**Dynamics of growth of wheat in Bangladesh Role of CIMMYT in institution building**

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**Acknowledgement**

Growth of wheat in Bangladesh is a spectacular story. The privilege of writing a part of it was granted by Dr. Jook Anderson, CCIAR/ World Bank to me and I remain grateful for that Dr. M. Rahman, Director General, BARI provided the critical insights that enabled me to develop a participative methodology for documenting various posts of wheat research. Dr. Butier, CIMMYT-CIDA project in charge with BARI was ever helpful. I appreciate the support by him and his staff very much.

Dr. Sufi M Ahmed and Mr. Razzaque of wheat Research Centre provided an extremely rich background of wheat improvement. Mr. Razzaque’s personal collection of every important document regarding wheat research was gold mine that I hope would be preserved for posteriority. I thank every other member of wheat Research Centre, Regional Research station, different division of BARI who me under the guidance of Dr. Mandal, Director of Research at BARI even on a holiday to discuss various aspects of wheat programme. I really appreciate their sincerity of purpose.

There may be many others (such as the driver on Butler’s staff) who have helped in this study and whom I may forget to thank.

Discussions with Dr. R.MK. Merdt and Scobie at Washington provided very interesting clues. Secretarial help from Mr. M. Venkatachelam has been of great help besides typing assistance by Mr. T.M. Durai Rajan. I appreciate their cooperation.

Responsibility of views, however, remains mine and mine only. This draft would be revised after editorial and other substantive modifications have been made.

Finally I must express my highest appreciation for small farmers of Bengaladesh who despite very complex and not helpful institutional structures have proved to the world, the \_\_\_mattis they are made up of.

I also express any interests thanks to authority Bettrall of Ford foundation of providing copy of various documents and the insightful discussion.

**Un edited Draft-I**

**PREFACE**

This report include most of the views gathered during a short visit to Bangladesh in October, 1984. This draft has not been seen by staff of Wheat Research Centre, Director General, BARI and CIMMYT’s resident advisor in Bangaladesh. Their comments would be extremely necessary for modifying this draft and according it a proper sanctity.

It was planned that a second visit would be made to Bangladesh to include farmers perspective on wheat but somehow the same could not be made. However, a fuller story of Wheat would require such a perspective to be added later.

It is hoped that constructive criticism at some places would be taken in right asperity by all those concerned. It is beyond doubt that CIMMYT and Ford Foundation have given a big hand to the Bangladesh efforts at wheat expansion. The initiative a spirit of the farmers particularly in rained regions deserve fuller appreciation. It is important to note that agrarian relation in. M. West are not most helpful for further expansion of wheat. It may not be out of place to suggest that future strategy should be to increase productivity further than area if proper balance between different crop has to b maintained.

Several innovative modification attempted by Director General, BARI such as a system of three tier review of research plans, visit to regional research station with various head of the divisions; opportunity to staff of regional/ research stations to question the research priorities or proposal suggested by senior scientists at head quarters, decentralisation of power and discriminative policy to reward performances.

Will hopefully revitalise the research environment at BARI.

After shifting main wheat centres to the worth\_\_\_\_\_\_\_, it is hoped that research focus would be sharpened and excessive emphasis on irrigated wheat will be tempered.

The staff of wheat Research Centres with all the limitations have set before others and excellent example of team work. They deserved to be supported and encouraged. Their partnership with farmers, we hope would become stronger in times to come.

**CYMMYT’S Contribution to Wheat Improvement in Bangladesh**

**Introduction**

Bangladesh is situated on the threshold of wheat region in the tropical world. For long it was believed that wheat could not grow at large scale in Bangladesh. The acreage of wheat during 1947-48 to 1965-66 had ranged from 0.03 million hectares to 0.06 million hectares except the year 1962-63 when it was around0.07 million hectare. 1965-66 proved to be turning point in the wheat history. Dr. Kazi M. Badrudoza sent a two pounds of wheat seeds of varieties P-62 and S-64 to Dr. Zaman in East Pakistan to expore the possibilities of wheat expansion. Dr. Zaman had been undertaking some experiments on what as a part of fibre division of agricultural research institute. He took help of regional stations of Jute research institute to undertake field trials of the promising wheat lines. It had been already recognised that the accelerated research programme of Rice might not be able to provide sufficient fillip to food production required to meet the growing demand.

After identifying the potential of these two lines in 1967-68 eight farmers were supplied the seed of these varieties. Teachers of National Developmental Training Institute at nature were requested to provide backup support to these farmers. One could justifiably give credit to tow farmers namely Sbar Ali Mullah and Abdur Rahman of Natore and Bara Harshpur also in Nattore project area for having heralded the wheat revolution in Bangaladesh. These farmers got 51.38 mounds per acre (19.01 qtls. Per acre) respectively. This yield high as it was somehow did not attract the attention it deserved. Secretary, Agriculture or for that matter other leaders at that time did not take any particular interest in looking at the progress of wheat crop at experimental stations.

During 1067-68, the acreage of wheat war was 0.08 million hectares which increased to 0.11 million hectares in 1968-69, largely through the effort made by the scientists and administrative system at local level which provided some support. It may be recalled that initially wheat crop was identified as a crop of West Pakistan and popularisation of wheat was considered at least by some leaders as a sort of attempt for subjugation of cost by the wheat.

The period when area under wheat doubled i.e. 1967-68 to 1969-70, the area under Boro rice also doubled from four million hectares to 8 million hectares. Curing 1967 and again in 1970 Dr. Narwez visited East-Pakistan to study the possibilities of expanding wheat program further. The hope at the time was that wheat would be able to more efficiently utilise the water compared to ice. An observation of Dr. Narwez that water used for one acre of rice could be used to grow 4 acres of wheat was quite approvingly quoted in the first accelerated wheat research program for East Pakistan proposed in 1970 July to last till June 1973. Subsequent development however, had revealed the technological change in the rice breeding itself besides the market conditions made cultivation of Boro rice quite attractive and wheat in fact did not expand to the extent it did mainly by substituting Boro rice. Neither did it expand as was also assumed by utilising only the land left fellow during rabi season. Even recent studies have shown that future growth of wheat should not be expected to be in the fallow lands particularly whom the survey have revealed its ability to compete with some of the pulses and oil seeds (Ahmed and Clements 1983:58). Another notion which continued to very strongly recur in various successive reports on wheat expansion was the hope that wheat would expand in the irrigated regions. Again the evidence shows otherwise. More than 60-70% area under wheat expanded in rain fed conditions where wheat was grown on the residual moisture particularly in North west.

It may be worthwhile to mention here that in the IV Five Year Plan of East Pakistan the proposal made by J.L. Sen noted, “It may be mentioned her that wheat is grown on higher land in East Pakistan during the period from November-March and as such it cannot compete with spring rice which on such land consumes three times more water than wheat.” The import of this issue is that while major research effort has been devoted to identify potential of new verities under mainly irrigated conditions the success so far has been achieved largely under rain fed conditions and that too because of an Indian variety namely Sonalika which occupied about 80-90%. Mr. Sufi Moiddin, has however been pleading for great attention to Rain fed Wheat breeding and agronomy (Razzoque 1982, 1975).

This, however, should not give an impression that extension at such scale could take place namely because of technology Ford Foundation provided not only the support for visit of Dr. Narveeze but also for the import of seed and other necessary equipments. Dr. Sufi Moiudeen had been sent to CIMMYT for advance training in wheat research so that he could provide leadership to wheat program in the year 1969. Later he was supported for his doctoral studies. Thus began the direct role of CIMMYT in shaping and strengthening the wheat production profile. Dr. Narveez in his report in 1070 (When Dr. Zaman has been transferred to BRRI and Mr. B.C. Sen had taken additional charge of economic botanist fibre) suggested that contact with CIMMYT should be maintained and the first trainee should be appointed as wheat botanist. He also suggested the most outstanding class II officers should be selected for further advance training. On his recommendation Dr. Borlough and Dr. Anderson were to be requested for visiting Bangaladesh to provide more intimate advice on improving wheat program.

While the efforts for improving the skills of wheat scientist were going on simultaneously the wheat production team small as it was continued to try to gain credibility. A wheat demonstration trial was aid down at the farm of Mr. Ahsan, member.

Planning commission who after seeing the crop falt persuaded about the potential of Mexican variety. Ford Foundation at its guest house had grown wheat in the flower beds to make it as visible as possible.

Eventhough after the introduction of wheat seed in the emergency conditions after Bedngal famine of 1942-43 there had been an upward trend in wheat production in the two decades prior to the advent of Mexican verities, the rate of increase was much higher in the 1970s. The large scale distribution of wheat seed during 1968-69 created an immediate impact on the trend rate in production which increased from 4.5% during the year 1947-48, 1966-67 to 11.7% per annum during 1967-68 – 1976-77 (clay 1978).

The visit secretary to the research station besides the visit of President and member of parliaments in the post 1974 period, gave a big push to the program. The import of wheat in 1974 subsequent to large scale misery had also stimulated demand for wheat due to changed food habits. Planners were beginning to realize the role wheat was to play in the economy of Bangladesh.

In the initial period farmer did not realise the importance of seeds as much as they did later. During 1976 many farmers had own the grains bough from ration shop which did not produce any ears. This created serious problem leading to complaints at highest level. Mr. Razzaque was asked to inspect the effected region and report. He found the farmers had grown the winter wheat imported as food grains. Immediately through mass media and otherwise, farmers were educated about the importance of using right type of seed. This was one of the major events influencing the difference between seed and food grains at farmer level. Though it must be added that farmer to farmer distribution of seed has remained a prominent way of diffusion of technology several other important interventions in seed industry were made particularly through BNADC to be discussed later it may however, be added that initial work by Dr. Zaman supplemented by the programming file of Mr. Sen gave big push to the wheat program which was triggered by the two rounds of seed sent by Dr. Kazi M. Badrudza from the West Pakistan. It may not be insignificant to mention that Dr. Sufi M. Ahmed who provided the leadership to wheat program later was sent for training to CIMMYT under the quote for West Pakistan through the efforts of Dr. Hazi and Dr. Narwaize and Mr. Razzaque (who in absence of Dr. Sufi led the programme and initiated wheat news letter) was one of the first CIMMYT trainee from Bangaladesh.

At times the outsiders have wondered as to what happened during the period of liberation struggle about wheat research programme. It needs to be underlined that while breeding material of most other crop was lost during the period, wheat material was \_\_\_\_periodically maintained and preserved through the heroic efforts of wheat scientists who undertook considerable personnel risks to uphold the best national interests. The delicacy of the task can be imagined looking at not so favourable climate for wheat grains during 1971-73.

Wheat Research Centre established in 1982 is now on its way to become a self contained research nucleus under the dynamic leadership of Dr. M. Rehman, Director General, BARI. The site allotted for the purpose about ten years ago in North-west Bangladesh is now becoming the focus of attention. After all the role of wheat in food basket of 2000 Ad in the country will be shaped from here. How have the skills and resources been generated to have such a hope will be discussed next.

**CHAPTER TWO**

**Institutional Setting for Research: Transferring skills and Resources**

As CIMMYT’s report number-15 on wheat in Bangladesh right notes, the report by Dr. Nareez after his visi8t in 1967 had generated little enthusiasm amongst most government officials and research administrators. The research priorities of wheat scientists in Pakistan and India wheat improvement programme were aimed at developing high yielding dwarf varieties with intermediate or late maturity characteristics for the Punjabi planes. The most distinctive feature of Bangladesh was that wheat was expanding in the regions were the growing period was short and farmer were trying to use residual moisture particularly after Aman crop of rice. The key implication was that a variety with much shorter duration resistant to diseases was needed in Bangladesh.

Sonalika originally developed for late sown conditions but with assured irrigation had adapted very well to Bangladesh . The other varieties which were released for the similar condition was India 66. For irrigated areas with longer growing season varieties like Tanory 71, Jupateco 73, and Norteno 67 were recommended. The breeding materials as well as already released varities provided by CIMMYT had led to the identification of Sonara 64, Maxipak 65, Norteno 67, India 66, Indus 66 varieties which gave about 14.4 per acre and could be sown even by 2nd half of the December. In the fibre division had 442 advanced lines and verities mostly of Mexican Origin; more than 800 segregating lines at various stages of development and 143 selected advanced lines. It was hoped that the gained on wheat front would enable Bangladesh to meet the food deficit.

For any research program to really take off, leadership becomes a very important consideration. Even though it may be a minor point but it would interest those not very familiar with the bureaucratic system in research establishments that Dr. Suffi Moiduein was considered “too young” by promotion committee in 1974. He could get promotion as principal scientific officer only after Dr. Borlkough, aware of his potential, wrote a letter secretary, Agriculture. Around the same time Dr. Kazi took over as Director, BARI. It may be added here that training at CIMMYT was not very attractive to the participants partly because it disqualified the trainees from going for a longer term training abroad. Despite this limitation some of the people who underwent training in the initial period showed remarkable commitment to wheat research. The general impression a that time was that people from the extension department were preferred for training abroad. It took long time for wheat scientists to get proper recognition. A proper historical perspective in this regard is presented below.

**Review of important studies/tour notes with regard to improvement in Uhlat Research**

To isolate properly the role CIMAYT played directly or indirectly in institution building with the specific reference to wheat improvement in Bangladesh, proper conceptualisation of the concept of training would be necessary. Generally, training has been equated with formal program oriented or task oriented skill transference. CIMAYT has been following several approaches to training including in service training in Mexico, exposure programme of the visiting scientists, in service training outside Mexico, consultations, conference and workshops, research fellowships etc. we will discuss the precise feature with regard to strength and weakness and areas of improvement in the next section. However, se want to emphasise a particular dimension of training which is through the visits and informal discussions of the scientists based in the recipient countries or at Mexico. WE will provide a very brief chronological account of some of the salient landmarks on wheat front relaying mainly on the tour notes or the studies done by various scientists in Bangladesh or outside. We will include some important studies or reports which may not have been inspired by CIMMYT scientists but nevertheless enable us to have a proper perspective of wheat improvement programme.

1) 1967-68: Reference has already been made to the visit of Dr. Narvae which was repeated in 1970 with the objective of reviewing the wheat breeding and production in East Pakistan so that concrete suggestions for improvement could be made.

2) 1970: subsequent to the report by Dr. Narvao, Mr. J.L. Sen, economist Botonist (fibre) prepared a draft proposal for accelerated wheat research programme for East Pakistan. It provided for CIMMYT’s involvement in training funded by Ford Foundation. It was recognised that since technical staff of the fibre division, did not have much work during dry months of the year particularly at head quarters it could be mobilised for wheat research. The total project was to cost approximately Rs.3,87,955.

3) 1973: There was a massive drought leading to large scale import of wheat grains as well as seeds. The sales of wheat seed in 1973 was about 14.46 tones which had increased in 1980 by nearly 10 times, The CIMMYT training programme had started getting participants from Bangaladesh from 1968 onwards and by 1972-73. Dr. Sufi M Ahmed, Mr. Razzaque and Mr. SBS Hussain had already been trained. Sonalika variety was identified in 1972 as suitable for Bangladesh.

4) 1974: A review of wheat research and production in Bangladesh was attempted by Dr. R.S. Anderson and E.B. Sarri which apart from other things noted the following:

 a) The seed stocks which were in short supply could be replenished by importing varieties like Mexipak 69, Mexipak 65, and Super X from Egypt.

 b) The fertilizer ration of NPK should be scaled down since the recommendations appeared to be some what higher than necessary and potash was really not necessary.

 c) The price environment for wheat should be made more favourable.

 d) If availability of seed use less, then it should be concentrated in areas with the greatest possibility of success.

 e) Alternative were also suggested in case the wheat seed from Egypt did not arrive.

 f) Since the wheat seed storage was serious problem availability of fresh seed could influence the production potential considerably.

 g) A technical coordinator for the crop should be appointed so that apart from linking up with various other institutions and BARC, he could also provide the link between scientists, extension workers and the farmers. For this purpose a strong crop oriented research team approach was favoured instead of discipline orientation which led to isolation and loss of contact with production needs.

 h) Training needs were identified as well as need for proper policy for promotions with the wheat program was underlined. It was noted that people should not be forced to change fields in order to attain advancement.

 i) In the first phase wheat scientists should concentrate on the selection rather than breeding and selection criteria should be adaptability and disease resistance.

 j) Apart from developing research infrastructure at the experimental farm research staff must be provided with the mobility so that off station trials or on farm trials could be properly followed up.

 k) Systematic effort for seed production must be built as also a system of inspection, recuing and seed certification needed to be developed.

It may be added here that the first jeep was provided to wheat program in the year 1973-74 and mobility to some extent has remained a constraint ever since though not to as great an extent as before.

5) 1975: This was an important year because of extensive reviews made by Anderson and Saari as well as Bigge and Clay to strengthen the wheat program. Anderson and Saari noted the following:

 a) Varities released by India in Wheat Bangal conditions could be tried in Bangladesh.

 b) The system for wheat seed import should be streamlined.

 c) Seed farms should be mechanised.

 d) For rain fed experimentation, prc sowing irrigation should be supplied to ensure initial stand. The subsequent water atress was expected to differentiate the drought resistant lines from the rest.

 e) It was noted though belated that good wheat crop was being grown under residual moisture condition and therefore wheat campaign should not be restricted to irrigated areas alone.

 f) The wheat prices should be attractive compared to Boro rice if wheat acreage was to expand. (in our opinion, the fact being noted now that wheat areas was expanding by substituting pulses and oil seeds was some how not appreciated as much as it \_\_\_\_\_\_ at that times.

 g) The need for crop diversification was indeed noted.

 h) One of the most important observations regarding training was,

 “Too often the people being trained to higher degrees are the politician scientists who lobby to obtain this training. Not those who can best serve their country’s needs. We suggest that young scientists be placed in work positions to determine which ones are natural leaders and are self motivated. These should be given the opportunity for higher degrees. They will then be aware of the needs of research because they were true researchers, Leadership will show. To do otherwise is to risk having unqualified people with higher degrees dominating the qualified with lower degrees. This results in the accumulation of scientific dead wood what suppresses excellence.

 i) Visit of secretary, agriculture, Mr. Anisuzzman along with other senior government officials of the ministry and publicity department at Dattanagar form to see wheat crop was complimented. Hole of such recognition in boosting morale of wheat team cannot be underplayed.

 j) Dr. Anderson also pursued the matter with Indian authorities with regard to the export of wheat seed to the extent of 2800 MT. FRO also supplemented the financial support for enabling import of about 100 tonne seed from Mexico.

 k) During the visit to Regional Research Institute useful tips were provided with regard to lay out of the experiments or the seed storage system etc.

6) 1975: B: Biggs end clay reviewed the wheat progress and suggested several important changes in the research and extension strategy. Some of the important were as follows:

 a) Even though the area under wheat during 1968-69 to 1974-75 increased at the rate of about 2%, the area under new varieties in the same period increased at the rate of 24% per annum. Therefore much of the change in production was brought about through productivity increases. The Indian experience of North east Bihar were local varieties of wheat had almost disappeared under rain fed condition over the period 1965-70 was found to be a good pointer towards the trend in Bangladesh.

 b) It was also noted that abnormally dry period in 1972-73 had reduced production by 20 percent compared to previous year. The prospects of substantial increase in wheat production were considered modest looking at the policy environment. An important factor explaining this feeling was the objective of first five-year plan (planning commission on 1973-88) which said, “to arrange supply of domestically produced rice the consumers of wheat hitherto imported.”This apart, the plan did envisage on expansion programme of 300000 acres in 1972-74 to 600000 acres in the final year of the plan i.e. 1977-78. The prospects of wheat expansion were considered limited in view of various Rajshahi, faridpur, kushtia and compile explaining about 75% of actual wheat average in Bangladesh during 1973-74. Recommendation was make that one should try to find out why farmers did not grow wheat and how could the production environment be improved monitoring system for generating reliable data needed to be established as also an apex coordination committee involving various agencies engaged in increasing wheat production needed to be set up.

**7) 1975 C: National wheat workshop 1975:** A comprehensive review of various aspects of wheat production was made in the workshop in which about 25 different papers were presented. Some of the recommendations made may be mentioned below to properly capture the feeling amongst wheat researchers during 1975-76.

a) Suggestion made earlier by Biggs and Clay was reiterated regarding establishment of high level committee for coordinating provision of input services and credit under the leadership of Ministry of food, Agriculture and Rural Development. (It is a different point that nothing much really happened in this regard). The system for credit, seed distribution and the price environment through support price and procurement needed to be improved. The suggestion was also made for setting up 3 tier training programme at agricultural research institute, district level and village level. Seed multiplication by the farmers’ groups to be certified by official agencies were also considered necessary for wheat expansion. In a way this suggestion is still valid despite the contract grower system introduced by Bangladesh Agricultural Development Corporation (BADC).

b) As regards the research programme, development of in-country training facilities for research staff was given top priority.

c) After defining different ecological conditions under which wheat could be grown in Bangladesh development of breeding after taking into account the area specific varietal characteristics was considered an important objective (it is regrettable that this issue has not received much attention so far.). The need was expressed for establishing facilities for artificial inoculation of disease so as to give facilities for screening varieties for resistance.

d) Seed storage was considered an important area deserving urgent studies apart from need for a studying corporative economics of wheat via-a-vis other competing crops. The need for establishing monitoring and concurrent evaluation system besides organization of periodical workshop was also underlined.

Dr. Sufi M Ahmed in his paper acknowledged the assistance received from CIMMYT in form of observation nursery, international apring wheat yield nursery etc. The material was also received from Arid Land Agricultural Development Programme in Lebenon. It was acknowledged that before releasing a variety it was necessary to test its performance on farmer’s fields. But it was regretted that facilities for mobility as well as necessary equipments were not adequate to conduct large scale trials. So much so that even sufficient transportation facilities for carrying seed, fertilizer and equipment were not available.

e) District agricultural officers from various parts of Bangladesh evaluated the prospects of wheat expansion in their respective areas in the workshop and draw attention to area specific constraints. Mr. M.A. Gofur Khan, District Agriculture Officer, Jesstore recalled the visit of Dr. Sarri and Anderson to Seeha Thana of the district and their advice to farmers for using double than the prevalent dose of seed rate in NYV wheat.

f) in other districts the existing land tenure system was considered a major problem (e.g. Neakhali) in the way of wheat expansion besides problem like scarcity of draft manials. Voluntary agencies like MCC which were taking up experimentation on small scale were complimented for their efforts.

8) 1975: During February 23-25, 1976 Dr. Anderson visited Bangladesh with the support provided by Ford Foundation to review wheat progresses. He visited Regional Research Institution at Jessore and looked at BADC farm in Kushtia followed by discussions with the scientists at Ishurdi. Informal discussion was also held separately with the former CIMMYT trainees at Mr. Sarin Ahmed’s residence.

**Other observations were as follows:**

a) The experimental conditions at various farmers were critically evaluated such that the utility of conducting experiments when standardising the soil water conditions was considered limited.

b) The moral of the scientists was found to be very high though availability of various equipments was considered inadequate. The seed farmers set up by BADC were considered satisfactory.

c) An important suggestion made at the Chukashangar project was the deputy director along with agriculture officer and farm leaders should go to see the development in Mehurpur and talk to the farmers so that the **reverse flow of knowledge from farmers to scientist could take place.**

d) Suggestion was made for raising support price for wheat and establishing buffer stock instead of keeping price of local wheat low through non support or through substantial high price of import.

e) Expansion of the tube well extension programme was considered necessary for increasing wheat area (though the recent developments have proved otherwise).

f) Suggestion was made that varieties from India doing well in North East like HD 1981 could also be imported.

g) It was agreed that with the support from Ford Foundation, CIMMYT would train agronomist and farm mergers besides subject matter specialist in extension agronomy.

9) 1976: Wheat evolution committee convened by deputy director tobacco development board comprising members from various departments and research institutions was appointed in December 1976 to evaluate the progress and achievement of the 1976-77 wheat programme in Bangladesh. It was noted that soil survey department had estimated about 3.3 million hectares suitable for wheat cultivation under irrigated and non irrigated condition. Out of this about 60 per cent would be left for other winter crops. Suggestion were made for improving programme like better input supply, incentive for extension officers, financial support for the task forces as well as extension officers, training arrangements for the staff etc.

10) 1977: Dr. Kazi, Director General, BARI while reviewing organisation and accomplishment of agriculture research in Bangladesh noted the progress made with regard to various crops but some how referred to wheat research in about 5 lines (Perhaps to keep balance with other crops).The observation in this regard made by some members of wheat team may be quite pertinent. It seems that the top leaders in agriculture research during 1976-77 used to give lot of importance to publications instead of concrete performance in the field. A specific case of pathology department BARI, was cited for having received special mention because of large number of papers published by them. Perhaps as an outcome of such a policy one notes that publication in the wheat programme picked up considerably from 1976 onwards.

11) 1978: Dr. Stephen D. Bigge renewed integrated wheat research and production programme. Important issues raised by him deserve to be mentioned here because they seem to have had an important influence on wheat development programme subsequently.

* Even though a formal integrated research and production programme had not been set up, necessary conditions for such a programme had already revolved. It was recommended, therefore, that BARC should help in organising integrated multi-disciplinary problem-oriented research in which regional research institution should be organically involved. Through workshop, newsletters and other communication methods proper link should be maintained amongst various sub-items. He added that the on-farm trial programme needed to be reorganised so that issues raised by Mugh Brammers with regard to potential for wheat cultivation in Bangladesh should be adequately taken care of.
* Need for village level survey was mentioned particularly to document the informal research and development system evolved by farmers of which examples are given below:

a) Dug-wells and hand pumps being used to irrigat4e wheat

b) farmers testing wheat seed germination on bamboo leaves before planting.

c) Farmers applying fertilizer after occasional rains in winter.

d) Farm-level wheat seed storage in traditional bins, tins and polythene bags, all resulting in high seed germination

e) Threshing of wheat by using adapted rice paddle threshers

f) hand threshing of wheat on a elated bullock cart frame.

g) early sowing of wheat on ridges (like potatoes) so as to avoid feeding if there are late rains.

h) Careful dividing of plate with ridges and channels to optimise the use of scare supply of irrigation water

i) Fertilizer application rates which are more appropriate to the economic and risky environments of farmers then the recommended package from the research and extension progress.

It was underlined that BABI and Bangladesh Agricultural University should have more organic link. Wheat workshops needed to be organised again, and proper link between research objectives of agricultural university and priorities of wheat research programme at BARI needed to be established. One of the most important suggestions was that agronomists, agricultural economists, agricultural engineers engaged in the formal research system should try to visit villagers as to become aware of the actual problem faced by farmers. This might generate more valid hypotheses leading to development of better technologies suitable for small farmers.

12) 1978: The expanded wheat research programme started in May 1975 was to be continued from May 1978 to May 1980. The expanded wheat research program (EWRP) was the revised scheme prepared after initial accelerated wheat research program (AWRP) was developed for the period 1970-71 to 1972-73. Till 1975 the scheme was continued with the spill over funds. The EWRP was initiated from May 1975 and in 1978 two years extension was proposed.

Since Mexipak-65 and Sonare 64 had already become susceptible to trust, need for varietal diversification was underlined. More than 66% area was under dry land cultivation. By this time seven breeders, six production agronomist, one pathologists and one technologist had been trained at CIMYT and were working in a team. There was provision of only nine technical officers and 4 non technical staff which was considered quite inadequate in cope with the vast research programme. A resident adviser from CIMYT was requested. Training programme for extension officers was also proposed by the wheat program scientists. Edward J. Clay reviewed 10 years of worst wheat production in Bangladesh and concluded that the extraordinary progress of wheat in an area which was close to the climate limit for this temperate zone crops was quite creditable. In a way the pessimism expressed in the first five year plan and also shared by Biggs and Clay (1975) and Ahmed (1976) had been boiled. The most critical variable influencing the wheat program was considered as the crucial dependence of the country on large scale import of seed. Suggestion was pace that in local capacities in this regard must be strengthened.

13) 1979: H. Brammer while reviewing the lessons from the 1978-79 drought noted that farmers had used their traditional knowledge to cope with the stress and cultivated some of the crop like Kaon and famine millet in Kharif season. The distinctive feature was that the rabi crop like wheat grown on residual soil moisture were little affected although the boro rice was considerably reduced. It should be noted that area during 1977-78 and 1978-79 increased by only 1.28 mill. Ha. But during 1978-79 it had increased by 0.76 million hectares. The same during 1979-80 was higher by 1.69 million hectares. Perhaps because of drought in Kharif early sowing of wheat might have been possible which led to the average yield continuing to remain at about 18.6 qts. Per hectare (this was marginally higher than average yield of the earlier year).

14) 1979: Dr. Anderson, Saari, Biggs, Marko and Byerlens reviewing rapid changes in Bangladesh wheat in early 1979 expressed their excitement about the motivation and enthusiasm of the young scientist working under the direction of Dr. Kazi Badrudoxxa and Mr.\_\_\_\_\_\_\_\_. It was mentioned that wheat acreange might expand up to 0.8 million hectares by 1985. However, during 1990-41 to 1993-94. It had fluctuated between 0.51 to 0.59 million hectares with highest in 1980-81. The hope that the target would be \_\_\_\_\_\_\_ provided adequate irrigation was developed and fertilizer and supply were made available together with favourable prices, has obviously not come true. And as we will discuss later, one reason perhaps was the excessive emphasis on irrigated wheat.

Anderson and his colleagues expressed concern on the fact that there was much greater dependence on a single variety namely Senalike than was really safe for the country, The resistance of leaf rust was found to be merging in some lines of sonalike and salastion for this type of teak was recommended. Agronomic aspects of trial, in view of the team, needed to be strengthened, caution needed to be exercised as the philariaminor, a weed of facting crop in India did not affect Bangladesh wheat. The margin competition between wheat and all seeds like mustard was also noted.

Other suggestions were as followed

a) On-farm trials should be conducted wide part in the region where most farmers had not adopted the package and practices.

b) An important suggestion with regard to training of a trainer was made on the CIMMYT could enrol an agronomist as an assistant training officer for a year. It was suggested that wheat programme should include a full fledge training cell to ensure cooperation between extension and research systems. (it may be mentioned here that a principal scientific officer posted for \_\_\_\_\_\_ and demonstration was withdrawn from wheat programme and attached to training cell of BARI).

c) CIMMYT also offered to provide further training to some more of BADC farm managers. The funds for graduated studies for promising wheat scientists also were considered necessary. Several questions were raised regarding the possible benefit to different clearances of farmers with introduction of various types of farm implements. Particular mention may be made about thresher which it was feared might benefit only large farmers as well, Many of these questions needed carefully study and spot testing. Finally it was suggested that barley and triticale should be included with wheat in coordinated winter areal progress.

d) The group did not feel that there was a case for wheat institute to be set up on the pattern of rise institute. In fact the cases interaction with other commodity programmes as also disciplines was considered quite functional within the jurisdiction of BARI. The need for annual wheat workshop in 1975, the group did not feel any need to divide Bangladesh into separate region for research purpose.

15) 1980 : Mr. Mazaque presented new research information on wheat in a workshop on modern rice cultivation in Bangladesh organized by Bangladesh Rice Research Institute in February. Apart from reporting the performance of new varieties like Balaka, Luel (later withdrawn) and pavon-76, the result of various other trials were also reported. One of the important aspects of the paper was result of mixed cropping in which wheat plus mustard was found to give 25 percent more yield than mono cropping.

It may be important to mention that the Bureau of Economic and Statistics did not including data on mixed crops superlatively with the result that acreage under wheat trenched to be reported on single crop producing perhaps the average productivity.

16) 1980: A proposal for establishment of wheat research centre under DARI was made. The need for according higher attention to rain fed wheat was again underlined and the rationals for wheat research centre was provided in view of increasing complexity of problems emerging with extraordinary growth wheat areas. In all 38 technical officers and 34 office and field assistants were provided for in the project. ( it is different point that not such of this staff could be provided after the establishment of the wheat research centre.) A resident advisor from CIMYT was also requested.

17) 1981: Hugh Breer, FAO land use advisor, in Ministry of Agriculture and forest while reviewing traditional and modern methods of intensifying crop production in Bangladesh noted that acreage and production of pulses and oil seeds could have decreased in the face of competition from high yielding varieties of wheat and paddy. Considerable concern was expressed about the mechanised pathway of intensification in cultivation because of possible adverse social consequences. He argued therefore for such policies which did not affect adversely the employment prospects in agriculture and considered thereby the problem of land less together with the problem of landed farmers. This assumes and added importance in context of Bangladesh where as many as 40 per cent inhabitants were considered to be landless.

18) 1982: BARC appointed a committee convened by Dr. Motlubor Rahman, Member, Director (Crop and Forest, BARC) to examine the various issues and problems involved in crop0 diversification in Bangladesh. One of the important issues noted was that the oil seeds, pulses, maize and vegetables were being neglected in the research, extension and input supply programmes. In order to protect the interests of diversified crop cultivation which will serve the short term and long term interest of ecological balance as well as adequate supply of oil seeds and pulses, a package of policies was drawn up.

19) 1982: B: First North West regional workshop on research and extension approaches to agriculture production was organised in May 1982 by extension research project of BARI and directorate of agriculture (Extension and Management), Unlike earlier conferences details of question and answers with regard to various research options were mentioned and proper guidelines for future research were drawn up. When attention was drawn to the \_\_\_\_ that maximum area of wheat was under rain fed situation and yet predominant varietal recommendations were made for irrigated situations, it was mentioned that experiences in rain fed conditions was not satisfactory (1982:46).

20) 1983: Two very important studies were completed in 1983. One by Ahmed and Claments to identify constraints to increased wheat production in Bangladesh and second aimed at socio-economic Assessment of Improved Technology and Identification of Constraints to Higher Production of wheat in Bangladesh by Elias and Hussain of BARI. Some of the distinctive features of \_\_\_\_\_\_\_\_\_\_ mentioned below:

 a) Ahmed and Cleanest: Even though the selection of sites was not very representative in both the studies yet the clear indication was that some of the key constraint were need, supply, draft power, irrigation and threshing. However, it was else underlined that any increase in the area under wheat in areas like comille and Dhaka would take place only at the expense of other Rabi groups. The general feeling that wheat expansion would generally take place into the farmers’ fallow land and was not found to be valid. The Redent menace was becoming a serious problem apart from the usual input related constraints.

B) Elias and Hussain 1983 summarised the studies continued for three years and completed in 1982-83. They noted that 86% of the sample farmers still used sonalike variety. The average yield was about 1636 kg. per ha. And quality of seed supplied by BADC was not found to be very good. Apart from fertilizers, draft power and human labour were considered as two important determinants of wheat yield.

21) 1984: Helmuth walter in a study of seed marketing and distribution in Bangladesh under Bangladesh German seed development project noted that only 6037644 ha. Were brought under wheat in 1983-84. While BADC contributed only 15% of the total seed requirement by distribution of certified wheat seed in 1983-84, the remaining seed were supplied by farmers own stocks. The BADC did not the entire production of contract growers which led many of them to tell the seed to others at higher price. It was felt that if 30 percent change of seed was to be aimed at then 25200 tons of seed would be require out of total seed requirement of 84000 tonne for 600000 acres. The importance of well planned seed distribution was underlined.

22) 1984: A: Wheat performance in Bangladesh was reviewed by Joseph Hunt and Jahangir Alam in a memorandum submitted to Mr.l Anisuzzaman, Secretary, Ministry of Agriculture and forestry in which findings of study by Brammer (1982), Ahmed and Clements (1983) and Elias and Hussain (1983) were reviewed. It was mentioned that much of the new area being brought under irrigation particularly in North West might have been absorbed by bore rice although no clear evidence was available. The farmers in many areas has reported dealing the yield after wheat, though findings on this subject appeared to be controversial. There were significant regional differences which in our view suggest a need for identifying distinctive wheat zone although authors did not consider it so necessary. Several systematic studies were suggested and later in a meeting with joint secretary Mr. Hoque on July 13, 1984 based on this memorandum short term and long term priorities were listed.

a) Due to extraordinary flood in 1984-85 a quick survey of seed loss was suggested to arrive at revised estimate of seed import requirement.

b) Price policy review was considered necessary

c) rainfed focuses was important since northwest Bangladesh ws the primary wheat production zone.

d) The new varities needed to be developed to reduce dependence on sonalika and

e) Water consumption of wheat vis-à-vis here needed to be studied so as to evolve an appropriate irrigation policy.

23) 1984: 8 Dr. Lerry Butler interviewed the CIMPYT executed wheat project funded by Canadian international Development Agency (CIDA) costing about 5 million Canadian dollars. He joined as breeder pathologist besides being administrative manager of the grant in 1982. His job was to provide adequate assistance, in service and post graduate training, and equipment to the Bangladesh Wheat Research Centre over a 5 years period. Dr. H. Gular, also a CIMYT staff member, was appointed as consultant agronomist. The review of CIMYT training done by Dr. Buller would be drawn upon in the next chapter.

The informal training provided through frequent vinits consultations, review of wheat wok etc. supplemented that Wheat work etc. suprimented the wheat scientists own initiative and efforts. The details of the observations made by CIMMYT scientists and Ford foundation staff bisedes others’have been included largely to highlight the initiate report which existed between Bangladesh scientists and the CIMMYT advisors.

We will study the formal aspect training in next chapter.

**CHAPTER – 3**

**CIMMYT’s Training: Reflection and reformulation**

As mentioned in the earlier chapter we do not believe that proper assessment of the role that training at CIMMYT has played in institution building via-a-vis wheat research progress in Bangladesh can be properly appreciated by restricting the re-appraisal only to its formal training efforts. It is necessary to have a comprehensive icon on the formal and informal training htat was provided not merely by the Scientists from CIMMYT but also through the periodical reviews by Ford Foundation staff particularly Drs. Biggs and Clay. However, we will discuss in the section the strength and weakness identified by the various trainees with regard to the training provided at CIMMYT followed by some general issues with regard to training which CIMMYT might find useful to formulate its training strategy for Bangladesh as well as other countries facing similar challenges.

Feedback from the trainees bas on the summary responses provided in table 1 we can crystallies major sgrength as well as weakness as follows:

Strength include the team spirit, the collegial atmosphere, emphasis on learning by doing and the professional values imparted indirectly by the behaviour of senior scientists-cum-trainers. This is not belittle the contribution of substantive skill building in various disciplines.

**Table 1 : Appraisal of CIMMYT Training by Former Trainee**

|  |  |
| --- | --- |
| **Strengths** | **Weakness** |
| * Friendly and cooperative environment
 | * Repatitive nature of experiments which don’t have much learning value, eg. Artificial inomulation continued for as long as three consecutive weeks.
 |
| * Team work
 | * Assignment to some sundry unimportant jobs
 |
| * Encouragement in taking individual initiative.
 | * Full crop cycle not covered in some cases
 |
| * Mass inoculation training
 | * The transportation to farmers’ field in micro buses some times quite inconvenient.
 |
| * Emphasis on applied research
 | * ­excessive work load on some days. Also when number of trainees were loses entire work planned to be done by trainees was passed on to the smaller group.
 |
| * Collaborative data collection, mutual respect and frequent discussions.
 | * Visiting scientists could be given better treatment
 |
| * Participation by senior scientists including Directory and Associated Directory in the field along with the trainees.
 | * It appeared or so the trainees felt that sometimes they were used as labourers
 |
| * Selection criteria
 | * ­Academic side was neglected
 |
| * Closer interdisciplinary cooperation, eg. Between pathology and Breeding
 | * Senior scientists too busy with their work and did not pay enough attention towards development of knowledge and shall of young trainees (this could have been on aberrant observation)
 |
| * Scientists less burdened with administrative work
 | * Irrelevant training provided, for examples, some farm machineries’ considered not very relevant for Bangladesh.
 |
| * Less rigid hierarchy
 |  |
| * Systemisation of routine work
 |  |

The weakness on the other hand include the respective nature of experiments, incomplete coverage of the crop cycle and lesser theoretical reigour in the curriculum. The need for relating training content to the specific problem and resource of developing countries as also voiced by many trainees. Some of the suggestions given by the trainees in modification of future programme are given below:

a) Administrative and logistic support:

 - The need for providing international insurance to he trainees was expressed besides suggesting deposits in dollar instead of Mexican currency particularly in light of the experience in 1982.

b) Professional support:

 - A theoretical exposure to different discipline must be provided in every programme be it breeding, pathology or agronomy. There must be a minimum core of essential exposure that every trainees would go through.

- There should be a news letter perhaps in the IRRI style or separately designed which should provide a platform ofer communication amongst the alumni and the CIMMYT staff. There was a strong feeling expressed that many of the trainees some how could not keep in touch with the CIMMYT people although they very much could like to do. It may be mentioned that concessional effort by Dr. Anderson to have informal meeting of alumnus when he used to visit Dhake served this purpose excellently. It might be useful to establish some sort of such convention so that when minor scientists from CIMMYT visit some of the emerging wheat producing countries, such contacts could provide the younger staff to interact with senior scientists and reflect on the use they put their knowledge to interact with senior scientists and reflect on the use they put their knowledge to (as mentioned later, some of the junior wheat scientists felt that they were not invited in the meeting organised when senior CIMMYT consultant visited Bangladesh).

- It is also felt that trainees whose performance was found to be extraordinary should be encouraged to pursue higher studies.

- One of the trainees reported that he was not sent the result of various group experiments in which he was engaged during his stay at CIMYT. Perhaps routine in this regard could be tightened.

- Eventhough the objective of CIMMYT included providing training for the complete crop cycle it is obvious that in some cases such a practice had not been adhered to. It might be quito logical to restore such a practice.

- There was a feeling that the analytical skills were given laportance compared to the technical skills about how to do a particular practices). It might be useful to think of some innovative ways in which this inadequacy could be overcome. For instance a staggered training schedule could be developed under which such before the wheat season in the countires from where trainees are to be drawn, there could be a 2 week or 3 week orientation programme in which apart from the basis skills, the trainees could be asked to design specific experiments to be implemented by them in their respective countries. With the help of former trainees bases in each country these experiments could actuall be excuted by the trainees who would be expected to go back to CIMYT for not only data analysis and interpretation but also for critical crutiny of their process diaries as well as quality of their work. This might relate training more organically with the context of trainees. (It may not be without significance to mention here a remark of a recently returned trainee from CIMMYT. He mentioned that while at CIMMYT, he did everything with his own hands whereas on return, he would start ordering others around perhaps this culture should cause concern to senior leaders of wheat programme and BARI).

- Many times skill which may not have enough relevance for the country of a trainee are inspired generating an element of cynicism or alienation. For instance certain types of farm equipments may neither be used in a particular country at present nor may likely to be used in future and yet trainees may be expected to learn their operation.

- Perhaps a system could be developed under different trainees could be individually taken care of by a scientist each for more intimate of time consultation. A very strong need was expressed to develop different modules within each training programme so that depending upon the key problem of a country the participants could choose or be assigned to learn specific modules.

- There was a suggestion that before trainees are sent to CIMMYT there should be some preparatory work required to be done before trainees arrives at CIMMYT. For instance they should be expected to do a review of work in their discipline and with the help of their team leader identify specific problem on which they should concentrate while in CIMMYT. A routine needs to be developed for pre-training brief which should be provided to each trainees before he leaves for CIMMYT. A routine needs to be developed for pre-training brief which should be provided to each trainees before he leaves for CIMMYT either by the resident advisor of CIMMYT or by some of the senor staff members in each country which may have had experiences of CIMMYT training before.

* It is quite creditable that in recent past CIMMYT has been making effort to help trainees pursue specific problem after the normal training was over by arranging visit to the relevant countries in these regards. Perhaps such an effort needs to be further strengthened and complimented.
* A suggestion was made that a systematic review of training needs should made periodically in each country. It may also be possible to suggest to the bilateral donors that they strengthen the training capacities at international Agricultural Centres life CIMMYT once such needs related to various aspects of wheat or other programme were identified.

**Utilization of skills:**

Several examples are given where the trainees had been able to utilize their skills after coming back. For instance, one person had tried to modify the date collection sheet as well as sytem for their preservation. Another designed two different experiments for rainfed breeding which were approved by the research review committee this year. Even though the experiment last year had failed.

There were a general feeling that trainees should also be provided scope for revisit after some period of time.

There should be sufficient exposure provided even in technical skill building programmes to the problems of small farmers in various developing countries so that the technologists could develop proper appropriation of the risks with which poor people had to deal with and also the skills and resources that they had historically acquired. In a few cases the the people who were sent for training were not necessarily the one’s who had sufficient experience in wheat research. It should be required that anybody to be sent for training should have had some experience on working of this crop.

The senior scientists from CIMMYT while visiting various developing countries should make a particular point to meet the junior staff who may have been trained but who were not generally invited to meeting called on such occasions by the local team leaders.

While there are several other ways in which training activities at CIMMYT can be strengthened and we do not have to go in to detail about each one of them. It may suffice to add that a preparative building input must must always be given some of the methodological innovations such as the one suggested by blog with regard to survey of informal R and D system i.e. farmer’s own innovation or selections from different verities could generate greater empathy towards the problems of small farmer. One could also underline the need for thinking in terms of region specific technologies. It may be worthwhile to refer to the recent report of BARI review mission (Nov. 12-23, 1984) which included following suggestions:

The term felt there was considerable scope for improving the efficiency of research, present research agenda suffers from a lack of focus, from overlap and from insufficient coordination. There is need to orientate research towards the seeds of clearly specified group of farmer scientists. To address these problems and sharpen the focus of research, it will be necessary to replace the package approach to farm recommendation. It is recommended that a menu approach be used by which BHARI places emphasis, on providing a range of improved technologies most likely to bring substantial economic benefits to different agro-economic groups of farmers.

Research in all areas should be increasingly oriented to the diverse made of the farmer climates in Bangladesh. The must include setting of a specific objective, setting targets and monitoring accomplishments. Field survey for understanding farmers circumstances\_\_\_\_ and diagnosis must be amented before and during the research process. Specific client group of farmers need to be defined. Adoption of technology by these specific groups needs to be carefully monitored.

It is obvious from above that training strategy for building capacities to deal with about type of concern would need considerable effort at the level of CIMMYT.

There is also a need for ensuring an appropriate mix of discpliness. For instance the on-farm trial division of BARI does not have anybody trained in farming system research or doing diagnostic studies or developing innovative weays of on-farm trials. The concerned hedad of the division felt this to be an important area which needed to be urgently strengthened perhaps while divising the training programme for different countries CIMMYT could ensure that a **minimum involvement of various skills was build up in the shortest possible period of time**. This will help the national research programme become self relient. As mentioned earlier, the Bangladesh policy preventing trainee having under gone short term training programme such as the ones affored by CIMMYT from qualifying for longer term training programme also needed to be modified. A general confidence was expressed by most of the senior trainees that it will be possible for them to train their other complete, although they felt a need for refreshing their own skills. There was also a feeling amongst the trainees that the team spirit should be of the same type in their own programme as they observed at CIMMYT. It goes to the credit of wheat research centre at BARI that in general it was adjusted as one of the most acheaive group having exceptionally cordial work atmosphere. There were only a few intence cited were some of the younger member felt that they could be given individual responsibilities for experiments.

Drawing upon Dr. Butler’s redent note, we may add the following:

An important aspect of utilisation of skills in Bangladesh is related to the training that wheat scientist provide to extension workers, subject matter specialist, officials of Bangladesh Agricultural Developmental corporation etc. The scientists are also engaged in developing publicity material with regard to various varities and the relevant package and practice. The wheat research programme had least about 18% trainee to other programme. Looking at the overall thrust of the programme one could not call this a very high proportion.

It may be mentioned that subsequent to 1972 when Dr. Butler and Dr. Guler joined the CIDA funded and CIMMYT executed wheat project, the assimilation of training at the centre has further increased. A total of 49 scientists have trained by the wheat programme at CIMMYT as per table-2 which shows that the economic/farming systems is one of the areas left under covered. The CIMMYT-CIDA programme provides for training of a BARI scientist every year. It might be worthwhile to include the persons from on-farm division in future batches. The trainees in farm management course were generally trained from Bangladesh Agricultural Developmental Corporation which has played an extraordinarily sital role in seed multiplication and distribution. Although several of the trainees have been shifted from the task of farm management to more general duties, many of them still remained in the seed division. However, the people sending the seed farms have also been trained under common technological assistance. The CIMMYT-CIDA progress has also sponsored even post graduate scholarship and it is crucial that such a support is continued to build up lengtyhen research capabilities of wheat improvement programme.

**Table 2: Number of Bangladesh Agricultural Personnel given wheat training at CIMMYT by year and course**

**WHEAT**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year entered** | **Breeding** | **Production** | **Pathology** | **Technology** | **St. Mgt.** |
| 1968 | 1 |  |  |  |  |
| 1970 | 1 |  |  |  |  |
| 1973 |  | 1 | 1 | 1 |  |
| 1974 | 1 | 1 |  |  |  |
| 1975 | 1 | 1 |  |  |  |
| 1976 |  | 2 |  |  | 4 |
| 1977 | 3 |  |  |  | 1 |
| 1978 | 1 |  | 1 |  | 1 |
| 1979 | 1 | 3 | 1 |  | 1 |
| 1980 |  | 4 |  |  | 4 |
| 1981 |  | 1 |  |  | 4 |
| 1982 |  | 2 | 1 |  | 2 |
| 1983 |  | 2 |  |  |  |
| 1984 |  | 2 | 2 |  |  |
| Total | 9 | 19 | 6 | 2 | 17 |

Source: L. Butler, BARI, Dacca.

Even though the link between BARI with other institutions like Bangladesh Agricultural University and \_\_\_\_\_\_\_ University are quite weak at present, there is a need to strengthen these links by involving some of the scientists from various universities also in the training programme. This will help develop in future a proper diversified coordinated wheat improvements programme.

Under the visiting scientists rpgramme various senior scientists administrators and political leaders have been invited for the exposure purpose to the CIMMYT. It may be useful to increase the preparation of administration in future visiting programmes not that adequate support from administrsative quarters for wheat research programme can be built up through links so established. This might become very crucial in future.

In-country training programme have also been organised with the support of CIMMYT/CIDA wheat project. The farmers training programme are also beaing organised at regional research stations. The logisitic support for the programme was provided by Dr. Butler through his project. A very innovative effort has been made by which farmers would select a particular variety of their choice and would be given a kilogram of seed on demand in the pre-sowing period.

The field days organized at the regional research stations have suffered at times because of insufficient financial support. The CIMMYT/CIDA programme has been approached to support such request also.

In 1981, a one week course in plant pathology technique for collection and storage of rust spores was conducted by an expert from Netherland collaboration with CIMMYT’s regional wheat representative. Plant pathologists drowned from wheat centre and plant pathology division of BARI were included in the programme. Dr. Butler expressed great satisfaction in this regard because when he joined in 1982, the personnel trained in the uses of equipment were already in position.

The jaint regional yield trials have been sponsored by BARI and CIMMYT. The two institution in 1984 (jan-feb) also sponsored a tour of the national programme with the specific reference to wheat research in Thailand and Bangladesh. The members of the team included director of wheat programme from Pakistan, India, Nepal, Burma, Philippines, Thailand and Indonesia. The interaction among the national wheat coordinator was found to be an extremely important by product of this tour. So far only two economists from economic division had been trained at CIMMYT. Somehow it appears that this particular aspect of training had not had a very significant impact. This area as mention.

A view was expressed by senior administrators of BARI and in view of strong research capabilities in the neighbouring country i.e. India, ther may be a case for strengthening the links between wheat research in India and Bangladesh. Perhaps the earlier link with Pakistan could also revived. This appeared as a very important aspect of wheat programme and perhaps by organizing some sorts of regional training programme or seminar such a gap could be filled up. It may be difficult to develop formal inter-institutional relationships (though it remained a necessary issues). The informal links established through such seminars might turnout to be much more potentially useful. It also appear that after Dr. Anderson’s visit there has not been such effort to provide crucial link between wheat research programme of India and Bangladesh. A concern was expressed that CIMMYT could possibly try to remedy the situation.

In the whole thue, we may concludes that CIMMYT training hass not only achieved a quite useful purpose, a scope remains for it to play an even more useful role. The analytical skills given inspear attention in put will have to be given higher importance in future training preparedness for those trainee who under went initial programme 7-10 years ago were urgently called for to invigorate the wheat research programme. CIMMYT’s formal and informal training and consultation provided in a mutual learning frame work constitute an important aspect of institution building exercise at wheat research centre, Bangladesh.

**CHAPTER – 4**

**The\_\_\_ sational setting for Research – The Administrative revitalization**

Eventhough the scope of original study was restricted to institutional building role of CIMMYT, an effort nevertheless was made to include some study of the general research-administrative environment. These was to strengthen the institutional building process already triggered by visits and study reports of CIMMYT and Ford Foundation scientists.

Four different inter disciplinary groups were formed as per the details sent earlier, which discussed various aspects of wheat related technical, managerial, administrative and extension related aspects.

This was in additional to the personal interview and structured questionnaires given on various wheat trainees.

While it is true that after Dr. M. Rashman tests were over a director General of BARI several meaningful changes have been made in the day to day functioning of BARI as well as wheat research centre. The crop still remains for further improvement.

**Coordination:**

The present way of coordination within BARI and between BARI and BARC and other institutions made considerable strengthening. The instances were reported when various Members Directors of BARC asked separate report from wheat coordinator which apart from adding to the avoidable paper work was also quite dysfunctional. To this extent coordination with BARC with regard to crop oriented programme may need to be reviewed and strengthened.

In many research programme, mobility of officials forms, an important ingredient of learning as well as management. In past the reimbursement of travel allowance used to take as long as one year. At such junctures sundry advances by Dr. Butler from his project funds proved extremely effective in overcoming frequent bottlenecks with regard to travel of wheat scientists. The problem became particularly mute in the wheat season when frequent visits to different regional stations were required. Many times the expenses had to be incurred first from own pocket. The dwelling allowance (DA) was very low in seventies (About take 7 ½ per day) and remains low even in eighties. This, however, is the national problem and not peculiar to wheat program. To the credit of BARI management it may be added that one of the important interventions making this is less discomforting proposition is the strengthening of guest rooms at each regional research stations.

There was a provision of principal scientist officer to supervise demonstration and training in the wheat research program and who has mentioned earlier unfortunately been transferred to training department instead of retaining with wheat program. The direct implication of this weakness has been that while more than 1000 on-farm trails were laid out but the results could not be prepossed in time.

An effort has also been made to revive a practice first started in 1966-67 to coordinate facility of regional research station of various institutions. Twenty years ago, the Jute research extension centres were used for laying out the wheat trials. Director General, BARI has been making an effort to rework the regional research resources of various institutions on that various crop programme can have the advantage of most diversified testing of breeding material.

When discussions were held with some of the administrator in the government about the specific routines developed by them in the field it was learnt that the wheat programme was provided lot of support in the past 1980 period, by using various inter organisational forums like district credit committees. The irrigation cooperatives were also given certain quate to buy wheat seeds and administrative authority was used to enfores some of these measures. In 1988 there was such a great demand of the seed that people ghered the district officials who had to send S.O.S. to secretary, Agriculture. It was found by some of the administrative that wheat stress was were durable for thatching the roof of the Jute and this abbreviation was fed to wheat program scientists. The feeder quality of strew was found to be however, poorer.

A suggestion was made that project coordinator should be provided sufficient contingency funds an annual basis to manage program effectively.

Some of junior staff member in the wheat program suggested that they should also have access to transport facilities for field visits.

The reward system needed considerable strengthening or improvement. It is creditable that while the wheat programme received several awards in the earlier years from government as well as voluntary organisations, there were **not many staff members** who had been given **accelerated increments.** This was one area which needed urgent attention by BARI management.

A suggestion was made with regard to upgradation of wheat research centre so that it could eventually become an institutions. In our view the advantage of wheat program remaining linked with BARI re for greater than in its becoming separate. In any case for a small developing country it was most important that scare national resources were used most judiciaously. Various facilities already created at BARI could unnecessarily have to be duplicated if a separate institute was to be established. While we very strongly feel the need for greater autonomy and decentralisation of power to wheat research program with research priorities of different departments. In fact as mentioned earlier, setting up of a national coordinated wheat research program should not be delayed any further. This will also require strengthening links between BARI and BARI.

**CHAPTER – 5**

**Seed of change: Multiplication processing and distribution of wheat seeds**

The story of wheat in Bangladesh can not be completed without an adequate appreciation of the sale that seed industry has played. While it is true that predominant sources of seed continued to remain the farmer to farmer exchange, the need for replacement of seed systematically by providing pure disease free seed by BADC can not be under played. In the earlier days of seed multiplication, there used to be a committee comprising of Director, BARI wheat research coordinator and BADC representative which used to make surprise check in field to enquire good quality of seed production.

It was felt that such a committee could be revitalised so that continued availability of good quality seed was ensured.

The storage of seed given to high moisture also faced serious problems and research by wheat centre on various storage methods used by the farmers has been extremely helpful. The distribution of contract growers has also been noted to be quite showed requiring a review so that problems in wheat seed transportation could be reduced. It was also felt that most of the senior officials in BADC were protected at head quarters instead of various regions leading to poor supervision. It might be worthwhile to consider this suggestion. The thrashing had been mentioned by various peop0le including scientists as on important. While the threshere were certainly needed at various seed production farms, their utility at farmers’level needed careful thought and deliberation. The possiblility of threshere replacing labour in the villages is real and any change in this regard should be thought of only after taking all possible care.