

Report No. 52

**Rice Seed Delivery System and
Seed Policy**

Centre for Policy Dialogue

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The Centre for Policy Dialogue (CPD), established in 1993, is an innovative initiative to promote an ongoing process of dialogue between the principal partners in the decision making and implementation process. The dialogues are designed to address important policy issues and to seek constructive solutions to these problems. The Centre has already organized a series of such major dialogues at local, regional and national levels. These dialogues have brought together ministers, opposition frontbenchers, MPs, business leaders, NGOs, donors, professionals and other functional groups in civil society within a non-confrontational environment to promote focused discussions. The expectation of the CPD is to create a national policy consciousness where members of civil society will be made aware of critical policy issues affecting their lives and will come together in support of particular policy agenda which they feel are conducive to the well being of the country. The CPD has also organized a number of South Asian bilateral and regional dialogues as well as some international dialogues.

In support of the dialogue process, the Centre is engaged in research programmes which are both serviced by and intended to serve as inputs for particular dialogues organized by the Centre throughout the year. Research activities at CPD are currently pursued under six programmes, namely, **The Independent Review of Bangladesh's Development (IRBD), Trade Policy Analysis and Monitoring the Impact of WTO, Regional Cooperation in South Asia, Governance and Policy Reforms, Population and Sustainable Development, and Investment Promotion and Sustainable Development.** With a view to promote vision and policy awareness amongst the young people of the country, CPD is currently implementing a **Youth Leadership Programme.** The CPD also carries out periodic public perception surveys on policy issues and development concerns.

As part of CPD's publication activities, a CPD Dialogue Report series is brought out in order to widely disseminate the summary of the discussions organised by the Centre. The present report contains the highlights of the dialogue on **Rice Seed Delivery System and Seed Policy** organised as part of its on-going agricultural policy research and advocacy activities with the International Rice Research Institute (IRRI) under the Poverty Elimination Through Rice Research Assistance (PETRRA) project. The dialogue was held at CIRDAP Auditorium, Dhaka on January 8, 2002.

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Dialogue on Rice Seed Delivery System and Seed Policy

The Dialogue

The Centre for Policy Dialogue (CPD) organised the dialogue on *Rice Seed Delivery System and Seed Policy* as part of its on going agricultural policy research and advocacy activities with the International Rice Research Institute (IRRI) under the Poverty Elimination Through Rice Research Assistance (PETRRA) project. The dialogue was held at CIRDAP auditorium on January 8, 2002. Dr. Mahabub Hossain, Head, Social Sciences Division of IRRI and a former Director General of the Bangladesh Institute of Development Studies (BIDS) presented the keynote paper entitled “*The Rice Seed Delivery System in Bangladesh: Institutional and Policy Issues*”. The paper was co-authored by Dr. Aldas Janaiah of International Rice Research Institute (IRRI), and Professor Muazzam Husain and Dr. Firdousi Naher of Bangladesh Rural Advancement Committee (BRAC). Professor Rehman Sobhan, Chairman, CPD was the moderator of this dialogue. The dialogue was participated by a cross-section of policy makers, plant breeders, representatives from the public sector research and development institutions, public and private sector seed agencies, NGOs, farmers' association representatives, agriculture journalists and leaders of civil society groups and members of the donor agencies. This report documents the dialogue including a summary of the keynote paper and highlights of major issues raised in subsequent discussions.

Welcome Address by Dr. Debapriya Bhattacharya

Welcoming the participants, Dr. Debapriya Bhattacharya, Executive Director of CPD, informed that CPD and IRRI are currently collaborating on agricultural policy research and advocacy activities under PETRRA project. He told that a series of policy dialogues related to agricultural policy will be held under this collaboration. Future dialogues will be held on trade liberalization and Bangladesh agriculture, impacts of agricultural research, poverty eradication and empowerment of women through rice research, and rice biotechnology policy. "I request you all to come and join and prepare a much more participatory and informed policy for the country", he added.

Dr. Bhattacharya also informed that CPD focuses on frontier issues which are critical to the development process of Bangladesh and tries to shape and influence the country's development prospects. "CPD's program portfolio includes research activities, holding dialogue, publication and dissemination as well as networking initiatives. CPD strives to enhance the national capacity for economy-wide policy analysis, foster regional cooperation and address issues, which concern Bangladesh's effective integration into the globalization process", he added.

While introducing the Keynote Speaker Dr. Mahabub Hossain to the audience, Dr. Bhattacharya told, "We are particularly pleased that we have with us today, Dr. Mahabub Hossain whom we don't think somebody who is outside of CPD although he has a specific institutional affiliation. He had been my Director General at the Bangladesh Institute of Development Studies (BIDS) when I used to work there. He succeeded Professor Rehman Sobhan as Director General of BIDS. Then he joined IRRI as Head of the Social Sciences Division. We are collaborating with Dr. Mahabub Hossain not only under this project but also on many activities, particularly on our Independent Review of Bangladesh Development (IRBD), he contributes chapter on agriculture in Bangladesh Development". He also introduced the co-authors of the paper.

Dr. Bhattacharya thanked Dr. Noel Magor for being always very helpful and supportive to the CPD-IRRI collaborative activities and for coordinating the partnership between IRRI, PETRRA, and CPD. He added that Dr. Magor is playing a leading role in shaping the outcome of the partnership. "We are very happy that there is a very distinguished crowd here today. It is almost difficult to say who is who in the area of the issue that we are going to discuss here today", he continued. He welcomed all participants and felt that each of the participants deserved to be named for their distinguished achievements. Dr. Bhattacharya concluded by saying, "We look forward to your discussion at the end of this session. The paper has been circulated and I think all the important elements of having a good and productive dialogue is there".

Introductory Remarks by the Chairperson

Professor Rehman Sobhan, the founder Chairman of CPD and Chairperson of the Dialogue welcomed Dr. Mahabub Hossain and his colleagues in the research program. He also welcomed the extraordinarily distinguished group of experts in the field of agriculture who had come to the dialogue. "Basically CPD, as Debapriya has pointed out, has been engaged and trying to mobilize the best professional talents in Bangladesh to address issues of public policy so that we can involve civil society in concerns of public policy rather than to leave it exclusively as the matters of government. At the same time, we want to interact with the government officials and expose them to the best professional talent in attempting to direct the attention of policy. We are happy to express that CPD always join with new constituencies of experts" he continued. "Quite a number of you are joining us for the first time and this is our privilege to be able to host you to be in attention of not just the policy makers but also the experts of the international professional community. We hope that your input will enable us to prepare the recommendations and to the direction of seed policies in Bangladesh" he added.

Professor Sobhan told, "Mahabub Hossain who has worked at BIDS for many years and succeeded me in BIDS and one of the distinguished son who has made himself throughout the Asian region and bringing back now the professional expertise to mobilize from around the Asian region to influence our policy. We are therefore, looking forward to a partnership with all of you. We will learn from you and give an opportunity to echo your views and to contribute in shaping the agricultural policy of the country".

Before handing over the phone to Dr. Mahabub Hossain, Professor Sobhan requested all to participate in the open floor discussion after the keynote presentation and provide inputs. He also told the audience that based on the outcome of this dialogue a report will be prepared and suggestions of the participants would be put forward to the policy makers.

Resume of the Keynote Presentation

Dr. Mahabub Hossain focused on the status, effectiveness and constraints of the existing rice seed delivery system in Bangladesh and recommended some policy options for development of an efficient seed delivery system in Bangladesh. First, he described the elements of the seed system and the structure of seed delivery system and then talked about the variety improvement process and impacts of new varieties. This was followed by a discussion about production and distribution of seeds. He then discussed the demand for seeds and role of the market and incentives for market participation. Finally, he put forward some issues for discussion and recommendations for enhancing the performance of the seed delivery system.

Dr. Hossain told, "Seed delivery system in general and the rice seed delivery system in particular is very important for our agricultural development. Different country experiences show that average paddy yields tend to be relatively high in those countries/regions where seed replacement rate is high". He added that farmer participatory experiments carried out in the Philippines and Bangladesh show that good quality seed (cleaned seed from farmers' own harvest) can increase rice yield by 8 to 10 percent. He added that Bangladesh can produce an additional 2.1 million metric tons of rice annually worth US\$ 420 million by ensuring quality seeds. Therefore, "an efficient seed delivery system with active participation of private and public sectors, and farmers' organizations can contribute to further increase in productivity in the crop sector of Bangladesh", he continued.

Stating a recent report of the Planning Commission, Dr. Hossain pointed out that public sector was able to provide to the farmers only 5-6 percents of total rice seed demand of 0.8 million tons every year. Bangladesh Agricultural Development Corporation (BADC) is the major supplier of seed and has the mandate to produce and supply quality seeds of

notified crops (rice, wheat, potato, jute and sugarcane). He added that the involvement of the private sector in the seed market is a relatively new development in Bangladesh. He pointed out that private sector participation is mainly confined to the marketing of hybrid seeds of vegetables, corn, oilseeds and fruits, and more recently, hybrid rice seeds which are imported. The 1998 *Seed Policy* of the government of Bangladesh has made provisions for active participation of private sector and NGOs. Since then there is a visible shift in the seed delivery structure with considerable participation by private sector and the Non-government Organizations (NGOs).

Elements of the Seed System and Structure of Seed Delivery System

According to Dr. Hossain, an ideal seed system in Bangladesh ought to serve the farmers with five key roles i.e. adequate supply of quality seeds of modern varieties at affordable prices in the right time. There are four prospective participating entities in the seed delivery system viz., the public sector, the private sector, NGOs and farmers' organizations that could serve farmers with all five basic roles. "An ideal seed system, however, needs supportive institutional and policy conditions for active participation of all key entities and for strengthening the public-private interface to play their basic roles in an efficient way", he opined.

Dr. Hossain explained four basic elements of seed system, namely, production and import of improved varieties, quality control of seed, production and marketing of improved seeds, and improvement in the quality seed kept by farmers. He mentioned that seed delivery system in Bangladesh has five stages. First stage is the development of new variety which is until now mostly done by the public system. Second stage of the seed delivery system is production of source seed (breeder's seed) and this is also done by the public system. Third stage involves multiplication of seed and this function is currently carried out by public sector, private sector and NGOs. Fourth stage of the seed delivery system is related to the marketing of seed. At present, public sector, private sector and NGOs are marketing seed through their own outlets as well as through private seed dealers. Last stage of the seed system is the farmers.

Variety Improvement and Impact

The key institution for development of improved varieties for rice is the Bangladesh Rice Research Institute (BRRI). Another national institute, the Bangladesh Institute of Nuclear Agriculture (BINA) has mandate for germplasm improvement through application of advance tools such as mutation breeding. In addition, agricultural universities are also engaged in plant breeding research. Dr. Hossain observed that private sector and NGOs in Bangladesh are not involved in the varietal development activity (plant breeding) but a few relatively large seed companies and NGOs are engaged in on-farm and on-station testing of publicly bred new cultivars. Until 2001, BRRI has developed 39 varieties and

one hybrid rice; BINA and Bangladesh Agricultural University (BAU) have developed six and two varieties, respectively. Dr. Hossain observed that there is an increasing trend towards production of new varieties. BRRI released nine varieties in the 1970s (1970-79), 13 varieties in the 1980s (1980-89) and 16 varieties in the 1990s (1990-99). He listed some popular varieties based on the farm surveys carried out at the micro level. Three varieties (BR1, BR3 and BR8) released in the 1970s, three varieties (BR11, BR14, BR16) released in the 1980s and two varieties (BRRI Dhan 28 and BRRI Dhan 29) released in the 1990s are popular. "We don't have information at the national level for these varieties. We have data on modern versus traditional varieties but not on variety level. Some of the micro level studies show that some of the varieties which were developed in the early 1980s or even 1970s remain popular for some time", he added. In case of variety development, he emphasized the role of international collaboration. He pointed out that the collaboration with international institutes (particularly with IRRI) has effect on variety development. Most of the varieties released by BRRI have both or one of the parents developed at IRRI, a few from other countries. For example, BR16 is the direct introduction of an IRRI line which was found suitable for release as a variety; BRRI Dhan 29 came from a line from Sri Lanka crossed with a line from IRRI. Collaboration and exchange is very important in developing a new variety. We need to see how we can continue exchange of scientific knowledge and information, and lines to develop suitable varieties for our country.

Dr. Hossain observed that the developed varieties have been adopted by farmers and creating impacts at the farm level. He reported that harvested rice area has not increased much since independence but rice production has more than doubled due to technological progress. Area under modern variety rice was only 28% in 1980-81 which has increased to about 64 % of the total rice area in 1999-00. About 78% rice now comes from the modern variety and only 22% comes from the traditional variety. Increase in modern rice area was achieved through the decline in area under traditional varieties. Production of rice (milled rice equivalent) has increased to 23 million tons in 1999-00 from 14 million tons in 1980-81. During this period, per capita production of rice has increased from 154 kg to 181 kg.

Dr. Hossain appreciated the efforts of breeders, scientists and others officials at the public and private sector who are helping farmers to reap the full benefit of the new technologies. However, he mentioned some weaknesses of the existing system. According to him, present system has three major weaknesses: (1) infrequent replacement of new varieties, (2) long time requirement for development and release of a variety, and (3) lack of institutionalized coordination among the R&D institutions.

Dr. Hossain pointed out that variety replacement is not frequent in Bangladesh. Based on the information gathered by the Department of Agricultural Extension in 1996-97 and from the surveys conducted under his leadership in 1987/88 and 1999/2000, he provided estimates of area under specific varieties. It appears that BR11 is the most popular variety in Aman season and it was released in 1981. Therefore, he argued that major varietal replacement did not occur during the last 20 years. He suggested that we should not keep the varieties long because of possible decline in resistance and also because of availability of new traits in the recently released varieties. He added that varieties are replaced fairly quickly in other countries but it is not happening in Bangladesh. "Farmers are still growing some varieties which they were growing in the early 1970s. But we want to have more quick replacement in order to tap the new benefits which breeders give in the new varieties. In Bangladesh, only recently BR28 and BR 29 have been able to reduce some of the area of BR 14 and BR16, which were popular during the Boro season. But in Aman season, farmers are still growing varieties which are released long-time back. We must have to accelerate the variety replacement process. This is one major weakness; we would like to see much more frequent exchange of varieties in order to see new traits are paying off", he continued.

Dr. Hossain observed that BRRI, BINA and agricultural universities are under three different ministries (namely, Ministry of Agriculture, Ministry of Science and Technology, Ministry of Education) and institutional coordination and cooperation among these institutes in the flow of information and breeding material are relatively weak. Therefore, the variety development and release process becomes difficult. Dr. Hossain opined that *institutionalised cooperation among these R&D institutes needs to be promoted for improving efficiency in the development of improved varieties of seeds*. He observed that the development and release system of new varieties is a complex process in Bangladesh. In case of rice, it takes about 10years (seasons) to evaluate and propose a variety for release, after identification of a promising line (after F6-F7 crosses), through several trials and their on-farm testing and evaluation in collaboration with the Department of Agricultural Extension.. The National Seed Board (NSB), chaired by the Secretary, Ministry of Agriculture, approves the release of a variety, if the results of all trials are found suitable. The approved variety is officially notified by the NSB, after which, the BADC, another public sector institution takes the responsibility for multiplication of seeds for distribution to farmers.

At present, it is not mandatory in Bangladesh that a certain minimum quantity of breeder seed (source seeds) has to be readily available with the concerned research station during the same year/season of a MV release. It takes another 3 years (seasons) for the certified seed of the notified new variety to reach the farmers through seed multiplication process (breeder seed>foundation seed>certified seed). Due to the complex process of variety

release and seed multiplication, it generally takes about 15-16 years from initiation of variety development process to cultivation in farmers' field of the identified new line.

Dr. Hossain observed that Bangladesh can take some lessons from India's Coordinated Rice Improvement Program for reducing the time required in the variety development and delivery process. Until recently India was following a similar system of varietal development and release that used to take the same time as in Bangladesh (15-16 years) from initiating the research and releasing the successful variety to farmers. Due to some policy reforms introduced in 1995, it now takes about 10-11 years (seasons) to develop, evaluate and transfer a new MV of rice to the farmers' fields. Therefore, it is relevant to briefly review the current system of a variety testing and release for rice in India through well-established multi-institutional and multidisciplinary coordinated mechanism. After identification of promising cultivars (after 6-7 crosses - F₆/F₇), the identified lines are tested for 3 seasons/years through coordinated network in as many locations/institutions as possible. If a variety is found suitable in more than one state after all these tests, a central variety release committee, chaired by a technocrat with the rank of Deputy Director General (Joint Secretary rank) of the Indian Council of Agricultural Research (ICAR), would approve the release of a new variety for India as a whole. If an MV is found suitable only in one state, the concerned state agricultural university would approve the release for the state. A new variety that was developed and identified in one institution/state can also be released by another institution for other state, if it was found suitable through the coordinated variety testing mechanism. In India, at least 500 kg of breeder seed (BS) of new MV must be available with the concerned research station/breeder at the time of proposing it for release. Therefore, seed agencies (public/private/cooperatives) could access BS during the same year of a new MV release for seed multiplication. Thus, India has been able to reduce the gestation period by five to six years. Dr. Hossain suggested that adopting a similar system with necessary modification we can also reduce the time taken for variety development and release.

Production and Distribution of Seeds

After successful development and release of a variety the institute/breeder who has developed the variety supply the "breeder's seed" for further production of seed by other agencies who then produce foundation seeds. Then "foundation seed" is distributed to the BADC, NGOs and private companies for production of "certified seeds" which are then sold to the market for use by farmers.

Dr. Hossain pointed out that the growth of seed industry primarily depends upon the demand for and supply of source seed (Breeder seed-BS). In Bangladesh, BIRRI and BINA are involved in the supply of Breeders seed. Private sector and NGOs are not involved in production of Breeder's seed but some private sector companies and NGOs

have signed Memorandum of Understanding (MoU) with BRRI to have access to breeder's seed for expanding activities on the production of foundation seed and certified seed. BRRI has also supplied BS to four other NGOs for the 'seed uptake program' under PETRRA (Poverty Elimination Through Rice Research Assistance) project on a request basis. He noted that *the amount of BS of rice distributed by the BRRI to all seed agencies has increased from 545 kg in 1993/94 to 2566 kg during 1999/2000*. Private seed sector and NGOs together received about 76 per cent and 52 per cent of the total breeder seed supplied by BRRI for *Boro* and *Aman-Aus* seasons respectively during 1999/2000. Dr. Hossain observed that there is a lack of involvement of universities in this process which constraints the increase in the supply of seeds. He also observed inadequate capacity utilization in the production of breeder's seed by BRRI and BINA. He added that availability of suitable land area does not appear to be a constraint for the R&D institutions to produce more BS. "Lack of adequate infrastructure (processing and storage facilities), incentives and support staff may however constrain the increased production of BS in all public sector R&D institution such as BRRI, BAU and BINA," he continued. Bangladesh Agricultural Development Corporation (BADC) is the main agency in charge of production of foundation seed (FS). The BADC multiplies foundation seed (FS) from BS on its own seed farms. Using FS, BADC produces certified seed (CS) in the farmers' fields through contractual arrangements. It has a huge network for production of FS and CS mainly for notified crops (rice, wheat, potato, jute and sugarcane). They have a fairly large infrastructure with 26 seed farms in different parts of the country with 1800 ha land and they produced 1063 tons of foundation seed in 1999/00. The BADC produces CS through its own contract seed growers by the contract arrangements. Among the contract seed growers of a particular location/village, BADC nominates one experienced seed grower as "group seed manager" (GSM) for every 25-30 seed growers. The GSM coordinates and supervises the CS production activities, but no payment is made by BADC for the services of GSM who collects informal service charge from the seed growers. The production of certified seed of all crops by BADC through contract arrangement had remained at the same level at about 29,500 tonnes between 1991/92 and 1998/99.

Dr. Hossain observed that as a result of 1992 Seed Policy and further modification in 1997, NGOs and private sector are now coming forward in production of foundation seed. They have started production of some foundation seed but they have limited facilities. They use contract growers for production of the seed. The network of seed growers for NGOs seems to be more extensive and widespread than for the private sector companies. Contractual arrangement is sometimes broken by either party (seed growers and seed companies) on quality issues and on the assessment of the market situation. At present, seed growers hardly complain to the concerned authorities in case of breaking of

contract by the seed companies since the contractual arrangement is unwritten in most cases.

Dr. Hossain also mentioned about a few special projects implemented under the public sector are being implemented to develop the entrepreneurship in the seed business and to expand the seed market. These are: (i) The FAO-UNDP sponsored seed project implemented by the Department of Agricultural Extension (DAE) since 1998 promotes seed production activity by entrepreneurial farmers, (ii) the BADC has been implementing since 1997 'Bangladesh-German Seed Project', sponsored by the German government, and (iii) a 'special seed uptake program' was initiated by IRRI under the PETRRA project, with financial support from the Department for International Development (DFID) of UK. Farmers under the special seed projects of DAE and BADC, have produced about 16000 tons of CS of rice by the year 2000 and distributed to other farmers. This informal flow of CS is not included in the official statistics on the seed replacement rate. If we consider both formal sale of BADC seed (about 14000 tons) and the informal flow of certified seed (16000 tons), seed replacement rate would be about 9 per cent of the total modern variety seeds planted by farmers.

Quality Control, Processing and Storage

Certification and quality control is very important for supplying healthy seeds to farmers. The amended 1998 Seed Act provides that BS and FS of the notified crops, produced by the public sector agencies must be certified by Seed Certification Agency (SCA), however, certification of FS produced by the private sector and NGOs is optional. At present, private sector companies and NGOs certify the quality of their seeds by themselves after conducting the required quality tests known as truthful labeling (TFL). Breeder's seed produced by the concerned research institutes are certified by the SCA. The SCA in Bangladesh argues that it is needed to ensure the quality and purity of source seeds (breeder seed). Dr. Hossain viewed that the issue of quality and purity for BS is not relevant since plant breeders directly supervise the BS production in research farms. The breeder should have better technical knowledge about the seed than the staff of SCA. It is widely recognized all over the world that the breeder seed, produced by the plant breeders, has adequate genetic purity that could be used for large-scale multiplication of commercial seed. "We are not aware of any country in the world that requires formal and compulsory certification for breeder seeds by any controlling government agency", he added.

At present, SCA has only 30 seed inspectors to attend certification for all notified crops all over the country. "The limited human resources of SCA should be better utilized for the certification of FS by the BADC, NGOs and the private sector companies", Dr. Hossain argued.

In case of the production of CS, the contract seed grower supervisor (CGS) of BADC visits the CS farms 3-4 times and advises the seed growers on quality maintenance issues. Although the seed inspectors of SCA are supposed to visit CS plots of BADC contract farmers, it rarely happens in practice due to inadequate human resources with SCA. After the harvest, the contract grower takes the seed to the BADC processing unit for cleaning, drying and for final grading. The BADC has 16 processing and storage units all over the country exclusively for rice and wheat seeds with the capacity of 30,000 tons. These units are largely used for processing and storage of CS of BADC. Sometimes, BADC also offers these services to private seed companies and NGOs at a fee varying from Tk. 150 to Tk. 200 per ton depending on the moisture content of seed. However, the processing and storage facilities need modernization for ensuring better quality of seeds. At present few NGOs and seed companies have their own processing plants for rice seeds. The ultimate output of the processed/cleaned CS is about 20 per cent lower than the non-cleaned harvest. The entire amount of the cleaned and processed seeds are procured by the BADC and distributed to the farmers with a 'truthful label' (TFL).

Seed Marketing

There are three formal marketing channels for the distribution of publicly produced CS under BADC. These are: (i) BADC's own widespread marketing network, (ii) the licensed private seed dealers, and (iii) the NGOs. BADC has 22 regional and 42 district level sales centers and 36 sale outlets at the *thana* level which are located all over the country. In addition, BADC has about 1300 licensed seed dealers for marketing seeds throughout the country. Registered private seed dealers, and NGOs can buy CS from BADC outlets and sell with the BADC brand name through their networks. The seed dealers and NGOs get a margin of four to seven per cent on the retail price fixed by BADC, depending upon the distance of seed dealer from BADC seed sales outlets, and the quantity of seed requested by the seed dealer. Some NGOs sell the BADC seed under their micro-credit programs.

Traditionally, the private sector in Bangladesh has largely been confined to the marketing of the imported seeds of hybrids of non-rice crops (vegetables, corn, etc) and the BADC supplied seeds of major crops (rice, wheat, jute, etc). In recent years, private sector and NGOs are expanding their operations in selling rice seeds. At present, there are more than 200 private companies; most of them are seed merchants/dealers are engaged in the marketing of seeds. About 80-85 per cent of the seed turnover under the private sector is through marketing of both locally produced and imported hybrid seeds.

Demand for Rice Seed

Dr. Hossain estimated that Bangladesh has a potential rice seed market of Tk 1650 crore (US\$ 290 million) with an annual demand for about 800 thousand tons. He added that demand for seeds of modern and traditional rice varieties are 500 thousand tons and 300 thousand tons, respectively. The public sector meets only 5-6 percents of total seed demand and another four percent is met by the private sector and the NGOs. Informal system (farmer's own seed and farmer to farmer exchange of seed) provide more than 90 percent of the required rice seed.

Why the farmers keep seed from their harvest? Is it because there is no market for seed or it is just their habit. Dr. Hossain told, "Farmers say that their own seed is of better quality than the seed they sometimes purchase from the market. So, the issue of trust and confidence need to be addressed by the private sector. Farmers purchase seeds from the market when they want to adopt a new variety.

Dr. Hossain added that IRRI tried to assess the importance of quality seeds in rice production. "We carried out farmer participatory experiments in farmers' field with farmers' seed. BRRI and BAU cleaned farmers' seed in their seed pathology lab and asked farmers to grow clean seed as well as his own seed in the same plot and see the difference in yield as a result of quality of seed", he continued. He reported the results on effect of clean seed on Boro and Aman season of 2000. The parcel sown with clean seeds had a 9 percent increase in yield in Boro season and about 13 percent increase in Aman season. If you combine the two seasons together you will increase the yield nearly by 11 percent just by bringing the quality in seed which farmers are using. "If we can do this at the national level then rice production can be increased by 2.1 million tons, valued at about US\$ 420 million.

Incentives for Market Participation

Effectiveness of the seed delivery system also depends on the extent of incentives provided to key participants (like plant breeders, private seed companies, seed dealers, etc.) in the seed market. Dr. Hossain opined that *lack of incentives for the production of breeder's seed and the regulation in the pricing of BADC seed are the key constraints to the expansion of the seed market*. He discussed the existing incentive structure for different players of the seed system. He observed that BADC nominates one experienced seed grower as a 'group seed manager' to coordinate the certified seed production but does not pay any fee for his/her service. It may be noted here that the services of the seed organizer of the public and private sectors in India (similar to the group seed manager of BADC) is provided with Rs.1 per kg of certified seed of rice produced by his/her group.

The net returns to seed growers are fairly attractive as compared to earnings from cultivation of rice because seed price (Tk. 12-13 per kg) offered by the BADC to the seed growers is much higher than grain price (Tk. 12-13 per kg) in the market. Out of the selling price, BADC offers about four to seven per cent margin for private seed dealers for marketing of its seeds. On an average, the private seed dealers get only Tk. 1.00-1.50 /kg for marketing of the BADC rice seeds, which is much lower than the margin in the marketing of other seeds. There is no price control on the selling of privately produced seed (either private companies or NGOs). The selling price of private sector paddy seed was 50 per cent higher than the price of the BADC seed. One reason why BADC has lower cost of production of seed is that they have large sunk investment. The salaries of the BADC staff, and the cost of repair and maintenance of the private sector are met from the government budget. So, there is implicit subsidy in BADC operation. He also pointed out that the NGOs and the private seed firms offer higher margins for the private seed dealers compared to that offered by the BADC. So there is a clear disincentive for the private sector for marketing the BADC produced seeds. The private sector seed companies also face unfair competition from the NGOs who do not have to pay tax from the proceeds of their commercial operations.

On an average, the net return in the business of the production of rice seed for the NGOs (BRAC) and the private seed companies was about Tk. 1.62 and 1.84 per kg respectively. The margin is lower than the margin in the business of marketing hybrid seeds of vegetables, maize, pulses, etc. So in order to induce the private sector to expand the business of production of certified rice seeds the companies should be allowed to charge higher prices. This is not possible as long as the price structure of the BADC's seed remains the same. Dr. Hossain thought that the competition between BADC and private sector is not fair because BADC receives subsidy from the government for its operations but private sector has to pay all production and marketing related costs. "This is an issue we need to reconcile. If we allow private sector to operate then there should be a level playing field", he added.

Dr. Hossain opined that the price of rice seed should be double of the price of paddy for the minimum level of incentive required for the private sector to operate in the market. He stated that the ratio between the paddy price and seed price is 1.5 to 1.7 in Bangladesh compared to 2.0 in Andhra Pradesh of India, where farmers buy 46% of their rice seed from the market. Dr. Hossain argued that if we are able to supply good quality seeds to the farmers then they can get an additional 10% production from which they can easily cover 1.5% additional costs if the seed price increase by 50%. He mentioned seed accounted for only 3% of the value of rice produced by a farmer. According to Dr. Hossain, if BADC increase its seed price then it will not only encourage private sector

investment in seed but BADC will also be able to operate better because it is regularly facing fund crisis for its operation.

Bottlenecks and Constraints

Dr. Hossain identified the following as major constraints of the existing seed systems:

- Release of varieties that often are not superior over the existing varieties
- Inadequate participation of farmers in variety testing
- Lack of inter-institutional coordination/network for development and promotion of new MVs through better utilization of available germplasm across R&D institutions.
- Complex and lengthy procedures for a variety release
- No special incentives for plant breeders to produce enough breeder seeds.
- Inadequate manpower & skills, and modern infrastructure for testing seed quality
- Restrictive public policies on pricing of seeds
- Lack of farmers' protection against unfair seed business.

Recommendations for Improvement of the Seed System

Dr. Mahabub Hossain recommended the following to improve the efficiency and effectiveness of the current seed delivery system.

- *An Institutional Reform is needed in the variety identification, testing and release system.* In view of the growing access of improved varieties and advanced lines to the private sector and NGOs, *initiation of a coordination/network cell in the R&D institutions (like for rice at BRRI, for wheat at BARI, etc.) may be considered to facilitate sharing of the information and breeding materials among the concerned R&D institutions.* This would enable all concerned R&D institutions to participate actively in the testing of advanced lines across the production environments and facilitate the movement of advanced breeding material among different R&D institutions. Through this process the gestation period for varietal release could be reduced by at least three years. *Research institutions should be allowed to set up a commercial wing to facilitate increased production of breeder seeds. Financial incentives should be provided to the breeders for the development of MVs and promotion of BS production.*
- *Certification norms may be reviewed. The BS needs to be totally exempted from a formal and compulsory certification by the SCA.* More emphasis ought to be given on how to maintain the quality of foundation seeds produced by the BADC, NGOs, and the private sector. Given adequate competition in the marketing of certified seeds the quality control may be ensured by developing trust in brand names through truthful labelling. Resources however need to be invested for

developing infrastructure to support the testing of seed quality including assessing seed health standards.

- The price structure of BADC's seed needs to be revised in such a way that would recover all costs (including operational and fixed costs) from seed sales. This would not only facilitate a fair competition with private sector and NGOs in the seed market, but also improve the financial efficiency of BADC's seed division.
- Introducing "minikit/block demonstrations" by the DAE immediately after the release of new MVs as a parallel activity to breeder seed production to help familiarize the farmers with new MVs.
- Infrastructure for modern processing and storage may be developed under the public system with the provision of selling the services to the private sector and NGOs engaged in the production of foundation and certified seeds.

Floor Discussion

Institutional Reform for Variety Identification, Testing and Release

Dr. Showkat Ali, Former Secretary for Agriculture, agreed with Dr. Mahabub Hossain's suggestion on institutional coordination and reform in variety release procedure. Dr. K. G. Pillai of FAO-Bangladesh also supported Dr. Hossain's recommendations. He thought that involvement of the farmers to the plant breeding process should be increased and viewed that the country has the ability to produce sufficient seed with proper incentives. Taking part in the discussion Dr. Gul Hossain of the ASIRP project of the Directorate of Agricultural Extension told that introduction of participatory plant breeding research will improve efficiency of plant breeding research in Bangladesh and our system would be able to deliver more cost effective technologies suitable for our socio-economic condition.

Dr. Lutfur Rahman, Dean, Faculty of Agriculture of the Bangladesh Agriculture University (BAU) opined that lack of demand for breeder's seed limits the production of Breeder seed. Therefore, mandatory provision of having 200 kg of breeder seed will not solve the problem. He asked, "Why should I produce breeder seed of Sampad, which I bred in 1984?"

Certification Norms and Notified Crops

Mr. Mohiuddin Khan, Director of the Seed Certification Agency (SCA) viewed that it would not be wise to exclude rice seed from the notified seed. He added that SCA is dealing with only five notified crops namely rice, jute, wheat, sugarcane and potato, and they do not have any problem of certifying the breeder's seed. He opined that SCA should continue to certify breeder's seed. He also told that it is a voluntary provision for public

sector for certification of "certified seed" by SCA and BADC has already withdrawn from mandatory certification of "certified seed".

Dr. Anwarul Islam, Chief Scientist and Former Head of the BRRI Plant Breeding Division told that breeder's seed need to be totally exempted from a formal and compulsory certification by the SCA. He told that quality of breeder seed is very good because breeder is producing the seed which he has developed. So it should be exempted from certification by SCA.

Dr. Lutfur Rahman of BAU opined that considering the risks of food security, we should continue rice as a notified crop. He added, "Notified crops should not be de-notified."

Dr. Mahabub Hossain told that if SCA put emphasis on ensuring quality of foundation seed then impacts would be larger. He clarified that since breeder's seed is produced by the breeders themselves then we need not worry about its quality and in no other country except Bangladesh certification of breeder's seed is mandatory. He added that competition among different seed suppliers for their market share would ensure the quality of "certified seed" and therefore, SCA should put more emphasis on the quality of the foundation seed.

Demand for Rice Seed

Mr. F.S. Ansary of the H.S. Agro Business disagreed with Dr. Hossain's estimated potential market demand of seed for Tk 1650 crore. In his view, the potential market for rice seed is much lower than that because farmers use much higher seed rate than recommended by the scientists. Dr. Showkat Ali mentioned that if farmers are using more than double the recommended seed rate then we must investigate it. Dr. Lutfur Rahman of the Bangladesh Agriculture University was highlighting the importance of expansion of seed market for sustainable variety development and seed delivery system. He also noted that the report presented by Dr. Mahabub Hossain documented lower yield obtained by the farmers from purchased seed than yield of farmers' own seed. He asked, "Why our farmers will buy seed from market when the yield is low?"

Role of BADC and Incentives for Market Participation

Mr. F.R. Mallik, Executive Director of the Mallika Seed Company Limited told that they are competing in a market where source of fund and motive of competitors are different. He pointed out that NGOs' get a lot of fund from foreign donations but private sectors do not. He added that private sector has to generate its fund with commitment for adequate dividends to the investors. So the competition between NGOs and private companies are not equal. He noticed that NGOs are increasingly involving themselves in commercial activities. He apprehended that if proper measures are not taken then in this race private companies will be knocking out from the competition. Mr. Mallik opined that either

sources of fund of the two sectors should be same or the field of operations should be different for private and NGO sectors. He thought that BADC should continue its operation in seed business but should remove subsidy for seed.

Dr. M. A. Jabber, Principal Economist of BRRI told that if BADC is not involved in seed production and marketing then private sector will fix seed prices beyond the affordability of farmers. So, in his view, public sector is necessary for ensuring fair pricing in the development of the seed market of Bangladesh.

Mr. Moklesur Rahman of BADC pointed out that BADC is a service oriented institution of the Bangladesh government and distribute about 10 percent of the total seed which is of very high quality. This role needs to be recognised in proper spirit. He added that BADC can not provide more quality seed due to the lack of our manpower.

Dr. Showkat Ali told that all seed corporations in India are not self-financed. He viewed that selling of seed by BADC is also a promotional activity because they are selling seeds of newly released varieties. Therefore, we should not stress too much about cost of production of these new seeds. However, he felt that there should be level playing field for both BADC and private sector. He was in the opinion that participation of the private sector need to be encouraged.

Dr. Jahangir Alam, Member Director (Agricultural Economics) of Bangladesh Agricultural Research Council (BARC) opined that government research institutes may be allowed to open commercial farming on a limited scale for supplying MV seeds. However, he thought that it is difficult unless the money comes from the public sector.

Mr. Harun-ur-Rashid, Secretary General of the Bangladesh Krishak League told that farmer's do not get adequate incentives for producing quality seeds and marketing of the seeds. Dr. Lutfur Rahman of BAU also viewed that farmers should get adequate incentives through market assurance and guarantee for their output. "Without their participation our policy will not be fruitful", he added.

Dr. Mahabub Hossain agreed with other participants that BADC is a service oriented institution and its role in seed supply should be reduced gradually. However, he mentioned again that BADC is not counting all cost items in its seed production cost. The cost which was already invested for developing the infrastructural facilities and the personnel cost are not included in the production cost. He reminded that public sector not only operates on "no profit and no loss" basis but also some times operates on subsidy given by government. But private sector is profit oriented. If they get profit then they will expand their business. He categorically mentioned that though he believes that private sector should have adequate incentives but he is against super normal profit. He added that competition will ensure that nobody obtains super normal profit. So, we must

encourage competition. Dr Hossain also pointed out that lack of incentives for seed breeders is a critical constraint to the expansion of the seed market. He suggested that research institutions be allowed to operate separate commercial wings for income generation. Breeders should also get royalty for developing new varieties. He laid special emphasis on updating regulatory regimes such as biosafety rules and inter-ministerial committees to review experimental results so that frontier technologies like genetic engineering could be used to developing new varieties. He also put stress on formulating a plant variety protection law to preserve the country's rich bio-diversity, and protection of the rights of farmers and plant breeders.

Buffer Stock of Seed

Ex-secretary for Agriculture, Dr. Showkat Ali pointed out that Bangladesh is a disaster prone country, and drought and flood regularly affect us. He recommends that a buffer stock for seed is necessary particularly for post flood situation. He opined that it is an effective measure to ensure production and price stability after disaster.

Mr. Harun or Rashid, General Secretary of Bangladesh Krishak League also recommended the buffer stock system. He suggested that buffer stock should be established according to ecological or sub-ecological zones.

Extension Services

Dr. Ferdousi Naher, Research and Evaluation Division of BRAC opined that lack of awareness among farmers is also contributing to less frequent replacement of seed. She suggested that more extension services are needed for frequent replacement of MVs and for production and maintenance of quality seeds by farmers. Dr. Showkat Ali suggested that Block Demonstrations by the DAE which is in line with the Minikit should be strengthened.

Other Issues

Ex-agriculture secretary Dr. Shawkat Ali noted some emerging issues, such as IPR, bio-tech, recognition of plant breeder's right, plant variety protection act, genetic diversity issues etc. He noted that the Agricultural Research Management Programme (ARMP) is about to complete with a complete inventory, very good infrastructure and other facilities. The programme will also find out areas where private research of modern varieties should be encouraged. He mentioned that replacement of old varieties by new varieties is essential. However, he cautioned that we should be clear about varieties to be replaced and by which variety and in which locality. He suggested that we should at least target a seed replacement rate of 20 percent against of existing 10 percent.

Dr K.G. Pillai of FAO in Bangladesh told, "Bangladesh is rich in rice bio-diversity. Therefore, we should not only work for breeding improvement but also conserve genetic

diversity in rice ". Dr. Showkat Ali observed that actions from BARC in this regard are slow. He mentioned that though an Institute of Plant Genetic Resources was established but it is not functioning properly.

Concluding Remarks of the Chairperson

Professor Rehman Sobhan, Chairperson of CPD, in his speech as Session Chair told, "At the end of the day we should all remember that of all the people in Bangladesh who operate on an unlevelled playing field, the farmers are the ones who operate on the most unlevelled playing field. So, whatever policy interventions you make to level the playing field, the first beneficiary of that will need to be the farmers themselves, because, they are the largest neglected private sector of Bangladesh". "The issue, therefore, at the moment when government agencies have progressively failed, policy is failed and donor agencies have compounded these failures and notion is that somehow you cannot deliver the services to farmers to level the playing fields for them whether for rent seeking or for poor governance reasons. Therefore, the policy is moved towards intervention at the price level where you afford to support farmers at this level without such an intervention. Now, this is found that it is a totally wrong approach to it. We should decide whether we can support farmers and if we are to support farmers then whether this is an appropriate mechanism to do so and see how effectively you can reach intermediate inputs as well as services to farmers at prices which will enable them to even the playing field when they are competing with bigger players whether it is within the production sector or whether it is an uneven competition with the forces of the market", he continued. He added, "These are then should be major area of policy consideration and particularly in the area of seeds where it is absolutely essential that every farm household should get access to the best available seeds at prices which they can afford so that they can enhance their productivity and improve their livelihood".

Finally, Professor Sobhan thanked every body by saying, "This is a very distinguished group and we appreciate your presence over here. We hope that you will continue to interact with us in further dialogues we will organise in this sector. Thank you and thank you again Mahabub".

List of Participants

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| <i>Mr Waliul Alam</i> | The New Nation |
| <i>Mr Salahuddin Bablu</i> | The Daily Inqilab |
| <i>Mr Moinul Huq Chowdhury</i> | The Daily Arthaneeti |
| <i>Mr Golam Kibria</i> | The Daily Prothom Alo |
| <i>Mr A T M Ishaque</i> | The Daily Ajker Kagoj |
| <i>Mr Masud Parvez Milon</i> | The Daily Arthaneeti |
| <i>Mr Tareque Moretaza</i> | The Daily Manabjamin |
| <i>Mr Samuzzaman</i> | Freelance Journalist |
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