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Adding Flavour

A value chain approach for aromatic rice

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SUMMARY

APEX, a national NGO, formed a coalition with Mark Industries Ltd., the Bangladesh Rice Exporters Association and poor farmers to plan and implement a sub-project on "Technological Development of Production, Processing and Marketing System of Aromatic Rice in North-West Region of Bangladesh". APEX established a national inventory of indigenous and modern varieties of aromatic paddy. Through on-farm trials, farmers identified the three best performing high-yielding aromatic varieties viz. BRRI dhan 34 and 37, and Basmati. APEX formed and trained 67 groups, totalling 330 resource-poor farmers, who may be called upon by any exporter or miller. A contractual marketing system ensured timely supply of desired aromatic rice varieties to millers, exporters, local and overseas consumers. Buy-back guarantee of paddy reduced transaction costs for farmers and middlemen. Farmers also received at least an 18% premium on top of the normal market price, increasing their income by on average Tk 4,100 per acre (US\$ 170 per ha). The project helped to increase milling recovery from 52% to 63%, after which two mills also agreed to improve their packaging technology. To strengthen the value chain, an Aromatic Rice Export Clearinghouse (AREC) was established to help farmers, millers, and exporters with advice, logistics, arbitration, market intelligence and market promotion. The following case study uses the enterprise web as a management tool to pinpoint the weakest links in an emerging pro-poor aromatic rice value chain.

TECHNOLOGY

Situational context

Bangladesh has attained near self-sufficiency in rice production, whereas over the years the farm-gate price of rice has declined (Natural Resources Institute of UK, 1996; Project No: R-6689). NRI conducted a study on the prospect of expanding aromatic rice to meet local and export demand. The study focused on traditional varieties like Kalizira, Chinigura and Kataribhog. But these varieties have a problem of low yield and very low milling recovery. In 1998, BRRI developed high-yielding aromatic rice varieties BRRI dhan 34, 37 and 38. Bangladesh still imports Indian and Pakistani Basmati and Thai Jasmine rice; local demand is not met by local production. Therefore with professional production, processing and marketing support for aromatic rice a potential local niche market for local producers may be created.

Modern and local aromatic varieties

All aromatic rice varieties are cultivated in the rainy aman season (July - November), apart from Basmati, which is grown mostly during the dry boro season (November - May).

BRRI dhan 34 is a relatively short grain aromatic variety, which gives 30-40% higher yield than local aromatic rice varieties like Kalizira, Chinigura and Kataribhog. The aroma, other characteristics and market price of milled BRRI dhan 34 is comparable to those of the traditional aromatic rice varieties.

BRRI dhan 37 is a lodging-resistant aromatic variety that is photosensitive and suitable for the aman season. It has good-looking grains, a strong aroma and is comparable with Kataribhog, an aromatic land-race of Dinajpur. And it gives 25-37% higher yield.

BRRI dhan 38 is very similar to Basmati, but has a slightly shorter grain (Table 14.1 and see Nasiruddin and Ahmed, 2004).

Production system

Common belief holds that mostly rich farmers cultivate aromatic rice, which raises the question as to how the poor could benefit from it. But our socio-economic

Table 14.1 Classification of modern and local rice varieties based on grain size

RICE CLASS	GRAIN SIZE (MM)	VARIETY
Short	< 5	BRRI dhan 34, Kalizira, Chinigura
Medium	5.00 - 5.99	BRRI dhan 37 and 38, Kataribhog
Long	6.00 - 6.99	Jhinga Shail (non-aromatic)
Extra-long	> 7	Basmati

survey in 2001 revealed that resource-poor farmers allocate a greater proportion of their land to aromatic rice than large farmers, 14.6% of their total rice land compared to 9%. They could benefit even more from growing aromatic rice if they were organised as production groups and linked with the markets through a system of buy-back guarantee with millers and traders.

Milling system

By surveying 14 mills, we learnt that low head rice recovery and poor quality milled rice resulted from poor quality paddy, over drying, one time high pressure milling, over milling, and the lack of a length grader and mist polisher. By upgrading the milling technology, quality of milled rice improved significantly and recovery rate increased from 52.5% to 66.3% (Rickman, 2003; Salam et al., 2004; Salam and Azad, 2004). We demonstrated this modernised system to millers and developed a training programme for them. Through the project they also gained access to improved milling technologies from visits to Thailand.

Marketing system

A nationwide market survey in 2002 revealed that a family of 5.5 members ate on average 28.1 kg of aromatic rice per year, with consumption increasing in recent years (Hassanullah et al., 2004). Consumption varied among different economic classes: upper class people with an annual income of more than Tk 1,500,000 (US\$ 26,400) consumed 58.4 kg of aromatic rice per year, whereas a labourer consumed only 5.5 kg.

In 2002, Bangladesh imported 50,000 tons of Basmati. The country exported only about 1,100 tons of aromatic rice from a total production of 486,000 tons. With the projected national consumption being 703,000 tons in 2010, the production of aromatic rice will need to increase to meet demand.

The aromatic rice trade channel is a long and complex one, involving many stakeholders. Our surveys indicated that the major problems for the value chain were:

- the short-bold grain types of local varieties
- low yield (1.5 to 2.0 tons per ha) of local varieties
- poor recovery and quality in traditional milling system
- uncertain paddy price for farmers
- lack of contact with overseas markets.

Customers want the best. Increased milling recovery is one of the incentives for millers to invest in modern technologies. By doing so, also the quality of aromatic rice improves, complying with international expectations.



ACTORS AND NETWORK

The value chain approach required a coalition of farmers, traders, millers and exporters (Table 14.2). This was facilitated by APEX, a voluntary organisation for community development. Other specific members were Mark Industries (Pvt.) Ltd., and the Bangladesh Rice Exporters Association (BREA). The coalition is very single minded about exploring all aspects of the value chain for aromatic rice.

Table 14.2 Profile of various actors in aromatic rice value chain

ACTORS	TYPE OF ORGANISATION	SKILLS AND ASSETS	MOTIVATION TO CONTINUE COALITION
APEX	NGO	Experience of organising poor for mutual benefits	An important commodity to support rural poor
BREA	Trade organisation	Mobilising exporters for export of aromatic rice	To assists its members for supply of raw materials
MARK Industries	Manufacturing industry	Professional engineering expertise and equipment	To expand business
AWLIA	Engineering workshop	Technical skills	To expand business
IRRI	International Rice Research Institute	High level professional skills	To contribute to future rice development in Bangladesh
Farmer groups	Informal organisation	Land and expertise to produce aromatic rice	To gain economic gain by cultivating aromatic rice
Millers	Industry	Milling equipment	To procure quality aromatic paddy for better milled rice
Exporters	Trading agencies	Trading link and skills	To expand business
AREC	Service agency	Information and business contact	To continue providing services

APEX is an action-oriented organisation that endeavours to improve the socio-economic condition of disadvantaged rural people and empower women through generation of employment opportunities. APEX chose aromatic rice as a potential commodity that can accrue benefits to the poor and helped to organise poor farmers in groups. APEX also has the ability to link in at high levels in government and to the business community.

Mark Industries (Pvt.) Ltd. manufactures a wide range of products from pharmaceuticals to chemicals to agricultural machinery. In recent years, the company showed a high capability to fabricate equipment for urea briquetting, pulping, packaging, rice harvesting, husking and milling. Experienced engineers and technicians provide customer services and undertake R&D; but not enough for innovating the rice milling system. For this project, they therefore joined with the

Awlia Engineering Workshop, which specialises in production and installation of various components of automatic rice mills and their maintenance.

BREA (Bangladesh Rice Exporters Association) aims to bring production, processing and marketing of aromatic rice under one umbrella, as in Thailand. The organisation works closely with the Ministry of Food and Export Promotion Bureau. It can mobilise its fifteen members to undertake any R&D for the benefit of aromatic rice export.

Mr. Joe Rickman, head of the agricultural engineering unit at the International Rice Research Institute (IRRI), Los Baños, Philippines, helped to improve the existing milling efficiency in Bangladesh.

The Aromatic Rice Export Clearinghouse (AREC) was established with supplementary support from PETRRA to provide aromatic rice stakeholders with information and advise them on protocol and logistic services, and arbitrate if needed. But also to help out with merchandising, market intelligence, and market promotion.

A committee representing APEX, exporters, millers, and research and extension staff has been managing AREC in the premise of APEX, but is moving to new premises shortly.

THE ENTERPRISE WEB FOR AROMATIC RICE

Figure 14.1 shows three clusters of activities, covering production with farmers, processing with millers, and marketing with merchants and export association. Each is interdependent but also has specific requirements. And all are in their early stages of development.

Production technology

Selection of suitable ecosystem

Aromatic rice cultivation requires special agro-ecological niche to ensure better quality and aroma. We identified Naogaon, Rajshahi, Dinajpur, Sherpur and Bogra districts as most suitable for aromatic rice.

Selection of resource-poor farmers

As per PETRRA's criteria, we identified farmers who have less than 0.6 ha of land and 3-8 months rice provisioning ability per year. Initially, 36 farmers, men and women, were selected and twelve groups formed to conduct six trials in three experimental sites. Intensive dialogue took place to convince the selected farmers about the benefits of forming groups to make contractual arrangement with millers and exporters.

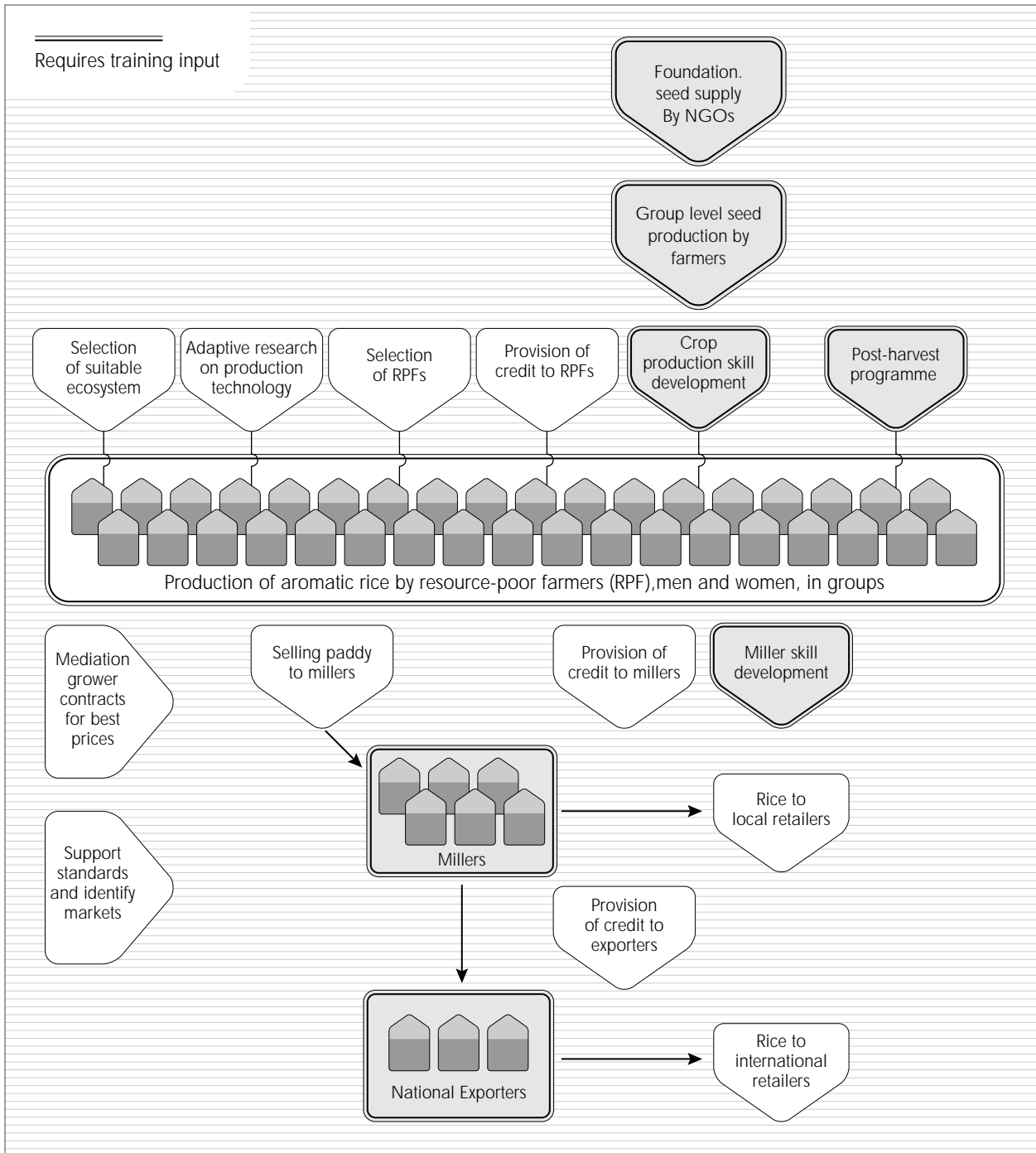


Figure 13.1 Enterprise web for mobile pump uptake for poor men and women

Adaptive research on technology

During the participatory variety selection, the twelve groups visited each trial at the growth, panicle formation and harvesting stage. In consultation with the breeder, the group members observed three modern varieties alongside a predominant local variety. After observing their desirable characters, farmers selected BRRRI dhan 34 and 37 for aman season and Basmati for boro. Although the aroma of Basmati was higher in aman season, farmers decided to grow it mainly during boro based on its yield performance. Basmati yielded on average from 3.0 to 5.0 tons per ha in aman and boro season, respectively.

A dedicated farmer Munshi Shamsuddin said, "APEX motivated me to spare two acres of land for BRRRI dhan 34. Due to the bumper yield and price contract with them, I received almost 7,000 Taka more profit compared to Chinigura [variety] last year."

Seed system

Once the best varieties were known, we collected foundation seed of BRRRI dhan 34, 37 and 38 from the Rajshahi regional BRRRI station. Farmers were taught about the production technology of foundation seed of Basmati. To obtain foundation seed, certain conditions are to be met (see Chapter 17). Dr. Mohammad Nasiruddin, former director research of BRRRI, taught the beneficiaries the seed production technologies. In the future, farmer seed producer groups could be established to ensure quality seed supply. Various innovative systems are given in Chapters 18 to 20.

Skill development for production and post-harvest handling

In 2002, we trained 41 farmers for variety purification and seed production and preservation and developed improved cultivation technologies. BRRRI dhan 34 and BRRRI dhan 37 yielded 3.0 tons per ha compared to 1.2 tons per ha for local aromatic rice.

In 2003, we formed another 55 groups, bringing the total to 320 resource-poor farmers (236 male and 94 female), and trained them in commercial production of these varieties during the following sessions.

Investment support for the poor

Microcredit from local NGOs or aromatic rice production loans needs to be available to the poor for production and storage. The first loan, granted during the cropping season, should help to pay their operational expenses. But as prices of aromatic rice are at their

Learning from local experts. Involving experienced aromatic rice growers in new producer groups enhances learning among all members.



lowest during the harvesting period, a second injection of financial support would allow farmers to store their rice and sell it a couple of months later at up to an 80% higher price. The length of the loan could even be tailored to link to the higher prices around the time of religious festivals such as Eid Ul Fitr and Eid Ul Azha.

Processing

Contract mediation between farmers and millers

Contract arrangement for production and supply of desired quality of paddy required an intensive dialogue between the millers and the farmer groups. APEX worked as contract witness and mediator between parties, after having discussed the terms and conditions of the contract (see Figure 14.1). Other contractual arrangements will follow the same approach in the future.

Miller skill development to meet export standards

We chalked out a programme and gave hands-on training to 40 millers and technicians in two batches. Mr. Joe Rickman of IRRI, with expertise in rice processing, acted as a resource person.

Investment support for millers

This is an essential activity in the total system. Owners of M/S Raj Auto and Rokeya Auto Rice Mills perceived that the improved system not only gave higher milling yield but also higher head rice recovery. They estimated that the extra return was worth Tk 6 (US\$ 0.11) per kg of output. Daily output of the two mills was 90 tons and 135 tons, respectively. At 100 tons per day of output, this means they would have US\$ 11,000 extra profit per day. So, interested millers should have access to easy term loans for modernising and expanding their old mills (Table 14.3).

Marketing

Contract production and marketing was an appropriate system for poor aromatic rice producers, who received an 18% premium (Tk 472 per maund compared to Tk 400

Table 14.3 Investment analysis for upgrading rice mills (at 100 tons per day)

INVESTMENT ANALYSIS	
Break-even point sales volume (annual)	1,105 tons (18% of capacity utilisation)
Break-even point sales value	Tk 26.5 million (US\$ 466,000)
Pay-back periods	Four years from the date of operation
Net present value	Tk 41.8 million (US\$ 736,000)
Internal rate of return	30%

per maund; one maund equals 37.3 kg). It enabled many marginal growers to produce a quality product on demand.

Information and requests to comply with specific quality standards could be easily conveyed from the export market back to the millers and through to growers. This feedback mechanism allowed for a swift response, only because farmers were organised in groups. This is one of the reasons why working through NGOs who can coordinate many farmer groups offers extra advantages compared to working with large, but individual farmers.

Market exploration

We identified potential markets in Europe, the Middle-East, Africa and Southeast Asia. Supported by donor agencies and the Export Promotion Bureau, a series of trade missions was planned to establish contacts with export markets and make detailed feasibility studies.

Aromatic Rice Export Clearinghouse

AREC played a critical facilitation role in drawing growers, millers and marketers together so as to achieve a desired volume of exports and thereby address a niche in the market in a coordinated way (see Figure 14.1). AREC may eventually be transformed into an organisation of aromatic rice growers, processors and market agencies.

Attracting attention. Making attractive packages is part of the marketing strategy, as Bangladeshi aromatic rice will be on the shelf competing with this of other countries.

Investment support for exporters

In neighbouring rice exporting countries such as India, Thailand and Pakistan, the government keeps a buffer stock of exportable rice to facilitate exporters. Exporters are also adequately financed to buy large stocks. In Bangladesh, as export of aromatic rice is an emerging business, exporters do not have many overseas contracts yet and hence are uncertain about the size of orders they will get. But once they receive an order, they need to respond swiftly, not let importers wait. Timely supply of quality product is of critical importance, especially in the early stages of building international relations. Hence, adequate financial support should be available to the exporters to buy in bulk in accordance of the value of Letter of Credit, send by the international clients.

Awareness raising and policy advocacy

One of the major tasks was to create awareness about the new technologies and products. Based on the initial trial results and with support from the agronomist working in the project, we published a leaflet in Bangla on aromatic rice



cultivation and distributed this among farmer group members. Extension staff of the Department of Agricultural Extension and NGOs viz. RDRS, Proshika and RSDA working on aromatic rice also received copies.

We also produced a leaflet on exportable Bangladeshi aromatic rice highlighting the qualities and grades, and handed them out to traders and exporters.

APEX in collaboration with BREA participated in the international rice congress held in Beijing, 2002. It sponsored a Bangladeshi stall and displayed samples of Bangladeshi aromatic rice. Publications were distributed among congress goers to create international awareness among potential buyers. A video programme was made and a book published to further increase awareness among stakeholders and the general public at large.

We conducted eight regional workshops on production and milling, in which about 500 representatives of all stakeholder groups participated. A national dialogue was held for policy makers to adopt appropriate strategies for promoting export of aromatic rice.

Training

Through study tours and trials, we exposed groups in which all stakeholders were represented to the aromatic rice production, milling and packaging technologies. To establish good mutual understanding, millers and exporters also took part in 41 demonstrations for farmers. Similarly, when we showed the improved milling system to potential millers, we also invited farmer group leaders and traders. These activities helped in building system transparency and mutual understanding of the complexities of the value chain.

The sub-project dealt with commercial entrepreneurs who were involved in production, milling and trading. Although some common problems emerged, each actor faced quite unique technological problems. High-level professionals and technicians provided services for personal guidance and counselling to farmers, millers, traders and exporters.

KEYS FOR SUCCESS

Farmer contracts

Buy-back price guarantee given to the beneficiaries motivated them to actively participate in the crop and seed production training and ensured maintenance of field standards.

Technical links for upgrading processing and marketing

From the inception of the sub-project, poor head rice recovery and quality of milled rice were perceived as major problems for promoting aromatic rice. As

technical expertise was not available in Bangladesh, input from Mr. Joe Rickman of IRRI was significant to the success of the project. AREC aimed to establish a continuing relation with IRRI and other international institutes dealing with livelihood improvement.

Partnership between key actors

For aromatic rice, the key actors are the producers, millers and exporters; and direct participation of all is a prerequisite for success. In this sub-project, the NGO APEX organised farmer groups and brought the different actors together, but in future any NGO with an interest in agriculture could take the lead and help negotiating contracts between millers and farmers. At the production end there is an interchangeability of agents for securing contracts.

Mark Industries and Awlia Engineering are private businesses, who expanded their markets by selling innovative machinery for improved milling and by providing maintenance support. The Bangladesh Rice Exporters Association assisted the exporters for marketing and exporting of aromatic rice.

POTENTIAL PITFALLS

The institutional base of resource-poor producers

In the second year, the number of producer groups increased to 67 for trial commercial production. A contract arrangement was made with a miller and an exporter to provide buy-back guarantee, but we fear that two cropping seasons is too short to develop a strong institutional base of producer groups. In future, it would be better to train existing groups under local NGOs viz. RDRS, Proshika and RSDA or community-based organisations and link them to millers who in turn are linked through AREC to exporters. Examples of existing farmer seed producers are given in Chapters 18 to 20.

In the development of the market chain, inclusion of resource poor farmers must be purposeful. The transaction cost of millers to work with poor farmers at first sight appears to be higher compared to dealing with large farmers. However, when working through NGOs who can coordinate groups, the reverse may be true. But a social capital development cost is needed to build the local level organising capacity, which is required to draw up and comply with production and marketing contracts. It is important for this to be self-financing. A sustainable cost-sharing mechanism developed by the RDRS federations could serve as an example (see Chapter 20). Millers received an extra Tk 6 per kg of output (see above) and growers receive 18 percent premium. Maybe a better contractual arrangement can be made for farmers so that they receive part of the Tk 6 per kg extra that the millers obtained. It is here that a complete financial and transaction cost analysis is needed of each activity in the enterprise web.

Institutional development of BREA

BREA is a key actor in marketing aromatic rice. We used the platform, but did not foresee the need to build capacity of BREA for long-term sustainability. Although it brought exporters together in a common platform, in 2004 it still had to establish its legal status through registration with the government authorities. Immediate attention is needed to reinforce this institution for exporting rice. To strengthen BREA's operations and service delivery to all its members, not only aromatic rice producers, AREC could operate as a cell in BREA's premises to reduce management and operational costs.

Access to international market

Modernisation and expansion of the aromatic rice industry depends on access to international markets. Unless contracts are established, it will be difficult to expand production and improve the milling system. This sounds like the chicken or the egg riddle, but reality tells us that the bulk of increased production will not be absorbed in the local market and increased cost of milling will not be recovered by selling to the local market. Hence, links should be further developed with the international market.

Bangladesh competes in the export market with India and Myanmar, both of whom provide export subsidies (Hossain and Deb, 2003). Although Bangladesh has recently introduced export subsidies for agro products this does not include aromatic rice (FE Circular, 2004). Government support for this industry in its infancy is necessary.

Apparently, the value chain approach for aromatic rice could benefit resource-poor farmers. But how to develop the capacity of the mills to meet standards for local and export markets needs to be explored. Export substitution should be possible but will be dependent on achieving consistent standards.

CONCLUSION

The advancement of resource-poor farmers through production of aromatic rice is dependent on developments in production, processing and marketing technologies and institutions. There are essential upward linkages to businesses and marketing houses. The formation of AREC is an important key in building volume of trade and ensuring standards. The enterprise web is in its early stages of development and does require consolidation.

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