-95
Consumers	64	31	18
Retailers	10		
Own governorate		47	26
Other governorate		15	20
Wholesalers	26	6	36

TABLE (5)
The Design Capacity of Surveyed Public Mill

Name of Mill	Company Name	Governorate	Design Ton/Hour
Dekerness	DAKAHLIA	DAKAHLIA	8
Fowa	RASHID	KAFR EL-SHEIKH	6
El-Nasr	GHARBIA	GHARBIA	10.8
Abu El-Foutouh	DOMIAT & BELKASS	DAKAHLIA	6
El-Nasr	KAFR EL-SHEIKH	KAFR EL-SHEIKH	7.5

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TABLE (6)
Changes In Public Sector Procurement Of Paddy
Period of 85/86 Until 96/97

Crop Year	Total Paddy Rice Production	Public Sector Procurement
85/1986	2310304.00	1087325.00
86/1987	2443780.00	1127750.00
87/1988	2404300.00	1175734.00
88/1989	2130570.00	971611.00
89/1990	2676131.00	1131694.00
90/1991	3166136.00	1021176.00
91/1992	3446570.00	885742.00
92/1993	3922942.00	922760.00
93/1994	4159133.00	572427.00
94/1995	4581901.00	579418.00
95/1996	4788097.00	338312.00
96/1997	-	95000.00

Source : MALR and Holding Company for Rice and Wheat Mills, 1997.

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Table (7)
Comparison Of Paddy Rice Procurement Prices

Year	Private	Public
1990/91	393	319
1991/92	402	403
1992/93	421	402
1994/95	644	425
1995/96	770	570
1996/97	850	550

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TABLE (8)
Paddy Rice Quantities Processed By Surveyed Public Mills and Percentage To Design Capacity During The Period 1991/92 - 1995/96

ACTUAL CAPACITY Ton/Year													
Name of Mill	**91/92**		**92/93**		**93/94**		**94/95**		**95/96**		**Average**		**Design Capacity**
	Ton	%	Ton	%	Ton	%	Ton	%	Ton	%	Ton	%	
DEKERNS	26938	53.9	25525	51.1	21839	43.7	11985	24	6044*	12.89	18466	36.9	50000
FOWA	19013	54.3	19549	55.9	10909	31.2	15587	44.5	5601	16	14132	40.4	35000
EL_NASR	25277	38.9	31505	48.5	32432	49.9	36093	55.5	35496*	54.6	32161	49.5	65000
ABU El_FOTOUH	19865	53	20689	55.2	17513	46.7	15649	41.7	7934	21.2	16330	43.5	37500
EL-NASR	20634	45.8	21573	47.9	11285	25.1	6559	14.6	6992	15.5	13409	29.8	45000
SAMOHA	20278	89.1	21123	92.8	1424	6.3	18786	82.6	9791	43	14280	62.7	22750
ABU-HOMOS	33086	57.5	33107	57.6	23908	41.6	19464	33.9	20352	35.4	25983	45.2	57500
TOTAL	**165091**	**52.8**	**173071**	**55.3**	**119310**	**38.1**	**124123**	**39.7**	**92210**	**29.5**	**134761**	**43.1**	**312750**

* 6044 ton = 3009 ton paddy rice + ½ (6070) white rice & 35496 ton = 28078 ton paddy rice + ½ (14835) white rice.
* The raw data depends on questionnaires designed and collected by the study team with the assistance of the folding company of wheat and rice mills.

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Table (9)
Changes In Milling Charges of The Surveyed Public Rice Mills During The Period 1993/94 - 1995-/96 - 1993/94 (OR) 1994/95 = 100

Name of Mill	93/94		94/95		95/96	
	LE	%	LE	%	LE	%
DEKERNS	-	-	113	100	223	197
FOWA	109	100	78.5	72	202.3	186
El-NASR	78.4	100	73.4	93.6	181.4	231
ABU EL_FOTOUH	-	-	81.7	100	164.75	202
El-Nasr (K.E.)	154.9	100	130.9	84.5	145.9	94.7
SAMOHA	150.9	100	131.5	87.1	231.7	153.5
ABU-HOMOS	155.5	100	163	105.2	210	135.5
Average	**129.74**	**100**	**110.29**	**85.10**	**194.15**	**149.80**

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Table (10)

Profits and Losses of The Public Rice Mills During The Period of 91/92-95-96

Value in thousand LE

Company	91/92	92/93	93/94	94/95	95/96
Alexandria	-5752.00	-13626.00	-12589.00	-3529.00	-33578.00
Rasheed	-9619.00	-11194.00	-11'02.00	-8706.00	-12909.00
El-Behira	2104.00	1227.00	1445.00	266.00	-8427.00
Kafr El-Shiekh	782.00	900.00	1733.00	1901.00	-5644.00
Gharbia	2205.00	2032.00	6943.00	2068.00	-30154.00
Dakahlia	4724.00	1931.00	3987.00	494.00	-13933.00
Domiat & Belkass	8366.00	3548.00	7000.00	2637.00	-17586.00
Sharkia	9094.00	5219.00	8068.00	3042.00	-4469.00
Rice Marketing	9078.00	5483.00	1593.00	450	1991.00
Total	**20982.00**	**-4480**	**17078.00**	**-1377.00**	**- 124709.00**

Source: Holding Company for Rice and Wheat Mills

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Table (11)
Total Market Values of Surveyed Public Rice Mills Distributed Among The Most Important Components

(Thousand LE)

	Land		Bldg & Constr.		Eqpt & Machines		Trans. Means		Other Assets		Total	
Name of Mill	Ton	%	Ton	%	Ton	%	Ton	%	Ton	%	Ton	%
DEKERNES	27772	83.9	2484	7.5	2531	7.7	131	0.4	165	0.5	33083	100
FOWA	3154	60.7	625	12	1245	24			174	3.3	5189	100
EL-NASR	4009	42.4	1727	18.2	3581	3581	37.8	0.5	105	1.1	9466	100
ABOU EL-FOTOH	21682	74.6	3938	14.5	1527	5.6	28	0.1	46	0.2	27221	100
El-NASR (K.E)	7347	39.9	3231	17.6	7755	42.1			71	0.4	18404	100
SAMOHA	10024	59.8	4325	25.8	2386	14.2	4	0.02	18	0.1	16757	100
ABU_HOMOS	3038	31.4	4406	45.5	2054	21.2			179	1.9	9677	100
TOTAL	**77026**	**64.3**	**20736**	**17.3**	**21079**	**17.6**	**207**	**0.17**	**758**	**0.63**	**119806**	**100**

* 6044 TON = 3009 TON Paddy Rice + ½ (6070) White Rice & 35496 TON = 28078 TON Paddy Rice + ½ (143835) White Rice

** The Raw Data depends on questionnaires designed and collected by the study team with the assistance of the Holding Company of Wheat & Rice Mills.

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Table (12)
Operating Characteristics of Small Village Mills
(Capacity expressed as tons of Paddy Rice)

Year	Months of Operation	Reported Capacity	Actual Qty Milled	
		(Tons/Month)	(Tons/Month)	(Tons/Month)
1990	8.2	64	24.6	202
1991	6.5	56	26.2	170
1992	8.0	70	48.8	390
1993	7.1	76	55.4	393
1994	8.3	137	68.8	571
1995	8.0		60.0	600

Table (13)
Major Findings of The Private Mills Sample Survey, 1997

ITEM		Small Village Mills	Old Commercial Mills	New Commercial Mills
No. of Surveyed mills		12	12	12
Average Working days		300	300	300
Range of capacity utilization	tons/hour	(0.25 - 0.5)	(2-4)	(3-10)
	hour/day	8	8	10
	tons/day	2	(18-30)	30-100
	month/year	10	10	10
	tons/year	600	4500-9000	9000-30000
Average milling rate (5)		60	65	70
Price paid for paddy rice (LE/t)			850	850
Price received for milled rice (LE/tons)			1250	1300
Average milling cost (LE/tons)		10	20	35
Average margin (LE/tons)		20	20	30
Average investment cost (100 LE/mill)		3 to 5	15	45 to 500
Number of permanent workers		1	2-7	8-15

Table (14)
Rice Milling capacities By Governorates, 1997

				Small Village mills						Commercial mills			Publi M.	
Governorate	Cultivated Area (000 fd)	Percentage of Area %	Production 000 ton	No. of small village mills (licensed) after 1992	No. of small village mills (licensed) before 1992	Total No. of small village mills (licensed)	Total No. of small village mills (unlicensed)	Total No. of small village mills	Max milling capacity of village m.	Total no. of commercial mills	Max milling capacity of commercial m.	Total Milling capacity of all privately owned mills	Public milling capacity	Total Milling capacity of all types of mills
	(1)	(2)	(3)	(4)	(5)	(4) + (5) = (6)	(7)	(6) +(7) = (8)	(9)	*	(10)	(9) + (10) =(11)	(12)	(11) + (12) = (13)
Dakahlaya	412	29.39	1,401	893	395	1,288	718	2.006	1,204	18	336	1.540	316	1,856
Bahayra	212	15.12	721	80	106	186	104	290	174	26	137	311	396	707
Kafr El-Sheikh	269	19.19	915	661	135	796	444	1,240	744	29	326	1,070	272	1,342
Sharkaya	228	16.26	775	473	122	595	332	927	556	39	327	883	234	1,117
Gharbaya	129	9.20	483	265	98	363	202	565	339	20	39	378	224	602
Fayoum	35	2.50	119	67	21	88	49	137	82	4	19	101	0	101
Damietta	68	4.85	231	146	61	207	115	322	193	6	2	195	270	465
Ismailia	4	0.29	14	8	2	10	6	16	9	1	2	11	0	11
Qualubya	22	1.57	75	42	13	55	31	86	51	3	8	59	0	59
Alexandria	23	1.64	78	0	0	0	0	0	0	1	30	30	273	303
Total	**1,402**	**100**	**4,767**	**2,635**	**953**	**3,588**	**2,001**	**5,589**	**3,352**	**147**	**1,226**	**4,578**	**1,985**	**6,563**

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Source:
(1) MALR
(2) Calculated based on national average yield of 3.4 t/fed.
(4)-(*) Actual figures of governorate survey conducted by the team members, commercial records of Dakahleya, sharkeya, Kafr-el Sheikh, and Beheira Governorates, June 1997.
(9) Total milling capacity is 600t/year per small village mill.

* This figure is very large in spite of the limited no. of commercial mills. This is due to the huge milling capacity of some mills like GEFCO company which has the capacity of 36.000 tons a year.
** Similarly to the Dakahlya case this is a mill with huge capacity in Alex. (El Mabrouk Company) of 38 thousand tons/year

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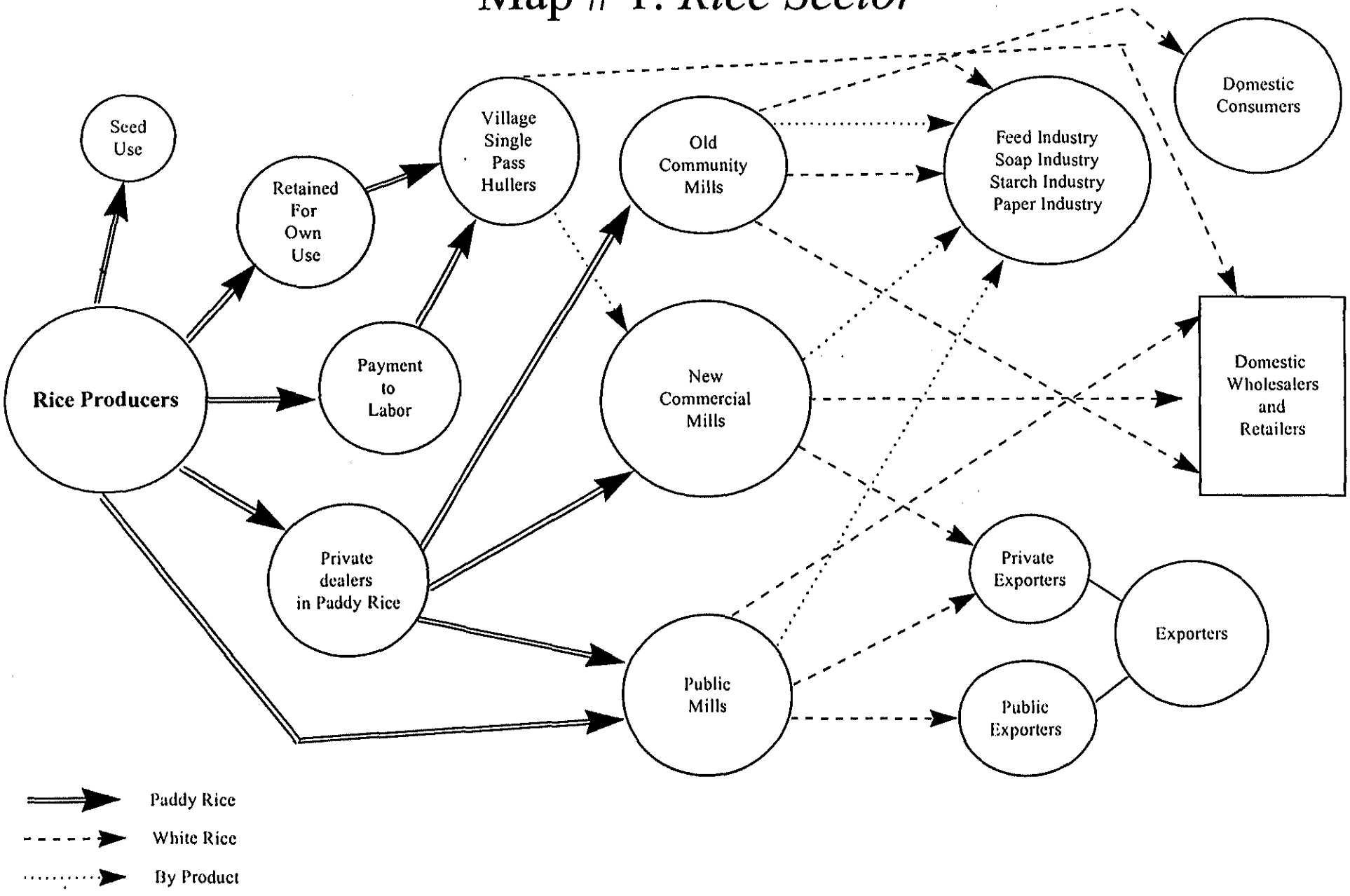
ANNEX [B]

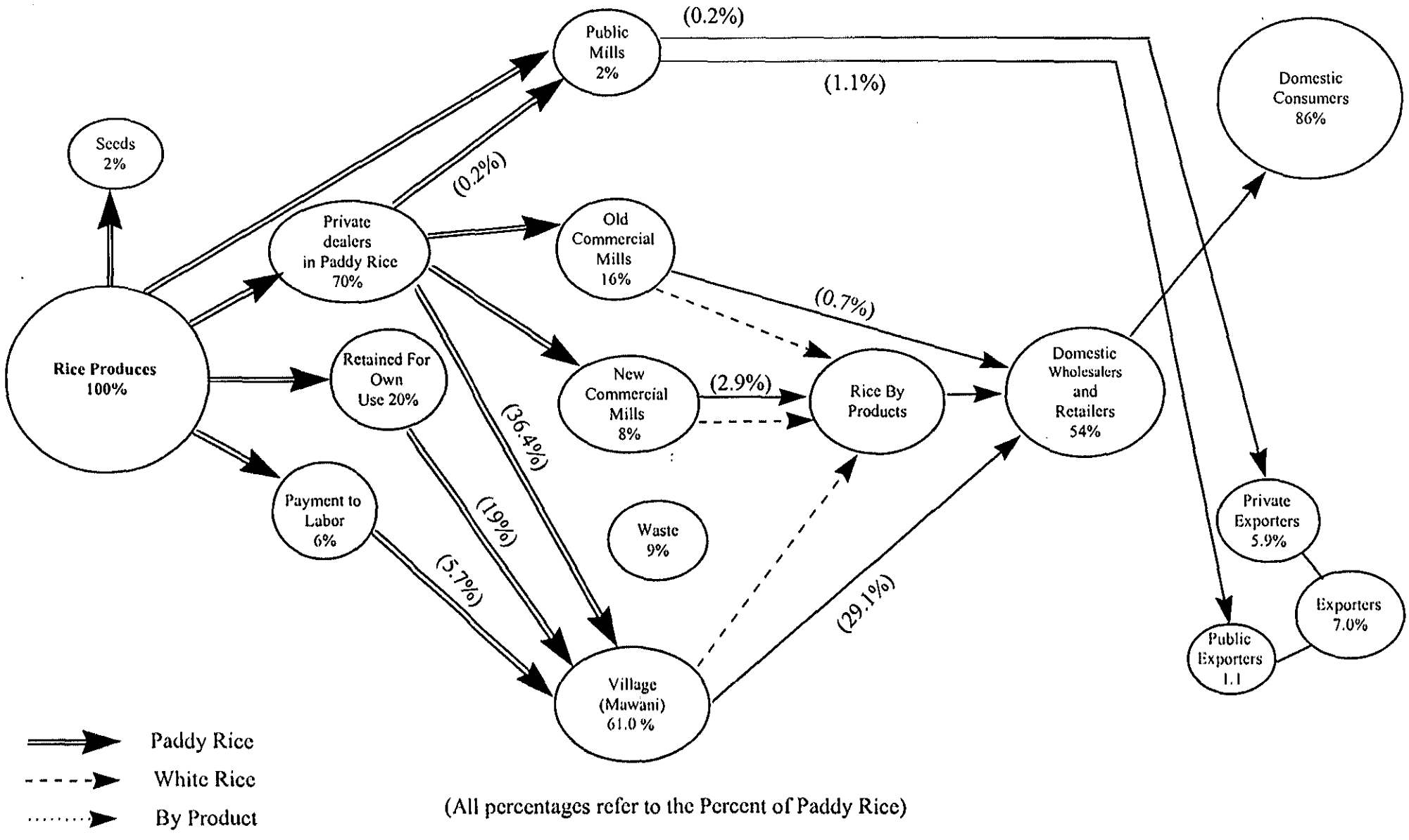
RICE SUB-SECTOR MAPS

⇒ **Map #1 : Rice Sector**
⇒ **Map #2 : Physical Movement of Domestic Rice**
⇒ **Map #3 : Ownership of Domestic Rice**
⇒ **Map #4 : Total Physical Movement**
⇒ **Map #5 : Number of Firms**
⇒ **Map #6 : Physical Units per Firm**

Map # 1: *Rice Sector*

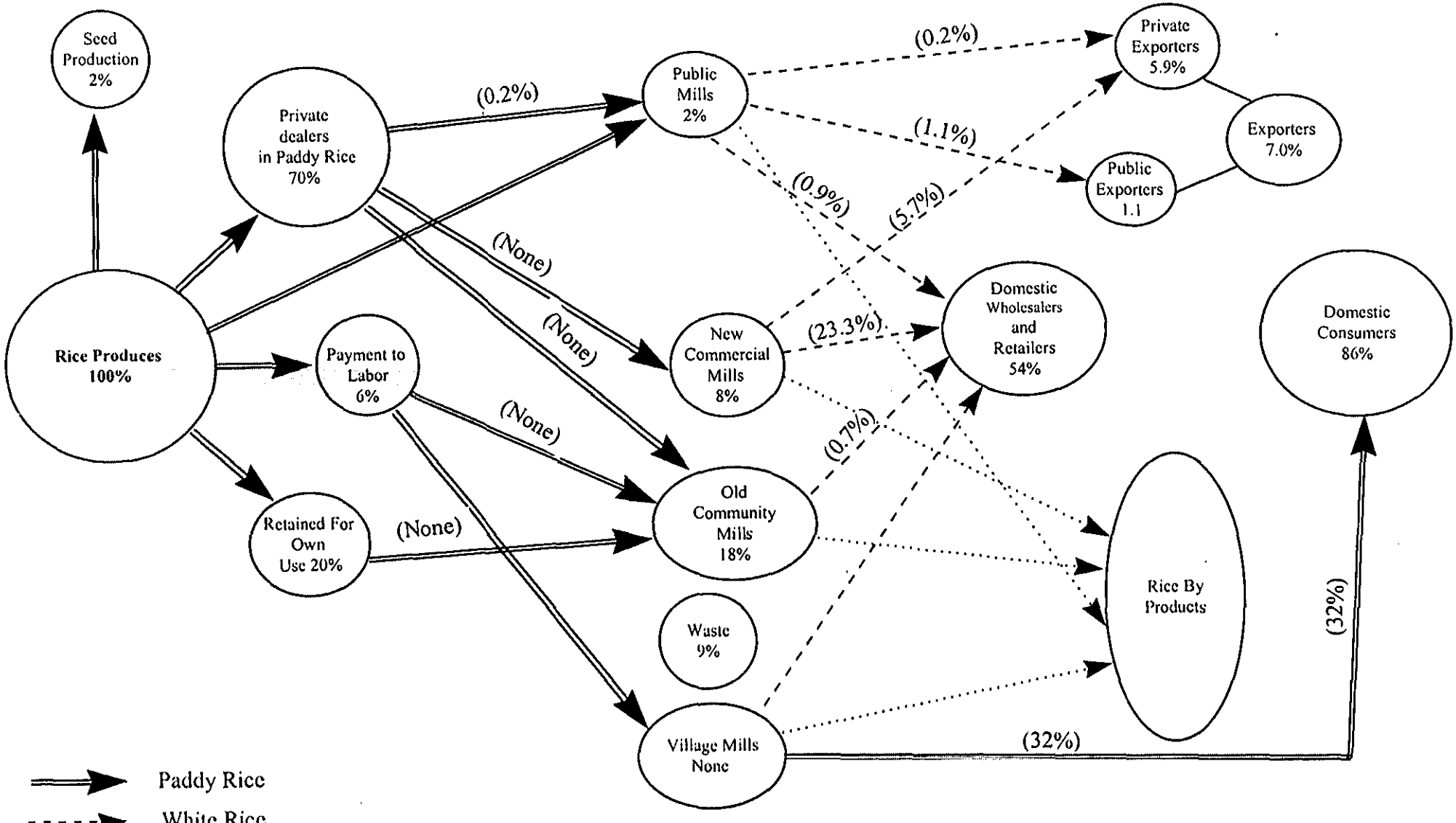


Map # 2: *Physical Movement of Domestic Rice*



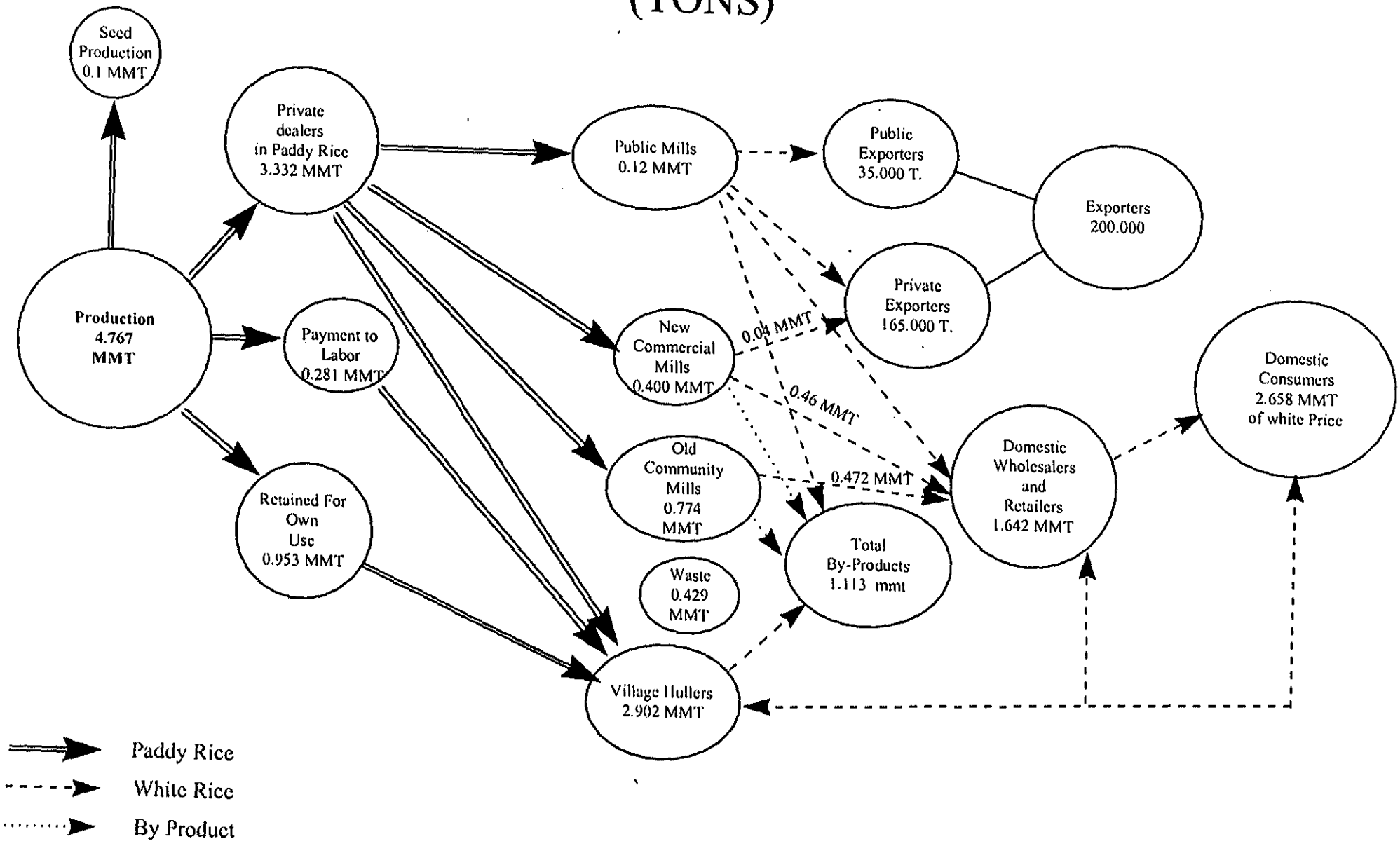
(All percentages refer to the Percent of Paddy Rice)

Map # 3: *Ownership of Domestic Rice*

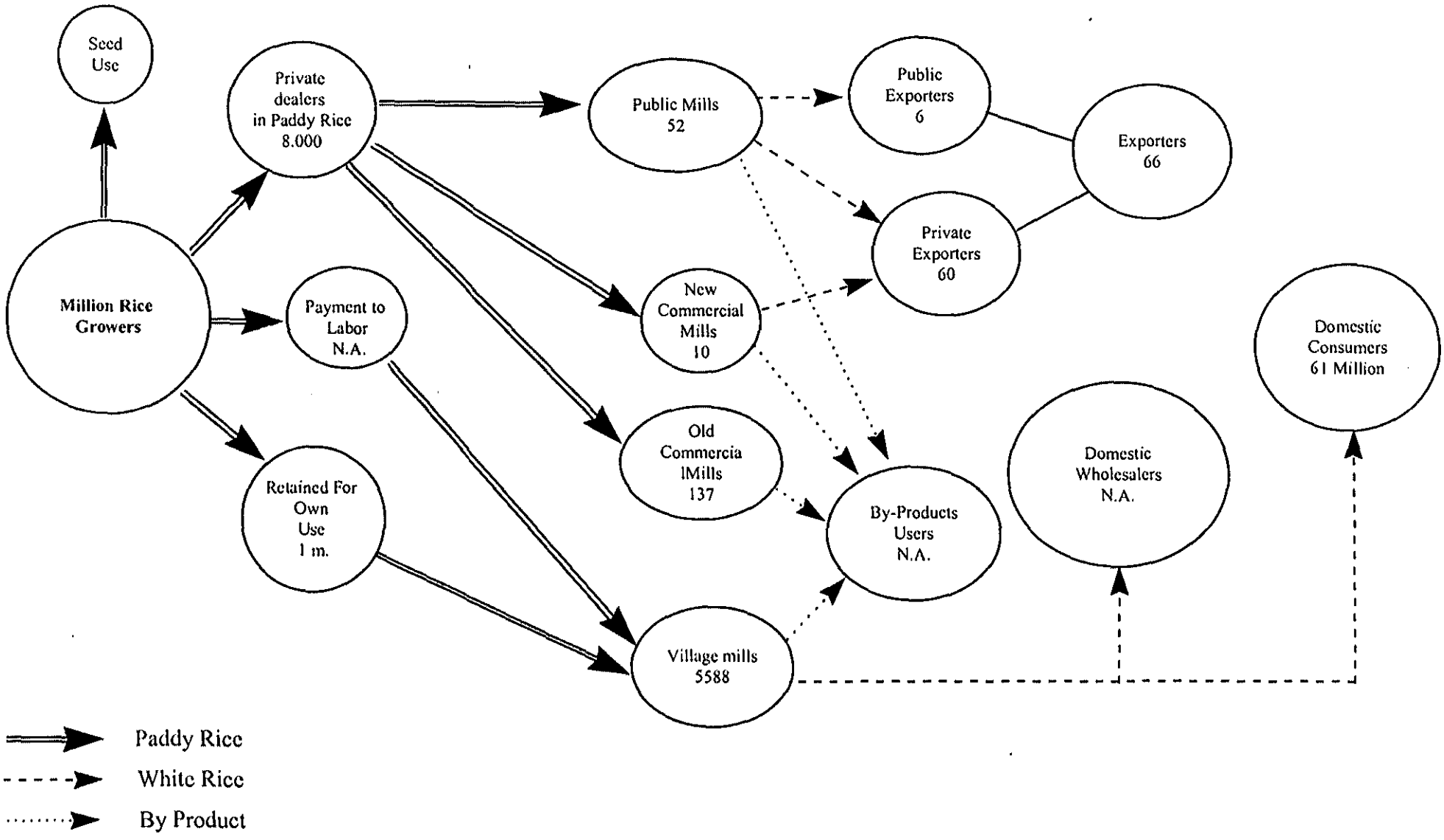


(All percentages refer to the Percent of Paddy Rice)

Map # 4: *Total Physical Movement* (TONS)

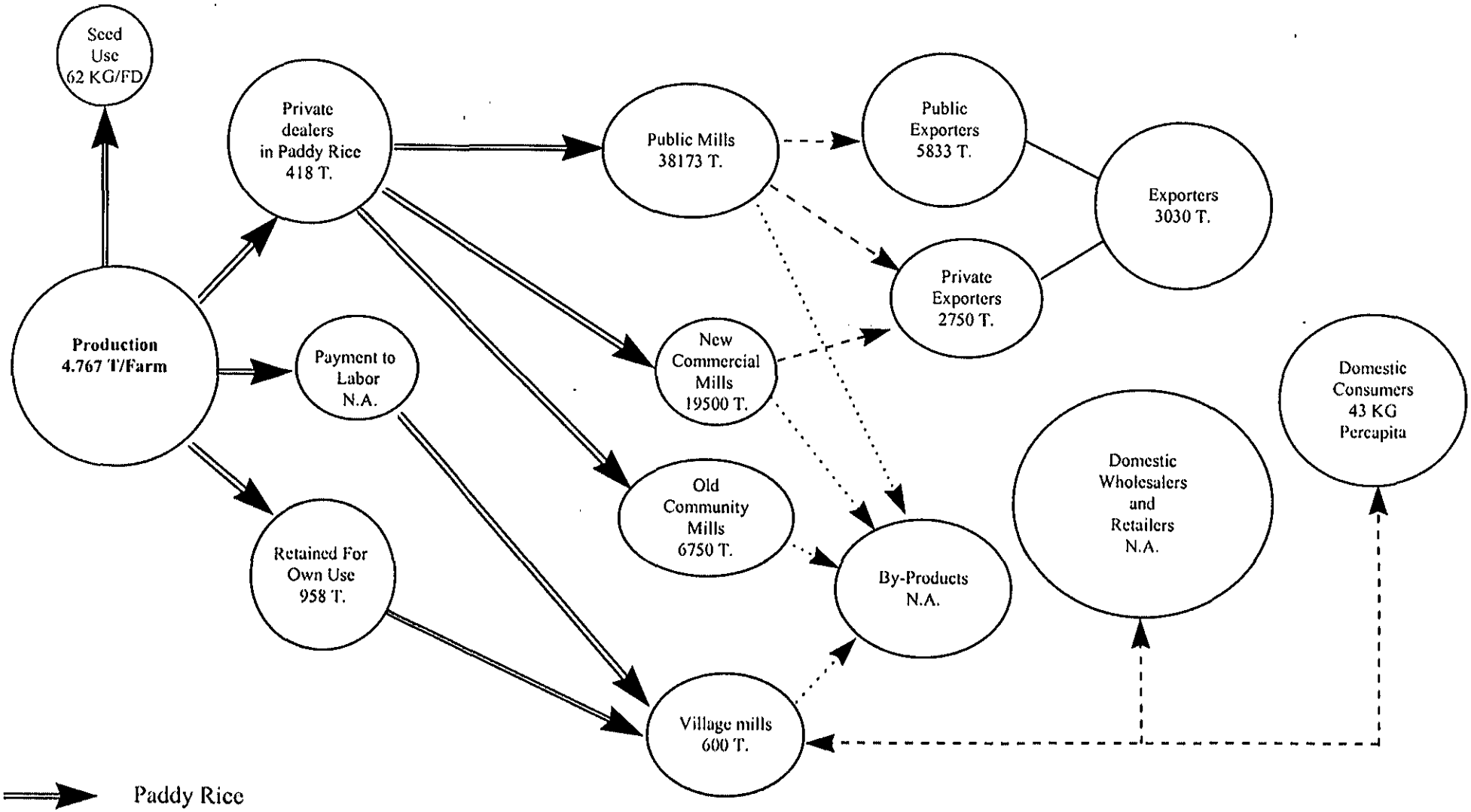


Map # 5: *Number of Firms*
m.= million



4/

Map # 6 : *Physical Units per Firm*



Paddy Rice

White Rice

By Product