Sown & Reaped

Dhaka, Sunday, February 6, 2011, E-mail: business@thedailystar.net

Time to give farming a lift

Sohel Parvez

SINCE boyhood, the 40-year-old farmer Kamal Hossain had been used to growing rice during the dry months.

Till 2004, he cultivated high yielding variety (HYV) rice, mainly BR-29 on his own and rented lands, inspired by a steady rise in production as he farmed his lands carefully providing required irrigation and applying doses of fertilisers and pesticides.

Later, Hossain shifted to hybrid rice cultivation as depending solely on HYV BR-29 appeared less beneficial to him.

"If I take good care of the BR-29 planted fields, I can harvest up to 60 maunds of paddy per acre, whereas, I can bag up to 70-80 maunds of paddy with hybrid ones," said Hossain of Mithamoin, Kishoreganj.

Of his 20 acres, he has marked 16 acres for hybrid rice this dry season.

Like him, farmers everywhere in Bangladesh are looking for seeds with higher yields as performance of the available high yielding varieties, the offshoot of Green Revolution, has reached a plateau, one might say.

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The dry season crop, locally known as boro, is now the lifeline for Bangladesh. Over the past decade, the HYV-based boro has emerged as the biggest contributor to the national food basket due to rise in its yields and acreage thanks to intensive irrigation and use of chemical manures and pesticides.

In the past four decades, the Green Revolution has helped propel rice output to treble from one crore tonnes to over three crore tonnes in 2009-10 fiscal year, helping Bangladesh reach closer to food autarky status.

The clock is ticking.

With the rise in population against the backdrop of steadily declining agricultural lands, the HYV-based rice culture may not be enough to meet future staple needs of the country with over 16 crore population and an area of 147,570 square kilometres.

According to an official estimate, 21 lakh new mouths are added to the population every year now, pushing up the demand for rice to about 3.5 to 4 lakh tonnes.

By the year 2020, the population is expected to touch the 18.5-crore-mark and go up to 22.2 crore by 2050. It means that by the time, over four crore tonnes of rice will be required to ensure domestic food security.

But the scope for horizontal expansion of rice cultivation to meet the additional demand is shrinking due to reduction of arable land by 1 percent annually amid pressures of new settlements, growing industrialisation and rapid urbanisation.

The scope for increasing production vertically through intensive HYV farming is also limited. Presently, the average yield of rice per hectare is about 2.80 tonnes with boro contributing the highest, which is nearly four tonnes per hectare.

The gap between achieved and potential yields in HYV based boro cultivation is reducing.

Scientists say the present average production may be improved by 1-1.5 tonnes per hectare by reducing yield gap through measures including appropriate soil nutrient management, irrigation and a balanced use of fertilisers and quality seeds.

But achieving higher yields from the boro cultivation zones, mainly the north and northeast, may be difficult due to the presence of various risk factors.

Increasing dependence on underground water to irrigate boro is causing a gradual reduction of water level in the groundwater aquifers. It also increases the risk of accumulation of arsenic in croplands.

Soil degradation has also become a concern, resulting mainly from increased use of chemical fertiliser and fall in organic matter content due mainly to rise in cropping intensity.

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Farmers prepare fields for Boro paddy at Subgram in Sadar upazila in the northern district of Bogra.

Add to it the possible negative manifestations of climate change contributing to increased temperature, erratic rainfalls, droughts, cyclones and floods.

"Agriculture is going to be affected in every manner due to climate change," says M Asaduzzaman, research director of Bangladesh Institute of Development Studies, who has recently been nominated a member of International Commission on Sustainable Agriculture and Climate Change.

To ensure adequate rice output through coping with these possible threats, policymakers are attaching importance to hybrid crop seeds. They are also considering bringing in nearly 10 lakh hectares of salinity-prone land in the south and southwest under boro cultivation by using surface water.

At the same time, the government also considers boosting output from the wet season crop, the rain-fed aman, once the biggest contributor to the rice basket.

A drawback, however, remains. Except for BR-11, no major HYV seeds for aman season have been released for years.

"We are working to introduce more rain-fed aman rice varieties," says Dr Md Khairul Bashar, director for research of Bangladesh Rice Research Institute, which has so far introduced 57 HYV seeds.

Due to the susceptibility of aman to natural calamities such as drought, flood and cyclone, the expected rise in output, however, will depend largely on the impact of climate change.

Scientists are now working on innovating varieties that can tolerate flood, drought and resist pests and diseases, said Bashar.

Some achievements such as saline tolerant, drought and submergence tolerant rice varieties have emerged, of late, from ongoing research.

But analysts say, such efforts may not be adequate to attain and sustain food autarky in the long run, while foods are getting pricier globally amid demand spikes in emerging economies, food grains are used for bio-fuel production and outputs fall due to inclement weather.

"We should consider bringing about a second phase of the Green Revolution," says Wais Kabir, executive chairman of Bangladesh Agricultural Research Council.

He said with proper technological back-up and intensive care, Bangladesh may be able to produce the required quantities of rice in the years ahead through cultivating the Green Revolution based HYVs. "A breakthrough in technological intervention and research is needed to ensure future food security."

Asaduzzaman echoed Wais and said: "For the time being, conventional agriculture is ok. But we should not think for the short term only." Hybrid cultivation has begun to meet future needs of increased domestic production, he said.

"But it (hybrid) may not be the only solution. We have to introduce new HYVs that will consume less input and give high yields. It's time to begin the process of a quantum leap in terms of production to address the longer term food security issue."

"We may also need going to GM (genetically modified) crops," he added.

But unless there is a rise in public investment in research and extension, desired results may remain unattained. Investment in these areas still remains low, observe analysts.

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Living on scanty investment

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PUBLIC investment in agriculture remains inadequate, despite its critical role in ensuring food sufficiency, experts said.

Over the past decade, three important areas of agriculture -- research and technology, extension and marketing -- have not received sufficient fund, they added

They said increased investment in the farm sector is essential to introduce new technologies and transfer those to the farmers quickly, as the demand for food is going up due to a steady rise in population.

If agricultural research receives substantial investment, both yield and production will rise, enabling Bangladesh to produce bulk of its future food requirement by narrowing down dependence on the international market, they observed.

But the prime necessity, they said, is to invest in enhancing the capacities of institutions under the National Agricultural Research System (NARS) by building adequate number of scientists with advanced skills and knowledge on modern agricultural technologies.

Analysts raised the issue of substantial investment in agriculture, as concerns over food price shocks are growing amid rising prices, with many saying -- days of cheap food are over.

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People sow boro seeds. Experts say the farm sector needs substantial investment to ensure food security.

"Agriculture has been accorded minimal support in terms of resource allocation, despite its critical role in keeping the nation fed and providing employment to the majority," says a publication titled 'Investing in Crop Agriculture in Bangladesh for Higher Growth and Productivity and Adaptation to Climate Change.'

The publication was released in May last year during the Food Security Investment Forum. It said research and development show a fall in nominal expenditures over the first few years to 2000.

Investment revived couple of years after the beginning of the immediate past decade. But real expenditures barely exceeded their initial level at Tk 1,698 crore recorded in fiscal 2000, it said, comparing data between fiscal 2000 and fiscal 2009.

At the same time, real investment for extension hardly saw any improvement, it added.

"The worst situation is in marketing services, which has received only a pittance of public funding."

Mahabub Hossain, former head of social science division of International Rice Research Institute (IRRI), said the capacity of the NARS to utilise funds has deteriorated due to a lack of investment in capacity enhancement.

There has been a lack of scientists in the NARS," said Hossain, also executive director of Brac, an NGO.

"We need new skills now. A renewed focus is needed to build scientists so that they can contribute to increasing food production," he said.

He also suggested hiring new talents and sending them aboard for advanced study to help them enhance knowledge and skills on modern agricultural technology such as biotech.

ICT should be used to provide extension services to farmers in remote areas, he added.

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