

OVERCOMING GENDER GAPS IN RURAL MECHANIZATION

Lessons from reaper-harvester service provision in Bangladesh

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The introduction of new agricultural technologies is never gender-neutral, but the differential changes are not always immediately evident. While the most visible gender gaps between men and women appear in the hands-on use of technologies, in the case of agricultural machinery, gender differences also arise in farmers' ability to rent and hire machinery. To explore gender dynamics in emerging markets for agricultural machinery service-provision in Bangladesh, the Gender, Climate Change, and Nutrition Integration Initiative (GCAN), the Cereal Systems Initiative for South Asia (CSISA), and CSISA–Mechanization and Irrigation (CSISA-MI) partnered to conduct qualitative research in Faridpur and Jhenaidah districts in October–December 2017. We interviewed husband and wife machine service providers (machine owners who charge affordable fees for machinery services to other farmers) (19 women, 18 men), men and women who hire these machines for their farms (26 women, 17 men), women farmers in non-mechanized farming households (12), and CSISA staff and community leaders (2 women, 7 men).



Both women and men can earn an income: Husband and wife Liajur Loshkar and Sathy Begum count money gained from their agricultural machinery service provision business in Bangladesh's Gopalganj District. Photo: S. Majumder.

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AT A GLANCE

Custom hiring of labor- and cost-saving agricultural machinery services is increasingly common in South Asia. We studied the gendered differences in women's and men's involvement in emerging markets for reaper-harvester machinery services in the Feed the Future Zone in Bangladesh. We find that women benefit from managing and sometimes owning machinery services, as well as from the direct and indirect consequences of hiring such services to harvest their crops. However, a number of technical, economic, and cultural barriers constrain women's full participation in these benefits. The brief provides suggestions for initiatives promoting rural machinery services to more fully engage women, as business owners and users of machinery, to expand the benefits of these markets, with relevance for South Asia and other farming geographies dominated by smallholders.

We focused on machinery services for multi-crop reaper-harvesters, which enable farmers to rapidly cut rice, wheat, sesame, jute, and other crops during harvest. Two types of reapers are common in Bangladesh: the self-propelled 'walk behind' model and the two-wheel tractor-attachable and rideable models. Both technologies reduce drudgery and alleviate family or hired labor bottlenecks at harvest time. Service providers running reaper businesses often hire skilled machine operators to harvest farmers' fields. Reapers can reduce the time and costs of harvesting by 80% and 60%, respectively, while enabling the rapid clearing of land so that farmers can sow the next crop by the recommended planting date. Women in Bangladesh face cultural constraints to participating in agricultural work in the field as well as working outside the home. This note provides insights into why female participation remains low in both reaper service business ownership and in

hiring these services, and how development initiatives can support women to take advantage of the opportunities offered by mechanization in agriculture.

UNDERSTANDING THE GENDER GAP IN MACHINERY SERVICE PROVISION

While over 90% of reaper service providers registered by CSISA are men, their wives often assist in running the business. While men typically supervise machine operator or drive themselves, men acknowledged their wives' contributions, which included advertising the reaper to other farmers through their social networks, bringing fuel for the machine and food and water for the reaper operator while in the field, and cleaning and maintaining the machine when it is in storage. Some wives assist with accounting and keeping track of prospective clients when the husband is not at home. When asked, wives of reaper service providers were knowledgeable about business operations, and some indicated they could help more to increase revenues. The wife of a reaper service provider in Faridpur noted that, "It is not wrong [for women] to work to provide food and shelter for the family!" Three women interviewed independently manage reaper service businesses. Their husbands had left agricultural activities to them due to the husbands' disability or employment as a machine dealer. One woman owns the machine with a women's group and has an adult son who assists in the business. In addition to using the reaper in their own fields, both men and women appreciated the earnings, which can exceed \$1,250 per year, from providing machinery services to other farmers and harvesting dry and wet season rice, in addition to wheat. Their social status also increased by helping their community.



With more years of schooling than her husband, Chandana Rani keeps financial records of the profits earned from their agricultural machinery business in Bangladesh's Faridpur district. Photo: S. Majumder.

Gender-based challenges for female agricultural machinery service providers

Men and women interviewed during the study identified several reasons why women face particular barriers to running a service provider business. These include the following:

- **Learning about the machine:** Due to cultural norms in Bangladesh, men generally have closer relationships to those knowledgeable about agricultural machinery, such as NGO, extension, and research institute staff and machine dealers, and can ask them questions about the machine, whereas women are restricted from spending time with strangers and in public places, where they could otherwise be exposed to new technologies.
- **Investing in the machine:** Reapers can cost between \$500–2,000, depending on the make and model. Purchase is therefore a significant cost. While women have some access to finance, it is typically insufficient to invest in a machine. Many reaper service providers have prior experience as farmer-customers renting machinery. However, due to restrictions on their work, women may lack experience with business planning or in hiring agricultural machinery services.
- **Advertising the machine to clients:** Men generally have more connections to other farmers and can publicize the availability of reaper services through word of mouth and in public spaces, including by displaying their machines at markets and using the machine for free on influential people's farms to increase interest.
- **Operating the machine:** Our research indicates that some male reaper operators may refuse to work for women machine owners, or may try to exploit them. A woman reaper service provider in Jhenaidah observed, "...the operator does not give the earned money back properly. This mainly happens because I am a woman." In Bangladesh, strong cultural restrictions exist against women driving reapers themselves. A female reaper service provider and wife of a machine dealer in Faridpur noted that, "A woman running a business is not bad, but running a machine is." Women's limited mobility outside the home also makes reaper maintenance difficult as they are unable to go to markets to get spare parts or interact with male mechanics.

- **Lack of family and community support:** Women traveling or working outside the home is often perceived negatively. Women are generally discouraged from paid work as this reflects negatively on her husband's ability to provide. One woman, who is also the wife of a service provider in Faridpur, commented that, "If I get out of my house or go to the market, people tend to point me out and say, 'look at that woman, she is going outside.'" Men and women themselves may also internalize beliefs that women are incapable of operating machines, too busy with household chores, or not knowledgeable about agriculture or business.

Suggested approaches to close the gender gap in machinery service provision

Despite these gender-based constraints, many women expressed interest in participating more or starting their own reaper service provision business.

- **Joint ownership and training:** Many women expressed interest in owning the machine jointly with her husband or independently. Training husbands, wives, and other household members on business management, machine use and maintenance, and advertising, can strengthen women's business skills and self-confidence.
- **Leveraging women's networks to expand the client base:** Women may be able to play a key role in expanding the client base by reaching other women, especially because women farmers in more conservative areas prefer to contact wives of service providers rather than men directly.
- **Well-targeted, smart subsidies:** Subsidies could work to encourage women to buy machines, but unless there are strong conditions and verification, husbands may take over machines after subsidized purchase. Women-headed households could be targeted for support. Subsidies for men and women as joint owners, conditional on their completion of focused training and business plan development, could also more meaningfully include women.
- **Leveraging credit:** Interviewed women participate in various village saving and loan associations and other organizations, but none had heard of the service provider business opportunity through these groups. Development initiatives and machine dealers could reach out to these organizations to disseminate information about the machines, and partner to provide loans coupled with business support for the machines. Additional sources of information about financing options are machine dealers themselves. If they become more knowledgeable about providers of credit for women, they could better advise prospective female buyers.
- **Group ownership:** Some women are already collectively purchasing machines and running service provider businesses. The collective power of a group may discourage clients from not paying as agreed. A 52-year-old woman from Jhenaidah and member of a collectively owned service provider business noted, "I do not face problems getting payment as a woman... I am not alone. I have a women's committee." She also shared how group ownership assisted in reaching new clients: "The machine operator would come, decide and tell us who he wanted to rent the machine out to. I discussed this with the women. It would not have been possible to do all this alone. The girls from the group would also recommend names. They would know in which places cultivation would be taking place."
- **Mobile payments:** Some women with access to mobile phones could benefit from mobile transfers that reduce travel time and risk collecting payments and carrying money from distant clients. CSISA-MI has started work to facilitate payment



Bringing gender into focus is necessary for equitable agricultural development. Mrs. Amena Begum and Md. Ferdous await a reaper service provider to harvest their family's wheat field in Bangladesh's Barisal district. Photo: R. Martin.

between client and service providers via mobile bank transfers. This could particularly benefit women, because many farmers can only pay for the reaper service after harvest, when they have sold their crops at the market.

- **Sensitize men to women’s contributions:** For women with husbands, their chief request was that their husband be supportive, despite cultural norms discouraging women from working. These women believe that machinery businesses can enhance family status and offset negative judgments. Men were also open to the idea of women generating additional income, so this angle could be emphasized to encourage men’s support for women in agricultural trainings and in advertising machinery services. Exposure visits between villages or families to meet women involved in service provider businesses can increase women’s confidence to start a business, as well as show men the benefits of women’s involvement.

“Involving women in business can be good. If women are given the knowledge, then they would also be able to do what a man does. They would come, [saying] ‘This is my work, so I have to do it. No matter what others say. If the husband supports and helps their wives, what others say should not matter.’”

– Male service provider, Faridpur

ADDRESSING THE GENDER GAP IN THE HIRING OF MACHINERY SERVICES

As with service providers, most of the farmers hiring reaper services are men, but women in these households can also benefit from mechanization. Most service providers interviewed mentioned that they have several female clients whose husbands have migrated, passed away, or are occupied with non-farm employment. In rural Bangladesh, women involved in agricultural work may be from less financially stable families, with limited household labor and extreme time constraints. The time and cost savings from machinery services are therefore of particular value for these women.



Women in Barisal District negotiate prices for agricultural machinery services. Photo: R. Martin.

Benefits of reaper services hiring for women and men

Men and women both acknowledge numerous advantages of hiring a reaper over hiring wage laborers.

- **More payment options:** Farmers appreciate that they can pay for the reaper service after the market day (*hat bazars*) instead of upfront, as they must do with manual laborers.
- **Time savings:** Hiring machine harvesting services reduces the time and stress involved in finding, negotiating with, and supervising hired laborers. All men and women interviewed noted that hiring a machine reduces men and women’s time burden during harvest and post-harvest. Women no longer need to cook and bring food over the course of days or weeks to the wage laborers for whom they typically provide meals and accommodation. Several widows and poorer women mentioned that they used to work during the night alongside wage laborers to avoid criticism for working in the field. Now that they hire a machine, these and other women pursue other income-earning activities with the time saved.
- **Cost savings:** In addition to taking less time, reaping with a machine costs about half as much as harvesting by hired wage laborers. Several women say that the savings can provide an opening for greater decision-making power within the household. One woman in Faridpur explains:

“If I say something to my husband he listens to me now. Previously he would not, since in poor families there is no time to listen... The crops that were produced were used for our food, therefore leaving no crops to sell, so why would he listen to me? The money that gets saved [now] can now be used for other expenses such as my children’s education or the household and that is my decision. I do not have to tell my husband.”

– Woman in household that hired reaper, Faridpur

Gender-based challenges in hiring reaper services

- **Unequal opportunities to learn about the services:** As with the service provider opportunity, women often hear about reapers and other agricultural machinery through their husbands, who in turn learn about machinery in the market,

or through interacting with extension and project officers. However, in a few cases women learned about the reaper when they saw it being used or in a demonstration, thereafter proposing the idea to their husbands.

- **Gender restrictions in contacting service providers:** In conservative areas and for women practicing *purdah* (the practice of female seclusion found in South Asian Muslim communities), women do not contact male service providers directly and must “...take help from another man, who would talk on her behalf, and would later bring in the money from the women...in other words, there is no direct communication.” (Male service provider, Faridpur)
- **Not prioritized by service providers:** Because demand for reaper services outstrips supply, service providers say they serve farmers on a first come, first served basis but prioritize larger farms, contiguous plots of land, and well-known farmers who pay in cash. Women without husbands may be disadvantaged in accessing reaper services if they have smaller landholdings and are unable to pay in cash. However, many service providers also expressed a sense of wanting to give back to the community and occasionally give reaper services for free to those who cannot afford payment.
- **Potential loss of fodder:** Many communities value *bichali*, rice straw that is sold or used for livestock fodder, but if reaper settings are not properly adjusted, the reaper can cut the rice too short to be used for fodder. Women, who are traditionally responsible for livestock, expressed frustration in losing this source of fodder.



Mr. Lutfar Rahman (right) harvesting rice with a reaper machine in Faridpur district. He was hired by Mrs. Selina Begum (left) to harvest her field. Photo: Md. Salahuddi.

Suggested approaches to close the gender gap in reaper services hiring

- **Prioritize joint learning:** Encouraging husbands and wives to attend machinery field demonstrations together and having other users explain the cost and time savings for *both* men and women could encourage adoption.
- **Advertising to women’s groups and collective hiring:** Dissemination of reaper services through women’s self-help groups remains an untapped opportunity to reach out to women. Many women’s groups function well and have established a high level of trust. These groups could encourage women to organize their farms into contiguous blocks of crops to reap, helping to attract reaper service providers. A higher number of female service providers could also facilitate women’s access to these services.
- **Lowering service provision costs:** Projects could support reaper owners to provide subsidized services to widows or female-headed farm households. Mobile payments could also assist women farmers in securing reaper services on their farm without having to travel. This would also allow them to pay after they sell their crops.

REFLECTIONS ON GENDER AND RURAL MECHANIZATION SERVICE PROVISION

For others working on gender, agricultural technology, and rural entrepreneurship, our research provides important lessons on strengthening the inclusion of women:

- **Question the meaning of “ownership” over technology:** Though men are often considered owners of agricultural machines, this does not mean wives do not participate in the day-to-day running of service provision businesses. Despite strong cultural norms discouraging women’s work in Bangladesh, many women already play important roles that can be further strengthened, contributing both to the business and to building women’s skills and networks. To ensure women

are not merely owners in name only, governmental subsidies encouraging female ownership of machines need to be carefully targeted (for example, to widows or single women, or to couples who undergo joint training).

- **Consider joint ownership and trainings:** Married women do not necessarily want to be individual owners of machines. Rather, many prefer their husbands to support and work with them, rather than assume the risk of the business alone. Men frequently recognized how their wives help them make machinery services more productive. If men work alone, they also face risks that they will become sick or unable to manage conflicting obligations; if their wives are involved in the business, they can help manage activities and ensure the consistent generation of income in their absence. Joint training and ownership can increase women's skills, knowledge, and say in the business and shift beliefs that women are not capable of this kind of work.
- **Tap into women's networks to boost technology adoption:** With the frequent migration of men out of rural areas to secure more remunerative employment, women farmers represent a relatively untapped market of latent demand if services are offered at the right price and if they are able to learn about and access these services. Women service providers are better positioned than men or development project staff to reach out to other women through their networks and organizational affiliations, expanding the reach of their business and benefiting otherwise marginalized farmers.
- **Agricultural machinery is both a business and service to farmers:** Development projects working with agricultural machinery should seek to understand differences in men and women's ability not only to use the technologies on their farms, but also in their access to the business opportunity presented by machines. Women represent untapped potential in these markets as both clients of these services and business providers. Machine dealers, project officers, extension agents, and service providers all have a role to play in encouraging women's participation in service provision.

Achieving the goals of the Feed-the-Future Program and the Global Food Security Strategy requires careful consideration of the impact of climate on agricultural production and livelihoods, while at the same time considering other cross-cutting issues that influence agricultural growth, poverty alleviation and resilience, especially gender and nutrition. To address these challenges the Gender, Climate Change and Nutrition Integration Initiative (GCAN) works with USAID headquarters, field missions, and partners to enhance understanding of the linkages between climate, gender, and nutrition for increased resilience, women's empowerment and improved nutrition. See also <https://gcan.ifpri.info/>

The Cereal Systems Initiative for South Asia (CSISA) is a regional initiative to sustainably increase the productivity of cereal-based cropping systems, thus improving food security and farmers' livelihoods in Bangladesh, India and Nepal. CSISA works with public and private partners to support the widespread adoption of resource-conserving and climate-resilient farming technologies and practices. The initiative is led by the International Maize and Wheat Improvement Center (CIMMYT), implemented jointly with the International Food Policy Research Institute (IFPRI) and the International Rice Research Institute (IRRI) and is funded by the U.S. Agency for International Development (USAID) and the Bill and Melinda Gates Foundation. Supported by the USAID/Bangladesh Mission, the CSISA Mechanization and Irrigation (CSISA-MI) Project emerged out of CSISA's ongoing efforts and focusses on unlocking agricultural productivity through increased adoption of agricultural mechanization technologies and services. CSISA-MI is led by CIMMYT in partnership with International Development Enterprises (iDE). <http://csisa.org/>



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