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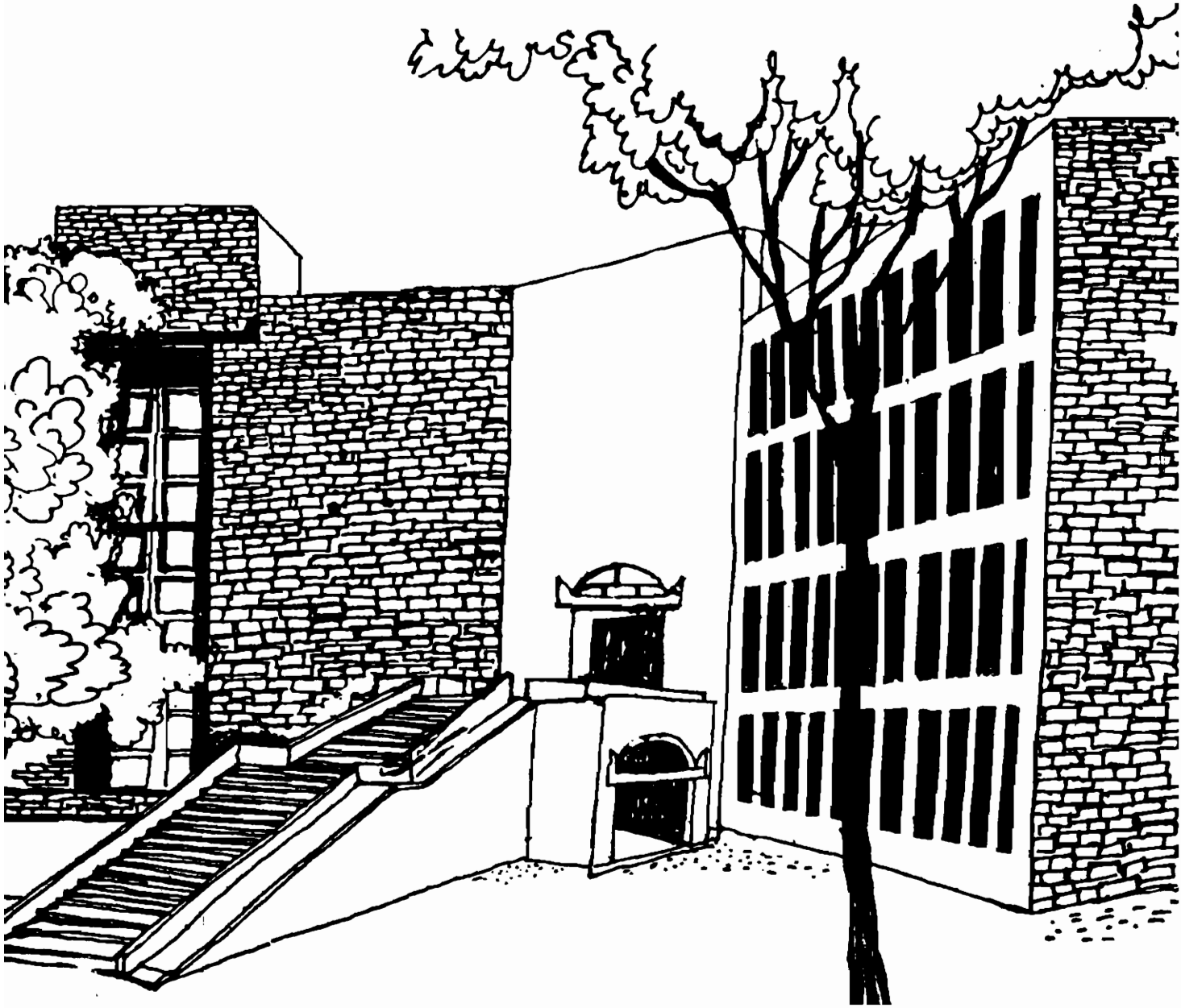

CAN GLOBALISATION BE AN UNQUALIFIED KEY TO SUCCESS? THE CASE OF INDIAN RICE

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CAN GLOBALIZATION BE AN UNQUALIFIED KEY TO SUCCESS ? - THE CASE OF INDIAN RICE

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Abstract

For a variety of reasons, reaping higher international prices of rice in response to the demonstrated comparative advantages of India is not as easy a task as the recent calculations of global competitiveness coefficients by Gulati and his associates seem to suggest. It is against this background the paper has critically examined the existing literature and applied Policy Analysis Matrix (PAM) to data collected from Indian exporters with two purposes: first, to paramaterise India's proclaimed comparative advantage in rice and examine the `robustness' of this result with respect to various national and international parameters, and second, to supplement this exercise with additional qualitative considerations - for example, (a) by finding out potential areas where India can profitably export rice of available quality, (b) by identifying whether and how India can raise enough exportable surplus of the requisite quality without any substantial increase in costs, (c) by trying to evolve a suitable management system for handling the problem of vulnerable sections of the community within and outside of the village economy who are net buyers of rice and are, therefore, likely to be hit hard by free international prices of a basic cereal like rice, and (d) by evolving suitable organisational forms and structures, which can enable the growers' of rice to reap the benefits of higher international prices.

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Can Globalisation be an Unqualified Key to Success? - The Case of Indian Rice

I Background

Several recent studies of Gulati and his associates (1989, 1991, 1994) which have coincided with the country's economic reform programmes under the New Economic Policy of liberalisation and globalisation of the economy has brought out India's strong comparative advantages in several agricultural commodities including rice and built up a strong case for opening the opportunity of free exports at higher international prices to the Indian farmers. These authors have calculated three ratios - namely, nominal protection coefficient (NPC), effective protection coefficient (EPC) and effective subsidy coefficient (ESC) for Indian Rice and argued that in spite of huge subsidies on inputs, the output prices are suppressed so much below world prices that it amounts to `net taxation' of farmers. This has been happening because agricultural trade is mostly controlled and is generally geared to the objective of keeping consumer prices low. The view is therefore increasingly gaining ground that as India has strong comparative advantages in the export of agricultural commodities like rice, wheat and cotton, gradual reduction of all kinds of governmental interventions in both output and input fronts would bring in more allocative efficiency by attracting more resources in these crops, besides enabling the Indian farmers and traders to encash on the trade opportunities arising out of the post-GATT scenario. Incidentally, quite a few studies, after examining the major provisions of the GATT Accord- namely, (1) the market access clause, (2) the domestic support clause, (3) the export competition clause, (4) trade related intellectual property rights (TRIPS) clause, and (5) sanitary and phyto-sanitary provisions, have arrived at the conclusion that these clauses would not affect India; on

the contrary, a number of markets would be opened up for Indian agricultural products.

Among the foodgrains, rice is consumed by half of the world's population. While the current level of production of rice just keeps up with the demand, the situation is rapidly changing with population growth. By the year 2025, the present world population of 5.5 billion is projected to reach 8.3 billion with the population of rice-consuming countries growing even faster than the rest of the world. It is estimated that the demand for rice would increase by 70% over the next three decades necessitating production of 350 million more tons of rice each year. To make matters worse, some of the best rice lands are being lost to population growth and rapidly growing urban centers and some 25 million acres of good rice land in South Asia constituting about 10 per cent of the world's irrigated rice land are showing signs of soil fatigue following from intensive monoculture. This has happened while the world's rice acreage has remained virtually stable since 1980. This means the world has to produce more rice with less land, and most probably with less water, less pesticide and less fertilizer, given the worldwide growing concern over environmental degradation. One can appreciate in this context the warning from Worldwatch Institute, Washington D.C. that "the world was entering an era of food scarcity". Notwithstanding the world scenario, India, the world's second largest producer of rice, however, has managed to accumulate an enviable stock of foodgrains inclusive of rice, thanks to the success of the `Green Revolution' technology, the government buffer stocking policy and achievement of good crops in succession over the last several years. The shortages of rice, which are being reported from various parts of the world has therefore obvious implications for India's foreign trade policy with respect to foodgrains, in general and with respect to rice, in particular. There have been further and significant developments during 1995. China, the

largest producer of rice and a regular exporter has turned into a net importer this year, while there are further import demands from Bangladesh, Indonesia, West Africa, Phillipines, Nepal, South Korea and Brazil. This is no doubt a boom time for Indian rice exports and it would appear India should seize this opportunity by all possible means and even by unilaterally dismantling all types of trade controls in order to establish itself in the global rice trade market.

However,there are other viewpoints (see, for example, Nayyar and Sen, 1994), which favours a more careful approach with respect to trade policy reforms in India which seeks to dismantle especially the non-tariff restrictions on trade. This cautious and careful approach is based on the following considerations:

First, India being a large producer and consumer of most agricultural goods, dismantling of existing restrictions on international trade would invariably lead to a general worsening of India's terms of trade. So, India ought to consistently maintain a wedge between domestic and international prices.

Second, given multilateral trade liberalisation likely to take place following the GATT Accord,India needs to properly sequence unilateral trade liberalisation, specially keeping in view the possible impact of multilateral trade liberalisation on world prices.

Third, while the agricultural policy of most developed countries invariably aims at protecting the interests of producers, the Indian policy, though in ultimate analysis is more favourable to the consumers rather than to the producers, has atleast attempted to achieve a balance between the interests of the two sides. In India, not only some major manufactured exports are subsidised through lower domestic prices of agricultural inputs like cotton, but also cheap food constitutes an indirect wage subsidy. Given

the implied equity considerations, India should therefore think twice before totally removing the trade controls on agriculture.

Fourth, even though trade liberalization leads to higher income for farmers and exporters, given the difficulty of collecting tax revenue out of these additional incomes, it would invariably mean some loss in government revenue in net terms. The fear is therefore expressed that public investment in agricultural research and infrastructure which is only complementary to private investment would suffer and slow down the pace of long-term progress of agriculture.

Finally, even if the country decides to eventually move to a higher relative price for foodgrains, the prices should be allowed to move up slowly in phases commensurate with the upward revision of wages and not suddenly by permitting free exports. Moreover, international prices being more volatile than domestic prices, it is wise to continue with the present domestic buffer stock policy for maintaining food security rather than maintaining foreign exchange reserves and then depending exclusively upon foreign trade to take care of supply-demand imbalances.

Given the above-stated considerations, reaping higher international prices of rice in response to the demonstrated comparative advantages of India (as calculated by Gulati and Sharma) is not as easy a task as it may seem at first sight.

II. Objectives

Given the above stated background, the purpose of this paper is two-fold: First, to parameterise India's proclaimed comparative advantage in rice and examine the `robustness' of this result with respect to various national and international parameters, and second, to suppliment this exercise with additional qualitative considerations - for example, (a) by finding out

potential areas where India can profitably export rice of available quality, (b) by identifying whether and how India can raise enough exportable surplus of the requisite quality of rice without any substantial increase in costs, (c) by trying to evolve a suitable management system for handling the problems of vulnerable sections of the community within and outside of the village economy who are net buyers of rice and are, therefore, likely to be hit hard by free international prices of a basic cereal like rice, and (d) by evolving suitable organisational forms and structures, which can reap the benefits of higher international prices for the growers of rice.

III. Study Design and Organisation of the Paper

The study is mainly based on a critical review of the existing literature on the subject and an analysis of secondary data and information available from government, cooperative and private business sources (namely, from the exporters). The secondary source materials have been supplemented by some primary-level data collected from farmers, traders and processors from the states of Andhra Pradesh, Haryana, Madhya Pradesh, Punjab and W. Bengal through interviews.

The paper has been organized as follows. The next section re-estimates and reinterprets the global competitiveness status of different major varieties of Indian rice based on realistic and updated data from the field, besides providing a critical review of the existing literature. The section five qualifies the global competitiveness analysis of the previous section by evolving a suitable management perspective for the paddy-rice system in India based on an analysis of the sectoral and likely constraints confronting Indian exporters, farmers, consumers and the country as a whole.

IV. Estimates of Global Competitiveness of Indian Rice

The global competitiveness coefficients (namely, NPC, EPC and ESC) as estimated by Gulati et al (1989) based on data from 1980-81 to 1986-87 and as summarised in Table 1 below seem to indicate that an Indian exporter of rice has enough cushion to hedge against any future contingencies in terms of unfavourable price and non-price movements.

Table 1 : Global Competitiveness of Indian Rice

Under Exportable Hypothesis			State	Under Importable Hypothesis		
NPC	EPC	ESC		NPC	EPC	ESC
-	-	-	Andhra Pradesh	0.69	0.66	0.88
0.87	0.87	1.21	Punjab	0.74	0.72	1.01
-	-	-	All India (Weighted average)	0.67	0.65	0.88

Source: Gulati et al (1989).

However, the study by Gulati et al (1989) does not distinguish between different varieties of paddy (especially between *Basmati* and non-*Basmati*), nor does it take into consideration the potential for byproducts use, nor is this study based on current and more realistic field-level data on cost of cultivation as well as on costs of processing, transport and marketing. So, using a PAM (Policy Analysis Matrix) structure and recent data the global competitiveness coefficients have been re-estimated for three broad scenarios: 1) *Basmati* without byproducts use 2) Non-*Basmati* without byproducts use and 3) Non-*Basmati* with byproduct use (Table 2). As three broad sub-categories of non-*Basmati* rice were encountered in the states of Haryana and Punjab where the field studies were undertaken, these

estimations have been performed separately for these three varieties of non-*Basmati* rice under scenario 2 . The following broad assumptions have been made in performing the re-estimation exercise:

Table 2 : Global Copetitiveness of Basmati and Non-Basmati Rice

Alternative Senarios	NPC	EPC	ESC	DRCR (Rs.)	DRCFE (Rs/$)	Break-even International price ($ per ton)
1.Basmati Rice (Without byproduct)	0.962	0.961	1.033	0.479	15.59	43.03
2.Non-Basmati Rice (Without byproduct)						
(a)71/12 UP	1.117	1.131	1.348	0.525	17.09	18.72
(b)Haryana Long Grain	1.058	1.064	1.244	0.448	14.59	19.13
(c)PR-106	1.133	1.152	1.427	0.629	20.45	18.03
3.Non-Basmati Rice (With byproduct)	0.891	0.876	0.934	0.262	8.51	16.39

Note: DRCFE stands for domestic resource cost (in Rs.) for earning one $ of foreign exchange. The assumed values of important parameters for the different sets of calculations are given below :

Scenerio 1 : Yield=23 quintal/hectare; domestic price of paddy = Rs.1200/quintal; domestic value of rice full = Rs.2000/quintal; border price of full rice = $80/quintal; human labour cost = Rs.5000/hectare; port, transport & marketing cost = Rs.25, Rs.40 and Rs. 50/quintal, respectively; milling cost = Rs.45/quintal.

Scenario 2 (a) : Yield=56 quintal/hectare; domestic price of paddy = Rs.475/quintal; domestic value of rice full = Rs.780/quintal; border price of full rice = $30/quintal, human labour cost = Rs.4500/hectare; port, transport & marketing cost = Rs.25, Rs.40 and Rs.50/quintal, respectively; milling cost = Rs.45/quintal.

Scenario 2 (b) : Yield=56 quintal/hectare; domestic price of paddy = Rs.545 /quintal, domestic value of rice full = Rs.908/quintal; border price of full rice = $35/quintal; human labour cost =Rs.4500/hectare; port, transport & marketing cost =Rs.25, Rs.40 and Rs.50/quintal, respectively; milling cost = Rs.45/quintal.

Scenario 2 (c) : Yield=56 quintal/hectare; domestic price of paddy = Rs.360/quintal, domestic value of rice full = Rs. 600/quintal; border price of full rice = $25/quintal; human labour cost = Rs.4500 /hectare, port, transport & marketing cost = Rs.25, Rs.40 and Rs.50/quintal, respectively; milling cost = Rs.45/quintal.

Scenario 3 : Yield=56 quintal/hectare; domestic price of paddy = Rs.475/quintal, domestic value of rice full =Rs.780/quintal; border price of full rice=$30/quintal; human labour cost = Rs.4500/hectare; port, transport & marketing cost = Rs.25, Rs.40 and Rs.50/quintal, respectively; milling cost = Rs.45/quintal

Source: Datta, S.K. et al., 1995.

First, the calculations have been made only for the raw form of rice on the assumption that it is being produced, procured and processed around Karnal in Haryana and transported to the Kandla port for export. For parboiled rice, the international market is limited and the price realization is less, while percentages of brokens are also less and the percentage extraction of rice bran oil is better.

Second, the cost of production figures used in the calculations are taken from commercialised farmers from Haryana, rather than from the governmental sources, as the former are found to be far more logical and convincing than the latter.

Third, because of a liberalised exchange rate regime, the prevailing market exchange rate rather than an inflated shadow exchange rate (20% inflated rate is assumed by Gulati et al, 1989) has been used in the present calculations.

Fourth, the present calculations are based on the same subsidy/tax rate on tradeable and non-tradeable inputs as has been used by Gulati et al (1989) in their calculations.

Fifth, use of paddy byproducts has been restricted to generation of electricity, rice bran oil, furfural and deoiled rice-bran cake, as is being done in the largest rice mill of this country - namely, Oswal Ago Furane Ltd in Punjab (scenario 3 in Table 2).

Finally, the economic value of electricity power has been assumed to be 50% higher than the current market price.

Table 2 measures the global competitiveness of Indian *Basmati* rice within a PAM structure. At this stage, we make no provision for byproduct use. While the tradeable product is only rice, the non-tradeable products include straw, husk, bran and broken rice. All the calculations are made on per hectare basis and under exportable hypothesis. The economic price of

these non-tradeable products is assumed to be the same as their domestic market price in the absence of more detailed information. In this situation, the global competitiveness indices - namely NPC, EPC and ESC turn out to be much higher than the estimates provided by Gulati et al (1989). In other words, if one concentrates only on these competitiveness indices, it would appear that India has only marginal competitive strength in the export of *Basmati* rice. However, a DRC analysis reveals that an Indian exporter has considerable amount of buffer, because India requires spending of only Rs. 0.479 on non-tradeables in order to earn one rupee of foreign exchange (DRCR = 0.479). In other words, India needs to spend only Rs. 15.59 worth of non-tradeable resources in order to earn $1 of foreign exchange. The break-even international price being $43.02, India will enjoy positive social profit as long as the international price does not go below $43.02. At the prevailing international price of $80, therefore, an Indian exporter has a buffer of about $37 per quintal.

The picture changes drastically as one proceeds to examine the global competitiveness of non-*Basmati* rice, using especially the usual competitiveness indices - NPC, EPC and ESC. This has been done with respect to three major varieties of rice - namely, the 71/12 UP variety, the Haryana long grain variety and the PR 106 variety in rows 2(a), 2(b), and 2(c) of Table 2, respectively. In these three exercises, NPC, EPC and ESC turn out to be greater than unity, thus not confirming India's competitive strength in exports. This appears to be contradicting the results earlier achieved by Gulati et al (1989). But when one performs DRC analysis, one finds that India can still profitably export these three varieties of rice, although the margins of profit per hectare are much smaller as compared to the *Basmati* case (namely, Rs. 10,634, Rs.14,956 and Rs.6,564, respectively; figures not displayed in Table 2; for details, see Datta et al, 1995). The domestic resource

cost ratios for these three exercises turn out to be Rs. 0.52, Rs. 0.45 and Rs. 0.63, respectively. The buffer per quintal available to Indian exporters against unforeseen contingencies is roughly of the tune of $ 11, $16 and $7, respectively. Obviously, the case for Indian exports of non-*Basmati* rice becomes stronger when (i) the Food Corporation of India (FCI) confronts problem of storing foodgrains far in excess of the country's food security requirements, (ii) the scope for building upon the country's goodwill is there, given the fact that the neighbouring countries like Bangladesh and China are suddenly facing acute shortages of rice, and (iii) India wants to build up the image of a reliable exporter.

The case for Indian rice exports becomes even stronger the moment one allows for byproduct use. This is done in rows of Table 2 using the 71/12 UP variety of non-*Basmati* rice. The country is yet to seriously and commercially use the full range of the byproducts of rice as countries like Japan and Thailand have been doing. For example, the country is yet to commercialize the use of straw for straw-board making, the generation of electricity out of husk-burning, production of refined rice bran oil for direct consumption, the use of rice brokens to produce rice flakes, although isolated examples of commercial use are there and even such incidents seem to be on the rise. Given this scenario, the possibility of byproduct use has been restricted to generation of power for self-consumption and local use, to production of edible rice bran oil for the local *vanaspati* industry, and production of furfural and deoiled cake for exports, as one large rice-milling industry in Punjab has been doing and several others in other parts of the country (namely, in W. Bengal, Haryana, Uttar Pradesh, Andhra Pradesh and Madhya Pradesh) have either started or are in the process of doing so. The moment this possibility is allowed, NPC, EPC and ESC drops to 0.89, 0.88, 0.93, respectively, whereas DRCR drops to Rs. 0.26. The break-even international

price being $15 in this case, the industry would have an even large buffer of $14 per quintal. Datta et al (1995) have showed that, given the various possibilities of byproduct use accommodated in this case, the extent of overall policy transfer turns out to be negative, meaning that the industry is being taxed to the extent of Rs. 2624 per hectare in the absence of the requisite byproduct use and free trade.

For a better understanding of the global competitveness position of Indian rice and its implications for policy action, it is necessary at this stage to point out the limitations of the above-stated analysis usually cited in the literature, and also to add appropriate qualifications to the above stated analysis:

(i) The data requirements especially for arriving at domestic cost structure, world reference price (i.e., border price) and opportunity cost for outputs/inputs in question (or, of their close substitutes) are enormous and therefore the possibility of running into error are quite large while making these calculations.

(ii) The above-stated data problem gets intensified when one encounters several varieties of the same commodity, wide variations in input mix for producing any specific variety, wide fluctuations in the exchange rate, in domestic prices and more particularly in the international prices, and the difficulty of estimating shadow price of resources.

(iii) Implications of risk averse behaviour of farmers in the presence of inter-temporal fluctuations in the rates of return across crops and uncertainty over availability of resources like rainfall, irrigation and even soil fertility are not captured in these coefficients.

(iv) For a large country like India, the international prices are likely to move against it, the moment the country decides to enter the international

market either as a buyer or as a seller. This feature adds to the unreliability of global competitiveness analysis.

(v) Yet another limitation of the competitiveness analysis is that it cannot incorporate nor override the strategic considerations like food security for which a commodity may be produced at home in spite of its confirmed disadvantages. Take, for example, the use of mustard grown on rainfed land in Rajasthan during the *rabi* season, or the use of paddy grown in low-lying lands in Andhra Pradesh during the *kharif* season. In either case, alternatives are not easy to find out. Even if alternatives like tree plantations (in rainfed areas of Rajasthan) or jute (in low-lying lands of Andhra Pradesh) are explored, these may jeopardise the food security of the concerned farmers, if not of the region or the country as a whole.

(vi) One criticism often directed against this approach including DRC analysis is the difficulty of predicting general equilibrium effects, both on the output side and on the input side. This criticism is valid since this approach does not indicate how much incremental production can be absorbed by the economy before prices are affected. Even the DRC analysis implicitly assumes that changes in production patterns would not have significant effects on output as well as input prices. It must be pointed out, however, while even the DRC framework is admittedly based on partial equilibrium approach, it is precisely this feature which makes the DRC analysis practical.

(vii) Still another criticism against the DRC approach is that it does not really measure comparative advantages, since social profitability levels and Domestic Resource Cost Ratios (DRCRs) are estimated on the basis of world reference prices which may themselves reflect significant policy induced distortions. So, it is argued that "rather than providing a true measure of relative efficiency in production, DRC analysis merely generates a measure of one country's ability to compete with prevailing world prices. Put

another way, this means that DRC does not measure comparative advantage, but rather competitive advantage" (Morris, 1990, P. 35).

Most of the limitations listed above however signify complexity of analysis and data problems of one kind or another in application of the concept rather than irrelevance of the concept of global competitiveness *per se*. Given detailed enterprise level data, it is possible to overcome most of these limitations through sensitivity analysis which would permit one to predict the impact of changes in the values of important parameters and thus to judge the `robustness' of competitive strength of specific sectors and commodities. This is being attempted below.

The sensitivity analysis involves changing the values of important parameters of the system and noting down the impact of these changes. Such parameters include the yield rate, the domestic price of paddy (which is in one-to-one correspondence with the domestic price of full rice), the international price of full rice, the cost of human labour, the port charges and transportation and marketing costs, the milling cost and the percentage of broken rice. In Tables 3 and 4 this sensitivity analysis has been performed for two situations: scenario 1; that is, the case of *Basmati* rice without byproduct use and scenario 2a; that is, the case of non-*Basmati* rice (specifically, 71/12 UP variety) without byproduct use. The results of sensitivity analysis for the case of non-*Basmati* rice with byproduct use can easily be guessed from these two exercises.

These last two tables bring out the following stylized facts:

(i) While yield rate does not influence NPC, it does so only marginally in cases of EPC and ESC. But all three domestic resource cost indices (namely DRCR, DRCFE, Break-even International Price) are clearly and inversely related to the yield rate - that is, the higher the yield rate, the lower the domestic resource cost indices.

Table 7: Sensitivity Analysis of Global Competitive of Basmati Rice without Byproduct Use

Competitiveness Indices	Effects of Parametric Changes							
	Base Values	Yield (18-25)	Domestic Price of Paddy (900-1400)	International Border Price of Full Rice (70-120)	Cost of Human Labour (50% increase)	Port, Transportation & Marketing Charges (100% increase)	Milling cost (100% increase)	Broken% (15% - 35%)
1. NPC	0.9622	0.9622 to 0.9622	0.7711 to 1.0865	1.1070 to 0.6317	0.9622	1.0089	0.9622	0.9622 to 0.9622
2. EPC	0.9608	0.9603 to 0.9609	0.7551 to 1.0945	1.1181 to 0.6147	0.9608	1.0111	0.9608	0.9610 to 0.9606
3. ESC	1.0335	1.0347 to 1.0332	0.8279 to 1.1672	1.2028 to 0.6613	1.0335	1.0877	1.0335	1.0237 to 1.0443
4. DRCR	0.4897	0.6071 to 0.4440	0.4546 to 0.4964	0.5582 to 0.3069	0.5705	0.5048	0.5173	0.4135 to 0.5519
5.DRCFE	15.916	19.730 to 14.430	17.731 to 19.361	8.1441 to 9.9758	18.543	16.407	20.176	13.441 to 17.938
6.Breakeven International price	43.7390	52.667 to 40.2495	41.2442 to 44.2142	43.0262 to 43.0262	49.48	46.5647	45.69	37.9160 to 48.4937

Note:Base values of important parameters are: yield=23 quintal/hectare; domestic price of paddy = Rs.1200/quintal; domestic value of rice full=Rs.2000/quintal; border price of full rice = $80/quintal; human labour cost =Rs.5000 /hectare; port, tansport & arketing cost = Rs.25, Rs.40 and Rs. 50/quintal, respectively; milling cost = Rs.45/quintal.

Table 4: Sensitivity Analysis of Global Competitive of Non-Basmati Rice without Byproduct Use

Competitiveness Indices	Effects of Parametric Changes							
	Base Values	Yield (45-65)	Domestic Price of Paddy (450-500)	International Border Price of Full Rice (35-25)	Cost of Human Labour (50% increase)	Port, Transportation & Marketing Charges (100% increase)	Milling cost (100% increase)	Broken % (15% - 35%)
1.NPC	1.1174	1.1174 to 1.1174	1.3369 to 1.4458	0.9398 to 1.3777	1.1174	1.2899	1.1174	1.1174 to 1.1174
2.EPC	1.1314	1.1353 to 1.1292	1.3857 to 1.5102	0.9349 to 1.4324	1.1314	1.3290	1.1314	1.1294 to 1.1335
3.ESC	1.3487	1.3587 to 1.3433	1.6609 to 1.7854	1.1145 to 1.7076	1.3487	1.5844	1.3487	1.3159 to 1.3849
4.DRCR	0.5258	0.6679 to 0.4488	0.6579 to 0.6737	0.4345 to 0.6658	0.6261	0.6177	0.6382	0.4512 to 0.6081
5.DRCFE	20.509	21.707 to 14.587	25.658 to 26.274	14.123 to 21.638	20.351	20.077	24.891	14.666 to 19.764
6.Break-even International price	18.720	22.315 to 16.683	18.571 to 18.868	18.720 to 18.720	21.106	22.258	21.393	16.755 to 20.822

Note:Base values of important parameters are: yield=56 quintal/hectare; domestic price of paddy = Rs.475/quintal; domestic value of rice full= Rs.780/quintal; border price of full rice = $30/quintal, human labour = Rs.4500/hectare; port, transport & marketing cost = Rs. 25, Rs.40 and Rs. 50/quintal, respectively; milling cost = Rs. 45/quintal.

(ii) All the competitiveness coefficients - NPC, EPC, ESC and DRCR are positively related to the domestic price of paddy. That is, the higher the paddy price, the lower the competitive strength.

(iii) The competitiveness coefficients are inversely related to the border price of rice. That is, the higher the border price, the lower the values of NPC, EPC, ESC and DRCR.

(iv) Cost of human labor does not directly influence NPC, EPC and ESC, but it does directly and positively influence DRCR.

(v) Port charges, transportation cost and marketing cost together directly and positively influence NPC, EPC, ESC and DRCR.

(vi) Milling cost alone, being an insignificant component, has no or negligible impact on NPC, EPC and ESC, but it has a positive relation with DRCR.

(vii) Percentage of broken rice has no impact on NPC, negligible impact on EPC, but positive relation with ESC and DRCR.

(viii) Since DRCR, the most comprehensive and authentic measure of global competitiveness is quite sensitive to changes in any of these parameters, policies ought to be aimed at monitoring and guiding changes in these parameters as far as possible.

V. Constraints on Rice Exports

This section brings out the various qualitative constraints to rice exports, which could not be quantified, nor even incorporated as parameters in the global competitiveness analysis of the preceding section. While discussing these constraints, it is necessary to separate out those confronting the exporters from those confronting the farmers and the domestic consumers of rice. There are also certain overall constraints

confronting the country as a whole which may not always find adequate reflection in the calculus of concerned individuals, but which are nevertheless quite important in an analysis of long-term policy perspective.

Marketing Constraints of the Exporters

Stiff Competition and Near Stagnation of Indian *Basmati* in the Traditional Middle East Market: The fact that Pakistani *Basmati* is 20-25% cheaper than its Indian counterpart coupled with the fact that the consumers in this part of the globe are less demanding in terms of quality as compared to the European or the American customers, poses stiff competition to Indian exporters. The fact that many exporters compromise on quality to match low-valued quotations of the importers further complicates the problem by inducing a chain effect - still lower-valued quotations and further deterioratation in quality. As most of the Indian exporters are dependent on local distributors' in this market segment, they are often forced to sell in the local distributors' brand name and are thus deprived of the benefits of value-addition through creation of brand images. Though disciplining the exporters through concerted efforts is no doubt needed in the long term interests of the business, Indian exporters would probably be better off by diversifying their products as well as the markets, and especially by gradually shifting towards the premium markets of Europe, the U.S. and Australia.

Lack of Reliability of the Product: The above-stated feature coupled with the fact that there are several varieties of *Basmati* which visually come close to fulfilling the desirable features but cannot be distinguished prior to cooking, raises suspicion in the minds of the consumers, on the one hand, and opens up scope for opportunistic behaviour on the part of unscrupulous businessmen, on the other. A long-term solution to this problem involves a number of steps in several directions: (i) evolution of a scientific grading

system, if necessary by grouping together a number of varieties which are close to each other in terms of key characteristics, (ii) regulating breeding, multiplication and application of seeds, keeping the above-stated grades in mind, (iii) adequate training and education for the farmers as well as for the breeders and seed-producers, which goes far beyond the control of the exporters or any association of exporters. Supplementary and short-term measures would be to promote branded products as well as to discipline the exporters through a statutory body like the proposed Rice Export Promotion Council and circulation of a list of processors-cum-exporters with proven track records to the embassies of the importing countries.

Weevils: Weevils, which develop because of the inherent property of *Basmati* rice once the temperature crosses 28 to 30 degree celcius in spite of adequate cleaning and full fumigation prior to shipment from India, poses a major problem in tapping the full potentials of *Basmati* exports, especially in the quality-conscious markets. Currently, this problem is being handled by the exporters through nitrogen flush packaging which prevents development of insects even if the rice is kept unused for a long period of time. It is learnt that recently the University of Texas in coordination with the USDA and the Millers' National Federation has developed a rapid and sensitive biochemical assay known as ELISA for insect detection, which is likely to be marketed in the near future. A positive response from the country's R & D organisations for solving this problem is long overdue.

Presence of Chemical Residues: If Indian rice exports are to capture a larger share of the world market, chemical residues will have to be removed at the milling stage, given the sanitary and phyto-sanitary clauses under the GATT Accord. Several steps seem necessary in this context. First, if husk-fired furnaces used for drying of parboiled rice are mainly responsible for the chemical residues, such furnaces ought to be banned and only standard

systems ought to be permitted for drying. Second, the country has to reduce its dependence on inorganic fertilizers and chemical pesticides and move towards organic farming (e.g. through use of AG-GRO, a natural bio-catalytic soil builder and conditioner for healthy plants and crops), which is the latest trend in the developed countries of the world. Third, *Neem*-based pesticides and symbiotic fertilizing of the soil through azulla bacteria are recommended for increasing the nitrogen content of the soil, which is believed to be a critical factor favouring growth of paddy. Finally, public relation measures ought to be undertaken to impress upon foreign buyers that the Indians do not indiscriminately use chemical fertilizers, insecticides and pesticides in agriculture, storage, preservation and processing.

Eco-friendly and Environmentally Acceptable Packaging: Besides being eco-friendly and environmentally acceptable, the packaging material must be commensurate with the premium image of *Basmati*. It should be at the same time cost-effective and eye-catching. Packages must also be able to withstand wear and tear of handling during logistical operations. It should be pilferage-proof as well. Moreover, the shape, size and dimensions of package should be such that it saves storage and transportation costs, besides conforming to the international standards, in general, and to the specification of the importing country, in particular. Although currently rice is being packeted in containers of jute, cloth, plastic, flexible laminates, cardboard boxes etc, multiwall paper bag provides one option which has wider global acceptance. This option is believed to be having the following advantages, as claimed in a recent article in *Rice India*:

i) It has global acceptance in almost all major markets - namely, Middle East, Europe, USA.

ii) Being eco-friendly, it can meet various environmental requirements.

iii) As any design, colour, logo, tonal/semi-tonal images can be exactly reproduced on the paper bags, it has also printability advantage.

iv) As the paper once stitched cannot be tampered with and then restitched, it is completely pilferproof.

v) Through designing it is possible to have product differentiation and to create brand awareness.

vi) All necessary barrier properties like moisture barrier, aroma barrier etc. can be imparted to this option.

vii) As it is made from specially paper, it is very strong.

viii) It has the convenience of easy handling.

ix) Though slightly costlier in terms of unit prices, taking the above-stated qualitative factors into consideration, it is an effectively cheaper device, given the fact the it provides chances to increase the market share with unique designing and positioning.

x) With the advances made by the paper and packaging industries, such bags are now-a-days available in abundance in India.

Fresh Tariffs on Imports into the EEC Market: In spite of the GATT, which raised hopes about slashing of import barriers and especially of tariff rates, the EEC countries, in order to revive their sick rice units, have imposed under Common Agricultural Policy fresh and steep tariffs on imports of processed rice beginning January 24, 1994. This has been quite shocking to Indian rice millers. India needs to carefully examine the wording of the GATT Accord on this issue as well as on the issue of non-tariff restrictions and should draw attention of the World Trade Organization (WTO) to this discriminating policy for remedial action.

Logistical Problems of the Exporters

Problems of Rail Transport: Since about 80% of the country's export trade in rice originate from just a few places in Punjab, Haryana and Delhi to

a single destination - namely, Kandla with no stoppages *en route*, and the railways also get a lot of fertilizer cargo to carry back to the Punjab-Haryana belt, one would expect that the Indian railways would capture this advantage and enter into a mutually profitable deal with the rice traders in India. Unfortunately, this has not happened, even though the rice traders turned to railways given the abnormal freight charges of truck unions and occasional strikes by the truck operators. The specific problems encountered by the rice exporters with Indian railways are listed below:

First, it is extremely difficult to get wagons during November to February, the peak season of rice exports, when nearly 55% of the total export order are executed. The exporters allege the regrettable practice that without bribing one cannot get wagons especially during this peak season.

Second, the exporters further allege that with the connivance of railway staff, the wagons are sometimes detached somewhere *en route* and declared sick, thus wasting the valuable time of the exporters in locating their cargo.

Third, the railways having high, fixed and equal freight charges between any two places (e.g., Delhi-Kandla), both for onward and return journey, the comparative costs of roadways and railways transport work out against the latter. The picture becomes even more unfavourable towards railways, when one takes into consideration other factors like time taken, handling, demurrage, liability and hygienic transport. Agricultural Products Exports Development Authority (APEDA) must take initiatives to bring the Commerce Ministry, the Railways Ministry and the All India Rice Exporters' Association (AIREA) together and satisfactorily resolve these problems.

Problems at Kandla Port: The problems at Kandla port appear too many at this stage: (i) tremendous congestion arising from the overall capacity constraint and only two berths of the present total of sixth berths are currently being made available for exports, (ii) acute shortage of pilots, (iii)

insufficient dock labour board gangs, (iv) insufficient number and poor maintenance of shore cranes, besides unhelpful attitude of crane drivers, (v) absence of a business complex with good and modern communication facilities, (vi) vulnerability to pilferage and theft due to lax security, (vii) lack of properly fumigated and contamination-free space for storage of directly consumable agricultural products like rice. While it is difficult to estimate the losses arising out of all these problems, a partial estimate of the loss due to delay as provided by AIREA is US $ 45 million for a total of 904 vessels handled in 1993, taking on average a standing cost of US $ 500 per day per vessel. Both the Commerce Ministry and the Port Authorities ought to be serious about resolving these problems most of which are short-term in nature. However, at the same time they should start implementing a long term plan of expanding the port's capacities at multiple locations including Haldia, Kakinada, Bombay and not merely at Kandla. Given the fact that the warehousing facilities at Kandla are not only primitive but also limited in terms of godown capacity of 110,000 square meters, part of the huge amounts of surplus land around Kandla Port ought to be made available on long lease to relevant private bodies like AIREA for constructing their own and separate godowns for each commodity. Labour reforms necessary to discipline labour, which are proceeding at a very slow pace, ought to be courageously implemented by the government at this critical juncture of the country's reform programmes.

Customs Problems: It should not take more than a few minutes to complete the formalities and endorse and stamp the Duty Exemption and Entitlement Certificate (DEEC) and thus to certify that the cargo has actually been shipped. But the customs officials take months on this job. They usually demand proof of actual realization of payment before they could do so, even though it is not at all their job. The customs people are also

reported to be questioning the provision for `self-certification' granted by the Commerce Ministry only to those exporters who have over the years built a reputation. The consequent hustles and delays hurt not only the exporters but also the prospects of rice exports from India. Indian customs should probably take note of a comparative perspective between India and Hongkong on customs efficiency published in an article (Economic Times, Ahmedabad, March 6, 1995) by Mr. Kewalram Sital, Chairman of Style Asia Ltd. about the corruption and delays due to Indian customs and the high price India is required to pay due to such inefficiency and corruption.

Constraints on Free Movement of Rice: Even though it is a single Hindusthan and there are no formal constraints on movement of foodgrains at this stage for purpose of exports, some of the state governments like Andhra Pradesh and W. Bengal are reported to have demanded special clearance for movement of foodgrains through their territories to the relevant ports. Both central and state governments must institute modalities to ensure free movement of exportable items, which are on a fixed time schedule to reach foreign destinations. They must also ensure development of a cadre of specialist and export-friendly bureaucracy for handling exports and export-related matters, as a part of the country's reform programmes.

Moisture Problem during Shipment: Grain deteriorates through insect attack and mold damage and can even become poisonous if mycotoxins form, if adequate care is not taken particularly when rice is imported into regions with frequently high ambient temperatures. The basic reason for this problem is the general lack of awareness of exporters about the technical requirements for management of grain in tropical climates. It is heartening to note that the AIREA has been creating awareness among the exporters on this issue. Formal and statutory training of exporters must be instituted, probably with the help of Central Food Technology Research Institute (CFTRI),

Mysore and other competent bodies as a long term solution to not only this problem but also many other technical problems being faced by the rice industry.

Constraints Faced by the Processors

High Import Duties on Quality Machineries: Ever since the Indian economy started the liberalisation and globalisation process, the rice milling industry, given the prospects of global markets and international competition, started radically transforming the production technologies and management practices. This is reflected in the fact that the industry has gone in for sophisticated imported machineries like graders, sorters, polishers etc in a big way, has invited a number of missions and delegates from the importing as well as potentially importing countries, and has been increasingly going in for ISO-9000 certification, which is fast becoming the hall mark for entering into Western markets. Unfortunately, the industry is required to pay 15% customs duty on import of capital goods in spite of their export obligations and bank guarantees, as compared to a general 25% duty on import of machinery for the agro-industry. The industry sources allege that this is not providing enough incentives for fast modernization, which is necessary for strengthening of rice exports at this stage.

Absence or Near Absence of Byproduct Processing: The entire paddy rice product and byproduct system togetherwith its implications for agro-processing has been studied by Gaikwad and Gupta, 1987 (displayed in Figure 1). While byproduct processing in an integrated structure would considerably strengthen the competitive strength of rice exports, it is most unfortunate that our R & D organizations have hardly been able to commercialize byproduct processing and even to create sufficient awareness among the farmers and the processors. There is urgent need to update the existing

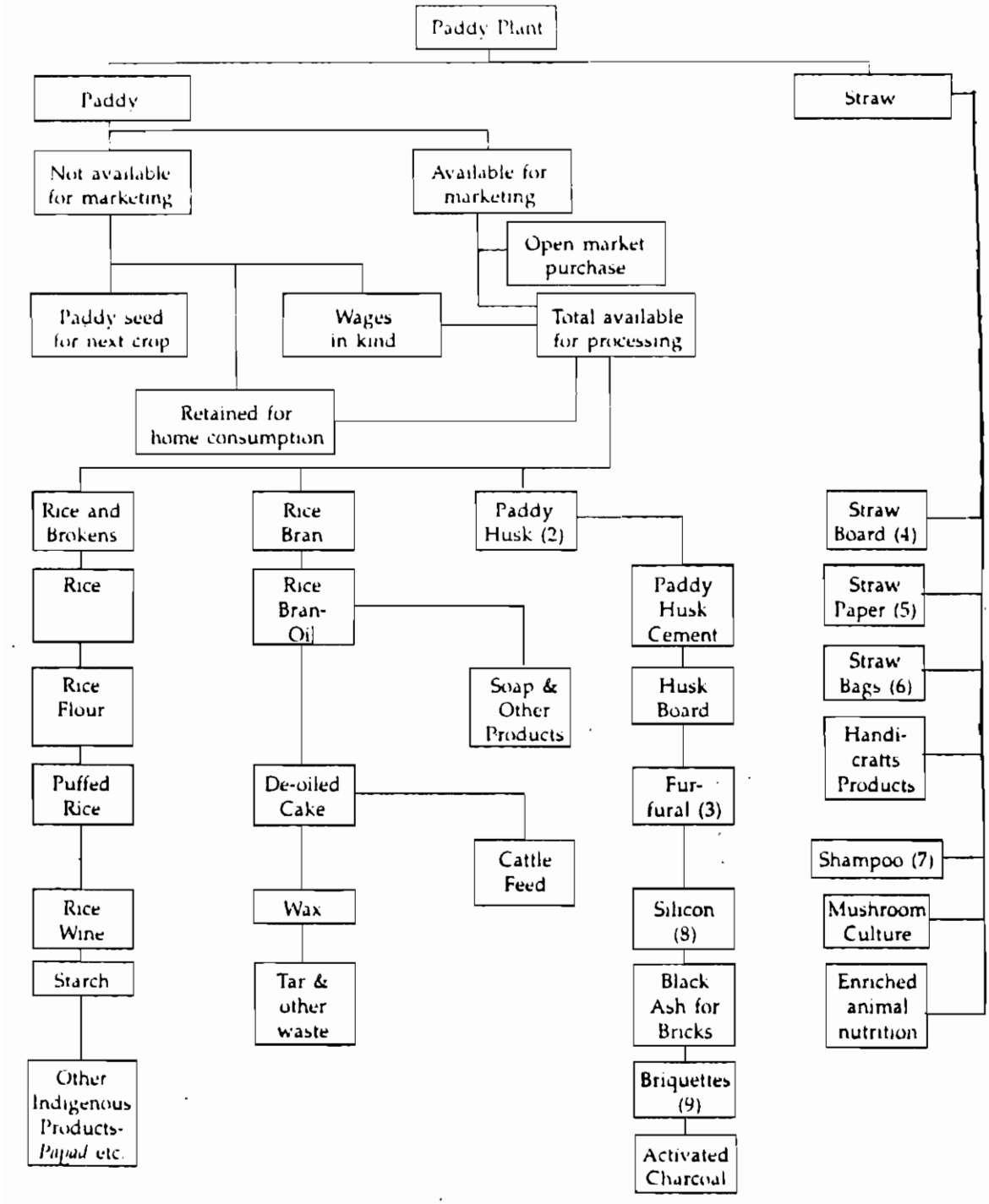

Figure 1.: Paddy-rice product and by-product system

Footnotes to Figure 1

1. Rice wine is commonly produced in many South-East Asian countries such as South Korea, Japan and India.

2. Cement from paddy husk has been recommended by the Central Building Research Institute, India.

3. Furfural is a chemical produced from rice husk. This is used as a catalytic agent in petro-chemical industries as well as for many chemical products.

4. Several private firms are currently producing straw-boards which is a strong but light board made from paddy straw.

5. Paper from paddy straw is also produced in many places.

6. With the help of a binding chemical, paddy straw has been used for manufacturing bags in S. Korea.

7. Hair shampoo manufactured from paddy straw is a popular product in Indonesia.

8. Rice husk, generally used as a fuel and a source of cellulose, also provides a cheap source of high purity silicon for solar cells and electronic industry. Cheap silicon is produced by a metallurgical process where silica and carbon are heated together. Rice husk which contains 15 percent silica can provide pure silicon (as reported in Science Today, Vol. 16, No. 8, August 1982, p. 12).

9. There are many plants in India manufacturing briquettes from carbonized husk as a substitute for coal.

Source: Gaikwad & Gupta (1987), p. 75-76.

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literature with recent innovations on byproducts use. A recent issue of *Rice India* has reported a major break-through by an American Corporation, (International Equity Partners, L.P.) permitting separation of crude rice bran oil from raw rice bran through a low temperature extraction process. The company has a branch office in New Delhi which is entertaining queries etc about this process. The following advantages are claimed for this process as compared to the pre-existing ones: (a) minimal energy usage, (b) generation of virtually solvent-free bran oil, (c) indefinite reuse of the solvent which is not denatured or destroyed during the process, and (d) no environmentally

harmful emissions as the process operates within a closed loop system. There is need to perform follow up exercises on such and similar innovations by Council of Scientific and Industrial Research (CSIR), to create greater awareness within the industry through promotional agencies like APEDA, AIREA etc, to encourage joint ventures with appropriate foreign multinationals and even joint ventures between private and cooperative enterprises in India to avoid wastage of byproducts, and to encourage byproduct processing industries through various fiscal and monetary incentives.

Power Cuts and Inappropriate Power Tariffs: In many of the paddy growing states, there is acute power shortage, which forces the industry to rely on diesel generators, which add to the costs. There is also no adjustment in power supply and power tariff in response to the requirements of this seasonal industry during peak (November-April) and slack months. There is considerable room for planning, rationalisation and improvement in the functioning of the State Electricity Boards (SEBs). In fact, if SEBs rationalise their policies, the economy would be in a position to generate surplus electricity in many parts of the country through agricultural byproduct processing in sugar and rice mills.

Inadequate Training: Although the industry started modernization immediately after export of *Basmati* was put under Open General Licence (OGL) in 1980s, the sector continues to be reserved for small scale industry while its training requirements continue to be only poorly attended to. The industry continued to be composed of heterogeneous units with relatively inefficient hullers and hullers-cum-shellers with byproduct wastage still growing and constituting a large component (above 75 %) of the total industry. Absence of a mandatory requirement to undergo professional training as soon as a license is issued is making matters worse. Currently, CFTRI, Mysore and

IIT, Kharagpur are conducting intensive training programmes. These opportunities need to be fully tapped.

Constraints in Procurement

Lack of Requisite Statistics for Purchase Planning by the Exporters: The cost of cultivation data published by the Directorate of Economics and Statistics in the Ministry of Agriculture, Government of India does not publish not only recent data, but also any separate data on area, production and yield of *Basmati* paddy, not to speak of publishing projections about production of different varieties of rice in different states. Moreover, the published cost of cultivation data does not distinguish between the cost figures for commercialized farmers, who are mostly relevant from the exporters' point of view. As a result, official data sources are of little help in efficient business planning for taking appropriate purchases decisions. Speculations therefore play a very major role which benefits the intermediaries but not the farmers nor the exporters. Often there is mad rush for purchases and the exporters, in order to sustain their images as sustainable suppliers, tend to stock 2-3 years' supplies with the consequent damaging implications: need for greater storage space as well as larger working capital requirements. It appears the agricultural universities/ organisations in charge of collection of the cost of cultivation data do have the micro-level data and even if they are not doing so, these organizations can be instructed to collect, process and publicize the requisite data with probably minor modifications in the sampling design, but without any substantial increase in their costs of operation.

High Incidence of Local Taxes and Local Restrictions: Although the country has removed in response to the requirements of the industry and changing circumstances highly restrictive provisions like MEP, export quota,

canalisation, essential commodities tag etc., state level taxes and restrictions still continue to affect the industry's procurement activities. This is in sharp contrast to the role of the government in several rival and neighbouring exporting countries like Pakistan, Thailand and Vietnam. The following provisions are alleged to be especially restrictive:

(a) The 4% purchase tax in Punjab and Haryana (in fact with retrospective effect from 1971 in Haryana) which would force the industry to migrate to neighbouring states of Rajasthan and Uttar Pradesh, which have exempted such taxes.

(b) Double taxation of market fee and HRD tax, as the Government of Punjab has been insisting on purchases of paddy from the neighbouring states by the exporters in spite of similar tax payments to the latter states.

(c) Agricultural cess of 3% on all the rice that is brought into Haryana from other states.

(d) A 2% trade tax on paddy in the state of Uttar Pradesh from the provisions of which the manufacturer exporters are not exempted.

(e) The prevailing restrictions on maximum stock holding limit on Basmati rice in Madhya Pradesh inspite of the central government's directive to all state governments and union territory administrators to exempt Basmati rice meant for both exports and internal market from this restriction with effect from December 10, 1993.

(f) The essential commodities tag and levy on *non-Basmati* rice which may be removed or at least reduced to reasonable levels, as the country has built up huge buffer stocks of rice even beyond its storage capacity.

It is estimated that the impact of the various local taxes add an extra $60-75 per tonne on Indian rice exports. If India is to capture the global markets, the central government as well as the relevant state governments must reconsider these taxes and restrictive provisions.

Inefficient FCI Functioning and Unfavourable FCI Pricing Policy: Even though the FCI has decided to off-load a part of its stocks for exports, the issue prices continue to be above the world prices and moreover, the stock is found to be too old with attendant quality problems. In 1995 Indian exporters could bag contracts for a supply of 200,000 tonnes of average quality rice with 30-35% brokens at around $ 225-300 per tonne FOB. Because of the above-stated problems, the industry failed to make large business out of this contract. It is high time to achieve greater transparancy in FCI functioning, to trim FCI's size of stockholding, its staff strength and operations, besides streamlining its functioning.

Overall Constraints

There are some overall constraints, which may not directly and in the short run hurt the interests of the exporters and even of the farmers and consumers, but which may pose problems to the long-term export prospects of Indian rice, besides imposing severe social costs in view of several environmental as well as socio-economic implications of mindless production and export of rice. These are listed below.

Absence of Patent Rights: Just as in the case of Darjeeling tea, neither Indian exporters nor the Indian farmers nor even the promotional agencies like APEDA or AIREA have so far patented *Basmati* rice. This is inspite of the fact that serious research efforts are under way in both Thailand and the US to replicate *Basmati*, although so far they have achieved only partial success. If callousness on the Indian side continues, given the pace of developments, one would not be surprised if tomorrow either the US or Thailand, if not Pakistan, claims patent rights on *Basmati*. One fails to understand why serious efforts are not being made in this direction.

Excessive Investment in Rice Milling Capacity: The estimated rice milling capacity of the country is several times the maximum level of paddy production the country has witnessed so far. It obviously raises the question about the excess burden on both domestic and international consumers of mindless over-investment in capacity. The state food departments as well as AIREA/APEDA ought to maintain vigilance on this matter, as these are the authorities which issue milling licences and register the exporters.

Harvesting at Right Moisture Level: In India, paddy is often allowed to stand in the field after maturity for the purpose of drying. As a result, the farmers suffer huge losses on account of shattering during the harvesting process, besides keeping the land engaged for additional 10 to 15 days. During this period, given the retained moisture level in soil, a second pulse crop can be started in many rainfed tracts of the country. In general, it would provide additional 10-15 days for the second crop. It has been reported that the field yield of dry paddy is 15-20% higher if paddy is harvested at 22% moisture level. Moreover, as the percentage of broken goes down with this higher moisture level, the milling efficiency also increases. Only farmer level organizations can educate the farmers about this practice and ensure prevention of the implied losses.

Need to Augment Production and Productivity to Sustain Exports: Since production of *Basmati* is restricted to only certain pockets of certain states, it is necessary to initiate scientific researches to explore the possibility of extending *Basmati* to areas like eastern Uttar Pradesh, Northern Bihar having excellent soil and irrigation facilities, as suggested in certain quarters. The farmers in these areas may be educated and motivated to grow *Basmati* through a buy-back arrangement. Even if such areas can grow grade 2 or grade 3 varieties of *Basmati*, the farmers, traders

as well as the country will be immensely benefited. In fact, many parts of the country grow local aromatic varieties, which are as good as or may be even better than *Basmati* in terms of aroma, but being short grains, they do not come anywhere near the real *Basmati* and as such they do not attract international customers. But given the fact that the demands from international customers also vary across countries and regions, and aroma is one of the key attractions of *Basmati*, it may be worthwhile to explore marketing of these short-grain aromatic varieties on a pilot basis, given the ever-increasing demand for *Basmati* from all parts of the world.

On the non-*Basmati* front, there is even greater need to augment production through increase in yield, as the scope for area expansion is extremely limited. Table 5 describes the potential for increase in area and yield of paddy. During 1970-71 to 1990-91, only pulses and oilseeds have achieved outstanding growth rates in terms of area expansion, while the average annual growth rate in area under paddy, though not negative, is rather low (0.67%). In terms of yield growth, cotton and soyabean are super-performers with respectively 6% and 5.47% average annual growth rates, the growth rate being relatively moderate (2.7 %) in case of paddy. The extent of irrigation coverage being quite low in most of the paddy-growing states, the scope for application of the `Green Revolution' technology and achieving high yield are quite limited.

Table 6 displays the domestic incentives in the form of average profit and rate of profit over the paid out cost of cultivation (that is, cost concept A2) and average annual percentage change in area under paddy and other competing *kharif* and perennial crops across the major paddy-growing states of the country for the period between 1980-81 and 1986-87, as estimated by Gulati and Sharma (1991). As it can be seen from this table, in Andhra Pradesh paddy appears to be more lucrative compared to other seasonal crops,

Table 5: Changes in Cropping Pattern and Yield Of Major Crops in India Between 1970-71 to 1990-91

(Area in '000 hectares, Yield in '000 kgs. per hectare, Annual growth in per cent)

Crop Group	Crop	Area			Per cent of GCA		Yield		
		70-71	90-91	AV.ANN. GROWTH	70-71	90-91	70-71	90-91	AV.ANN. GROWTH
Cereals	Paddy	37592.00	42596.30	0.67	22.67	24.50	1.12	1.75	2.79
	Wheat	18240.00	23977.20	1.57	11.00	13.79	1.30	2.27	3.73
	Others Cereals	36139.00	35480.90	-0.09	21.80	20.40	0.60	0.91	2.56
	Total Cereals	91971.00	103121.10	0.61	55.47	59.30	1.01	1.60	2.93
Pulses	Pulses	7839.00	24397.00	10.56	4.73	14.03	0.70	0.70	0.00
Oilseeds	Mustard & Rape Seeds	3320.00	5780.00	3.70	2.00	3.32	0.59	0.90	2.63
	Groundnut	7326.00	8297.20	0.66	4.42	4.77	0.80	0.90	0.63
	Soyabean	30.00	2365.30	389.22	0.02	1.36	0.43	0.90	5.47
	Total Oilseeds	9223.00	24013.70	8.02	5.56	13.81	0.58	0.77	1.64
Fibre Crops	Cotton	7605.00	7395.50	-0.14	4.59	4.25	0.10	0.22	6.00
	Jute	749.00	777.90	0.19	0.45	0.45	1.19	1.80	2.59
	Total Fibre Crops	8354.00	8173.40	-0.11	5.04	4.70	-	-	-
Sugarcane	Sugarcane	2615.00	3681.50	2.04	1.58	2.12	48.32	65.27	1.75
Horticulture Crops		1268.00	1646.00	1.66	0.76	0.95	-	-	-
Plantation Crops		692.00	-	2.57	0.42	-	-	-	-
Spices and Condiments		1340.00	1581.00	1.00	0.81	0.91	-	-	-
Gross Cropped Area		165800.00	173890.00	0.24	100.00	100.00			

Notes: " GCA " refers to gross cropped area inclusive of area under all food and non food crops. Hence the sum of per cent of GCA of all crops may not add up to 100.

Source : Data on GCA are from Basic Statistics Relating to the Indian Economy, CMIE, August 1993, approximate figures of area for crops under Horticulture, Plantation and Spices & Condiments are from Indian Agriculture in Brief, 1990, DOE&S, GOI, while the data for rest of the crops are from Fertilizer Statistics, various issues.

Table 6: Domestic Incentives and Changes in Cropping Pattern, 1980-81 to 1986-87 (at 1988-89 Prices)

Crop		A.P	Assam	Bihar	Haryana	M.P	Orissa
Paddy	A=	3666	2339	2584	3390	1858	2390
	B=	72	200	171	85	151	117
	C=	.03	-1.16	0.63	4.28	0.04	-0.08
Maize	A=	-	-	3306	-	1362	-
	B=	-	-	289	-	149	-
	C=	-	-	-3.8	-	0.88	-
Moong	A=	861	-	-	-	1169	1656
	B=	76	-	-	-	184	172
	C=	1.65	-	-	-	-4.3	0.09
Urad	A=	1625	-	-	-	1132	1790
	B=	127	-	-	-	163	258
	C=	9.6	-	-	-	-0.45	+3.7
Ground -nut	A=	1604	-	-	-	2669	4182
	B=	60	-	-	-	187	182
	C=	3.8	-	-	-	-3.3	12.6
Soyabean	A=	-	-	-	-	2198	-
	B=	-	-	-	-	187	-
	C=	-	-	-	-	23.5	-
Jute	A=	-	2074	2335	-	-	5087
	B=	-	118	203	-	-	210
	C=	-	2.80	2.89	-	-	-2.6
Cotton	A=	-	-	-	-	2006	-
	B=	-	-	-	-	229	-
	C=	-	-	-	-	-2.6	-
Sugarcane	A=	14265	-	9621	8819	-	-
	B=	155	-	286	274	-	-
	C=	2.3	-	1.7	1.67	-	-

Table 6 continued.

Crop		Punjab	T.N	U.P	W.B	Total weight	Weighted average
Paddy	A=	4439	4827	2139	3281	89.6	2906
	B=	86	73	102	112	22.9	125.2
	C=	6	-1.9	0.41	-0.55	-	-
Maize	A=	-	-	-	-	47.7	2202
	B=	-	-	-	-	3.3	201
	C=	-	-	-	-	-	-
Moong	A=	-	-	-	-	55.7	1204
	B=	-	-	-	-	1.7	193
	C=	-	-	-	-	-	-
Urad	A=	-	1215	1274	-	68	1511
	B=	-	132	180	-	1.7	200
	C=	-	8.3	0.23	-	-	-
Ground -nut	A=	-	2697	-	-	82.5	2231
	B=	-	83	-	-	4.1	87
	C=	-	2.2	-	-	-	-
Soyabean	A=	-	-	2242	-	95.4	2207
	B=	-	-	162	-	0.55	182
	C=	-	-	3.7	-	-	-
Cotton	A=	-	-	-	-	80.9	1865
	B=	-	-	-	-	4.3	102
	C=	-	-	-	-	-	-
Sugarcane	A=	-	16877	9920	-	86.9	11374
	B=	-	141	322	-	1.7	271
	C=	-	2.2	3.6	-	-	-

Note to Table No. 6:

A= average profit per hectare at 1986-87 prices.
B= average rate of profit (%).
C= average annual change in area (%).
All figures are averages for 1980-81 to 1986-87.
Figures under column 'total weight' indicates the total area covered by the state mentioned under a given crop. The second figure represents share of the crop in all-India gross croped area. All weights are average of 1980-81 to 1986 -87.

Source : Gulati and Sharma (1991).

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scale shifting of area in favour of paddy away from these crops. As a result, the average annual growth rate in area has been a meagre 0.03% in Andhra Pradesh. The situation is quite similar in Madhya Pradesh and even in Uttar Pradesh. The annual rate of area growth is relatively moderate in Bihar (0.63%) in view of limited alternatives and less profitability of sugarcane there.In Assam, Orissa, Tamil Nadu and West Bengal, the rates of area expansion are in fact negative as other crops are becoming more profitable than paddy. Only

in the states of Haryana and Punjab areas are growing at relatively high rates of 4.28% and 6.3%, respectively. But given the environmental problems associated with larger application of irrigation and chemical-intensive technology in paddy, it is extremely doubtful how far this unqualified area expansion under paddy ought to be encouraged. In fact, as Table 7 displays,

Table 7 : Production and Consumption Scenario in India

(Quantity in Million Tonnes)

Year	Paddy	Rice Production	Rice
1990-91	111.45	73.56	73.29
1991-92	116.53	76.91	77.98
1992-93	108.93	71.89	75.11
1993-94	117.01	77.23	75.98
1994-95	115.51	76.24	76.80

Source: All India Rice Exporters' Association

the country's production level at this stage does not provide any room for surplus over consumption. If the country has started exporting non-*Basmati*, it is merely on the strength of the excess foodgrains buffer the country has accumulated over the years. True, the per capita net availability of foodgrains has increased in India over the years, thanks to the success of the 'Green Revolution' strategy, but given the fact that India continues to be a poor country which is still in the process of transition towards development, there is little scope for curtailing per head consumption, which is, as a matter of fact, likely to increase with growth in income. This leaves no alternative other than augmenting yield per hectare through further scientific researches, extension and introduction of hybrid rice as the Chinese have done. But whether India should pursue more intensive application of the chemical technology in order to sustain non-*Basmati*

exports, given the signs of soil fatigue and concomitant environmental problems already surfaced in the traditional 'Green Revolution' belt, it is a highly debatable and doubtful question. India probably would be better off by concentrating more on production of quality rice without inviting further environmental problems, and supplementing its domestic supplies, if necessary, through imports of cheaper varieties of rice from Thailand and Vietnam.

Environmental Considerations: In view of the environmental hazards associated with an irrigation-fertilizer-pesticide-intensive crop like rice (about 45% of the country's irrigation water is consumed in rice cultivation), the country needs to consciously plan for restraint on its enthusiasm for non-*Basmati* exports, except on a miniature scale and unless the country happens to accumulate excessive buffer stocks over time. In fact, in order to minimize the environmental problems, the country needs to seriously follow optimum irrigation regimes (for example, submergence to a depth of 5+/- 2 cm rather than at 10 cm. depth as per the current practice in the eastern parts of the country and termination of the last irrigation 14-17 days before harvest, without any loss in production) as well as alternative cropping patterns like rice-mustard-sesamum, rice-mustard-*mung* bean, rice-potato-*mung* bean.

Untapped Potential: Indian *Basmati* has vast untapped potential markets in Africa, Latin America, Australia, New Zealand and even in Japan. It is learnt that Indian *Basmati* finds its way to Japan through Hong Kong and Thailand. While not withdrawing nor even withdrawing promotional efforts from the Middle-east, Europe and the U.S., the country should increasingly participate in international food and beverage fairs like FOODEX 94 in Tokyo, World Food Fair 94 in Moscow and Sial Food Fair 94 in Paris. At the same time concerted promotional efforts need to be directed towards countries having

large Indian population who can act as catalysts in promoting our rice and especially the *Basmati* rice.

Given the fact that Japan is opening up its domestic market for imported rice as per the GATT Accord, it is high time to gear up scientific efforts and even try joint ventures with Japanese collaboration to produce Japonica variety of rice in selected pockets of the country as identified by the scientists (Table 8). It is believed that the listed areas lying 25 degree to 27 degree north latitude and 85.5 to 97.5 degree east longitude have difficult hilly terrains ranging from a few hundred to over 28,000 feet in elevation, tropical to cool and sub-tropical to temperate type climate, and also a tradition of growing Japonica-type semi-sticky and glutinous rice.

Table 8 : Possible Areas for Japonica Rice Cultivation

Name of States/region	Approx. Area	Varieties grown
Jammu and Kashmir - *High & Mid altitudes*	1 lakh ha	K 332, K 333 Norin types
Himachal Pradesh - *Kulu Manali*	25,000 ha	Taichung 65
U.P. Hills - *Almora, Nainital, Garhwal, Dehradun*	About 1 lakh ha	VL8, Kaohsiung 22
North Eastern India Hills of Assam - *Arunachal Pradesh, Nagaland and Sikkim*	Limited Area	Local Varieties

Source: Rice India.

Further Constraints arising from Farmer-Consumer Perspective

Even though the winds of liberalization are quite strong and the exporters of rice are fairly well-organized, India cannot afford to take a long run perspective on the issue of rice exports ignoring altogether the interests of its vast millions of rice producers and rice consumers, many of

which are economically quite vulnerable and live below the poverty line. Moreover, even though one looks at the issue of rice exports only from the viewpoint of exporters, one is confronted with the problem that the most significant of the recommendations cannot be implemented without an effective backward linkage with and without cooperation from the farmers. It is therefore no wonder that the AIREA, while it is proposing formation of a statutory body like Rice Export Promotion Council to act as an effective forum for a constant dialogue between the government and the trade and as an authentic voice of the rice exporters abroad, it has found it equally important to guide and coordinate efforts to raise productivity and to undertake specifically the following functions: (a) good seed production and distribution activities, (b) allocating funds for research on premium quality rice, and (c) distribution of suitable insecticides to minimize the incidence of disease and pests.

While there is no doubt about the need for forming a statutory body like the Rice Export Promotion Council with the proposed set of functions, the farmers' interests will not be adequately served and therefore the farmers cannot be roped in into a strategy of sustainable export supply, unless and until (i) the farmers are adequately benefited from better marketing and value-addition activities, (ii) the farmers are properly educated, trained and integrated with the requirements of the premium markets through suitable backward linkages and (iii) adequate safeguards are instituted to check the plight of vulnerable sections of the farming community - namely, agricultural labourers as well as small and marginal farmers, who are net buyers of foodgrains and who are suceptible to the problem of `exchange entitlement failure' just like the urban poor. Two major steps needed in this connection are illustrated below.

First, while the FCI and the PDS should be rationalised, reformed and pruned, the government should not give up food security policy and the PDS for the weaker section of the community. However, the PDS should be appropriately targeted through linking PDS to Employment Guarantee Scheme (EGS) or Jawahar Rojgar Yojana (JRY) and giving food stamps for purchase of subsidized food only to the participants of EGS or JRY.

Second, the rice sector being vast and composed of millions of farmers, the chances of success of contract farming appears quite low. The only sensible way the exporters can establish healthy, profitable and sustainable backward linkages with the farmers is through the producers' cooperatives. Such cooperatives can also provide immense benefits to the farmers. There are two types of successful rice cooperatives observed in this country. The first type of cooperative rice mills structured within multipurpose Primary Agricultural Credit Societies (PACS) or Primary Agricultural Marketing Societies (PAMS), which are completely owned, controlled and managed by rice-growers, though only few in numbers, are found mostly in Andhra Pradesh. The second type of cooperative rice mills are owned and fairly efficiently operated by parastatal cooperative federations like MARKFED-Punjab, MARKEFED-Haryana and MARKFED-Madhya Pradesh. Though benefits of better marketing and value-addition flow less to the farmers in the latter category of cooperatives than in the former category, the farmers are nevertheless immensely benefited and both types of cooperatives have been fairly successful in establishing strong backward linkages with the farmers. Given on the one hand that the private exporters have established their comparative advantages in promoting forward linkages through efficient processing and premium marketing, which the cooperatives are generally found lacking, and on the other hand that the cooperatives of either varieties have evolved strong backward linkages, which the private

processors and exporters need to and also are keen to develop, it is therefore logical that the two should join hands wherever possible and share the benefits of an integrated business structure. Such alliances are already found, though at a rather informal level in Punjab where MARKFED-Punjab has been a consistent supplier of paddy to Oswal Agro Furane Ltd. for processing. Even though the present study is not over-enthusiastic about the non-Basmati exports, it is strongly in favour of paddy-rice product and byproduct processing through strategic alliances between farmers' cooperatives and the private enterprises. The gains are substantial and there is enormous scope for such alliances not only in Punjab and Haryana but also in other major paddy-growing regions of the country. However, while promoting cooperatives for such alliances, the state governments must be well advised to implement the necessary cooperative sector reforms following the example of the recently amended Andhra Pradesh Act, rather than creating usually loss-making parastatal structures in the name of cooperatives. It is important to add that only very few of the parastatal cooperative federations are efficient and are running profitably.

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