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Fortnightly column
Village Dynamics Insights

Mechanization on farm

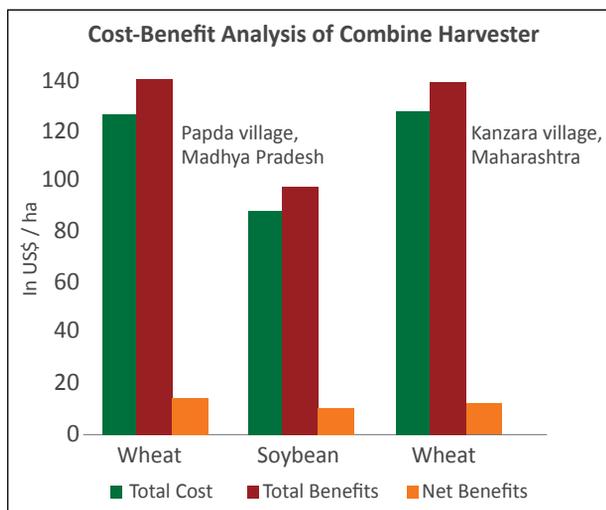
A large proportion of farmers are relying on combine harvesters for completing farm operations in time, reducing their reliance on labor and the risk of crop damage due to uncertain weather.

An ICRISAT-VDSA study in two villages, Akola district in Maharashtra and Raisen district in Madhya Pradesh, investigated the extent of use of combine harvester for wheat and soybean, and compared the costs and returns of manual versus mechanical harvesting.

Kanzara village in Maharashtra has seen a fluctuating and increasing trend of wheat acreage, and a steep growth in the use of combine harvesters from 20% of the 80 ha grown in 2006 to 90-95% of 325 ha crop grown in 2013-14.

“Peak season labor scarcity intensifies when all farmers in a village grow the same crops, such as soybean or wheat, as they need to harvest and thresh the crops at almost the same time. If the crop harvest is delayed, farmers can face loss, due to shattering of soybean pods, or the risk of crop damage by untimely rainfall,” said Dr Bhattarai.

“In addition, the farmers have said that using combine harvesters has helped them to expand their wheat crop by at least 30-35% a year, allowing them to grow another crop in the next season, leading to overall increase in cropping intensity and farm profitability,” he added.



“While the net financial benefits of using the harvesters are low, the farmers want the harvesters for timely harvesting so that they can grow next season’s crop in time,” said Dr Madhusudan Bhattarai, Principal Scientist-Economics, Markets, Institutions and Policies, ICRISAT.

Local trend of mechanization

Mechanization in Kinkhed village, Maharashtra, started in 1982, with a diesel and power thresher used for wheat and sorghum. From 1985 the machine was rented for threshing safflower for ₹ 300/acre (US\$30/ha in 1985 exchange rate). In 2007, as plenty of canal water became available, the area under wheat in *rabi* (post-rainy) season and soybean in *kharif* (rainy) began to increase. In 2007, wheat was cultivated in 550 acres (220 ha), and with increasing scarcity of labor, two to three combine harvester-threshers were brought from Punjab to harvest about 400 acres (160 ha). The harvesters were rented at ₹ 700-800/acre (US\$18-20/ha in 2007 exchange rate). In 2013, the farmers grew 700 acres (280 ha) of wheat in *rabi*, with 1,000 acres (400 ha) of soybeans in *kharif*, which were harvested mechanically at a cost of ₹ 1,000-1,100/acre (US\$42-46/ha). Presently three combine threshers are operating at the village and district level. Development of the rental market has provided benefits to a large number of smallholder farmers, who could not otherwise access this expensive machinery.

Mechanical harvesting and threshing an acre of wheat is done in one hour (or 2.5 hours/ha), compared to more than 15 labor days spread over two weeks (or 38 days/ha) if done manually. In return, farmers pay a rental charge for the machinery, lose 2-5% of the grain and the opportunity cost of the straw - which cannot be recovered when using a combine harvester.

In Papda village, Raisen district of Madhya Pradesh, mechanized harvesting provided a net benefit to the farmers of ₹ 236/acre (US\$10/ha) for soybean and ₹ 330/acre (US\$14/ha) for wheat (see figure). The farmers paid ₹ 1,300-1,400/acre (US\$54-56/ha) for renting a harvester. ■