

Breakthrough  
outcomesPRISMA's stories of  
systemic change

# Turning the cogs

## A story of progress towards systemic change in the mechanisation sector

### The tyranny of cost

In a country with over 270 million people, labour shortages may be a surprising fact. This is a significant problem faced by smallholder rice and maize farmers in Indonesia's crop sectors. The rapid increase of migrant labour leaving Indonesia to Malaysia and other Southeast Asian countries has contributed to the labour shortage and increased labour wages. While this benefits labourers, the labour shortage during peak planting and harvesting times significantly increases smallholder farmers' production costs.

PRISMA has found that labour costs in the rice sector in East and Central Java often triple during peak periods. It takes at least three days for smallholder rice farmers to harvest a hectare of land using manual labour. Likewise, planting takes more than 20 person-days to plant a hectare of rice, and maize farmers face the same

labour scarcity issues. In the rice sector, labour costs account for 49 percent of the total production cost for smallholder farmers.

Manual harvesting also results in higher crop loss compared to mechanisation, with the loss being as much as 14 percent. Farmers encounter further loss when waiting for labour to become available. During the waiting period, the rice's moisture content can exceed the stalk's holding capacity, and the crops fall over, resulting in further loss.

Increased labour costs and crop loss during harvesting significantly reduce household income for the poor and threaten agricultural viability and food security in the long term.

### The barriers to adoption

In 2019, PRISMA saw an opportunity to work with the private sector to introduce harvesting and planting machines to smallholder rice and maize farmers to reduce the cost of production, increase productivity, and improve food security. Using appropriate machines has added environmental benefits, including minimum soil disturbance and permanent soil cover. However,

introducing mechanised technology to smallholder farmers is no small feat due to land fragmentation, small landholdings of less than a hectare, and the lack of finance for farmers to invest directly in the technology.

Market research undertaken by PRISMA in 2019 noted that it had taken almost ten years for the market to adopt

combine harvesters in the rice sector, and it was only in 2018 that the leading agricultural machinery companies saw an escalation of sales, but mainly to government

grant programs. Up to 80 percent of all sales by the private sector in 2019 were servicing the government.

## Re-setting the framework by identifying opportunities

PRISMA saw an opportunity for machinery companies to increase the market segment for harvesters by targeting rice millers, large traders, and aggregators. There was also an opportunity to increase demand if companies adopted a new business model incorporating a renting service. By renting out the machine with the operator, the private sector could increase their market share and directly service smallholder farmers who could not afford their own combine harvester. To reach the farmers using government grant machines, PRISMA promoted improved after-sales service by the machinery companies so that machines that were sitting in villages not working could be easily fixed and maintained<sup>1</sup>.

While off-takers see the benefit of using combine harvesters to decrease harvest loss, the machine companies and distributors have noted that uptake by farmers has been slower. Talking to any machinery company sales agent elicits the same answer; “the farmer’s mindset is hard to change”. So, while the machinery companies are there and off-takers are purchasing machines, farmers have not readily adopted the practice of using the machinery. PRISMA prioritised working with the machine companies’ on-demand activation marketing strategies to address this, including targeted demonstrations focussed on rice millers and off-takers.

## A few small cogs can turn a much bigger wheel – the success of pilots

PRISMA piloted the approach in late 2019 and 2020 with PT Rutan, a local machinery company. COVID-19 impacted the intervention’s progress because of increased spare parts and machine prices, supply chain disruption, and a more risk-averse lending environment. However, as a direct result of the revised marketing strategy, PT Rutan increased their commercial sale of combine harvesters and 4WD tractors by 30 percent during the pandemic. In 2021, PT Rutan expanded their marketing strategy nationally and succeeded in selling 52 combine harvesters and 28 4WD tractors that year.

PT Rutan also adopted PRISMA’s business model for rental services. The company invested in a new subsidiary company, Terra Agro Digital, to provide combine harvester services to smallholder farmers. With the support of PRISMA, the company used a digital application to allow farmers to aggregate smaller plots of land into a single ‘service.’ This meant that farmers with quarter-hectare blocks or smaller could come together to benefit from joint harvesting services.



“The shift to a service delivery model has been eye-opening because we didn’t realise how big an opportunity this was. When smallholders cooperate and share resources, it becomes more efficient and creates a huge untapped market. This service business model has been so successful that we are considering expanding PT Terra Agro Digital to Lombok and Sumbawa. For us, it is not just about service rental but changing smallholders’ mindset to innovate” Andrew Budiman, Director PT Rutan Machinery.

In 2021, the product marketing, after-sales, and rental approaches started to gain more traction from other machinery service providers. CV Argo Jaya, a distributor for the large machine company Kubota from Japan, partnered with PRISMA on the back of the success with PT Rutan. Based on their adoption of the new marketing strategy and after-sales service, CV Argo Jaya received an award for most sales and opened a new branch office

in East Java in May 2022. PRISMA was able to partner with PT Galaxy Partani Mas for the provision of smaller tools in the maize sector.

<sup>1</sup> According to PRISMA partners, of all government grant machinery provided to smallholder farmers, only ten percent of the machines purchased remain in working order and only one percent of the machines purchased undergo maintenance and purchasing of spare parts.

## The road to scale

The partnership with PT Rutan induced crowding-in with a new player, Lovol, entering Indonesia and hiring PT Rutan's former manager to head their operations in Indonesia. A competitor to PT Rutan, Maxxi, copied the service provision model and has set up their own servicing arm, Maxxi Tani, now providing machinery services to smallholder farmers. These are all excellent signs of progress towards systemic change.

Another three partnerships are in the pipeline for product provision and after-sales models in rice combine harvester and 4WD tractors and a further three partners for smaller tools, such as planters and transplanters in the maize sector. Partnering with more companies will move the access to machinery for smallholder farmers closer to scale.

For mechanisation to reach scale at the farm level, a critical mass of smallholder farmers must adopt the new way of working. In the two years PRISMA has been actively working in the sector, the adoption of combine harvester services by smallholder farmers has increased from 6.67 percent to 36 percent, a significant jump. The benefit for smallholder farmers is that harvest time has been reduced from three days to three hours, decreasing costs by 32 percent. In addition to savings in labour, crop loss has also been reduced by 80 percent. The savings have meant a 46 percent reduction in the cost of production. The impact at the household level has been a 26 percent increase in income for 20,433 farmers. These benefits will encourage more farmers to seek mechanised services leading to increased demand.

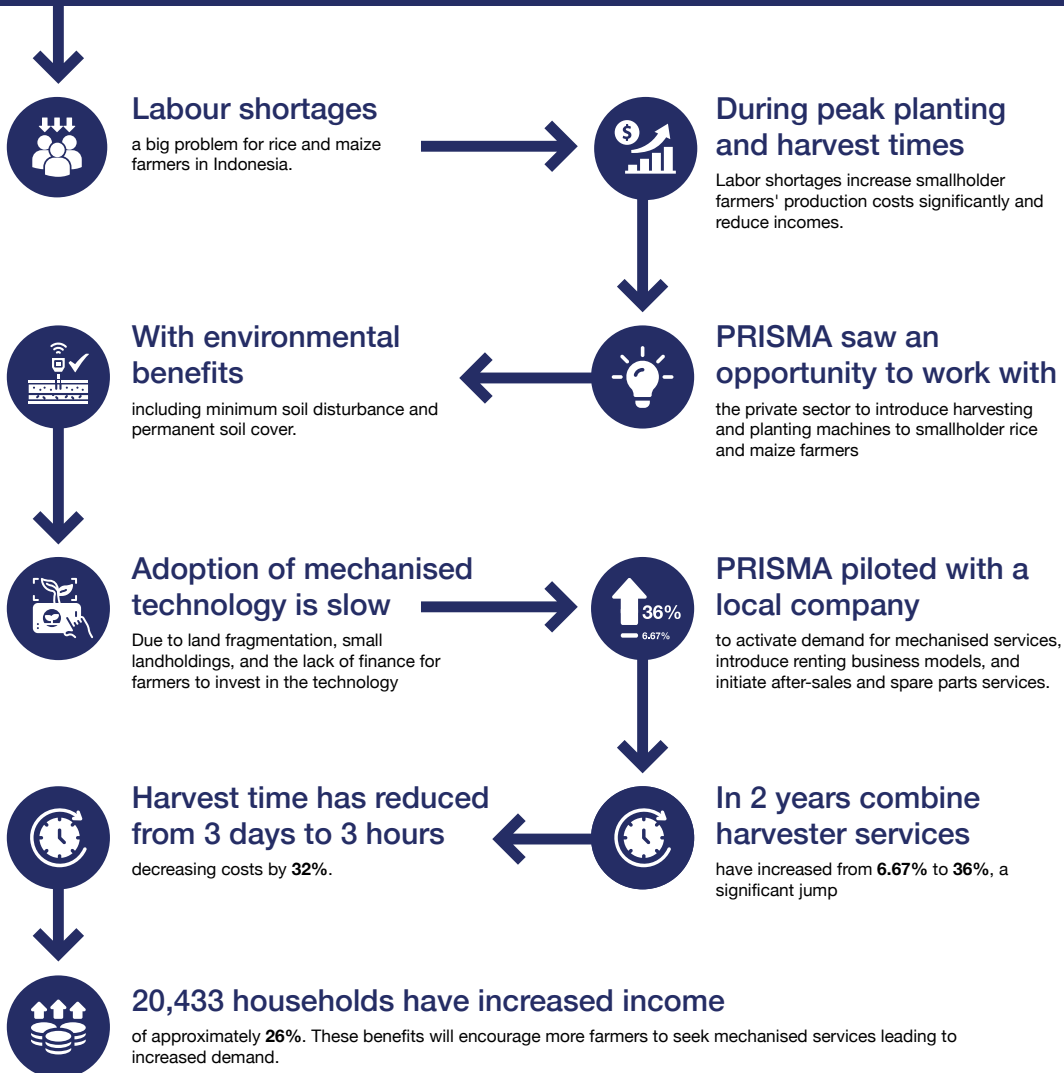
## Partnering with drone companies

An exciting new development for PRISMA at the end of 2021 has been partnering with drone companies to pilot the use of drone technology for crop spraying. While plantations in Indonesia use drone technology, there is potential to expand this market. Three companies have partnered with PRISMA; two of them, Halo Robotic and Full Drone Solutions are looking at selling drones to service providers using the marketing model, and the third, Sentragro, is looking at providing spraying services to farmers. After partnering with PRISMA, Sentragro has already serviced 500 hectares of smallholder farmer land in Lamongan and has just recently expanded to two neighbouring districts by subcontracting two service competitors, Aria and Frogs. Based on competitor success in services, Halo Robotics also recently expanded its business to include the servicing model and hired five new staff. While the program is not expecting this innovation to reach scale in the next 18 months, PRISMA is laying the foundation for this service to take off. Already Halo Robotics has seen an increase in just six months from two service inquiries to 25.



## Systemic change of mechanisation

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## About PRISMA

PRISMA is an innovative partnership between the Government of Indonesia and the Government of Australia to grow agricultural markets in rural Indonesia. Our strategic aim is to address food security and poverty by making rural markets more inclusive. We do this by partnering with businesses, government and investors to remove market barriers and introduce product and production innovations.

PRISMA is supported by the Governments of Australia and Indonesia and implemented by Palladium, with Technical Assistance from Swisscontact, Zurich.

Find out more: [www.aip-prisma.or.id](http://www.aip-prisma.or.id) // [info@aip-prisma.or.id](mailto:info@aip-prisma.or.id)