



# National Workshop on Maize Production, Promotion, Diversified and Alternative uses in Bangladesh

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BARC Conference Room 1, Farmgate, Dhaka 1215, Bangladesh



**Report prepared by:**

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Editor: Frances Hunt



Above: During inauguration session. Photo credit: Uttam Barman

National Emeritus Scientist, Dr. Kazi M. Badruddoza, Bangladesh Agricultural Research Council (BARC). Special Guest was Dr. Golam Faruq, Director General, Bangladesh Wheat & Maize Research Institute (BWMRI). Dr. Shaikh Mohammad Bokhtiar, Executive Chairman, BARC, chaired the session. Dr. Wais Kabir, former Executive Chairman, BARC, facilitated the workshop.

Present at the inauguration session of the workshop as Chief Guest was honorable

The workshop was organized into the following presentations, followed by discussion:

- 1. Maize Association of Bangladesh (MAB)**  
Md. Mizanul Hoque, Vice President, MAB
- 2. Government Priorities on Agricultural Research on Maize in Bangladesh**  
Dr. Golam Faruq, Director General, BWMRI
- 3. CIMMYT's Research on Maize and Its Alternate Uses**  
Dr. B. M. Prasanna, Director, Global Maize Program, and  
CGIAR Research Program Maize, CIMMYT
- 4. Maize as Fodder in Bangladesh**  
Ms. Stephanie Cheesman, CIMMYT, Dhaka
- 5. Production of Corn Oil in Bangladesh: The Prospect, Challenge & Our Expectation**  
Dr. Abul Kalam Azad, Bangladesh Academy of Agriculture (BAAG) and Former  
Executive Chairman, BARC



Above: During discussion. Photo credit: Uttam Barman

### **I. Maize Association of Bangladesh (MAB)**

**Mr. Md. Mizanul Hoque**, Vice-President, Maize Association of Bangladesh (MAB), informed that MAB established in 2002 as non-governmental organization to promote maize in supporting nutritious food security in Bangladesh. He shared MAB's vision, mission and they focused on maize production expansion opportunities in the new areas and strengthen the capacity building among the maize dealer & farmers on modern technology and varieties.

## 2. Government Priorities on Agricultural Research on Maize in Bangladesh

Dr. Golam Faruq, Director General, BWMRI, presented the current situation of maize production in Bangladesh and the country's requirement, indicating the area under maize cultivation, yield and seed requirements, and future projections. He outlined the thrust of current institutional research and its future priority, and identified potential areas of maize expansion, such as *haors* and *chars*.

## 3. CIMMYT's Research on Maize and Its Alternate Uses

Dr. B. M. Prasanna, Director, Global Maize Program, and CGIAR Research Program Maize, CIMMYT, discussed current maize production and its future agenda, and the trade-off in terms of its industrial use. To introduce a popular cropping pattern such as *aman* rice–mustard–*boro* rice and to build international capacity, requires a review of the country's farming scenario. A pilot project could be implemented as part of a feasibility study. However, producing maize with a higher oil content compromises its yield, which remains a major concern. The corn oil industry, involving local production, may not be a feasible option in Bangladesh.

## 4. Maize as Fodder In Bangladesh

Ms. Stephanie Cheesman, Post-Doctoral Fellow, Cropping Systems Agronomist, CIMMYT, presented her experiences of maize-based fodder production in Ukhiya *upazila*. She emphasized the desirability of short duration maize and its suitability for fodder, and the unintended consequence of maize in the area involving women in the dairy industry.

## 5. Production of Corn Oil in Bangladesh: The Prospect, Challenge & Our Expectation

Dr. Abul Kalam Azad, Fellow, Bangladesh Academy of Agriculture (BAAG) and Former Executive Chairman of BARC, reiterated the need to get germ plasm with a higher oil content into the Bangladesh environment and include it in cropping patterns. He explained global corn oil production and its potential in Bangladesh, and the government's priority in import reduction of edible oil through increasing oil crop production and the process of oil production. He outlined the different industrial uses of maize and the prospects for local oil production, pointing out the dearth of skills in oil production in the country, and that this may need attention.

### After the presentations, the following observations and opinions were expressed:

**Farid Uddin Ahmed**, Fellow, Bangladesh Academy of Agriculture

1. Scaling up production of maize is essential, both in newly accreted (*char*) land and in freshwater swamp areas like Sunamgonj and Netrokona. I have worked in both and find there is still scope for bringing more areas under cultivation.
2. There is a need to promote maize for two purposes – grain and silage. The communities living in the area of Ukhiya near Teknaf have been using the maize plant as fodder (for them, cobs are not as important as the dearth of fodder – due to the Rohingya influx, grazing land has been reduced).
3. It is too optimistic to consider that Bangladesh will produce corn oil as an output of maize production. Bangladesh Council of Scientific and Industrial Research (BCSIR), commonly known as Science Laboratory, has already completed research as mandated, conducting pilot level testing of

production followed by industrial scale feasibility. Corn oil production was not found to be feasible in Bangladesh.

**Lutfur Rahman, PhD**, Fellow, Bangladesh Academy of Agriculture & Former Professor, Genetics and Plant Breeding, BAU

1. The workshop organized by CIMMYT in collaboration with BAAG and BARC was the first initiative, well-covered program to address the potential and constraints impacting on maize production and its uses in Bangladesh (although the processing sector's participation was not as visible as one would expect considering the workshop's title).

2. However, some points of clarification are needed. According to the workshop:

- Bangladesh's total annual consumption of maize is 7.5 million tons.
- We produce 5.5 million tons annually.
- Annual imports total two million tons.
- Poultry, fishery and livestock feed account for 90% of the maize grain the country produces.
- Total seed needed, annually, is 9500 tons – local production is <90 tons.
- Per acre income as shown in the Maize Association of Bangladesh (MAB) presentation appeared to be too high.
- When maize is processed and stored for industrial uses, the moisture content must not be more than 12%. However, according to expert opinion, this has been recorded as 14% and income also estimated based on that moisture value.
- Land needs to be available at least for 100 days to cultivate one maize crop.

Providing this status of maize production but omitting to report on the condition/status of processing and industrial uses (including the connectivity of the industries using maize for different feed and food uses) seems to be a serious gap in the presentation.

**The following points of observation were provided in response:**

1. As maize is one of Bangladesh's most important cash and food crops, and farmers are already interested in its production, the specific need is to link farmers/groups of farmers with the country's processing industries to secure a better and appropriate market price.
2. Funding individual farmers through a banking channel will not be as effective as through groups. Farmers' groups can produce large quantities for industries to buy at a reasonable and previously agreed price. This will result in a contract farming system which provides a win-win for both parties as practiced by the seed industries.
3. In respect of R&D and the development of varieties able to produce yields greater than 12 tons per hectare, several very important points need to be considered. Inbred lines that produce more than 10 tons per hectare will be required with international collaboration.
4. BWMRI could start a maize pilot project with CIMMYT's assistance, involving the following:  
(1) large-scale testing of CIMMYT inbred or hybrid seed in different environments (and more particularly in the southern belt of the country under non- to low irrigation support)

- (2) designing a project to ensure the adequate participation of the country's private industries and DAE and NGOs, which would be useful
- (3) BWMRI leading the program in collaboration with CIMMYT to determine the potential of the composite varieties/inbred/hybrids, not only in terms of yield but also for duration, location, and quality traits such as vitamins and nutrients, and oil composition (this will take not more than three cropping seasons, as the materials will be supplied by CIMMYT)
- (4) at the same time, BWMRI ensuring its own program is in place aimed at the further improvement of the varieties already in the fields
- (5) recognizing that maize has diversified uses, from popcorn and sweetcorn to baby corn, with the entire biomass able to be put to diverse uses such as silage, fodder and soil-improving materials, including using its soil stabilizing capability.



Above: During presentation and discussion. Photo credit: Uttam Barman



## Q & A – feedback

**Dr. Mohammad Abduhu**, Additional Director (Inputs), Field Service Wing, Department of Agricultural Extension (DAE)

- Maize yields are still low in Bangladesh; good quality seed varieties are needed.
- Why are we focusing on late markets? CIMMYT has a heat tolerant variety of maize.

**Dr. Md. Abdus Salam**, Member Director (Current Charge), Planning and Evaluation Division, BARC

- An action plan is needed for maize expansion and lodging resistance, with the involvement of MoA and considering the similar experience of the onion production action plan.

**Dr. Naresh Chandra Deb Barma**, Senior Specialist Crops Krishi Gobeshona Foundation (KGF)

- The workshop focused on maize production and promotion of its diversified use. It is important to include the private sector, without which it would be difficult to increase business. Increasing hybrid maize and sweetcorn has strong potential in the climatic conditions of Bangladesh.
- Corn for oil production is for tropical regions which is very difficult to consider independently of other issues in the industry; it requires more thought.

**Dr. Mahesh Kumar Gathala**, System Service Head, CIMMYT

- There needs to be a way forward in seed sector development, with specialized zones, and involving both public and private sectors.

- Implement a pilot in partnership with the private sector to address issues in the value chain.
- Implement an additional project with private actors.

Together, this will enable a complete idea of what the 'future of Bangladesh' will look like.

**Krishibid Mr. Zakir Hossein**, Deputy Director, DAE

- We need to introduce good maize varieties, because our target is to produce 12 ton/ha, increased from current averages of 10 ton/ha.

**Mr. Md. Mizanul Hoque**, Vice-President, Maize Association of Bangladesh (MAB)- MAB, established in 2002 as non-governmental organization to promote maize in supporting nutritious food security in Bangladesh.

- The 30% percentages perception of wheat flour mixed with maize has no authentic data, considering the processing of wheat and maize is different.

**Dr. Golam Faruq**, Director General, Bangladesh Wheat & Maize Research Institute (BWMRI)

- 11,000 tons of seed is imported by the private sector, and BWMRI assigns 5 percent of its land to seed production which is insignificant. Linkage between R&D and industry needs to be strengthened to facilitate the expansion and industrial use of maize.
- We need to provide a five-year projection of seed requirements. Maize is also used as fodder, besides feed and other uses.
- In regard to corn oil, the process is very difficult in Bangladesh and would need a suitable variety/variety.

**Mr. Bidhan Chandra Paul**, Manager, Seed, Bayer Crop Science Limited

- A pilot project in collaboration between CIMMYT and feed companies could provide opportunities to work jointly. We need to increase production in line with demand.

**Mr. Mahabubur Rahman**, Technical Consultant, Varosha Agro Chemicals Ltd

- Maize contains only 5% oil. This is a by-product but should be a main product.
- In the corn oil extraction industry dry corn grain and then oil is extracted by solvent extraction, known as dry milling. The remaining milled product is used for production of either starch or feed etc. However, in Bangladesh wet milling process is used for recovery of germ and oil.
- What is Bangladesh's limit of production? The industry currently obtains 3% oil, which goes mostly unused (except in the soap industry). Corn oil contains 7% fatty acid, as well as dextrose and fructose which can replace cane sugar in syrup.
- In Bangladesh, at a moisture content of 14% or more, micro-biological activities are active.
- In terms of the quality of maize, maize contains industrial dust, vitamins, 6.5% germs and protein. More foreign matter is present in poultry and hatchery mixture.

- More interaction is needed with academia and researchers to address maize industry issues.



Above: Dr. Timothy and Dr. Bokhtar in discussion. Photo credit: Uttam Barman

**Dr. Timothy J. Krupnik**, Country Representative for Research and Partnership, Bangladesh, CIMMYT

The workshop has been very useful for stimulating close discussion, covering the following:

- Maize is considered a cash crop by Bangladeshi growers.
- CIMMYT's global program has focused on biotic and abiotic stresses as well as maintaining genetic materials.
- Industry issues need to be included in CIMMYT's research design.
- Corn oil production is still being debated from the Bangladesh perspective, as it is suitable for temperate countries.
- US private industry is mostly dominating the corn oil industry.
- Increase private sector partnership where possible.
- Regarding corn oil, we have no solutions yet. This workshop has offered the first opportunity to discuss our ideas, which have been very applicable and include alternative product uses.

**Dr. B. M. Prasanna**, Director, Global Maize Program, CIMMYT and CGIAR Research Program

- Bangladesh needs to push forward and establish a global network in small farming systems.
- We cannot get hold of the germ plasm needed to achieve high oil content in Bangladesh; this comes mostly from temperate countries.
- A 1% increase in oil can decrease maize production by up to 2%. It needs a robust breeding program.
- We acknowledge the need to recognize the private sector, but also need to obtain good quality/suitable varieties from both private and public institutions.
- Market issues need to be considered: the role of maize as an economic product in the global market; micro economic research into corn oil in terms of international and local production needs to be undertaken.
- Private and public institutes can get together to initiate a pilot project with corn oil as a byproduct.

**Dr. Kazi M. Badruddoza**, National Emeritus Scientist, BARC

- Maize should remain an important crop.
- Maize production is growing in Bangladesh with the growing feed industry, and we need to give much attention to maize research. Research and development into diversified uses of maize (including oil) should be given priority.
- CIMMYT can start a breeding program of rich oil content and collaborate with Bangladesh counterparts in skills development.

- BWMRI needs to develop research into post-harvest processing to achieve product diversification.

**Dr. Shaikh Mohammad Bokhtiar**, Executive Chairman, BARC, thanked CIMMYT for organizing the workshop jointly with BAAG and MAB. He expressed his wholehearted gratitude for the presence of honorable National Emeritus Scientist, Dr. Kazi M. Badruddoza, and said he found the workshop very impressive and interactive, with effective feedback. He made the following points:

- The current focus is food security; we are a little closer to our production target. The GOB has in place the priority strategy that the agriculture sector needs.
- A strong commitment is needed at both the public and private levels to augment maize production.
- Technology alone is not sufficient; it needs to go hand-in-hand with policy and financial support.
- There needs to be a focus on achieving better quality harvests and post-harvest activities.
- BWRMI needs to develop an action plan to ensure self-sufficiency in maize.

**Dr. Wais Kabir**, Former Executive Chairman, BARC, summed up by mentioning the following issues:

- It seems international donors are not supportive of breeding programs for the industrial development of maize (that is, the corn oil industry). The government can encourage the private and public sectors in the development of maize with a high oil content and seek international collaboration.
- Sacrificing yield by producing maize with a higher oil content could constitute a threat to maize expansion in Bangladesh.
- A pilot research initiative for corn oil production by BAAG and other partners may be undertaken involving the private sector. This could further study the profitability and marketing of producing corn oil compared to importing it, taking economies of scale into consideration.
- BWMRI needs to revitalize research into product diversification with regard to maize, and the workforce to be deployed accordingly.
- BAAG/BWMRI may engage some young scientists to explore the potentiality of corn oil production in Bangladesh.

The meeting ended with thanks to everyone for their valued participation.





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