



Polder Tidings

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Towards better integration of R4D for improved food production systems in coastal Bangladesh

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Improving food security and livelihoods by strengthening partnerships in Bangladesh

by Liz Humphreys, Sudhir Yadav, and Lanie Reyes

Rice is life in Bangladesh. It accounts for 95% of the total human grain consumption and provides about two-thirds of the calorie supply and half the protein intake of an average person. About 75% of the total cropped area is planted to rice. Thanks to the first Green Revolution, rice production in Bangladesh increased more than threefold in the last few decades enabling the country to achieve rice self-sufficiency recently.

However, with the population increasing at 1.47% per year and the gradual decrease (1% per year) in the area of cultivable land, the challenge of ensuring future food security is daunting. Furthermore, malnutrition is rife. Over 80% of the population suffers from protein deficiency. A

Green Revolution is needed and has already begun in Bangladesh. For this revolution to succeed, effective partnerships, such as those between IRRI and the Government of Bangladesh and other development partners, are crucial.

Science-based technologies contributed significantly to the first Green Revolution and, while increasingly complex, will be just as important for the second one. These increasing complexities arise from the need for a more holistic approach to development. This, in turn, requires multidisciplinary and trans-disciplinary approaches involving all stakeholders affected by the issues being addressed.

This is most evident in the coastal zone of Bangladesh, which missed out on the benefits of the first Green Revolution because of the environmental and socioeconomic challenges there. Yet, with current technologies, a tremendous opportunity is available to make a quantum leap in tackling both caloric and nutritional food security while improving the livelihoods of rural communities—men, women, and the youth.

The coastal zone has a complex agroecology, with low lands lying between huge tidal rivers. Over 1 million hectares of agricultural lands were enclosed in polders in the 1960s and '70s to provide protection from tidal flooding and saline water intrusion. Now, the polders are



Different projects and institutes brainstorm on improving the production system in coastal Bangladesh.

Improving food security and livelihoods...

home to about 8 million people. Yet, despite the enormous investment in embankments and associated infrastructure, the majority of the rural households in the polders live below the national poverty line. The polders are subjected to flooding during the rainy season, drought and salinity during the dry season, as well as cyclones. As a result, productivity is low because low-yielding traditional rice covers most of the landscape in the rainy season. The rainy-season rice is often followed by a low-yielding sesame or pulse crop, (which often fails), and vast areas of land lie fallow for many months each year. These problems will be increasingly exacerbated by climate change and sea-level rise over time.

Recognizing these needs and opportunities, significant investment in the development of the coastal zone through its national research and extension system is now a priority of the Government of Bangladesh. International donors like USAID, Australian Centre for International Agricultural Research (ACIAR), and CGIAR Research Programs (CRPs) are also investing considerably in agricultural R4D and outscaling projects in the region. Among them are projects and programs, which hold a great diversity of disciplinary expertise, experience, networks, and indigenous knowledge. However, most of these projects operate in isolation and know very little about each other. To help address this problem, IRRI and GRiSP began an initiative, *Towards better integration of R4D for improved food production systems in coastal zone of Bangladesh*.

The first step was the conduct of a workshop in Bangkok, Thailand on 18-20 October 2016. It was an initial effort for wider information sharing and networking across the projects and programs. R4D programs in the coastal zone under the Bangladesh Agricultural Research Council (BARC), the Bangladesh Rice Research Institute (BRRRI), and the Bangladesh Agricultural Research Institute (BARI) outlined and discussed, together with twelve international R4D projects.

“More heads are better than one,” said Bas Bouman, GRiSP director. “This workshop, which is in line with the CGIAR’s goal of increased coordination and collaboration among its centers, is the first step towards bringing many benefits such as increased efficiency, a higher level of impact, and sharing of resources, among other things. This will eventually lead to more rapid progress in improving productivity, livelihoods, and nutrition in the coastal zone.”

The workshop was funded by GRiSP, with additional support from ACIAR and the CRPs on Grain Legumes and Water, Land, and Ecosystems (WLE). The workshop had good representation from national institutes and NGOs including BARC, BRRRI, BARI, BRAC, the Bangladesh Water Development Board, and the Department of Agricultural Extension.

International participants at the workshop included representatives of USAID’s Feed the Future Sustainable Intensification Innovation Lab, ACIAR, GRiSP, Grain Legumes, WLE, and FISH. Other CGIAR centers also participated including the International Maize and Wheat Improvement Center (CIMMYT), the International Crops Research Institute for Semi-Arid Tropics, and WorldFish. ■

Dr. Humphreys is a former water scientist at IRRI. Dr. Yadav is a water scientist at IRRI. Ms. Reyes is the editor in-chief of Rice Today.



Prof. Vara Prasad, SIIL-director (far left), deliberates on a “knowledge sharing” platform for coastal Bangladesh with colleagues, Liz Humphreys and Sudhir Yadav.

Water management: An entry point in the development of coastal Bangladesh

by Lanie Reyes

The monsoon season that comes once a year is part of the ecology in Bangladesh and an important source of water. It goes without saying that water is a vital need for humans, livestock, and crops. However, in Bangladesh, especially in its coastal areas, the problem is that there is too much of it—resulting in flooding. The water comes from the tributaries of the Ganges River. It flows to the southwestern coastal region where many farmers are affected. Moreover, storm surges from the Bay of Bengal aggravate the problem.

The coastal areas of the country have more than one million hectares enclosed by polders to control tidal flooding so that farmers can increase their productivity. Polder zones are mostly susceptible to climate change-related problems such as rising sea level and flooding. These problems put farmers in polder areas at a disadvantage allowing them to plant only a single traditional rice crop a year. Thus, poverty is common in these areas.

While the central and northern parts of the country benefited from the first Green Revolution, the polder areas were left behind because there were no varieties then that could tolerate salinity and flooding. The polder areas could not profit much from the on-going second Green Revolution because of long-standing flooding that even modern flood-



IRRI

tolerant and salinity-tolerant rice cannot withstand.

The problem is not the absence of modern high-yielding rice varieties because the farmers now have a number of choices. There are early-maturing rice varieties that allow farmers to plant more than two crops a year. There are high-yielding varieties that give farmers an edge

toward food security. Most of all, some of these varieties can withstand flood, salinity, and even drought to some extent.

The problem lies in water governance—or the lack of it—in timing the opening and closing of sluice gates, which requires the involvement of the community.

Water management

“Even if some farmers plant an early-maturing high-yielding variety, they could not benefit from having another crop because they have no control over the sluice gates, which determine the water coming in and going out of the farms,” Manoranjan Mondal, an IRRI water management expert based in Bangladesh, explained. “This is where the water management group comes into play.

“Farmers can come together to talk about many things including when to open or close the sluice gates,” said Dr. Manoranjan. “They need to agree among themselves when to plant their crops and what kind of variety to plant. If some cultivate early-maturing rice but others will not, then those who harvest earlier will have to wait for other farmers to harvest their late-maturing traditional crop before they can plant another crop.”

The water management groups (WMGs) allow the coastal communities in the country to manage the floodwaters and deal with poverty and food and income insecurities on their own.

“Water management has become the key entry point in changing people’s lives and triggers socioeconomic development in coastal Bangladesh,” said Sudhir Yadav, a water scientist at IRRI.

One example is the Fultala Water Management Group. Registered in 2014, the Fultala WMG covers 146 hectares and 262 households. It has 152 members, 85 of which are women. With a growing cash capital of 61,000 takas or around USD 700, they already own some farm machines including a power

Water management has become the key entry point in changing people’s lives and triggers socioeconomic development in coastal Bangladesh.

tiller, a power pump, and a thresher. They hope to be able to get into a microfinance program once their capital reaches 100,000 takas (USD 1,260).

But, they have a long way to go when it comes to water management. Since the political division is not the same as the hydrological management unit, the Fultala WMG will need to coordinate with other water management group to attain synchronous rice farming. Even if Fultala WMG members agree on sluice gate operations, they will still be affected by WMGs near their vicinity.

According to Dr. Yadav, there are scopes to create an ICT-based program that will send and receive data from areas in a hydrological unit. This way, the coordination from one

WMG to another will be easier.

“Truly, participation from the local community through the water management group affords people a sense of control over their own lives and livelihoods,” said Dr. Mondal. “With a simple change in water management, the road toward the project goal for people to increase their productivity and food security can be realized.”

Moreover, the prerequisite of women taking up at least 30% of membership in creating WMGs empowers women in molding the future of their community. Having the voices of women heard will have a positive influence on the cultural aspect of their lives. As women leaders start to rise to the occasion, other women and girls will view this as the “new normal.” This could trigger a ripple effect of empowered women ready to take on more significant roles in the community. ■

Ms. Reyes is the editor in-chief of Rice Today.



Manoranjan Mondal discusses water governance with WMGs to introduce an improved production system in the region.

Equipping locals with new skills

by Lanie Reyes

Farmers in Bangladesh are provided with an environment of acquiring knowledge and skills to improve their farm productivity through farmer field schools (FFS).

The farmers in Bangladesh are not empty vessels to be filled when it comes to farming knowledge and skills. But there is a kind of school that is giving them an edge in earning more income and making the most use of their land.

According to Tahmina Begum, deputy director for water management of the Department of Agricultural Extension (DAE) of Bangladesh, FFS is not new in the country. “It’s been here since the 1980s through a program conducted by the United Nations Development Program,” she said. “In the early 1990s, the Danish International Development Agency started several projects to spread the integrated pest management (IPM) to hundreds of thousands of farmers through IPM FFS. Through all these years, Bangladesh has developed a great capacity to carry out FFSs, especially through DAE.”

DAE, the largest public sector extension provider in the country, aims to provide efficient and effective need-based extension services to all kinds of farmers. As a change agent, it serves as the middleman between research organizations,

which have great technologies to offer, and the Bangladeshi farmers. Examples of these organizations include the Bangladesh Rice Research Institute (BRRI), Bangladesh Institute of Nuclear Agriculture (BINA), Bangladesh Agricultural Research Institute (BARI), Bangladesh Agricultural Research Council (BARC) among other national and international organizations including the International Rice Research Institute (IRRI).

Initially, DAE’s FFS followed the IPM FFS model and focused strongly on managing pest problems. Eventually, the FFS model evolved over time, along with the focus of the initiative. From IPM, it became ICM or Integrated Crop Management, “a holistic approach to sustainable agriculture.” It includes the condition across the whole farm, along with socioeconomic and environmental factors, to deliver the most suitable and safe approach for long-term benefit. Then it changed into Integrated Farm Management, which combines the best practices of traditional farming and modern technology.

But at the center of these changes are the farmers. Through the adult learning approach of FFS, farmers learn new techniques of farming that can significantly increase their income and improve their food security.

The DAE trains 25 farmers from 25 households at a time. The good

news is that more women are increasingly getting involved in FFSs. Since farmers learn how to cultivate fast-maturing and high-yielding varieties, their productivity increases. After harvesting their rice crop, they are able to plant additional crops such as mungbean, sesame, watermelon, sunflower, and winter vegetables.

Some progressive farmers have even become trainers in FFS themselves. According to Dr. Begum, this seems to multiply the success of FFS and gives her a high level of accomplishment.

“The mediation role of DAE has been increasing the farmer’s production and income from their fields,” said Dr. Begum. “Our task is to hone the abilities of the farmers to make critical and informed decisions in order to make their farming activities more profitable and sustainable.”

For Dr. Begum, such goals are her reason to reach out to farmers particularly, the marginal farmers of coastal Bangladesh.

“For me, success means equipping the local farmers so that they’ll have the option to redeem themselves from the pangs of poverty, and be more competitive in marketing their produce,” she said. “For example, by drying pulses on plastic sheets rather than on the ground, the end product is cleaner, reduces work, and gets a better price at market.”

Equipping locals with new skills

In coastal areas, the presence of water management group (WMG) also provides an opportunity to use this platform for enhancing the skills of the local people. With WMG as the target group, it would be easier for farmers to decide on the use of water and, therefore, the adoption of an improved production system. The SIIL-Polder project is working closely with DAE to develop an interface of extending FSS model but using WMG platform.

DAE has started working with WMGs for the adoption of improved production systems through better water management at sub-polder scale. Reaching farmers in 22 polders consisting of 11 upazilas could have a bigger impact in increasing

the agricultural productivity of the country. ■

Ms. Reyes is the editor in-chief of Rice Today.



Dr. Tahmina Begum talks with women farmers on improving their livelihoods.

DAE

Strategic alliance with BRAC

by Lanie Reyes

BRAC has a long history of development work and commitment to food security and reduction of hunger and malnutrition through improved agricultural productivity. This makes the organization a good ally in improving the lives in the polder communities in coastal Bangladesh, according to Sudhir Yadav, co-lead of SIIL-Polder project that focuses on the coastal area in the country.

From ruins to hope

When the Bangladesh War of Independence broke out in 1971, many people fled to neighboring India. When they came back after the war, they found that their houses

were decimated. With no livelihood, the people were helpless.

But Sir Fazle Hasan Abed, a man from a wealthy family, had a vision of reaching out to his countrymen. He sold his house in London in the United Kingdom, and he and his like-minded friends raised funds to buy building materials for their homeless countrymen. His work, which he started with his colleagues in a remote region of northeastern Bangladesh, led to the non-governmental organization known today as BRAC.

Although the building materials were intended for the poor, they

eventually ended in the hands of the rich as these were sold for food and other needs. Thus, BRAC saw the need of providing the poor with economic empowerment through livelihood activities. In terms of the scale and diversity of its interventions, BRAC (formerly known as the Bangladesh Rehabilitation Assistance Committee and then as the Bangladesh Rural Advancement Committee) is now the largest development organization in the world.

“BRAC counts 45 years of fruitful existence. Dr. Abed never imagined that BRAC would be this big,” said Dr. Islam. “The impact of the

Strategic alliance with BRAC

organization is so significant that Dr. Abed received the World Food Prize in 2015.”

Sustainable giant

Since the country’s economy is agriculture-based, BRAC’s entry point of intervention came through the agricultural sector such as crop-based livelihood, fishery, poultry, and livestock. In each aspect of agriculture, the end goal has always been enterprise development.

“The strategy is to reach sustainability,” said Dr. Md. Sirajul Islam, head of the Agriculture and Food Security Program of BRAC. “Donors may not always be there to finance the organization.”

One example of its viable activities is in the seed industry. “At first, we produced seeds and gave them to the farmers,” said Dr. Islam. “Since it was not sustainable, we ended up marketing the seeds, which eventually helped the seed sector. As one of the largest producer of quality seeds, we control the market to some extent. As a result, private seed producers could not unjustifiably increase the price because we have the biggest share. The revenue earned is fed back to the organization’s development activities.”

BRAC-IRRI connection

Dr. Abed has been a formidable ally of agriculture particularly the rice sector. He served as a member of the Board of Trustees of the International Rice Research Institute (IRRI) from 2005 to 2010.

Moreover, the connection between IRRI and BRAC does not end there. The late Dr. Mohabub Hossain, former

head of IRRI’s Social Sciences Division, retired from the institute in 2007 to serve as the executive director of BRAC. He addressed the challenge of the reemergence of food insecurity in the country and established BRAC’s Agriculture and Food Security Program.

BRAC focuses on three components on attaining food security through agriculture, according to Dr. Islam. The first on the list is research and development.

“We validate varieties developed by international institutions such as IRRI, and national institutions such as the Bangladesh Rice Research Institute (BRRI), before making them available to farmers,” he said. “We rigorously test any promising technology in our fields first. If we find the technology to be good, then we can go to the second component—bringing the mature technology to the farmers.

“Submergence-tolerant rice varieties like BRRI dhan51 and BRRI dhan52 are some of the varieties, which BRAC helped fast track the diffusion of the

technology in coordination with the Department of Agriculture and Extension (DAE) of the country,” he added.

“Our third focus is on climate-vulnerable areas,” stated Dr. Islam. “Coastal zones are highly vulnerable to climate change. These areas have problems including saline intrusion and flooding.”

Dr. Islam explained that fish is also a very big component in the south where the coastal zones are located. The country became the fourth largest inland freshwater fish producer in the world where BRAC fisheries activities also significantly contributed along with the government and other partners.

A worthy partnership

“BRAC is a worthy partner of the SILL-Polder project because of its expertise in technology dissemination,” Dr. Islam said. “Aside from IRRI, BRAC has been routinely partnering with other international institutions to improve the livelihood



Sirajul Islam and his team visit a sunflower demonstration supported by BRAC.

BRAC

Strategic alliance with BRAC

of the community in the south particularly after the cyclones Sidr and Aila devastated the country.”

Moreover, BRAC has a good infrastructure of 2,500 branch offices spread all over the country. Its infrastructural capacity makes it easy for the organization to implement project activities.

BRAC is not new to projects similar to SILL-Polder. The organization was a partner under the CGIAR Challenge Program on Water and Food (CPWF), in which one of the components was led by IRRI. In fact, the SILL-Polder project is the continuation of CPWF

and CGIAR Research Programme on Water Land Ecosystem (WLE) when it comes to improving the productivity of the coastal zones of Bangladesh.

The SILL-Polder project targets to reach 600 households in Polder 30. Although this may not seem much, but the real count starts “beyond the project.” BRAC will ultimately target to reach 100,000 farmers in two years, according to Dr. Islam.

“This may sound ambitious,” stated Dr. Islam. “But, we will be promoting the technologies together with DAE especially when the technology is technically sound, economically

viable, and socially acceptable.”

“With its success in its value-chain approach to agricultural development BRAC, as a strategic partner, will play a key role in attaining food security through improved agricultural productivity in coastal Bangladesh,” said Krishna Jagadish, lead of SILL-Polder project and associated professor at Kansas State University. ■

Ms. Reyes is the editor in-chief of Rice Today.

Integrating gender in agricultural research: More than counting the women farmers

by *Ranjitha Puskur*

Agricultural research paradigms have shifted over the years in response to demands to make it more efficient and effective. It has been widely acknowledged that closing the gender gap to help women access resources, technologies, and markets is critical to tackling the challenges of poverty and hunger, particularly in the face of increasing vulnerabilities to climate change. Integrating gender in agricultural research is no longer a debate. It is about doing it effectively.

Some initiatives and projects seem to be content with recording and reporting the number of women farmers engaged in research for

development (R4D) efforts. However, gender research is a lot more than that!

“Gender” is a social construct associated with being masculine and feminine. It defines what is acceptable for women and men and girls and boys to be, to do, to own, and to control. It is linked to a time and place but it is changing and changeable. It is important to note that women and men are not homogeneous groups. Their identities are influenced by social and economic classes, race, ethnicity, caste, age, location, among other factors. Gender research does not just focus on women and men,

but on social relationships and how they influence their different roles, responsibilities, opportunities, and needs. These relationships are governed by the power relations underpinning gender roles and norms, human behaviors and practices, and social systems and structures.

Gender integration in agricultural research and development is about understanding and taking into account both the differences and inequalities between women and men in program planning, implementation, and evaluation. Frontloading research for development projects with a

Gender integration in agricultural research and development is about understanding and taking into account both the differences and inequalities between women and men.

rigorous social and gender analysis to understand the social systems and contexts is critical in designing and implementing socioculturally appropriate and relevant interventions that would have bigger and lasting impacts.

Using a social relations framework can reveal the gendered power relations that cause and sustain inequities. The analysis should involve not just the household but also the community, markets, and institutions. Unpacking the gender relations and the associated dynamics in different social and institutional contexts helps identify women's bargaining position and design strategies to improve this.

According to the Global gender gap report 2016, although Bangladesh is leading in narrowing the gender gap in South Asia, it has recorded a widening of the gap in women's labor force participation and estimated earned income. Globally, the premise is that social norms and lack of care infrastructure are holding women back from accessing economic opportunities.

So, while we would like to engage women in alternative income-generating enterprises, it is important to understand how the social norms and structures would affect that and with what consequences for the men and women farmers. While increasing income is good, it is control over

income that is empowering. We need to also ensure that these new activities expand the remunerative choices available to the women.

In the polder zones of Bangladesh, the increased vulnerability due to the ecological collapse is leading to widespread male outmigration. As a consequence, the number of women becoming heads of male-absent households are increasing. These situations might lead to relaxing certain social norms allowing women to move into new roles and have a higher decision-making power.

However, we do not know whether these women are able to command resources in this situation and are able to develop social capital. Husbands and mothers-in-law are gatekeepers of women's mobility and their permissions are necessary to obtain participation in program activities.¹ The introduction

of microcredit has, however, contributed to increased women's mobility.

In 2014, the Feed the Future (FtF) assessment of Women's Empowerment in Agriculture Index (WEAI) in Bangladesh revealed that, despite gains in some areas, women are still very disempowered in Bangladesh. Female employment is much more concentrated in low-wage jobs and their wages for equivalent work with men are much lower. Their access to and control over inputs is severely limited, including credit. They face considerable mobility constraints and extension services fail to reach them. The family income is controlled by male family members as are decisions related to agricultural production.

A survey in Barisal District showed that purchasing of daily household

¹Sethuraman K, Kishore Kannuri N, and Prasad N. 2006. Report of the gender analysis of the Jibon-o-Jibika Program in Barisal, Bangladesh. Dhaka: Save the Children.



Ratna Rokhsana (in blue), BRAC gender specialist, discusses with women on their involvement in agriculture.

necessities is the only area where a significant portion of women report having autonomy in decision-making. The leadership roles for women in the community are limited: 46% of husbands, 33% of wives, and 60% of mothers-in-law do not think women can be capable leaders.²

Understanding and tackling these challenges must become an integral part of the research and intervention design for women to be empowered.

It is important to engage men as equal partners in this effort because evidence shows that failing to involve men in such interventions can lead to resentment and a worsening of gender attitudes and relations.³

The SILL-Polder project will focus on understanding how poor men and women are differently affected by the climatic stresses and trends; how their responses are shaped by their respective access to and control of

resources and assets which, in turn, are shaped by the prevailing social norms, attitudes, behaviors, and structures. These factors will influence and determine their technological choices around cropping system options, drainage management, and engagement in new income-generating opportunities.

We need a shift in paradigms and beliefs and, an effective evaluation and learning culture in tackling gender issues to have the impact we seek. ■

²HKI [Helen Keller International]. 2011. Gender attitudes and practices survey: Nobo Jibon gender baseline. Dhaka: HKI.

³Ahmed, F.E. (2008). Microcredit, men and masculinity. *Feminist Formations* 20(2): 122–155.

Dr. Puskur leads gender research at the International Rice Research Institute.

Ready to face the future in rice farming

by Lanie Reyes

One of the trends in Asia is the outmigration of rural farm labor to the cities and “half of the persons who run a farm are more than 57 years of age,” according to Bas Bouman, director of the Global Rice Science Partnership.

Labonomayee Mondal, a 50-year old farmer in Khulna District in Bangladesh, knows very well. How did she confirm that there’s shortage of labor in her rural community? Well, she said that her coconut trees were ready for picking long ago, but she couldn’t find any person to climb them for her.

The economic development in Asia has brought the influx of labor from rural areas to urban places. The farm laborers leave the rural areas to be hired as construction workers,

factory workers, or to be absorbed in the service sector of the growing economic development in the cities or find similar but high-paying jobs in neighboring countries. This is true, especially in Bangladesh.¹

The labor scarcity results in another unavoidable trend—increasing agricultural wage, which makes mechanization the most viable option in the future. And the outmigration of male agricultural workers gives rise to the feminization of the agricultural force. The farmer’s wife is left to do the husband’s full-time job as a farmer.

The SILL-Polder project is ready to make the women face the new trends in the farming sector. One of

the goals of the project is to develop and evaluate income-generating operating opportunities for women.

“The project aims to empower women by increasing their access to productive resources and their participation in decision-making, and by building their capacities,” said Sudhir Yadav, water scientist at the International Rice Research Institute (IRRI) and co-lead of the SILL-project funded by the Feed the Future System Intensification and Innovation Lab by the USAID. In July 2016, the project trained a few women on how to establish a mat nursery and check if it will be profitable for them in polder areas in Khulna. Mrs. Mondal is one of them.

Establishing a mat nursery for seedlings can be a practical home-

¹Bangladesh poverty assessment: Assessing a decade of progress in reducing poverty 2000-10, June 2013. The World Bank Office, Dhaka. www.worldbank.org.bd/bds



The SILL-Polder project works with communities in providing income-generating activities and integrating gender to improve the production system in the polders.

based livelihood for women. The mat nursery does not need large land, and it can be established closer to the house.

Mrs. Mondal said that she did her mat nursery in her front yard while

being responsible with many other things— raising her cattle, feeding her ducks and chickens, tending her home-based vegetable garden, and doing her household chores. From her two-bed nursery, she earned 600

takas (USD 7.50), “which is not bad,” according to her.

Although the seedlings were bought by the project and were used for a demonstration on the use of a rice transplanter, Mrs. Mondal said that mat nursery would be a profitable business for her in the future, especially when mechanization in her community will be the usual practice. She may not get hold of the latest statistics but she can attest to herself that there is no other way but for mechanization to come in the community. Unless she could easily find someone to pick the coconuts for her, her belief is firm on this. The good thing is that she has already the required skill to be able to supply the demand for rice seedlings when the time comes. ■

Ms. Reyes is the editor in-chief of Rice Today.

Training the next generation of scientists

by Lanie Reyes

Md. Shakawat Hossain, 24 years old, stood confidently in a flooded rice field in Khulna, Bangladesh as he answered questions from a professor from a prestigious American university. He didn't mind the blistering heat of the midday sun or the knee-deep muddy water that is a common problem in the polder area where his experimental field is located. He focused on responding to the questions of Jagadish Krishna, a professor at Kansas State University and lead of a project targeting the

polder areas in coastal zones of the country. The serious expression on Shakawat's face seems to indicate his dedication and passion toward the study he is pursuing.

“Why were the growth stages of the plants different from this plot? What could have been the causes? What were the variations of your experiment? Do you think the application of fertilizer could have brought a difference in the growth of the plant in a flooded field? What's the effect of water logging and

shading to the plant? What could you have done differently if you were to repeat the experiment?”

He answered each question thoughtfully. His study aims to understand how high-yielding rice varieties behave in the polder areas where cosmic and climatic conditions cause excessive water to flood the fields.

He is specifically studying nitrogen management of a high-yielding rice variety in polder ecosystem of the coastal Bangladesh.

Training the next generation of scientists

Shakawat is one of the scholars under the SILL-Polder project that aims to unlock the production potential of the polder communities through improved use of resources and diversified cropping systems in coastal Bangladesh. Capacity building is one of the specific goals of the project along with working with the farming community in the polder areas to develop and adapt cropping-system options for sustainable intensification, together with improved drainage management.

Driven by his desire to improve his country's agriculture, particularly rice farming, Shakawat wants to help farmers benefit more from technologies such as high-yielding varieties. However, flooding is a common problem among rice farmers in coastal communities in Khulna. During high tide, the water from the Bay of Bengal flows into the rice fields. During the monsoon season, the rice fields are filled with too much water. These conditions make it difficult for farmers to time the application of fertilizer.

"I would like to determine the amount and the best time to apply fertilizer, the most cost-efficient application in relation to yield, and whether the amount of fertilizer has any beneficial effect at all," said Shakawat about his study.

Shakawat is at home in the rice fields. He comes from a farming family and has been farming since he was 15. Although the youngest in the family, he has become the "man of the house" since his father passed on. His mother and sisters depend on him for help in tending their two-hectare farm.

"That is why going into agriculture was an easy choice for me," he said.

Living in a country that grows rice on 80% of the land, it was easy for him to find a vocation helping farmers make the most of the little amount of money they have for farm inputs.



Shakawat Hossain

"I am lucky that through the Sher-e Bangla Agricultural University, I was able to apply for a research grant from the International Rice Research Institute through SILL," Shakawat said.

He envisions himself as a rice researcher in the future. As for now, his focus is to complete his MSc.

Monoj Biswas, 25 years old, is also a scholar under the SILL-Polder project. His determination is a testimony that education is indeed a great equalizer. Although he comes from a poor farming family, he managed to finish his Bachelors in Urban and Rural

Planning from Khulna University. He said his poverty limits only his financial resources but not his intellectual capacity. True enough, his mind is rich with visions that go beyond monetary aspirations. He wants to help his poor community break the chains of poverty. Since he was raised in coastal areas of Khulna, he understands the plight of his community.

Monoj, the eldest child in a family of five, has a strong sense of responsibility. He helps his parents shoulder the costs of his studies as a tutor in physics, chemistry, and math for the senior secondary level. He does this side job three times a week in between his studies.

Monoj has no plans of leaving his community even after he graduates from his Masters of Development and Policy in Khulna University.

"I want to work directly with the poor communities in Khulna," he said. "I



Monoj Biswas

want to help the coastal region. I know their problems because I am among them.”

Monoj said the common obstacles that hinder farming communities to improve their living condition are salinity, flooding, damages in the embankment, and having a marshy land. He is still in the process of finalizing the topic of his research, but he is thinking of a study that will help the coastal community find options to bring them out of poverty.

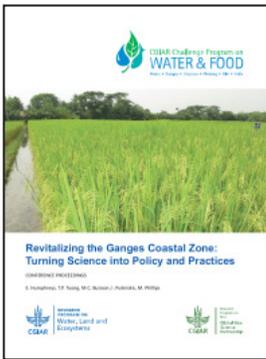
Monoj is highly interested in applying his classroom knowledge on the field by conducting research on food and nutrition situation of households in the polders and the factors that cause it. For his thesis, he will survey households on food availability and consumption pattern in the polder communities.

“The results of my study will provide information on food availability and consumption patterns, household nutrition intake, the correlation between agricultural diversification

and food consumption, and factors affecting food and nutrition intake of the household,” he said. “The information will be useful to design interventions to improve the food security and nutrition of the polder communities.” ■

Ms. Reyes is the editor in-chief of Rice Today.

Other useful resources



Humphreys E, Tuong TP, Buisson MC, Pukinskis I, and Phillips M. 2015. Revitalizing the Ganges Coastal Zone: Turning Science into Policy and Practices Conference Proceedings. Colombo, Sri Lanka: CGIAR Challenge Program on Water and Food (CPWF). 600pp

<https://wle.cgiar.org/revitalizing-ganges-coastal-zone-turning-science-policy-and-practices>



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Available research areas

Agronomy/water management

- Technologies for intensification and diversification of agricultural production systems
- Water management (supplementary irrigation, drainage, models of water management)
- Climate and cropping system modeling

Human nutrition

- Baseline situation—status, gaps, awareness
- Devising solutions to improve nutrition in households, with particular emphasis on children and women
- Quantifying the impacts of project interventions on nutrition

Socioeconomics/economics

- Adoption of improved technologies—quantifying adoption, perceptions, and the impacts of adoption on rural livelihoods
- Investment on infrastructure
- Community cooperation and coordination—enabling conditions

Gender in agriculture

- Quantifying the impacts of project interventions on women, youth, and other marginalized groups
- Models to attract youth into agriculture

Environment

- Soil fertility dynamics with improved production system
- Salinity

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