

Women in Small Farm Mechanisation: Lessons from Field Experiences in Kerala



In this blog, Meenakshi and Gayathri reflect on their learnings from the internship study on Small Farm Mechanisation for Women in Kerala.

CONTEXT

When we began our study on Small Farm Mechanisation for Women in Kerala (as part of our internship with CRISP) by mapping the various stakeholders, policies, and initiatives involved, we were impressed by the sheer number of actors and interventions working in this space: a network of institutions, schemes, and missions all seemingly working to bring women into the fold of mechanised farming. On paper, it looked like women had plenty of support and opportunities. But field visits and interviews quickly revealed a different story. Many stakeholders appeared outdated, inactive, or less influential than what the literature implied.

In Kerala, nearly 39% of rural women work in agriculture, yet they manage just 23% of farm holdings, most of which are under one hectare. Despite access to modern machinery, from tractors to drones, women rarely operate these tools. While paddy fields are nearly 80% mechanised, women-dominated crops like coconut and cashew rely on manual labour, with mechanisation below 30%.

Our study suggests that women are eager to learn about farm machinery, yet their participation remains low. This raises key questions: **What barriers hold them back, and how can extension systems bridge the gap between policy and reality?**



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Female service providers of Pampakuda Agro Service Centre; Ernakulam District, operating a rice transplanter during field operations

SMALL FARM MECHANISATION IN KERALA: Who's Driving It?

Kerala does have a strong ecosystem for agricultural mechanisation. Government departments like the Department of Agriculture and Farmers Welfare at the state level, its district-level offices and panchayat level offices called as Krishi Bhavans, the Krishi Vigyan Kendras (KVKs), along with research and training centres such as [Kelappaji College of Agricultural Engineering & Food Technology](#), Tavanur, [Research Testing and Training Centre](#), Vellayani, [ARS Agricultural Research Station](#), Mannuthy, etc, form its institutional backbone. Manufacturers and distributors across public, cooperative, and private sectors—including [Kerala Agro Machinery Corporation Limited](#), [Kerala Agro Industries Corporation Ltd](#), and [Regional Agro Industrial Development Co-operative of Kerala Ltd](#), along with private companies such as [Honda](#), [STIHL](#), [Husqvarna](#) ensure that farmers have access to machines, as well as repair and maintenance services, while workforce models like [Karshika Karma Sena](#), [Food Security Army](#), integrate skill development with service delivery.

Financial institutions such as [The National Bank for Agriculture and Rural Development \(NABARD\)](#), [Kerala Gramin Bank](#), and cooperatives provide credit and subsidies, supported by Central Government Schemes like [Sub-Mission on Agricultural Mechanisation \(SMAM\)](#), which provide enhanced subsidies for women (a 50% subsidy regardless of landholding size versus 40% for male farmers with large land holdings).

The [Kerala State Agricultural Mechanisation Mission \(KSAMM\)](#) further promotes mechanisation through the capacity building of existing Custom Hiring Centres, conducting agro-machinery repair camps, and implementing group-based models, resulting in easier access to mechanisation at a fair price for farmers.

Besides these, self-help groups under [Kudumbashree](#) and Farmer Producer Organisations (FPOs), such as [Gramasamrudhi FPO](#), are also participating in mechanisation by offering custom hiring and machine services to farmers. The [Coconut Development Board](#) has also launched initiatives like [Friends of Coconut Tree \(FoCT\)](#), which has trained around 66,500 individuals, out of which 10% are women, in using coconut climbing machines. Additionally, the [Hello Nariyal project](#) aims to connect different FoCT groups and provide coconut climbing services across the state.

Together, these efforts have shaped a robust mechanisation network across the state. Yet one question persists: how far does this progress truly reach, benefit and empower women? Despite schemes and training, women's representation in mechanised farming remains strikingly low—a gap that calls for a closer look at the barriers on the ground.

WHY DON'T WE SEE MORE WOMEN IN MECHANISED FARMING?

Training Without Follow-Up

We observed that during the three-day training at RTTC, women from Alappuzha's *Karshika Karma Sena* eagerly practised using brush cutters, power tillers, and coconut climbers. *"They were enthusiastic learners,"* a trainer shared. But when we asked if they would use them back home, many looked unsure.

Trainers also admitted, *"We train 30–40 people every week, but there's no follow-up to see if women actually use the machines later."* [A previous review of agricultural mechanisation in Kerala also noted that while training builds confidence, lack of post-training support and mentoring limits real adoption.](#) Without continuous support, even the best training remains just a short-term exercise.



With women trainees at the Research Testing and Training Centre, Thiruvananthapuram, during a practical session on farm machinery operation

Decisions Without Women

Although women form a significant share of the agricultural workforce, decisions on machinery purchase and use are often made by men, prioritising power and productivity over women's comfort. A technician at RTTC observed that petrol-powered tillers and brush cutters, which are lighter and more suitable for women, are often overlooked in favour of heavier diesel models because they're widely available and popular among dealers. Since men don't find them difficult to use, this preference continues, even though these models are much harder for women to operate.

Economic power deepens this gap. Many women lack land ownership or control over farm income. Even with subsidies available, complicated paperwork and a lack of awareness keep them out. *"Subsidies are there, but we don't know where to start,"* one trainee said. [As research notes, limited financial control and gendered norms restrict women's ability to invest in farm machinery.](#) As a result, their perspectives on safety, comfort, and the suitability of machines are rarely considered.

Gender-Blind Equipment Design

During field visits, we observed that the design of machinery itself limits women's participation. Many women trainees struggled with brush cutters that were too heavy, vibrated excessively, and lacked

proper safety gear. Climbing onto the high platforms of tractors and harvesters was difficult, and many machines required more strength to kick-start than most women could comfortably manage.

Research confirms this bias—agricultural technologies are often designed for male users, overlooking ergonomic and comfort needs essential for broader adoption. Lighter, safer, and ergonomically designed tools are not a luxury—they are necessary if farm mechanisation is to be genuinely inclusive.

Social Stereotypes and Institutional Barriers

In Kerala's tea plantations and government farms, women often make up the majority of the workforce, confidently operating garden tillers, brush cutters, and tea harvesters. These workplaces are safe, group-based, and provide stable wages, support, and recognition. This indicates that women's engagement in mechanisation depends less on skill or motivation and more on whether machinery is safe, accessible, and socially recognised. Environments with these conditions see high participation, while others leave women on the margins.

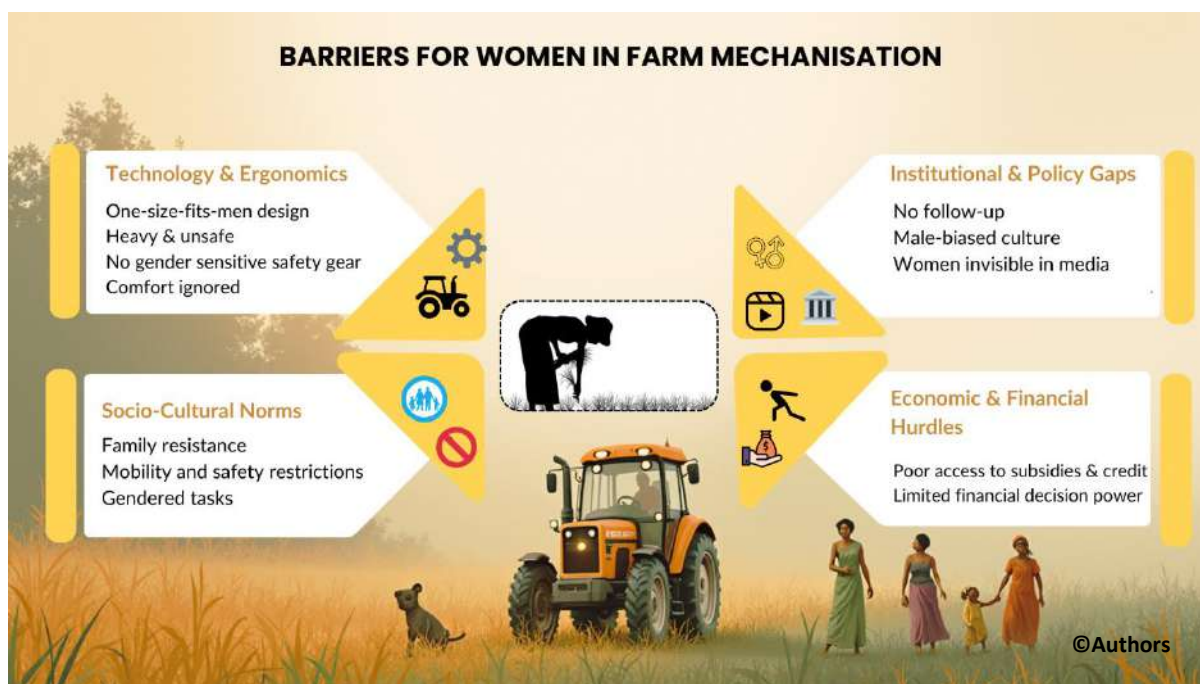
Even when trained, women frequently perform “light” tasks—such as nursery preparation, fertiliser mixing, or spraying—while men handle physically intensive operations like coconut climbing or tilling. Existing evidence suggests that women's labour is less likely to be utilised in operations that require physical strength. One woman farmer noted, “My husband supports me to learn and operate machines, but his family questions why I need to do this work when men can handle it.” Resistance from family and community continues to influence adoption decisions.

Mobility constraints further limit participation. Women often prefer working close to home—not simply by choice but due to domestic responsibilities, safety concerns, and social expectations.

In Kerala, women's participation in agricultural mechanisation is strongly influenced by social approval, family support, and cultural expectations, not just competence. Mechanisation is thus both a technical and social process, and without tackling cultural and institutional barriers, training and subsidies alone may not empower women. Attitudes further restrict participation.



Training on coconut climbing for women organised by ICAR-Central Plantation Crops Research Institute (CPCRI)



THE WAY FORWARD FOR EXTENSION: ENCOURAGING WOMEN IN FARM MECHANISATION

Despite the challenges women face in accessing farm mechanisation, Kerala is slowly but steadily moving towards greater inclusion, with collective initiatives and extension systems playing a key role. Under *Kudumbashree*, [over 4.32 lakh women cultivate around 20,647 hectares](#) through 94,594 farmer groups, transforming livelihoods while building confidence as machine operators and trainers.

One example is *K. Bindu* from the Kannur district, who manages 26 acres of land while training other *Kudumbashree* members in the use of machinery. Her efforts earned her [Karshakathilakam Award](#) (Kerala State Awards 2023), reflecting how peer learning and collective support can transform women's roles in mechanised farming.

Another promising development is *Kudumbashree's drone pilot initiative*, through which 50 women were trained as drone operators for precision spraying. Among them, [Sudha Devadas](#), trained under the [NaMo Drone Didi programme](#), was selected as one of Kerala's representatives at the 'Lakshpati Didis' convention. Once a self-help group member, she is now a recognised drone pilot and resource person who trains other women in gender equity and entrepreneurship. Her journey illustrates how targeted extension support can empower women to adopt advanced technologies and convert them into sustainable livelihood opportunities.



Jessna from Malappuram who is a certified drone pilot

Yet, much more needs to be done to make mechanisation truly gender-inclusive. Closing this gap calls for reimagining how extension programmes are designed, delivered, and evaluated.

The following suggestions outline how extension can act as a catalyst for inclusive mechanisation.

1. Start With Gender Audits

Extension institutions must first understand where women stand. Conducting periodic [gender audits](#) can help identify barriers to access to training, credit, and equipment.

The **Gender Audit** provides a simple diagnostic for extension programs to assess inclusivity:

- **Tracking:** Are adoption rates, not just participation, measured?
- **Design:** Are tools tested with women in real farm conditions?
- **Delivery:** Do service points welcome women's participation?
- **Decision:** Can women access credit independently?
- **Sustainability:** Is ongoing support provided post-training?

2. Co-Design Technologies with Women

Most agricultural equipment is designed for male operators, often prioritising power and cost over ergonomic comfort. When women are excluded from equipment selection decisions, their feedback never reaches manufacturers. Extension can change this by documenting women's ergonomic feedback and systematically sharing it with equipment designers and policymakers, ensuring the next generation of machines suits women's bodies and work patterns by design. One example is [the Improved Grabar weeder](#), which enabled women to cover nearly four times the area per day compared to the traditional *Khurpi*, while reducing fatigue and improving posture.

3. Make Training Gender-Responsive

Training sessions can be redesigned to suit women's convenience — held closer to villages, scheduled at suitable hours, and introduced through pre-training meetings with family members and local leaders. Separate sessions for women can also help create a more comfortable learning space. Beyond basic operation, training should cover maintenance, pricing, marketing, and enterprise management, enabling women to move from machine users to entrepreneurs.

4. Build Peer Mentoring Networks

Women learn best from other women. Extension agents can play a role in building peer mentoring circles that connect experienced machine operators with new learners. When mentors and mentees come from similar farming contexts and crop types, the learning feels real and relevant. Regular group reflection sessions, where women gather to share ideas, troubleshoot issues, and celebrate small wins, can turn training into a supportive community.

5. Promote Collective and Entrepreneurial Models

Women-led groups, such as SHGs, JLGs, FPOs, and cooperatives, can play a key role in mechanisation when treated as local service enterprises. With the proper support, they can manage custom hiring, drone spraying, and repair services—keeping machines in use and earning income even on small farms.



Chemmaruthy AO Division and Gramasamrudhi FPC team at the drone-based micronutrient spraying site, Thiruvananthapuram - SMAM funded initiative

Extension agencies can make this possible by linking these groups with panchayat-led farm activities to ensure steady work, helping them access group credit and women-focused subsidies to lower costs, and ensuring dealer support for spares and maintenance so machines stay functional all year.

6. Build Convergence across Stakeholders

No single agency can drive mechanisation on its own. Effective coordination among KVKs, RTTCs, Krishi Bhavans, Kudumbashree, KSAMM, NGOs, SHGs, FPOs, and equipment dealers ensures smoother handovers from training to subsidy support, mentorship, and group formation.

Extension works best when multiple institutions move together. Joint planning can help create seamless linkages. Consider this workflow: a woman trained in coconut climbing at RTTC immediately receives information about SMAM subsidies, connects with KSAMM mentors, and joins Kudumbashree collectives for collective equipment ownership and income-sharing. When these institutions work in silos, women navigate disconnected systems, losing momentum between stages. Extension must therefore focus on the system as a whole, ensuring that stakeholders are interconnected and working towards shared outcomes.

7. Diversify Media Representation

Representation matters. Including women prominently in posters, manuals, and videos, especially when they are shown operating machines, can challenge stereotypes and make mechanisation appear more accessible.

CALL TO ACTION

Kerala already has the ingredients for inclusive mechanisation—committed programmes, trained women, and responsive institutions. The next step is disciplined coordination and a sharper focus on women’s needs at every stage: policy design, equipment choice, training delivery, financing, and follow-up. Extension systems can lead this shift by offering long-term handholding, reliably connecting women to subsidies and group enterprises, and routinely feeding women’s ergonomic and operational feedback into future programmes. The task is not to “find a place” for women in mechanisation, but to recognise they are already in it—then strengthen the systems that keep them there. With steady demand pathways, accessible finance, and visible recognition, women can—and should—stand at the forefront of Kerala’s mechanisation story as skilled operators, reliable service providers, and confident Agri-entrepreneurs.

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