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Combine Harvester Subsidies and Agricultural Mechanization in Bangladesh

Recommendations for Reform

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This brief summarizes findings from a recent report[1] on Bangladesh's Phase III agricultural mechanization support program (2020–2024). The program distributed over 35,000 subsidized machines worth BDT 1,595 crore (USD 163 million). Combine harvesters (CHs) accounted for 84% of program value, making them the focus of this analysis. Drawing on administrative data, a survey of 979 Machinery Service Providers (including 400 CH MSPs), panel data from over 2,000 Boro rice-producing households, and 128 qualitative interviews, the report examines program impacts and identifies critical implementation gaps.

Key Findings

Substantial program reach: The Government of Bangladesh (GoB) distributed 35,347 subsidized machines (2020–Q2 2023), including 8,912 combine harvesters, worth BDT 1,595 crore (USD 163m), which is 84% of total subsidy value and nearly half the Phase III budget. Mechanized harvesting adoption among Boro rice farmers rose from 0.9% in 2018 to 19% by 2023.

Strong productivity impacts: Causal econometric analysis suggests that high-allocation areas saw 6-13% yield gains, 38%-70% lower labor costs, and 12-26% lower production costs.

Profitable MSP businesses: MSPs serve 216 farmers and 84 ha/year, earning BDT 489,530 profit/year (48% margin). CHs bought with a 70% subsidy break even in 31 months; those bought with a 50% subsidy require 42 months.

Targeting inefficiencies: A LASSO-PCA analysis of mechanization need—based on labor availability, cropping intensity, climate vulnerability, and infrastructure quality—reveals that several high-need districts in Rajshahi and Rangpur divisions remain underserved, while some low-need areas received disproportionately high allocations.

Excessive pricing and subsidy capture: Importer markups vary widely, from 27% to 113%, suggesting that some importers inflated retail prices to capture a portion of subsidy benefits.

[1] Full report link and QR code available at the end of this document.

Governance challenges and implementation gaps: Verification exercises found that 28% of listed CHs could not be located, 14% additional machines were discovered outside DAE's official list, and 27% of machines were registered under someone other than the actual owner. Furthermore, 14% of applicants reported paying unofficial fees averaging BDT 59,000 to secure or expedite allocation. Comparison of DAE allocation data (2020–Q2 2023) with NBR import data shows that, for several companies, the number of CHs allocated by DAE exceeds the number imported—suggesting that there were instances of 'ghost' machines that were never distributed.

Restrictive ownership and movement rules: CHs cannot be used as collateral for loans, limiting access for smallholders. MSPs must seek DAE permission to operate outside their upazila/district, constraining service areas and slowing investment recovery.

Weak after-sales, training, and financing: Only 37% of CH MSPs received warranty documents and 21% received training. 97% experienced downtime averaging 12 days/year (17% of service days), largely due to spare-parts shortages and lack of mechanics. 68% took loans; only 6% accessed banks, while nearly half relied on informal lenders charging around 22% interest.

Mechanization and labor market effects: Preliminary causal analysis suggests no adverse labor displacement effects because of agricultural mechanization. Overall agricultural participation has remained stable, with a shift from wage labor toward self-employment. Agricultural wages have not declined significantly, and off-farm employment patterns remain unchanged.

Recommendations

Reduce import barriers and support local manufacturing: Removing current import tariffs could decrease CH prices by at least 25%, offering a cost-effective alternative to direct subsidies while eliminating the administrative burden and governance risks associated with beneficiary selection, geographic targeting, and machinery quality assessments. Similar approaches have been successfully used in the past to support the diffusion of other agricultural machines such as two-wheeled tractors. In addition, imported spare parts for CHs are typically charged full tariffs. A reduction in spare part tariff costs is a logical extension of the suggestion to consider reducing current import tariffs. Additionally, supporting the local manufacturing sector to set up assembly lines and acquiring capital machinery through low-cost financing schemes may be considered.

Reform allocation approach – evidence-based targeting versus market mechanisms: Two alternative approaches merit consideration for future machinery distribution:

Option 1: Market-driven allocation. Eliminate geographic targeting entirely and allow market forces to determine machine distribution patterns. This approach could involve removing or significantly reducing both import tariffs and direct subsidies, thereby reducing administrative costs, eliminating targeting distortions, and enabling machinery suppliers and MSPs to respond directly to local market demand signals. Climate-vulnerable regions could still receive support through geographically targeted concessional credit rates rather than equipment subsidies.

Option 2: Evidence-based geographic targeting. If centralized allocation continues, implement transparent, data-driven frameworks such as the LASSO-PCA approach to provide policymakers with clear, analytical inputs that can inform—rather than replace—their decision-making on priority rankings. This framework is not meant to be definitive, but rather to complement existing institutional knowledge and provide an additional tool in the policy toolkit. By updating the model annually with fresh data, policymakers can adjust allocations as conditions evolve.

Standardize subsidy rates: Consider the establishment of uniform base subsidies across regions to eliminate cross-district fraud incentives created by the current 50% versus 70% differential rates (with higher rates currently applied in Haor and coastal areas versus inland regions).

Mandate comprehensive after-sales infrastructure: Importers could be required to establish district-level service centers staffed with certified mechanics, maintain 90-day inventories of ready-to-use quality spare parts, and provide warranty documentation along with Bangla-language manuals as conditions for import approval. This approach could be extended to mandating pre- and in-season machinery maintenance services to reduce the risk of breakdowns and unproductive downtime.

Develop specialized financial products: Remove policy barriers that currently prevent asset-based financing and other financial innovations. Introduce hire-purchase schemes that bypass existing ownership restrictions, asset-financing products that allow CHs to serve as collateral, seasonal credit lines aligned with harvest cycles, and MSP working capital facilities through specialized agricultural finance windows.

Strengthen governance and monitoring: Begin by digitizing the subsidy application and allocation process to replace the current paper-based system, creating a secure, verifiable database that reduces manipulation and prevents untraceable allocations. Consider GPS-enabled registration to support asset-based financing models—enabling lenders to use CHs as collateral, as piloted by companies such as ACI. Finally, institute independent third-party verification of allocations and empower community-based monitoring committees with frequent reporting to ensure ongoing accountability.

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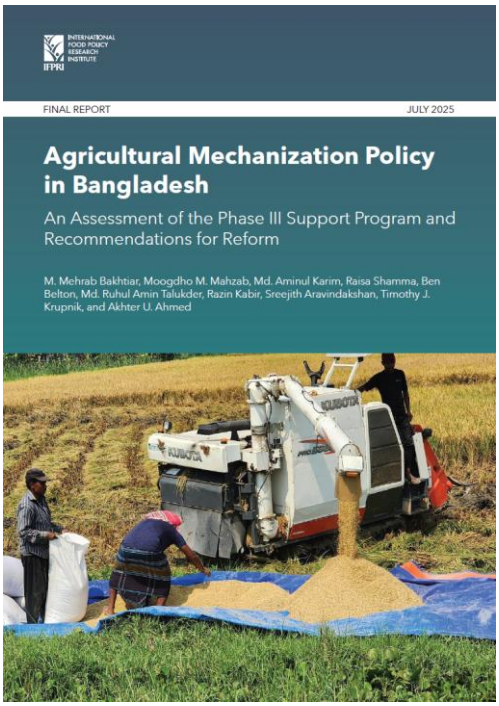

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