# I. Basic Features of the Sector

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## A. Background

Rice is Guyana's second major crop after sugar. Besides meeting local consumption demands, the rice industry is a major source of income and employment in rural areas, as well as an important source of foreign exchange. Exact figures on employment in the industry are not available, but at the time of the last agricultural census in 1978, just over half of Guyana's farmers were growing padi, some 12,600 households. The industry now accounts for 11 percent of GDP. Taking into account rice milling, that contribution rises to 13 percent. The 1994 production was 233,000 metric tonnes, of which 183,000 tonnes (79 percent) were exported. Preliminary figures for production in 1995 showed an increase of about 25 percent over the 1994 level. The current level of production is the highest ever achieved and this is directly attributed to the reversal of previous policies that restricted producer prices.

Per acre yields in 1994 averaged 24.4 bags (of 140 lbs. each) of padi rice on a national basis. Even the smaller rice farmers in Guyana are mechanised. Approximately twelve of the largest producers, all of whom have more than 100 acres, use aircraft for seeding and spraying. These producers all are found in the Berbice region, and they often share the costs of aircraft rental with neighbouring producers.

Seventy-five rice mills operate in the country, and most millers also produce part of the padi they mill.(1) Many millers are planning, or have begun, an upgrading of their facilities, including dryers that use rice husks as fuel. Prices paid to growers vary by grade, and a six-level grading system is in place. The larger and more efficient mills that can more easily satisfy the quality standards in international markets, typically carry out exporting.

The institutions specific to this sub-sector are: the Guyana Rice Development Board (GRDB), the Guyana Rice Producers Association (RPA), the Guyana Rice Millers and Exporters Development Association (GRMEDA), the Burma rice milling complex, and the Caribbean Rice Association. Although the focus will be on these institutions, it is recognised that the development of the rice sector depends heavily upon the general macro policy environment and upon other institutions that impinge on the rice sector. Rice institutional development, and the development of the rice sector in general, needs to be set in the context of exchange rate and trade policy and continued or improved performance of other key institutions such as: the Ministry of Agriculture, Drainage and Irrigation Board, training institutions such as the University of Guyana's Faculty of Agriculture and the Guyana School of Agriculture, regional and local authorities, commercial banks, etc.

Parastatals in the rice sector have a long history in Guyana. In 1946, the Guyana Rice Board (GRB) was established, bringing together Government officials and farmers to develop policy for the sub-sector. After independence, farmer representation diminished and by 1973, there were no farmers on the Board. The Rice Regulation of Manufacturing and Marketing Act of 1985 dissolved the GRB and in its place created three separate entities, namely, the Guyana Rice Export Board (GREB), the Guyana Rice Milling and Marketing Authority (GRMMA) and the National Padi and Rice Grading Centre (NPRGC). The original functions of GRMMA were to purchase and sell padi and rice and it had its own mills from which it supplied rice for domestic and export markets. Purchases were made at prices fixed by Government according to a formula based on cost of production. From the early 1980s, some private millers were authorised to buy and sell into the domestic market at fixed prices, and from the mid 1980s, they were allowed to export.

GREB was charged with the regulation of exported rice. It also arranged for the export of GRMMA rice. From 1985, it was responsible for licensing exporters and approving the quality and price of each export transaction. For this, it received a fee equal to 3 percent of the value of the export price received by the exporter. NPRGC was given responsibility for grading and certifying padi and rice for domestic use and export. It established national standards for grading and assigned personnel to the mills to monitor the grading process.

The combined activities of these three agencies amounted to significant intervention by the Government in the rice sector. In addition, there were restrictions on internal trade in rice, with farmers being constrained to sell rice only within certain geographical areas. There were further restrictions on the amount of padi or rice which farmers could hold - a measure to combat "hoarding."

Of all the policies and institutional arrangements that were put in place, it was the pricing formula that most severely distorted incentives to rice farmers. The 1985 Act had established that the Ministry of Agriculture was responsible for setting the legal price for transactions in different grades of padi and rice. Farmers could sell their padi to GRMMA or to millers. Millers were then able to sell to wholesalers or sell abroad at prices negotiated with the buyer but approved by GREB. Wholesalers sold to retailers at prices not higher than the maximum wholesale price and in turn the retailers sold to consumers at Ministry-set prices.

The padi price was determined by calculating the cost of purchased inputs and adding a multiple of this total to represent non-purchased, farm-supplied costs. To arrive at the post-mill price, milling costs were added to the rice-equivalent price of padi. The wholesalers' price was calculated by adding a gross mark up to the millers price, typically 12 percent, and the retailers' price was determined by adding a further gross mark up to the wholesalers' price.

Apart from the fact that the prices set bore no relationship to market prices, several

criticisms have been made. One analyst[2] pointed out that the data used in the calculations were not based on a survey of costs of production or a rural census; official estimates for the yield were nearly 20 percent higher than the actual average during the 1980s, and costs associated with cleaning and drying were not taken into consideration. The net result was to squeeze farmers' profits. From 1982 to 1989, the net margin allowed to farmers declined from 42.5 percent to 12.1 percent over the Ministry of Agriculture's estimated costs. The formula also favoured the rice milling segment of the industry, a fact that was not unrelated to Government ownership of most of the milling capacity. The fact that farmers were, in many cases, unable to obtain imported inputs at official prices and had to rely on the much more expensive parallel market, was also ignored. Further, by setting prices on a basis of cost of production, Government was severing the link between world market and producer prices and was implicitly taxing farmers' production.

The effects of these policies on small rice farmers were particularly severe and were only masked by the fact that, given the lack of alternatives, many small holders continued to produce rice. Another effect, however, was the consolidation of rice production into larger farms as many small holders rented out their lands, went into cattle rearing or migrated. Rice production fell significantly, reaching a low of 93,000 metric tonnes in 1990. Rice exports were correspondingly depressed during the 1980s, falling to a low of 29,000 metric tonnes in 1985.

By the late 1980s, the policy framework was clearly not working and Government begun to dismantle its pricing and institutional structure. The price formula was abandoned and farmers were allowed to sell freely according to the market of their choice. The devaluations of the exchange rate in that period also had the effect of dramatically raising rice (and sugar) prices relative to most other prices in the Guyanese economy. Also important is the fact that Government sold off almost all its rice mills (retaining only one complex under GRMMA). This sharply improved the competitiveness of the sector and once again gave farmers the incentive to invest in the industry. This triggered a rapid response in planted area. Area harvested increased by 46 percent from 1990 to 1991 and rice output increased by more than 60 percent to 151,000 metric tonnes. From 1991 to 1994 the area harvested increased by a further 29 percent and production by a further 55 percent, and the strong trend of increases continued into 1995.

The 1994 Rice Act streamlined the previous institutional arrangements. The Guyana Rice Milling and Marketing Authority (GRMMA) was dissolved and a small parastatal rice company was created to operate the Burma mills that are the only ones that remain State-owned. The GREB and NPRGC have been merged into the new Guyana Rice Development Board (GRDB).

Other factors that constrained rice production in the past included inferior qualities of seed, lack of adequate maintenance for drainage and irrigation systems, poor access to credit, and uncertain land tenure arrangements.

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## B. The Guyana Rice Development Board

The role of the Board, as stated in the Act is:

(a) to develop the rice industry in Guyana and to promote the expansion of the export trade in the said industry;

(b) to establish facilities for the conduct of research, and to conduct research relating to rice and extend to rice farmers through an established system the benefits derived from such research;

(c) to engage in such promotional and development activities that the Board deems necessary for developing the rice industry.

The specific functions of GRDB are:

(i) Grading

The functions of the Board with respect to grading are to grade and certify rice and padi and to train and license persons who are, in the opinion of the Board, qualified to grade. The objective of the Board is for grading to reach international standards. Right now, grading performed in Guyana is not recognised internationally and grading of exports is done at the destination. This can lead to delays in payment for exports and discourages trade. The Board is therefore taking the lead in developing grading in Guyana and will develop a training programme for graders.

(ii) Marketing

The Board is in a unique position of being able to monitor all developments in the rice industry at home and abroad. Much of this information is not easily accessible to those within the industry and until such information networks are developed, the Board will play an important role in the provision of information. One aspect of this situation is that the Board will develop guidelines for rice exporters and ensure that all rice export contracts are complied with. These guidelines will cover aspects such as appropriate rice prices and qualities. Compliance with the contracts is vital to maintain international contacts and clients for future exports.

(iii) Research and Extension

The responsibility for research and extension activities relating to rice has been removed from the National Agricultural Research Institute (NARI) and has been brought under the Board. This will take the burden for these activities out of the Central Government funding and will enable funds from the GRDB's commission to be channelled to this important activity. Among other functions, GRDB is helping in developing different varieties of rice to suit the preferences in different external markets.

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## C. Other Sectoral Institutions

Besides the GRDB, two other institutions play an important role in the rice sector. These are:

1. Guyana Rice Exporters and Millers Development Association

GRMEDA was established in 1992 as the successor to the Rice Millers and Exporters Association. The following objectives of the Association are set out in its Memorandum of Association: (i) Representative; (ii) Developmental - promoting the development, growth and expansion of the rice industry through the design and implementation of appropriate programmes, and also acting as a conduit for channeling assistance, technical and financial, to rice industry operators.

2. Rice Producers Association

The Guyana Rice Producers Association was established in accordance with the Guyana Rice Producers Ordinance, #7 of 1946. Principally, the Association while collectively a body corporate, qualifies as a non-Government organisation. The RPA functions to promote, protect and advance the interests of rice producers generally. It facilitates GRDB's efforts in the operation of research and extension services by being in a position to mobilise and inform rice farmers of meetings, etc.

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## D. Rice Marketing

In addition to the changes in the pricing regime and the institutional structure for the rice sector, a major boost to the sector has been the access granted to preferential European markets. In 1994, some 93 percent of exported rice went to the European Community, either directly or via the European Overseas Territories of Montserrat, Curacao and Aruba. This rice, which is exported in its "cargo" form, receives a price far higher than that prevailing on the world market. The remaining rice exports are to CARICOM countries, which is also a protected market.

Guyana's exports to the Caribbean, primarily to Jamaica, have felt pressure from United States exports under the PL480 Programme, which are sold at concessional prices. Guyana's rice also suffered a loss of competitiveness because of high freight costs. In 1993 the freight charge for shipping from Guyana to Jamaica was US$65/mt, while the cost of shipping from the United States to Jamaica was only US$25/mt. The lack of draught for larger ships in Guyana's harbours works to the country's disadvantage in this regard.

Another export market is that of parboiled rice. Guyana exported 54,000 mt of parboiled rice to Trinidad and Tobago and is improving its parboiling technology. It could eventually supply the entire Caribbean market with this product.

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# II. Description of the Principal Issues and Constraints Facing the Sector

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## A. Institutional Framework

An appropriate institutional framework is required to support the development of the rice industry. The broad functions that the rice institutions need to play are:

(i) Regulatory

(ii) Promotional

(iii) Service provision (collection and diffusion of information)

(iv) Policy development and planning

A framework is required which is: (a) fully representational of the rice sector community (producers, millers, exporters, input suppliers, etc.); (b) fiscally sustainable; and, (c) fully integrated into the Guyanese economy with inter-sectoral linkages, and linked strongly with international markets and development institutions (such as international research institutions).

1. Regulation of Quality

The privatisation of the rice industry has not been sufficiently complemented by the development of regulations and standards to dictate the operation of the private sector. The most serious consequence of this is that the reputation of Guyana as a rice exporter is at risk from:

- exporters enter into contracts when they are not always able to fulfill the contracts;
- inconsistent quality of rice exports;
- quality and quantity of exports inconsistent with contracts;
- grading of rice and padi in Guyana is not recognised internationally, resulting in grading at the destination that can delay payment to exporters and deter potential importers.

GRDB currently reviews and approves all export contracts. Although this is necessary to ensure that contracts are drawn up in the correct manner, it could contribute to delays in the exporting process.

At present, there is no consistency in export contracts with respect to specifications on grades of rice and on penalties. For instance, the percentage of broken grains required to achieve a certain grade may vary between contracts. Currently, there is a shortage of certified scales. The Bureau of Standards is responsible for certifying scales for weighing rice.

2. Analysis and Planning

A further issue is the lack of capacity for analysis and strategic planning for the expansion of the rice industry. It is important to supply the industry with assessments, at regular intervals, of developments and trends in the sector and issues that require special attention.

3. Provision of Services

Despite the general shift towards divestment and market liberalisation in the rice sector, many services are still provided through the public sector institutions, such as research and extension, grading of rice and padi and also milling at the Burma facility. The private sector could more efficiently perform certain aspects of these activities.

4. Burma Milling Complex

This mill was paid for from Japanese grant funds and remains the only State-owned mill in the country. Although operated by a private company, the Government is the sole shareholder. Some equipment in the mill is of very high technological quality, though currently, the mill is not operating close to capacity due to lack of investment for retooling, and the dependence on GEC for power. Government needs to assess the potential benefits of selling off its share holdings.

5. Financing of GRDB

GRDB is in an unsustainable financial situation over the long run as in the end it depends heavily upon its commission that is an export tax to finance all of its operations, neglecting other cost recovery alternatives. (The amount of the commission is US$6/mt on all rice exports.) If preferential markets are lost or significantly weaken, export taxes will seriously decrease the competitiveness of Guyana's rice industry and should be reduced.

6. Role of RPA and GRMEDA

As representatives of producers and millers, these institutions need to play a more active role in the development of the rice industry, including participating in forward-looking assessments of economic conditions in the industry and issues that affect it.

7. Institutional Linkages

(a) Inadequate linkages with international research institutions restrict productivity gains and could lead to duplication of research programmes.

(b) Rice institutions are currently distanced from other institutions within the sector, such as Lands and Surveys, Hydraulics, etc., and also from those institutions outside the sector that have relation to the rice industry, such as commercial banks.

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## B. Marketing

1. Export Marketing

a. Export Markets

Access to preferential markets (notably to the European Community under the Lomé IV Convention, which is set to end in 2001) is giving the rice industry misleading prices as Guyana rice does not have to compete on the world market. Although these preferential prices have given a major, and much needed, boost to the industry, there is also concern that Guyanese rice will not be competitive on the world market if and when the access to European markets is lost, or preference margins are reduced considerably. The high prices have led to a false sense of security in the rice sector and have created limited incentives for the rice industry to increase competitiveness in the world market, which includes competing against subsidised producers such as the USA.

Over-dependency on preferential markets is making Guyana's rice export industry highly vulnerable to adverse developments within these markets. There are fears that farmers may be "putting their eggs in one basket," and neglecting other crops and livestock in favour of rice.

In 1995 prices received in the European market (for grade B rice) were about US$400/mt, in the Caribbean market they were about US$262/mt, and in the world market, about US$203/mt (fob Guyana).[(3)] Costs of production, including allowances for producer profits, are about US$337/mt on large farms and about US$395/mt for small and medium farms. In Thailand and Vietnam, costs are under US$200/mt, and in the United States they are in the range of US$250-270 per metric tonne. These figures show in stark form the precarious situation of Guyana's rice industry should the Lomé Convention fail to be renewed or be weakened substantially. Most observers expect that it will not continue in its present form.

b. Exporting Costs

Costs of exporting are high due to insufficient export facilities (wharfs, bulk and bond facilities) and high handling and transport costs. The siltation of rivers is restricting the size of ships that can use the wharf facilities. Guyana's shipping costs to Europe could be reduced by half, or by about US$35-40 per metric tonne, if larger ships could enter its

harbours.

c. Quality Issues

Variable quality of exported rice products may be damaging Guyana's reputation as a rice exporter.

Preferential markets demand cargo rice, so the rice industry is not maximising value added within the country. There is considerable scope for developing the processing of rice within Guyana.

2. Domestic Marketing

The domestic market is poorly served, and characterised by variable supplies and consequently fluctuating prices; limited availability of certain types of rice; limited re-packing and processing of rice for local markets.

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## C. Productivity and Technology Development

1. Milling

a. Electricity supply

"Black outs" during milling contribute to an increase in the post harvest losses. Variations in the supply of electricity (no. of cycles - 50/60 c.p.s. and voltage - 110/220V) can lead to complications in operations and to serious damage to rice milling equipment.

b. Credit

Lack of sufficient investment in the milling sector is leaving the country without adequate improvements in the milling facilities, especially concerning the availability of dryers. Smaller mills find it difficult to access credit to upgrade their mills as the cost of upgrading exceeds the value of existing equipment, which is therefore not accepted as collateral. Also, the existing equipment may also have been bought under credit that is still being repaid, which also diminishes its acceptability as collateral.

2. Field Productivity

a. Credit

Rice producers have restricted access to credit due to the reluctance and inability of commercial banking institutions to supply financial opportunities to the rural sector. The usual reason for the lack of credit is the insistence of commercial banks to have land as collateral, and their reluctance to accept leasehold land, especially short leases, as collateral. The risk adverse nature of the banks has partly arisen due to the poor performance of farmers in repaying loans in the past. Some producers are also trapped

by their commitments to servicing GAIBANK loans, which sometimes hold all of a farmer's assets as collateral, thus preventing the farmer from looking to commercial banks for credit.

At present there also exists a physical distance between producers and the banks, with most of banking branches located in Georgetown. However, there are indications that banks are looking to open branches in the regions, e.g., GBTI is considering branches in Essequibo and Rosignol.

b. Land Issues

(i) Access

Despite the large increase of land that has come under rice in recent years, the general constraints to the transfer of lands (i.e., transfers of leases are not permitted, subleasing is not permitted, applying for leases is time consuming) have restricted the producers' ability to take advantage of the temporary preferential prices being offered to the rice sector, and hence has been detrimental to the economy as a whole.

(ii) Sizes of Holdings

Although there is little evidence of it at the moment, there is concern that the size of holdings for rice should be sufficient to support a household, to keep rural incomes above a certain minimum income level. Fragmentation of lands (for instance, when land is divided between many beneficiaries after the death of the owner) could lead ultimately to "agricultural slums" where farms are not of an economic size.

(iii) Security of tenure

Time delays in the processing of lease approvals and extensions; short term leases without renewable options; the prevention of the transfer of leasehold land into freehold: these factors all contribute to the lack of security of tenure experienced by rice farmers occupying state lands. Lack of security is associated with short term resource allocation of producers who are unwilling to make long term investments in the land, and therefore the sustainability of the land and future productivity gains are jeopardised.

c. Drainage and Irrigation

The deterioration of the drainage and irrigation network over the past twenty years is posing a considerable constraint to the increased production of rice. The funding for the necessary large scale rehabilitation of the infrastructure is beyond the capacity of small producers.

d. Farm machinery and equipment

Companies importing reconditioned machinery and equipment do not always have the necessary spares for repairs. Guyanese farmers seem to be overeager to invest in machinery when their size of holding may make such an investment unwise. Opportunities for machinery rental are insufficient.

3. Research Agenda

Several key constraints to the productivity and the consumers' acceptance of Guyana's rice are:

Grain quality: high percentage of broken grains; grain discolouration; amylose content; uneven grain dimensions (length, thickness); grain chalkiness.

Susceptibility to disease: Guyana currently sells Rustic rice, which is highly susceptible to a devastating strain of the blast disease.

4. Extension

The transfer of technology is of fundamental importance to the future of the rice industry. The main effort of GRDB right now is a seed programme, in which several hundred farmers throughout the rice growing regions are contracted to grow seed, which is then distributed by the GRDB extension workers.

RPA also plays an important role in the extension service. It is mainly responsible for mobilising farmers to attend seminars, demonstrations, etc., organised by GRDB, and also has the vital function of collecting information from the producers' community.

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### D. Environmental Concerns

1. Genetic Diversity

The increasing trend of producers to grow more rice is creating an environment of decreasing genetic bio-diversity, which makes the country vulnerable to environmental risks associated with genetic erosion.

2. Agro-chemicals

The current situation of increasing production of rice (more land under rice; greater intensity in input use; expanded milling facilities) is occurring within a general void of environmental legislation, enforcement and monitoring. Increased production inevitably leads to the greater demand for agro-chemicals, with potentially negative environmental impacts, which is especially noticeable in water supplies.

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## III. Sectoral Objectives

In light of the preceding discussion of issues, the overriding objective for the rice sector is necessarily that of assuring its survivability into the next decade, in the face of possible reductions of real prices preferential markets or even the elimination of those

markets. All actions in the sub-sector should be oriented toward the fulfillment of this objective. Failure to achieve it will risk experiencing brusque reductions in rural incomes as a whole and increases in rural poverty, thus jeopardising the achievement of the overall objectives of this National Development Strategy. On the other hand, achieving it will mark a significant advance toward maintaining Guyana's economic growth rates after the year 2000 and continuing to reduce the incidence of poverty.

The principal route to the attainment of this fundamental objective for the rice industry can be none other than reducing unit costs of production so that they come closer to matching world market prices.(4) Primarily, this must mean increases in yields per acre at the field level, so that unit costs per bag fall. It can also mean reductions in transport costs and improvements in quality, so that Guyana's rice fetches a price closer to the high end of the range that prevails in international markets. In addition, it will be essential to maintain a macroeconomic framework that favours the export industries, i.e., a real exchange rate that is realistically valued.

To put this objective in perspective, it is useful to make the following hypothetical but reasonably realistic exercise: Start from the current levels of production costs and specify actions, and their quantitative effects, that would progressively bring those costs down, in the direction of the world market price. The figures used here are only approximations, but nonetheless they serve well to indicate the nature and magnitude of the challenges that lie before the rice industry. The challenges are large, so having benchmarks to guide progress on the road ahead is important.

The starting point is the current level of costs of production, of about US$337/mt for the larger farms, and US$395/mt for small and medium farms(5) as compared to the expected world price of about US$202/mt. (All figures are in constant 1995 prices.) As a first step, if it proves to be feasible, an eventual increase in the average yields to 33 bags/acre, from the current level of about 25 bags/acre, would reduce unit costs by about one-third. Accordingly, the costs of production per metric tonne would fall to about US$248 for large farms and US$291 for medium and small farms. Obviously this degree of improvement would mark a great step toward achievement of the sub-sector's objective and must be pursued vigorously.

Next in sequence is consideration of the cost-reducing effects of a deep water port (Chapter 38 of this Strategy). It is estimated that shipping in larger vessels could reduce international transport costs by about US$35/mt, so if this project were undertaken and completed in timely fashion, the industry's cost figures could be compared with a fob price of about US$237/mt, so the gap would have almost been closed for large farms but not yet for small and medium farms.

The final measure of importance would be movement in the real effective exchange rate. To illustrate its potential effect, it can be noted that a 10 percent real devaluation would, in effect, make the costs of production for large farms about US$231/mt, and for small

and medium farms about US$271/mt, (allowing for the role of imported inputs), so the remaining gap between cost and price received would be about US$34/mt for this latter class of farms. It is possible that such a gap could be closed through quality improvements. For large farms, the gap would be completely closed by this combination of yield improvements, a deep water port, and a modest exchange rate adjustment.

Therefore, it can be said that with a deep water port and a strong effort to increase yields, the prospects for large rice farms into the next century appear reasonably bright. However, both those conditions need to be fulfilled. For small and medium farms the task is more difficult, and in addition to fulfilling those conditions those farms may require the assistance provided by an export-oriented exchange rate policy plus all the benefits possible from quality improvements that would result from better post-harvest management.

Further benefits can be reaped by moving upstream in the sense of increasing how much processing is given to rice locally, instead of concentrating exports on cargo rice.

While Guyana's rice industry is not currently competitive on world markets, the future panorama is positive, provided that required conditions can be met. The main concern is over the small and medium farms, and this is an important issue, given the central place of poverty reduction in this Strategy. All efforts should be undertaken to be sure that farms in those categories do not fall by the wayside economically after the turn of the century.

In effect, the principal sectoral sub-objectives are:

Large yield increases over the next four to five years.

Improvements in quality of the product.

Increases in the amount of domestic processing of the product.

These objectives will have to be supported by actions in the area of infrastructure, in the form of a deep water port, and macroeconomic policy, in the form of a realistic exchange rate. Another infrastructure improvement that is needed is an improvement in the reliability of the electricity supply, so that rice mills can play the role expected of them in quality enhancement.

Actions within the rice sector to promote the achievement of the sub-objectives and described in the following section.

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# IV. Policy Recommendations and Their Technical Justifications

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## A. Institutional Framework

### 1. Regulation

- Strengthen the capacity of the GRDB to develop set of regulations and standards relating to contractual procedures, payment mechanisms, rice quality, etc., for the industry to enable it to operate its mandate. IDB has previously offered assistance in this area. Such regulations require Ministerial approval to come into effect. This needs to be supported by a widespread campaign for building awareness, and training where necessary, especially for millers and exporters. GRDB will link with GRMEDA to operate seminars to demonstrate the correct procedures for entering into export contracts and maintaining quality control.
- Enforcement: the Rice Act, 1994 introduced stiff penalties for offenders (for example up to G$25,000 and two years imprisonment for the failure to comply with approved contract terms and conditions). Such penalties have never been imposed. GRDB needs to make the rice industry aware of these potential penalties, and impose them where necessary.
- Once the regulations are in place, this will remove the need for review and approval of each and every export contract. Instead, spot checks can be used to ensure compliance with regulations, together with the introduction of adequate penalties for offenders.
- There is a need to develop standard contract forms, with consistent specifications on, for example, qualities of rice. IDB offered some technical assistance for this which needs to be pursued.
- GRDB needs to play a lobbying role to put pressure on the Bureau of Standards to certify a larger number of scales for the weighing of rice.
- Arbitration: Right now there is no satisfactory mechanism for arbitration for contractual disputes. GRDB currently does this on an informal basis. Assistance, possibly from the international community, is required to develop regulations related to arbitration. One possible approach would be to form arbitration boards consisting of a representative nominated by each of the disputing parties, with a neutral chairperson, who would be satisfactory to both parties. GRDB would also need to extract a sample from all exports at the point of export to serve for arbitration purposes.

### 2. Analysis and Planning

a. New mills

GRDB has proposed amendments to the Rice Factories Act to revise the regulations required for a mill to be licensed and these amendments should be approved.

b. Expansion of rice lands

There is clearly potential for the expansion of agricultural lands in Guyana. This requires close coordination between relevant agencies, including GRDB, so that the new land offering the most potential for agriculture is identified. This assessment will affect the required infrastructure to be developed. The formal mechanism and organisation for such land-use planning needs to be established, and the best option may be to locate it within the planning division of the Ministry of Agriculture.

c. The capacity of GRDB to carry out forward-looking analyses of relevant issues should be strengthened.

3. Provision of Services

The provision of services needs to be rationalised taking into account the relative merits of different institutions and agencies in both the public and private sectors. GRDB (whose functions include regulation and promotional activities) should shift its role in services from a general role to one of providing services that the private sector is unwilling or unable to perform.

- Research: this is a fundamental activity that is not easy to privatise and for which it is difficult to implement direct cost recovery, although it benefits the entire sector, because it is difficult to identify and quantify the benefits accruing to individuals. GRDB has good research facilities at Burma, and money collected from the commission (which in itself represents indirect cost recovery) should be used to improve their facilities (human and physical). Linking up with regional and international agencies for research collaboration is vital for the increased competitiveness of the rice sector.
- Extension: recent developments that have seen the RPA and GRMEDA assist with the extension work for GRDB are welcomed, as RPA and GRMEDA are potentially in a better position to have close and widespread contact with producers and millers. GRDB is, in effect, contracting RPA and GRMEDA to perform these services and this must be reflected in financial support and also by channeling money into training programmes for extension workers. There is an important need for extension services to extend beyond the traditional role of providing information on production techniques and inputs (seed, agro-chemicals), and to include farm management as a core activity. As GRDB is the main developmental institution, it has to implement this change in focus, through comprehensive training of extension workers.
- Market Intelligence: this is within GRDB's mandate though as yet little work has been conducted, in spite of its importance considering the amount of rice exported from Guyana. GRDB is in a good position to collect and disseminate information pertaining to prevailing rice prices and future projections; international marketing opportunities; quantities and qualities demanded by the market; and status of importers, possibly including suspect agents.
- Grading: this is a function of GRDB that can be switched easily to the private sector (and GRDB is already in the process of training and certifying graders). For private sector grading to be efficient will require close monitoring of the performance of certified graders.

4. Burma Milling Complex

There is a need to investigate the different options by which the Burma mill could operate more efficiently, while complying with the Japanese conditions. The current arrangement prevents banks from approving overdraft facilities for the mill. Possible alternatives include: (i) Government entering into a joint venture; or (ii) the sale of shares to the private sector. Negotiations with Japanese donors should be pursued to attain the flexibility required to be able to implement one of these alternatives.

5. Financing of GRDB

*GRDB Commission:* Alternatives to be sought to replace export taxes with other fiscal tools that will lead to the better allocation of resources (such as land taxes, D&I rates, mill licensing fees, etc.) A request for a study of such options has been submitted to IDB. GRDB needs to appreciate that the commission is for the development of the entire rice sector, which includes the strengthening of NGOs such as RPA and GRMEDA, and that a proportion of the commission should be set aside for this purpose.

6. Role of RPA and GRMEDA

RPA and GRMEDA need to be strengthened and provided with assured sources of financial support

over the longer run. GRDB is currently in a position where it can provide some funding from its commission to support the activities of RPA and GRMEDA. In return for this support, these institutions need to put in place systems for the full representation of their members, including democratic elections. The organisations should also be moving towards increased cost recovery for the services they offer. This can be done through: subscription fees (in which case only those subscribers would be represented); possibly a fixed levy on production (charging a nominal fee for padi production and/or milled rice); or by introducing more direct forms of cost recovery.

7. Institutional Linkages

GRDB should play a pivotal role in linking the Guyanese rice industry to international and other domestic institutions, with the aim of improving the productivity of the industry.

a. International linkages

International linkages are especially vital to the future prosperity of Guyana's rice sector, particularly in the areas of market intelligence and research. In market intelligence, GRDB has an important role to play in linking up with international markets to promote Guyana's rice and gather information on qualities and quantities demanded. Although GRDB is mandated with this function, the department responsible for this has yet to be developed. Efforts need to be made to staff and implement this department. Research linkages are currently being fostered through the CRIDNET and their importance needs to be underscored, in view of the fundamental sub-sectoral objective of yield increases.

b. Domestic linkages

There is a need for a formal mechanism for linking the primary institutions of the agricultural sector concerning issues such as:

- the conflict between rice growers and cattle farmers;

- the need to put down new infrastructure (D&I, roads, etc.) for opening new rice lands;

- competition for scarce water resources;

- environmental issues.

Such issues require regular consultation among agriculture officials, and an appropriate mechanism for achieving this should be developed. The two main options for this purpose would appear to be the following:

*Alternative No. 1:*

The required interdisciplinary collaboration and consultation may be best achieved by establishing an Agricultural Development Board, consisting of the major agricultural sub-sectors. This Board would be consistent with the institutional framework proposed in Chapter 29 of this National Development Strategy, in which a new institution integrating agricultural services would be developed. Such a Board would meet regularly and settle conflicts of interests between the different agricultural sub-sectors, and to plan and coordinate the development of the agricultural sector.

*Alternative No.2:*

The Planning Division of the Ministry of Agriculture has been the traditional institution for the coordination of the development of the sector. However, in recent years, primarily due to low level of remuneration, Planning has lost many staff and is no longer able to play this role. The World Bank Public Sector Review identified the strengthening of Planning as a priority for the agricultural sector, and therefore accessing international funding for this purpose may be possible.

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## B. Marketing

1. Export Marketing

a. Export Markets

It is recognised that price mechanisms have contributed significantly to the current "rush for rice." For the rice industry to continue to benefit from participation in international markets over the long run, the benefits from the preferential markets need to be invested back into the industry to make the industry more competitive. GRDB has the key role in channeling funds into those activities likely to contribute to sustained productivity gains. In particular, research and extension services need to be strengthened to increase the accessibility of information about ways to improve milling facilities and techniques, particularly in padi drying.

It is likely that CARICOM markets will remain protected by the Common External Tariff, and that in years to come, Guyana will become the chief supplier of rice to the region. Efforts should therefore be made for catering to the CARICOM market as to types and processing of rice products. Guyana must strive to maintain existing markets within the region.

To address the need for agricultural diversification, funds raised by export taxes on rice should be set aside specifically for the development of the "other agriculture" sub-sector. This may require a review of the level of rice levy B. Changing the level of the levy would alter the price signals sent to producers and could contribute to a shift in the potential returns from different crops. By increasing rice levy B, the industry will be forced to focus on increasing efficiency, maximising value added, and reducing costs, and therefore be in a better position to compete on the world and regional markets once EC preferential markets are lost.

b. Exporting Costs

- Wharf facilities:

The Water Street wharf facilities are in need of rehabilitation. The options for rehabilitating and operating the wharfs need to be explored. One option is for GRDB to enter into a joint venture with the private sector. Alternatively, the facilities could be sold entirely to the private sector.

In addition, bulk and bond facilities need to be developed in other areas: Blairmont, Corentyne and Essequibo.

- Deep water harbour:

Implementation of the recommendations of Chapter 38 of this Strategy would be crucial for the economic survival of many rice producers in the long run.

- Dredging of water channels:

Those agencies responsible for dredging need to liaise with GRDB to ensure that this is done expediently.

- Research needs:

To guide the development of export facilities, studies need to be conducted into the average time from harvesting to optimum drying and average time from milling to export. Also, millers require assistance to put in place more efficient mechanisms for the bulk handling and transportation. For example, GRMEDA can advise on the development of bulk loading facilities at mills.

c. Quality Control

Combating the variable quality of rice exports can be done on two fronts:

(i) Issuance and enforcement of regulations to ensure the quality of rice exported is that which is stated on the export contract.

(ii) Improving grading services. Incentives need to be provided to encourage millers to invest in equipment to increase the processing of rice. One option already mentioned is to squeeze millers' profit margins on the cargo rice entering the EC market. To support this, further tax exemptions could be granted for rice processing and packaging equipment. This transfer to higher quality rice production needs to be done in conjunction with the identification of potential markets (probably in the Caribbean) and the promotion of rice in these destinations. This is a legitimate function for GRDB to perform.

*Diversification*: Rice has to be viewed as a raw material, and research to add value to products is important. Further processing of the raw material can yield products such as rice flakes, popped rice, rice straw (for mushroom production and as a ruminant feed) and the use of hulls in concrete. GRMEDA should play a prominent role in finding information on the alternative uses of rice, determine the feasibility of establishing the corresponding technologies in Guyana, and advise millers and other processors accordingly.

All developments leading to the additional processing of rice within Guyana, need to be placed within the context of greater market intelligence. GRDB has the function of exploring export markets to ascertain the demands of the market. In addition, as mentioned, GRDB needs to play a more prominent role in the promotion of Guyana's rice products.

2. Domestic Marketing

*Alternative No.1* - supplying the domestic market with home-grown rice:

Storage capacity needs to be increased to ensure rice is available for the domestic market at all times. The Rice Act 1994 allows for GRDB to establish depots for the storage of rice and permit those persons engaged in the rice export trade to use such storage facilities. Therefore, the active involvement of millers and GRMEDA in the development of storage facilities, with the help of Government (for example, by making land available in Georgetown for storage facilities), should be attained. In addition, a market information system needs to be in place to determine the likely availability and demands for rice on local markets (including quantity and quality).

*Alternative No. 2* - Rice imports:

The case for importing rice needs to be investigated. Importing rice has the following advantages:

(i) Rice on the world market is typically cheaper than rice currently sold on the domestic markets, so by importing rice, consumers will benefit from lower prices.

(ii) Considerable cost is involved by diverting rice intended for export onto the domestic market as prices on the domestic market are significantly lower than the price currently offered by the European preferential markets, so producers and millers stand to gain by the importation of rice.

Possible drawbacks are: the fear of the importation of pests and diseases into the country; imported rice would compete against rice produced by local millers (especially smaller millers) which is not of sufficient quality to be exported, and may force such millers out of business. To counter the fear of importation of pests, investments would be required in screening all rice imports for pests and diseases. In response to the second concern, it could be argued that the competition provided by imported rice would give incentives for domestic millers to improve the quality of their rice. On balance, the option of relying on imported rice would seem cheaper for the country and more satisfying for consumers. In adopting this policy, a public information programme needs to be undertaken to explain its rationale.

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## C. Productivity and Technology Development

1. Milling

a. Electricity supply

While measures are being undertaken to improve the national electricity supply (see Chapter 39), GRDB, acting through GRMEDA, needs to provide assistance to the milling sector to enable millers to assess whether or not self-generation of electricity is feasible. This is consistent with the general recommendation above calling for a greater business management emphasis for the rice extension services.

Where smaller millers are not in a position to invest in electricity generation equipment, efforts need to be directed on limiting the potential losses associated with the dependency on GEC for electricity supply in the near term. Millers need to be educated and advised on the installation of equipment, to ensure that the voltage requirements of machinery are met. Furthermore, millers need to be demonstrated the gains to be had by installing voltage regulating equipment and surge protectors. Despite the initial investment in such equipment, millers will benefit from the extended lifetime of their milling equipment.

There are alternative sources that have some potential for supplying electricity and where more research is required to determine their economic feasibility. They include husk burning and use of bio-gas.

b. Credit

Financing: there is a need for dialogue with commercial banks to discuss alternatives for increasing the flow of loans to the milling sector. As this problem of accessing credit is a wider problem faced by those across the agricultural sector, such discussions may also include producers from other sub-sectors.

Millers with outstanding debts to GAIBANK should be encouraged to look to other banks to take up their liabilities and reschedule them. Those banks will then be more willing to advance further loans.

Millers need to be educated in financial management, and in the operation of letters of credit and other methods of payment. This is the responsibility of GRMEDA.

2. Field Productivity

a. Credit

Several options exist to overcome the basic collateral constraint that is preventing greater credit flow to the rice producing community:

(i) Group lending: to overcome the problem of collateral, banks can explore (as Nova Scotia is currently doing) the possibility of lending to groups of farmers, who effectively guarantee one another.

(ii) Banks should be more willing to offer loans to millers for on-lending to producers. Millers who have developed long term relationships with certain producers may be willing to lend to them without collateral. Alternatively, legally binding contracts between millers and producers, committing producers to sell to a particular miller in return for loans may overcome the collateral problem. This "assignment of proceeds" approach provides security for the miller (and hence the lending bank).

(iii) Producers with outstanding debts to GAIBANK should be encouraged to look to other banks to take up their liability, which will be more willing to advance further loans.

(iv) The conversion of existing leaseholds to long-term, transferable leases and removing the barriers to land rental (as proposed in Chapter 29) will contribute also to easing the problem of collateral.

(v) The optional scheme of linked rural credit unions (Chapter 28) needs to be explored.

b. Land Issues

Similarly, implementation of all the recommendations of Chapter 29 will be very important to the future development of the rice sub-sector.

c. Drainage and Irrigation

The issues relating to drainage and irrigation are addressed in Chapter 40, Water Management and Flood Control Policies, of this National Development Strategy. The following recommendations are therefore brief and unexpanded.

- Major rehabilitation of the D&I system is required for the rice sector to realise its potential.
- There needs to be greater coordination of D&I services, as now several different agencies are involved in the operation and management of D&I.
- The appropriate institutional and fiscal arrangements need to be put in place to ensure that the D&I system is operated and maintained in an efficient and sustainable manner, including greater farmer participation.

d. Farm machinery and equipment

*Alternative No. 1:*

To eliminate the importation of old machinery that is liable to break down and for which there is limited access to spares, a ban on the importation of machinery over a particular age (say ten years) may be appropriate. However, this alternative is not recommended as it will penalise those farmers of limited resources who are unable to afford new machinery.

*Alternative No. 2:*

Importers of machinery could be required to import a certain value of spare parts for every unit of machinery imported, thus reducing the wastage of machinery from the lack of basic spares. In practice this may be difficult to carry out. A better approach may be for the Bureau of Standards to endorse and certify those importers that can prove that they have a sufficient stock of spares.

*Alternative No. 3:*

Farmers need to be educated and supplied with information before making major purchases. For instance, they need to be advised on whether the machinery is appropriate for their holding depending on the likely economic returns from their investment, and if so, what type of machinery is required. They further need to be aware of the servicing and repairing services offered for the different makes of machinery they are considering to purchase. Suppliers should be encouraged to supply warranties for their products.

*Alternative No. 4:*

GRDB should carry out studies to determine the obstacles to wider development of a machinery rental market, and take the corresponding steps to overcome those obstacles.

A combination of Alternatives 2, 3 and 4 should be implemented to achieve the objective.

3. Research Agenda

It is necessary to develop and implement a research programme based both on market demands and from the experiences of farmers. Such a programme should be relevant to farmers' perceptions of field-level problems, and it should lead to long run sustainability of the rice sector. Research should concentrate on increasing productivity, decreasing variability of yields, increasing pest resistance, and developing and maintaining those characteristics demanded by export markets and domestic consumers. Economic analysis of research proposals (cost-benefit analysis) will determine the feasibility of research projects.

The basis of the research recommendations is centered on the need to improve yields and other aspects of farm efficiency. Mechanisms need to be put in place to ensure that the research needs of the rice sector are met in the future when the GRDB commission, which currently finances rice research, may be lower. This can be simplified by networking, a process that has already been started. The network is the Caribbean Rice Industry Development Network (CRID Net), which is based in Guyana and serves the CARIFORUM states. This has been designed to allow collaboration on research and centralised training of technicians and farmers.

Priority areas for research are the following:

a. Improved germplasm

The introduction of improved germplasm will lead to the more efficient use of resources to produce a desirable grain. This could be done through the introduction of finished lines from other parts of the world (through linkages with CRID Net and also from IRRI) or through the breeding of desirable varieties at the Burma research centre. For germplasm from overseas, entry quarantine facilities need to be established. Breeding research must make rustic blast resistant while maintaining desirable characteristics. Above all, the breeding programme should find ways of increasing the physiological ceiling yield of this variety. Introduction of other varieties could also help in increasing Guyana's productivity by up to 30 percent.

b. Integrated Pest Management

This approach includes plant breeding as a means of pest and disease control, combined with cultural practices and the strategic and judicious use of approved pesticides. Further research is required in this area.

c. Integrated Crop Management

Studies must be undertaken to determine crop and livestock combinations and/or rotations that will make better use of resources. NARI is currently adopting this farming systems approach, and there needs to be greater collaboration between NARI and GRDB in this area.

4. Extension

Coverage: it is most important that rice extension workers reach the entire rice producing community, including those smaller, less accessible producers. There appears to be potential for increasing the role of the RPA in this process as they are in a position to mobilise the rice farming community and can inform farmers of meetings, demonstrations, etc.

Tools: GRDB is committed to improving the extension service it offers. Investment in developing the media for the transfer of technology can improve the service offered. Investigations are needed to explore the appropriateness of audiovisual media, though these should not be used unless the Board is convinced that the current available media: the written word; meetings and demonstrations, television, radio, etc., are being fully exploited.

Interface: The training programme for extension workers needs to be oriented to make the interface between extension workers and farmers a two-way flow of information. Information obtained from farmers should dictate the research agenda for rice, and also enable the Rice Board to monitor the status of field operations. Equally, mechanisms need to be defined to bring about closer collaboration between extensionists and researchers.

Content: Business management orientation of extension services. This element of extension work really needs to be emphasised. Rice farming is a business, and unless farmers perceive it as a business and have the skills to become business managers, then the ability of Guyana's rice industry to increase productivity and efficiency will be hampered.

Financing: At present, the rice extension service is almost entirely financed from the GRDB commission. This is paid on rice exports and is therefore directly supplied from within the industry. Although the alternative of imposing some more direct cost recovery for extension services has been considered, the present system appears to be working reasonably well as long as the funds from the commission are assured. Much of the extension service is geared towards smaller farmers, and as the funds come from the entire rice industry, this represents a redistribution of profits within the sector. Larger producers, who have better access to information on technology and markets and therefore less need for the GRDB extension services, in effect, support the smaller producers. Nevertheless, to the extent that large farms utilise some of GRDB's extension services, consideration should be given to instituting a charge for them, on the grounds explained in Chapter 28. If it eventually becomes necessary to reduce the commission to maintain export competitiveness, consideration may also have to be given to applying the extension charge to medium scale farms.

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## D. Environmental Concerns

1. Genetic Diversity

As recommended above, revenue derived from Rice Levy B could be channelled into financing the development of non-traditional crops.

Also, if the Government places a high priority on the development of "other agriculture," moneys accessed through foreign donors could be focused on such programmes that would facilitate the development of the other agriculture sector.

2. Agro-chemicals

*Regulation*: The Pesticides and Toxic Chemical Control Bill is due to come up before Parliament shortly. It provides for regulation of the importation, sale, and use of pesticides and toxic chemicals.

*Extension:* Extension workers need to be trained in environmentally sustainable cropping activities for padi production. The private sector agro-chemical suppliers can play a role in both suppling information to farmers through the established extension network, or providing information on agro-chemical use directly to users. There is always a concern that input suppliers will recommend higher, more potentially damaging applications of agro-chemicals. Encouragement needs to be given to NGOs to become involved in methods of sustainable agriculture, and donor support should be sought in this area as well.

*Monitoring: Environmental Protection Act, which creates an Environmental Protection Agency with powers to establish a regulatory regime for pollution control would be an institutional framework for this. The development of laboratory facilities is an important investment priority for this agency.*

*1. [0]This observation and others in this and the previous paragraph are taken from A. Angel, "Analysis of the Effects on Guyana's Export Sector of Changes in International Markets," report prepared for the Ministry of Finance, February, 19966.*

*2. [0] Quezada, N.A. "Guyana Rice Price and Marketing Policy: A Needed Reassessment" IDB, January 1990.*

*3. [0]A. Angel, op.cit., p. 41.*

*4. [0] Prices on world markets are not expected to change significantly over the next several years in real terms.*

*5. [0] A. Angel, op. cit.*