

A full-page photograph of a woman in a marigold field. She is smiling and looking towards the camera. She has dark hair in a braid with a red bindi on her forehead and a small orange flower in her hair. She is wearing a light green t-shirt under a pink and purple patterned sari. She is holding a woven basket filled with orange marigolds in her left hand and is reaching down to pick a flower with her right hand. The field is filled with many orange marigolds, and there are green trees in the background.

Fields of Change

Stories of Women's
Agency and Transformation

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Foreword

SOME of the most consequential work in development is also the least documented. The institution that outlasts a project, the woman who learns a technique and then teaches two hundred others — these seldom appear in a results framework. Yet they are what makes change endure.

This book documents four such efforts, and the women at the centre of them.

Professor M. S. Swaminathan founded this institution on a conviction not widely shared at the time: that science earns its value only when it reaches those who need it most, and that farmers — particularly women farmers — are not recipients of innovation but its co-creators. The four programmes described here, in Puducherry, Wayanad, Koraput and across India's small-scale fisheries, were built on that principle.

Reading them together, what strikes me is how far ahead of their moment they were. A pro-poor, pro-nature and pro-women philosophy was being articulated in 1992. Information technology reached village knowledge systems before digital inclusion had a name. Nutrition was treated as a question of food systems, not supplementation, well before that became accepted. These are early statements of positions the development community has since adopted.

The challenges ahead are different, and harder. Climate change is no longer a projection but a condition, altering what can be grown, where, and by whom. Food systems, nutrition and human health can no longer be pursued as separate agendas, any more than environmental degradation and disease can be. Women stand at that intersection, carrying a disproportionate share of the cost and holding a disproportionate share of the knowledge.

Our responsibility now extends beyond implementation. This Foundation has shown what works in a village, a hamlet, a landing centre; the harder task is to ensure such evidence shapes what governments

choose to do at scale. In my years in global health I saw repeatedly that evidence does not translate itself into policy. Someone has to carry it across. Documentation of this kind is where that begins.

It also asks greater precision of us. It is not sufficient to record how many women participated. We must measure who gained control over income and assets, whose decisions changed, whose working day grew lighter rather than longer, and what remained once external support was withdrawn. The chapters that follow are candid about where this evidence is thin. I regard that candour as a strength, and as an agenda for our next decade.

I congratulate the authors and contributors, and thank the editors — Dr Rengalakshmi, Dr Nitya Rao, Dr RV Bhavani and Meera Sundararajan— with the reviewers and colleagues whose inputs strengthened this work. Above all, I acknowledge the women whose knowledge, labour and perseverance fill these pages. They have been this Foundation's most demanding and most generous teachers.

—Dr. Soumya Swaminathan
Chairperson
M. S. Swaminathan Research Foundation



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About this Publication

FOR more than three decades, MSSRF's programmes have documented change in livelihoods, agriculture, nutrition and natural resources. Far less attention has been paid to another story running through them: the gradual expansion of women's agency, voice and leadership.

This publication revisits four of those programmes through a lens that has rarely been applied to them systematically. Across Biovillage, tribal development, community nutrition and fisheries, women's inclusion was deliberate, and these programmes often understood women as agents and co-creators rather than recipients. What the records of the time captured, though, was largely participation: numbers trained, groups formed, members enrolled. The

Read together, these accounts make visible dimensions of MSSRF's work that have long remained implicit, and they set up the questions the concluding chapter takes up: what actually moved the needle for women, what allowed those gains to endure, and what remains unfinished.

decisions women made, the technologies they adapted, the knowledge they held and taught, and the institutions they came to lead were evident in practice but seldom documented as outcomes in their own right.

Two frameworks structure that re-reading. The Reach–Benefit–Empower–Transform (RBET) framework separates who a programme reached from who gained by it, whose agency grew, and what changed durably. Naila Kabeer's Resources–Agency–Achievements framework, which organises the Kairali case study, draws attention to the conditions that make agency possible. Between them they bring recognition, collectivisation, women-centred design, economic agency, ecological stewardship and care into view, and they replace the question of what a project delivered with a harder one: how women gained resources, exercised agency, influenced institutions and shaped what lasted.

The chapters do not retell project histories. Each revisits an established programme through this common lens. Biovillage is reinterpreted as an ecosystem connecting technology, finance, institutions and collective action to expand women's capabilities, leadership and ecological stewardship. The Kairali Integrated Tribal Development Project is examined not only as a livelihood initiative but as a process that reduced



women's drudgery, expanded access to productive resources, strengthened voice and restored dignity. The Community Hunger Fighters and Farming Systems for Nutrition initiatives in Koraput show how nutrition work became a platform for women's leadership, community action and stronger local institutions. WomenConnect demonstrates that digital inclusion became transformative only when embedded within finance, enterprise development, collective institutions and locally relevant support.

Read together, these accounts make visible dimensions of MSSRF's work that have long remained implicit, and they set up the questions the concluding chapter takes up: what actually moved the needle

for women, what allowed those gains to endure, and what remains unfinished. Throughout, they document women as co-creators of resilient livelihoods, sustainable food systems and inclusive institutions, putting on record what these programmes long recognised in practice — a contribution offered both to MSSRF's institutional learning and to wider policy conversations on designing gender-just, community-centred development.

Acknowledgement

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CAB International plantwise MSSI

Awareness on IPM of South East Asian Thrips (Chilli Black Thrips)

Created by
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INNUYIR–THE SWEET LIFE MOVEMENT:

**Women's Agency and Transformation
through the Biovillage Model**

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1. The Biovillage Programme: A Brief Introduction

Before Biovillage: the context in Puducherry

In the early 1990s, rural communities around Puducherry faced two closely connected pressures: persistent poverty and the gradual degradation of the natural resources on which their livelihoods depended. Agriculture was dominated by paddy and sugarcane, often cultivated with intensive use of fertilisers, pesticides and groundwater. Small and marginal farmers struggled to access emerging technologies, while landless labourers depended on short periods of seasonal farm work and faced

months without reliable employment or income.

Women experienced these pressures differently. Many worked in agriculture, livestock and household-based activities, yet their labour was rarely recognised as skilled or productive. They had limited access to timely, locally relevant information; technology and skills; markets and credit; productive assets; collective power; and formal institutions. Social norms also constrained mobility and decision-making. Landless women faced an additional barrier: many agricultural interventions assumed access to land, leaving them





Historical programme snapshot

(Cumulative achievements documented through 2012 and verified in 2026)

54

Villages
reached in
Puducherry
by 2012

4,500*

Approximately
Women organised
during the expansion
phase

350

Approximately
Women's SHGs during
the expansion phase

1,922

SHG members involved in
income-generating activities

1,270.20 lakh

Credit linkages
mobilised for SHGs

12

Women elected
to Panchayati Raj
institutions

36

Community role
models identified

20

Biovillage Council women
recognised as National Virtual
Academy Fellows

61,384

trainee-days

Training delivered
between 2000
and 2012

*Refers to women formally organised into self-help groups during the expansion phase up to 2012. Cumulative reach across the full period of Biovillage operations is estimated by programme staff at approximately 50,000 women (G. Prasad, personal communication, July 2026).

with few viable pathways into productive work.

Even when training or a public scheme existed, women often could not use it without working capital, inputs, transport, family support, follow-up technical guidance or a buyer. Advice could also be poorly adapted to their land, labour, literacy or available resources. The problem was therefore not simply the absence of technology or finance, but the fragmentation of the support needed to act on an opportunity.

A human-centred response: from reaching the unreached to Biohappiness

The Biovillage concept emerged from Professor

M. S. Swaminathan's concern that advances in science and technology were failing to reach the people who needed them most. It grew out of MSSRF's 1991 interdisciplinary dialogue, *New Technologies: Reaching the Unreached*¹, and was first piloted in three villages of Puducherry in 1992. Biovillage was conceived not as a single agricultural project, but as a human-centred model of rural development. Its four defining orientations were pro-nature, pro-poor, pro-women and pro-livelihood. It sought to address rural poverty, human well-being and ecological decline together through technologies and enterprises that were environmentally sustainable, economically viable, socially equitable and capable of generating employment. Significantly, its own

articulation of the pro-women orientation linked women's access to skills and income with reducing drudgery and increasing the economic value of each hour of women's work (MSSRF, 2013a).

The programme began with the resources, constraints and aspirations of rural households rather than a predetermined activity. A small farmer might need improved crop practices, diversification or access to inputs; a landless woman might need a livelihood that did not require land; another woman might have a skill but lack credit, technical guidance, collective support or a market. Biovillage therefore offered different entry points according to landholding, skills, household circumstances and locally available resources.

Seen as a list, Biovillage's interventions—crop diversification and intensification, dairy and goat rearing, floriculture, small-scale vegetable production, nutrition gardens, fodder, mushrooms, aquaculture, integrated farming and related microenterprises, knowledge centres, savings groups, credit and market linkages—can appear wide-ranging. Their significance lay in how they were connected. Training was linked to technology, skills and inputs; credit to productive

activities and technical support; livelihoods to markets; and individual participation to self-help groups and community institutions. The Kodathur experience illustrates this integration: dairy was connected to credit, insurance and animal-health services, as well as fodder cultivation, water management, biogas, slurry and vermicompost, extension support and organised milk markets. A livelihood entry point thus became part of a wider production and support system rather than a stand-alone loan or activity (MSSRF, 2006).

A central principle was asset building. Professor Swaminathan argued that financial assistance alone could not create lasting change; development had to add value to people's time, labour, knowledge and skills and enable them to build productive, human and institutional assets. For women, this meant more than training: it meant access to finance, technology, information, markets, collective institutions and opportunities for responsibility and leadership.

Biovillage was not designed using today's language of "women-centred design." Yet its pro-women orientation reflected an important principle of such an approach: begin with women's lived realities rather than expecting them to fit a





standard intervention. It recognised differences in access to land, time, mobility, skills, household and community support, and the social norms that shaped which opportunities women could use.

The programme's larger aspiration was Biohappiness—using locally available human, biological and natural resources to create livelihoods and well-being without degrading the environment or excluding resource-poor communities. The health and happiness of rural families, rather than production alone, became the ultimate goal of development.

From the original three-village pilot, Biovillage expanded across Puducherry, reaching more than 50 villages by 2012 and influencing MSSRF's work in other agroecological regions. The Biovillage Resource Centre served as a hub for technology assessment, training, knowledge and practical support; Village Knowledge Centres brought locally relevant information closer to communities; and women's self-help groups created platforms for savings, credit and mutual support. The Innuyir Grama Sangam federation and its community bank further strengthened collective capacity.

Although led by MSSRF, the programme was built through partnerships with communities, government departments, banks, Krishi Vigyan

Kendras, research institutions, cooperatives and development organisations. Across two decades, it documented economic, social and political change, including women's access to credit and assets, emergence as trainers and resource persons, collective organisation and participation in local governance.

The historical snapshot below indicates the scale reached by 2012. The remainder of the chapter examines how the parts of this integrated model came together—and what they meant for women's agency, leadership, collective power and longer-term change.

2. Four Women, Four Pathways of Change

WOMEN entered Biovillage from very different starting points. Some had no land and depended on common-property resources; some relied on a single crop; and others were already working but lacked finance, markets or institutional support. The four journeys below show how livelihoods, training, technology, credit, collectives and sustained support combined to enable different forms of change.

2.1 From a Dalit Agricultural Labourer to Elected Leadership: Pakkirichi

Pakkirichi, a Dalit woman from Sorapattu, joined Biovillage in 1998 after years of combining household responsibilities with daily-wage agricultural labour. Her life had largely been confined to her home and village. Through the programme, she joined a women's group, conducted village surveys and received training in agriculture, livestock and livelihood activities. These opportunities connected knowledge with financial support, collective organisation and engagement with institutions.

Repeated opportunities to mobilise women, work with communities and participate in leadership and gender-equality training expanded her public role. Despite threats and resistance, she contested a Ward Member election in a ward dominated by another caste community—and won. She continues to work through the Women's Federation and a women-led Farmer Producer Organisation under the program. Her journey shows how inclusive livelihood interventions can become pathways to elected leadership when technical and financial support are accompanied by collective solidarity, institutional exposure and

sustained investment in women's agency.

2.2 From trainee to knowledge leader: Kathanayagi

Kathanayagi, a landless woman from Sivaranthakam, joined the Biovillage Programme in 1992 through oyster mushroom cultivation. At the time, her household depended mainly on her husband's labour income from a mill. Mushroom production was deliberately chosen because it required little land, could be undertaken close to home and used paddy straw that was easily available locally.

Biovillage provided training and access to mushroom spawn, but the original rack-based system soon proved difficult: it occupied considerable space, produced limited yields and was vulnerable to rats. Rather than abandon the activity, Kathanayagi and her husband worked with the programme to adapt it. They developed a rope-based tier system that accommodated more mushroom bags and reduced losses, while other changes lowered costs and improved humidity management and marketing.

As the modified system improved production, Kathanayagi and her husband shared their experience and knowledge with the BioCentre, allowing the innovation to become part of the programme's wider learning. Kathanayagi subsequently became a master trainer, training more than 200 resource-poor women in mushroom production; the programme later documented women from associated groups taking up cultivation at a medium scale after learning from her. Her journey therefore involved a progressive shift—from trainee to producer, from producer to innovator, and from innovator to



knowledge leader. Biovillage did more than transfer technology to her; it created the space for her practical knowledge to flow back into the programme and onwards to other women.

2.3 From livelihood diversification to wider choices: Tamizhmani

Tamizhmani belonged to a farming household that depended heavily on groundwater-irrigated paddy and household labour. Income was seasonal and input costs were high. Through Biovillage, she introduced vegetables, flowers, livestock, fodder and improved paddy practices, including the System of Rice Intensification.

Together, these activities reduced dependence on one crop and created more regular income. Vegetables brought daily cash, while flowers, dairy and fodder added further streams and supported household cash flow. The programme also connected her to training, demonstrations and women's collectives.



Tamizhmani linked her improved economic position to educating her daughters. Over time, she formed 22 self-help groups, was elected to a dairy cooperative, contested a Panchayat election and became a board member of the Pasumai Farmer Producer Organisation. Her movement from farmer to recognised peer leader shows how livelihood gains, reinforced by exposure, collective participation and institutional roles, could widen household choices and public aspirations.

2.4 From enterprise support to bargaining power: Kamakshi

Kamakshi developed a terracotta enterprise with financial support from the women's federation. The loan helped her meet capital costs, expand production and eventually





employ other workers. But the significance of the intervention was not limited to credit or income.

As her enterprise grew, Kamakshi began to see herself differently—not simply as someone producing goods, but as an entrepreneur whose skill and labour had value. She described gaining the confidence to demand a price that reflected the quality of her terracotta products. This mattered because women in informal and home-based enterprises often enter markets with little information or bargaining power and may accept prices set by others. This was possible due to her orientation to entrepreneurship and business planning skills from Biovillage.

The federation's support therefore did more than finance production. It gave her a collective and institutional base, strengthened her legitimacy and helped her negotiate with greater confidence. Her story shows that economic empowerment is not only about whether a woman earns. It is also about whether she can value her own work, influence the terms of exchange and participate in markets from a stronger position.

These women entered through different activities and travelled different distances. What connected their journeys was not one

livelihood, but the wider support around it—training linked to technology, credit linked to productive use, institutions women could rely on and harnessing collective power, overcoming local socio-cultural gender norms, markets they could reach, and opportunities to take on progressively larger roles.





3. The Levers That Made Change Possible

BIOVILLAGE'S

defining feature was not the number of activities it offered, but the architecture that connected them. Five levers repeatedly helped turn an available opportunity into one woman could use, sustain and shape.

3.1 A trusted local support system

The Biovillage Resource Centre, or Biocentre, served as a familiar hub for technology demonstrations, skills and entrepreneurship training, inputs, animal-health services, farm equipment, enterprise advice and links to public schemes. Village Knowledge Centres brought hyperlocal information on crops, livestock, weather, markets and entitlements closer to daily village life, often in local languages and through a mix of technologies. Women became knowledge workers, operators and community cadres, building peer-learning

networks. Crucially, communities had a trusted place to return when a crop failed, an animal became sick or an enterprise faced difficulty.

3.2 Technology adapted with communities

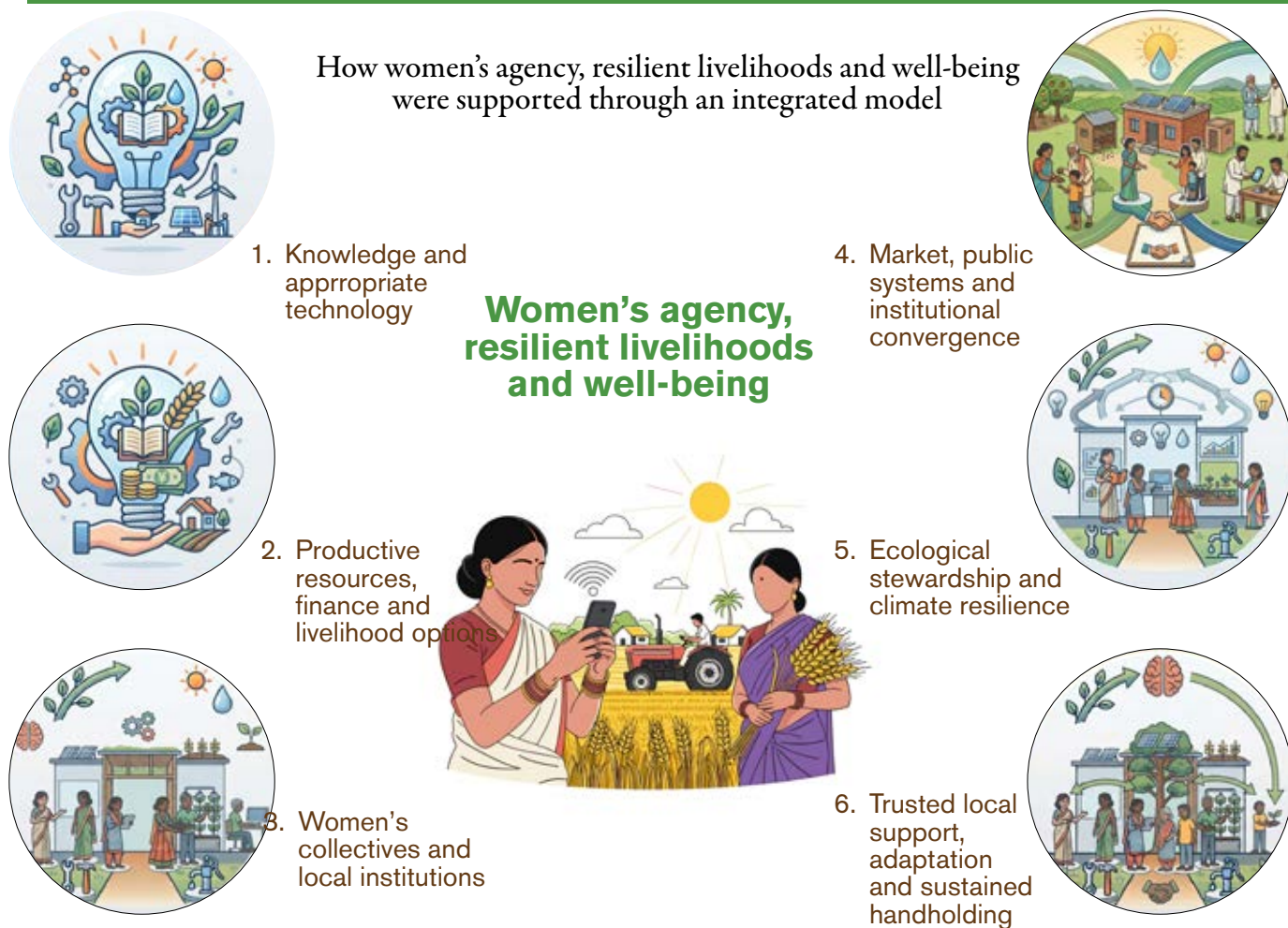
Biovillage treated technology as something to be tested and demystified rather than transferred unchanged. Practices were adapted to local resources, scale and management capacity. Kathanayagi's mushroom system is one example. In a later phase, ecological-intensification practices introduced with 24 paddy and bhendi (lady's finger) farmers in 2019 were adapted and replicated in other crops and villages. Technology transfer thus became a process of local testing, modification and horizontal learning between scientists and communities. Practices were more likely to endure when farmers found them useful, locally relevant and economically viable.

3.3 Finance connected to productive support backed with social capital

SHGs, bank linkages and the community bank gave women access to savings and credit, but finance worked best when connected to the rest of the livelihood pathway. Trust and relationships within groups and the federation provided social backing for productive investment. A dairy loan required animal-health advice, fodder, insurance and a reliable milk buyer; a microenterprise needed equipment, business planning, working capital and markets. By linking finance to technical and institutional support, the programme sought to make credit an enabling asset rather than an isolated transaction or a new source of debt.



Figure 1. The Biovillage ecosystem: connecting multiple interventions to advance women's agency and transformation



3.4 Collectives that built capability and voice

Women's self-help groups began as spaces for savings, loans and livelihood support, but also created repeated opportunities to meet, keep records, speak, resolve disagreements and act together. As groups federated through the Innuyir Grama Sangam, new roles emerged for animators, trainers, executive members and community leaders. Collectives provided practical support and reduced the isolation of approaching a bank, travelling for training, starting an enterprise or challenging an unfair practice alone.

Convergence across institutions

MSSRF worked with government departments, KVKs, universities, banks, research institutions, cooperatives and market actors. Rather than replace them, it often bridged the distance between these institutions and rural households—translating information, coordinating bundled services and connecting one form of support to the next. The model's strength lay in the relationship among the levers: together, they enabled women to receive an opportunity, act on it, adapt it and, in some cases, lead others.



4. What Changed for Women? From Reach and Benefit to Agency and Transformation

THIS chapter uses the Reach–Benefit–Empower–Transform (RBET) framework as its organising lens, supported by insights from the Women’s Empowerment in Agriculture Index, CGIAR gender research and FAO’s Gender Transformative Approaches. The framework is used as a qualitative reading rather than a scorecard. It asks four linked questions: Who was reached? What material benefits followed?

Did women gain greater agency, recognition and leadership? Did institutions or social relations begin to change? To these the chapter adds a fifth lens specific to Biovillage’s pro-nature commitment: did women’s ecological stewardship gain recognition and voice? This distinction matters because participation figures can conceal very different depths of change.

Reach: Inclusion beyond the usual participants

Biovillage deliberately reached beyond landowning farmers to include landless women and women from small and marginal farming households. Multiple livelihood options created different entry points: women without land could enter through mushrooms, livestock, coir or other enterprises, while farming women could diversify crops, adopt new practices and move up value chains. Village institutions and SHGs reduced the social and physical distance between women and formal expertise, while social mobilisation made groups a platform for accessing productive resources. Reach was therefore not simply a headcount; it depended on whether opportunities were usable by women with different assets, identities and

constraints.

Programme reflections indicate that 20–25% of groups eventually dropped out, largely among landed, upper-caste and older farmers. This pattern is important because it suggests that inclusion and continuity were shaped by social position as well as programme design. More systematic evidence is still needed on who remained involved, who left, and how caste, age, marital status, land access and care responsibilities influenced participation.

Benefit: Resources gained, Control less certain

Women gained practical benefits: livelihood options, knowledge and skills, savings and credit, technical advice, institutional links, collective power and, in some cases, livestock, equipment, land or other productive assets. The programme also documented diversified household income and greater investment in children’s education.

Programme reflections point to stronger productive roles and decision-making, and to positive changes where income and assets were held in women’s or joint names. Yet access is not the same as control, and benefit is not synonymous with empowerment. Domestic and caregiving responsibilities remained unevenly shared, often adding to women’s burden, while the historical record provides less systematic evidence on who controlled earnings, assets and credit. Income gains could therefore coexist with heavier workloads or limited say over resources. These distinctions are central to a contemporary gender assessment.

The ecosystem design also shows why



benefits rarely came from one input. Training became useful when women could obtain materials, seek advice and reach a market; crop demonstrations required follow-up and inputs; dairy required veterinary services and milk collection. The programme's contribution was to connect these elements rather than treat training as an endpoint.

Agency: From receiving support to making decisions

For some women, material benefits became the starting point for a deeper shift. Managing savings, repaying a loan, running an enterprise or solving a production problem gave women repeated experience of making decisions. Agency was not delivered through one empowerment session; it grew through practice—speaking in a meeting, travelling independently, negotiating with a buyer, approaching an official, adapting a technology or training another woman. It was also relational: women's ability to act depended on family support, collective backing and recognition from institutions. Recognition within households often began with contributions to income, care, children's education and social relationships. The deeper question is whether that recognition translated



into greater say over household, farm and enterprise decisions.

Collective power: From individual confidence to public leadership

SHGs and the federation helped turn individual confidence into collective capability and social capital. Women could draw on



group backing to secure credit, resolve disputes, challenge norms or act on issues that exceeded one household. Programme records describe collective responses to domestic violence and alcohol-related harm, challenges to caste exclusion, and participation in village and federation governance. Pakkirichi's journey shows how such backing could help a woman cross caste and gender barriers and enter elected public office. By the end of the

documented period, the programme reported 12 elected Panchayati Raj representatives, 36 community role models and 12 resource persons recognised by government.

Leadership did not begin only when a woman contested an election. It was practised in keeping accounts, convening meetings, training peers, representing a village or refusing to accept an inaccurate public claim. The reported numbers therefore do not capture all the women who exercised leadership in different spheres. Nor was individual confidence enough on its own: collective institutions provided legitimacy, shared risk and access to networks. Investments in social mobilisation, co-creation, capacity building, enabling governance and collective action supported these transitions across the different components of Biovillage.

Current evidence is still needed to understand which women moved from participation to sustained leadership, what enabled their transitions and what held others back.

A fifth lens: Ecological stewardship and women's voice

The pro-nature orientation was not an environmental add-on. Biovillage connected livelihoods with the conservation and productive use of land, water and biodiversity through crop diversification, soil and water management, nutrition gardens, fodder, bio-inputs and the rehabilitation of common resources, especially water bodies. Women participated in many of these activities, yet the historical documentation is less explicit about whether they influenced natural-resource decisions or whether their ecological knowledge was recognised. A gender lens asks not only how women contributed to resilience, but whether they had voice and control in how resources were managed.



Transformation: What outlasts the individual

The programme's records point to changes that extended well beyond individual income. Daughters' education gained greater importance, women travelled beyond their villages, caste boundaries were challenged, assets were sometimes placed in women's names, and women entered cooperatives and local government. These experiences suggest shifts in recognition, aspiration, mobility and access to public space. They also show how economic entry points and new skills could contribute to wider transformation when accompanied by collective support, institutional roles and sustained handholding.

The 2006 Kodathur assessment also captured some of the complexities accompanying these changes. Women's responsibilities could increase as they took on livestock management, group accounts and engagement with banks and government offices. At the same time, it recorded instances of men sharing responsibility for children, older family members and cattle when women were occupied with other work. These early observations underline the importance of examining economic participation alongside workload, care and household

roles (MSSRF, 2006). Seen historically, this breadth of ambition was remarkably forward-looking. Although Biovillage did not use today's language of gender transformation, intersectionality or women-centred design, its human-centred, pro-women, pro-poor and pro-nature orientation anticipated many questions that now shape rural-development practice.

A gender-focused reading of the available evidence also points to what contemporary programmes should document more deliberately: women's control over earnings and assets; influence in household and community decisions; changes in paid, unpaid and care work; differences across caste, age and landholding; and whether leadership roles and collective institutions endure. Transformative change becomes visible not only when individual women advance, but when institutional practices, public recognition and social norms begin to shift. Tracking these dimensions would help organisations and policymakers understand not only whether women benefited, but how far benefits translated into agency and lasting social and institutional change.



5. Revisiting the Biovillage Vision for Today

MORE than three decades after it was first imagined, Biovillage remains striking for the breadth and foresight of its vision. It treated rural development not as the delivery of one technology or livelihood, but as an enabling ecosystem around people and their lived realities. Its human-centred, pro-women, pro-poor, pro-nature and pro-livelihood foundations brought together concerns now discussed more explicitly as gender transformation, social inclusion, climate resilience, knowledge equity and sustainable livelihoods. Some enterprises and institutions expanded, while others changed or declined as markets, public programmes, technology, land access and agrarian relations evolved. This history invites attention not only to what survived unchanged, but to what women and institutions carried forward.

The institutional forms created through Biovillage have evolved rather than simply disappeared. The original Bio Councils are no longer active, but several former committee members moved into leadership roles within the Innuyir Grama Sangam federation, including as Executive Committee members and Cluster Coordinators. The federation now connects approximately 150–160 self-help groups; Joint Liability Groups, introduced around five years ago, have expanded to approximately 238; and women-led Farmer Producer Organisations continue to support aggregation, value addition and market engagement. As dedicated funding reduced, the federation increasingly focused on financial inclusion, credit, entrepreneurship and livelihood support. The continuity of the Biovillage vision therefore lies not in preserving every institution unchanged, but in the ability of women leaders and collective institutions to adapt to changing needs (G. Prasad, personal communication, July 2026).

BioVillage's ecological and technological concerns were equally forward-looking.

Environmental sustainability, climate awareness and information and communication technologies were already integral to its evolving approach; they were not later additions to the model. Cyclones, climate variability, pressure on land and water, women's growing role as farm managers and men's movement into non-farm work have made that integrated vision even more relevant. Rural women today also navigate fragmented holdings, migration, changing labour markets, emerging food markets, digital platforms and questions of access to devices, data and information. Younger women may seek pathways beyond traditional livelihoods, while greater economic and public participation can also intensify time poverty, drudgery and unpaid care.

Capacity building must evolve with these realities. Production and technical skills remain essential, but women producers also need market-facing capabilities: understanding demand, quality, value addition, branding, packaging, pricing, market intelligence, digital literacy, e-commerce and online marketing. The aim is not simply to train women in an activity, but to help them identify viable opportunities, participate across value chains and strengthen their bargaining power. It should also enable women to understand and influence how digital platforms, data and AI-enabled agricultural services are designed, accessed and governed.

Making BioVillage's founding values explicit in 2026 also means treating them as continuing design questions. Programmes need to ask who is included and who remains at the margins; who controls income, assets, technology and data; who influences household, livelihood and institutional decisions; who carries paid, unpaid and care work; whether technology is co-created with women; and which capabilities and institutions endure after external support recedes. These questions do not replace BioVillage's human-centred philosophy; they make its pro-women

commitment measurable in a rural economy whose opportunities and constraints have changed.

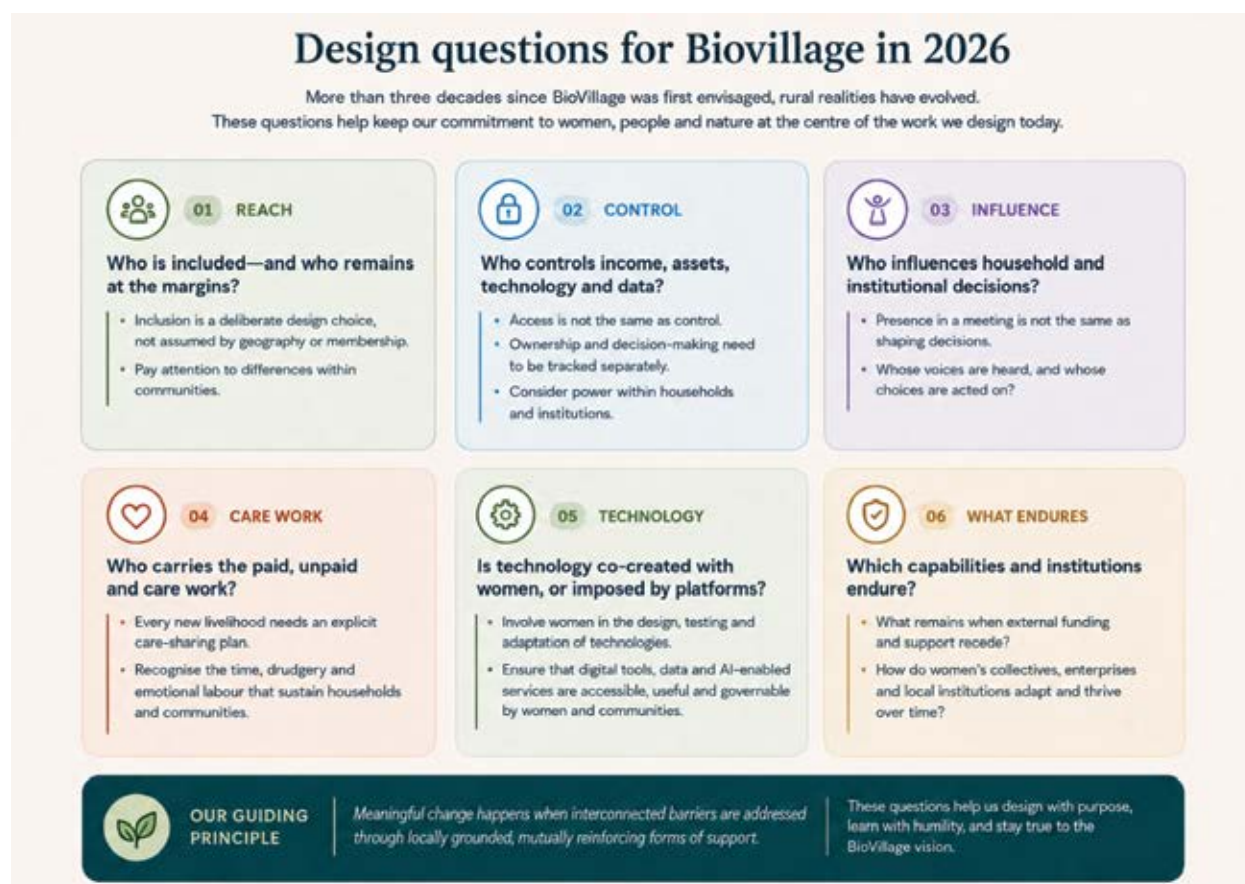
A contemporary expression of BioVillage would therefore not reproduce a fixed package. It could begin with clearly articulated outcomes—nutrition-sensitive and climate-resilient livelihoods; greater control over income and productive assets; reduced drudgery; stronger collective voice and leadership; ecological well-being; and meaningful participation in digital and data governance—and then assemble the locally relevant combination of knowledge, technology, finance, markets, public systems and collective support needed to achieve them.

The idea of Biohappiness remains central: improving well-being without diminishing the natural resource base on which rural lives depend. In 2026, that principle has become even more relevant as fragmented holdings, uncertain water availability and ecological stress shape rural

livelihoods. This context strengthens the case for recognising women not only as cultivators and custodians of biodiversity, but also as researchers, knowledge holders and co-creators of work on indigenous seeds, local ecological knowledge and climate adaptation. The same spirit that enabled Kathanayagi to become a co-designer of her mushroom system, rather than only a recipient of technology, remains deeply relevant.

This carries forward BioVillage's central insight: meaningful change emerges when interconnected barriers are addressed through locally grounded and mutually reinforcing forms of support. Viewed in this way, BioVillage is not only a historical collection of interventions, but an enduring way of thinking about women-centred rural development and Biohappiness.

Figure 2. Continuing questions for women-centred rural development





Conclusion

BIOVILLAGE moved the needle for women by connecting resources and relationships often delivered separately—knowledge, adaptable technology, finance, markets, collectives and institutional access. These connections created repeated opportunities to decide, manage, adapt, teach, travel and lead. The journeys were diverse, and the movement from material benefit to wider empowerment was neither automatic nor universal; the programme nevertheless showed how inclusive livelihood gains could become pathways to agency and equity.

Seen from 2026, the breadth of this vision remains remarkable. Long before today's language of gender transformation, intersectionality, climate resilience and women-centred design, Biovillage's human-centred, pro-women, pro-poor and pro-nature philosophy was engaging with many of these concerns in practice. Its enduring legacy lies not in any single intervention, but in an ecosystem approach that placed women's capabilities, collective agency and ecological well-being at the heart of rural development.

References

M. S. Swaminathan Research Foundation. (2013a). *Biovillages: Paradigm of human-centered sustainable development [Brochure]*.

M. S. Swaminathan Research Foundation. (2013b). *Biovillages: Transforming lives and livelihoods*.

M. S. Swaminathan Research Foundation. (2006, November). *Biovillage programme at Kodathur (Pondicherry): In partnership with State Bank of India (MSSRF/RR/06/13)*.

Quisumbing, A. R., Gerli, B., Faas, S., Heckert, J., Malapit, H., McCarron, C., Meinzen-Dick, R. S., & Paz, F. (2023). Assessing multicountry programs through a “Reach, Benefit, Empower, Transform” lens. *Global Food Security*, 37, Article 100685. <https://doi.org/10.1016/j.gfs.2023.100685>

Alkire, S., Meinzen-Dick, R., Peterman, A., Quisumbing, A. R., Seymour, G., & Vaz, A. (2013). The Women's Empowerment in Agriculture Index. *World Development*, 52, 71–91. <https://doi.org/10.1016/j.worlddev.2013.06.007>

doi.org/10.1016/j.worlddev.2013.06.007

Elias, M., Cole, S. M., Quisumbing, A. R., Paez Valencia, A. M., Meinzen-Dick, R. S., & Twyman, J. (2021). Assessing women's empowerment in agricultural research. In R. Pyburn & A. van Eerdewijk (Eds.), *Advancing gender equality through agricultural and environmental research: Past, present, and future* (pp. 329–364). International Food Policy Research Institute. https://doi.org/10.2499/9780896293915_09

Food and Agriculture Organization of the United Nations, International Fund for Agricultural Development, & World Food Programme. (2020). *Gender transformative approaches for food security, improved nutrition and sustainable agriculture: A compendium of fifteen good practices*. <https://doi.org/10.4060/cb1331en>





RECLAIMING TIME, VOICE AND DIGNITY

Case Study of the Kairali Integrated Tribal Development Project in Wayanad District¹

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1. Introduction

THE Kairali Adivasi Ooru² Integrated Tribal Development Project (henceforth Kairali Project) was implemented by the M.S. Swaminathan Research Foundation (MSSRF) in Mukkilpeedika, Muppainad Grama Panchayat, Vythiri Taluk, Wayanad, in the period between 2012 and 2015, with the objective of improving the socio-economic and ecological well-being of one of the region's most marginalised tribal settlements. Spread across 32 hectares of forest land recognised under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act,

2006 (henceforth FRA)³ the settlement is home to 80 tribal households, predominantly Paniya (74%), one of the most marginalised tribal communities in Kerala, with the remaining households belonging to the Thachanadan Mooppan community which in the local social order occupies a higher position than the Paniyas and have historically been more resourceful than the Paniyas. Prior to the intervention, the settlement was characterised by severe deprivation, including inadequate housing, unsafe drinking water, the absence of sanitation and electricity, fragile livelihoods, and widespread dependence



on seasonal agricultural wage labour especially on coffee plantations.

Recognising that poverty and deprivation in tribal communities are multidimensional and deeply intertwined with historical inequalities that indigenous communities have endured, the project adopted a participatory development approach. The architects of the project along with the community members addressed the social, economic and political marginalisation that the indigenous communities face through a bundled approach that simultaneously addressed natural resource management, livelihood enhancement, infrastructure development, food and nutrition security, capacity development, and women's empowerment. Unlike conventional development programmes that focus primarily on infrastructure or income generation, the project positioned women's empowerment as a cross-cutting objective embedded across all interventions, acknowledging that sustainable tribal development requires strengthening women's access to resources, reducing drudgery, enhancing livelihood opportunities, improving health outcomes, and increasing participation in community institutions. A closer look at the project design reveals that both the community members and the project designers were aware that development is a complex, gendered process that generates differential and often unequal experiences for men and women across different communities.

Over three years, the project demonstrated the pathways through which integrated tribal development can generate transformative and sustainable outcomes. This was one case where the principles of an Evergreen Revolution, as articulated by Prof M.S Swaminathan, namely, ecological viability, economical feasibility, social and gender equity, energy efficiency and employment security were sought to be translated into action on the ground. While tangible improvements in water availability, environmental restoration, agricultural productivity, livelihood diversification, and community infrastructure are evident, the project's broader significance lies in its contribution to enhancing women's

capabilities, reducing their drudgery, creating an ecosystem of care, expanding livelihood opportunities, strengthening their role in community institutions, and fostering greater social inclusion.



2. Life Before the Kairali Project

THE Paniyan are the largest indigenous community in the state of Kerala, with the highest concentration residing in Wayanad district. Historically, the community was subjected to bonded labour, primarily working in the paddy fields owned by landlords from dominant social groups. Deprived of ownership over productive resources, Paniyan households were almost entirely dependent on wage labour for their survival, with men, women, and even children contributing to the household economy.

In 2002, approximately 126 landless Adivasi families from different parts of Wayanad occupied 32 hectares of tropical semi-evergreen forest situated at an altitude of 821–867 metres above sea level. This occupation formed part of the broader land reclamation movement led by Adivasi leader C. K. Janu across Wayanad, which sought to reclaim ancestral lands and secure land rights for the adivasi communities. At the time of occupation, the forest was largely uninhabitable, with dense stands of wild bamboo and almost



no infrastructure. Men, women, and children collectively undertook the arduous task of clearing sections of the forest to construct temporary shelters and establish the settlement, even inner paths for basic mobility.

To sustain their livelihoods during this period, many families continued to engage in wage labour. Men and women travelled to the coffee and pepper plantations in the regions from which they had originally migrated, while others worked in paddy fields or in wetlands that had been converted

into arecanut plantations. The decline in paddy cultivation in Wayanad and the rise of banana and arecanut cultivation in wetlands resulted in significant loss of work, especially for women. Moreover, these workplaces were located far from the Mukilpeedikka forest settlement. Residents descended the steep forest terrain each day and commuted (mostly by walking) between 20 and 30 kilometres to reach their places of work. Upon returning, they continued clearing bamboo and preparing the land for habitation. The physical demands of establishing the settlement while simultaneously relying on distant wage labour proved unsustainable for many households. Consequently, around 46 families eventually left Mukilpeedikka, returning to their previous locations.

By 2012, approximately 80 families remained in the settlement and were granted legal rights over the occupied land under the landmark Forest Rights Act. Following the recognition of these rights, the settlement was named Kairali. Although securing legal tenure represented a significant milestone in the struggle for land rights and social justice for the historically marginalized Paniyan community, improvements in living conditions remained limited.

Basic infrastructure and essential services continued to be largely absent. In particular, the settlement lacked both natural water sources and public water supply systems. As a result, women were required to travel downhill 1.5-2 kilometres of extremely arduous terrains each day to collect water from public wells and taps for household consumption. The considerable time and physical effort required to secure water, combined with the absence of viable livelihood opportunities within the settlement, meant that most households continued to depend on low-paid wage labour.

Housing conditions were similarly inadequate. Families of four to six members resided in small temporary hutment dwellings with limited access to safe drinking water, sanitation, and other basic amenities. These conditions contributed to poor health outcomes, including high rates of anaemia, low birth weight, and infant mortality. The burden of domestic work, caregiving, and ensuring household food and water security fell predominantly on women. Consequently, the need to travel long distances to obtain water, procure food, and engage in wage labour substantially increased women's time poverty, reduced opportunities for rest and income generation, and adversely affected their physical health and overall well-being.

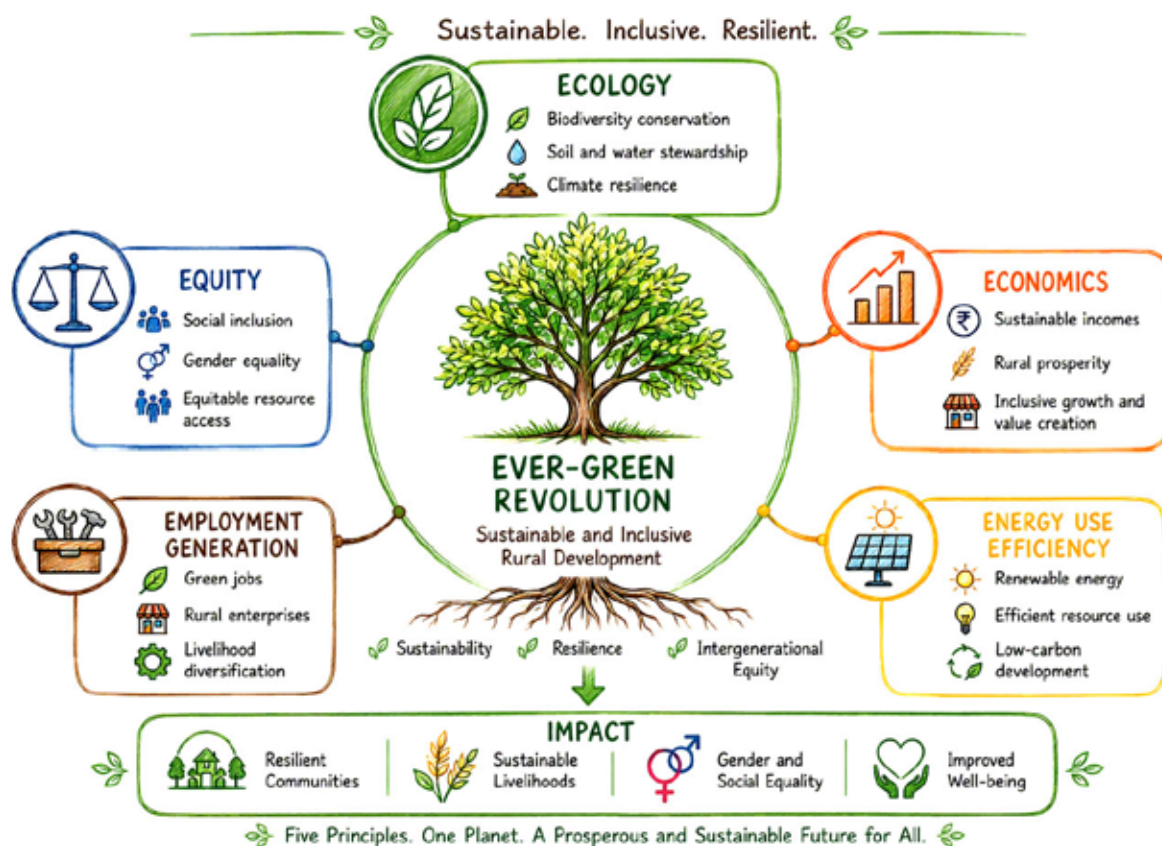
3. The Need for an ‘Ever-Green Revolution’

THE Kairali project was among the earliest initiatives conceptualised and implemented by the M. S. Swaminathan Research Foundation (MSSRF) to operationalise Prof. M. S. Swaminathan’s vision of the Evergreen Revolution. Swaminathan articulated this concept in the early 1990s as a response to the emerging ecological and social challenges associated with the first Green Revolution. While the Green Revolution had substantially increased food grain production and helped India achieve food self-sufficiency, it also exposed significant

concerns related to environmental degradation, depletion of natural resources, widening regional and socio-economic inequalities, and the exclusion of marginalised groups, particularly women and smallholder farmers, from the benefits of agricultural growth.

Recognising these limitations, Swaminathan argued that agricultural development could no longer be driven solely by productivity gains. Instead, he emphasised that the challenges of environmental degradation had to be understood alongside rising economic inequalities, jobless

Figure 1. The 5 Es Framework for An Evergreen Revolution



Source: M S Swaminathan, 1996



growth, and the increasing feminisation of poverty. As he observed, “the tools for measuring sustainability will have to be enlarged in a manner that concurrent attention can be paid to economic viability, environmental sustainability and social equity” (Swaminathan, 1996). He therefore proposed the Evergreen Revolution as a pathway for achieving sustainable increases in agricultural production and productivity without causing ecological harm or exacerbating social inequities. Central to this vision was the integration of five interdependent principles—ecology, equity, economics, employment generation, and energy-use efficiency (the 5Es)—to ensure that the short- and long-term goals of food security, livelihood enhancement, and environmental conservation were mutually reinforcing rather than conflicting.

The Kairali project translated these principles into practice by demonstrating how participatory,

gender-responsive, and ecologically sustainable rural development interventions could simultaneously strengthen livelihoods, conserve natural resources, and promote social justice. In doing so, it served as an early demonstration of MSSRF’s commitment to advancing an Evergreen Revolution that placed sustainability and equity at the centre of agricultural and rural development.

As described earlier, the life of women, men and children in Kairali were marked by inequalities, lack of livelihood opportunities, poor health and lack of access to basic infrastructure and amenities calling for a development intervention that brought together all the 5 E principles.

4. The Genesis of the Kairali Project

IN 2012, the Integrated Tribal Development Programme (ITDP) Officer invited the M. S. Swaminathan Research Foundation (MSSRF) to submit a proposal under the Special Component Plan (SCP) and Tribal Sub-Plan (TSP) to design and implement a comprehensive livelihood and development programme for tribal families. MSSRF’s proposal, which focused on improving the livelihoods of the most vulnerable Paniya families, was reviewed by the Wayanad District Collector in consultation with a multidisciplinary team representing the District Planning Office, Departments of Agriculture, Soil Conservation, Industries, Dairy Development, and Animal Husbandry. As Kairali was among the poorest Paniya settlements at the time, it was selected for implementation.

The interdepartmental review process fostered collaboration with government departments whose support was critical for ensuring

convergence and long-term sustainability. Before signing a Memorandum of Understanding (MoU) between the ITDP Office and MSSRF, the project team conducted multiple field visits to Mukilpeedika to understand the community’s socio-economic conditions, priorities, and aspirations. Guided by a participatory planning approach, these consultations actively involved community members in identifying development priorities and shaping the design, implementation, and ownership of the interventions.



5. Transformative Agenda-Setting

SINCE the success of the project was entirely dependent on the partnership between the community, MSSRF, local government and the government line departments, dedicated efforts were put into building these relationships. But neither was the community a homogenous unit nor were the government institutions gender sensitive. The attempt of the project, therefore, was to center the concerns and priorities of women in development planning and reconfiguring the existing institutional dynamics between the tribal men and women with the state based on

principles of equality. To this extent, six strategies were used to foreground the “gender equality” agenda. These were:

- a. **Equitable and Gender-Responsive Planning:** Gender was treated as a cross-cutting principle, with the distinct needs and priorities of women and men integrated into all planning and livelihood interventions through gender-disaggregated evidence. Rather than adopting a uniform approach, the project recognised the structural disadvantages faced by tribal communities,



particularly women, in accessing land, natural resources, public services, and livelihoods. Participatory village-level assessments informed context-specific interventions, while ensuring the equal and meaningful participation of women and men throughout the project.

- b. Ecological and Habitat Restoration:** The project integrated gender into ecological restoration by recognising that tribal women were disproportionately affected by environmental degradation while possessing extensive knowledge of biodiversity, forests, water, and household food systems. Instead of treating women as passive beneficiaries, it positioned them as central actors in planning, implementing, and sustaining habitat restoration. Basic infrastructure development was also recognised as an essential component of gender-responsive habitat restoration.
- c. Employment Generation and Economic Empowerment:** By promoting crop diversification, establishing poultry, apiary, dairy, and composite mushroom units, and providing farm, non-farm, and green skills training, the project created local livelihood opportunities for women, reducing their dependence on poorly paid, long-distance wage labour.
- d. Institutional Partnerships and Governance:** The project forged strong partnerships with local governments and line departments to promote integrated community development, strengthen governance, and build women's capacities to participate actively in local decision-making.
- e. Centering Care in Community Engagement:** Care was a guiding principle throughout the project. From the outset, the project team engaged women, men, and children with empathy and respect. The community kitchen, jointly managed by MSSRF staff and community members during intensive planning and implementation phases, exemplified how care shaped

relationships, participation, and collective action across the project.

The overall approach of the project was interdisciplinary, that brought together the natural and social sciences to understand the context and issues in depth and then worked closely with the community members to design strategies that put indigenous knowledge and practices at the centre. While the core team only had 4 members, it leveraged the support of agricultural scientists, microbiologists, natural resource management experts in MSSRF and brought in expertise from elsewhere to contribute towards specific activities.

Figure 2. Architecture of the Integrated Tribal Development Project implemented in Kairali Colony





1. The Architecture of Change

THEKairali project adopted an integrated, participatory approach that combined community engagement, natural resource conservation, livelihood enhancement, capacity building, and infrastructure development to address the multidimensional challenges faced by the tribal settlement.

Participatory Planning and Community Engagement: The project began with a participatory assessment to identify the community's needs, priorities, and aspirations. Multiple visits were undertaken to engage with men and women, both separately and jointly, to understand their gender-specific as well as shared development needs. The assessment used key informant interviews, focus group discussions, and household surveys, ensuring representation of both women and men. The assessment team comprised the Project Coordinator, two field assistants, and six community-based staff members (five community mobilisers and one community teacher). Participatory transect walks and GPS mapping were undertaken jointly by the project team and community members to systematically document land use, agrobiodiversity, natural resources, infrastructure, and public amenities. Every household and dwelling unit in the settlement was mapped, providing the foundation for planning subsequent interventions.

Community-led Natural Resource and Agrobiodiversity Conservation: Given the fragile ecology of the hilly landscape, improving soil and water resources was a central objective. The interventions sought to conserve the thin topsoil, enhance year-round water availability, reduce the impacts of heavy monsoon rainfall and seasonal droughts, restore degraded landscapes, improve agricultural productivity, and strengthen climate resilience. The project supported the construction of brushwood check dams, restoration of streams, biological stabilisation of stream banks using reeds and pandanus, and the planting of vetiver grass on earthen bunds to reduce soil erosion. Since much of the settlement was initially covered with dense bamboo, crop augmentation and diversification

were undertaken in cleared areas. Based on community consultations and technical guidance from agricultural scientists, the project promoted coffee, pepper, arecanut, fruit trees, tree spices such as nutmeg, clove and garcinia, medicinal plants, cardamom, and fodder grasses, ensuring that interventions were locally appropriate and ecologically sustainable.

Sustainable Livelihoods and Employment Generation: Enhancing household incomes and reducing economic deprivation were key objectives, with particular emphasis on expanding livelihood opportunities for women whose employment had declined due to changing agricultural practices and the increasing reliance of plantation owners on migrant labour. To diversify income sources, the project established apiaries, high-tech polyhouses for vegetable cultivation and nursery raising, poultry units, dairy units, goat-rearing units, vermicomposting units, community germplasm plots for conserving rare tuber varieties, and a large-scale mushroom production unit managed by women's groups. Both women and men received technical training in agroecological farming, natural resource management, value addition of agricultural and forest produce, and green housing technologies to strengthen local capacities, improve livelihoods, and promote sustainable resource management.

Capacity Building: To address widespread malnutrition and poor health, the project promoted household nutrition gardens comprising vegetables, fruits, roots, and tubers, with small-scale mushroom cultivation integrated to improve dietary diversity. Household herbal gardens containing ten medicinal plant species were also established to support primary healthcare and strengthen traditional knowledge systems. Men and women were equally encouraged to maintain these gardens. Recognising the community's long history of social exclusion, the project organised awareness and life-skills programmes at the community facility centre on food and nutrition, maternal and child health, adolescent health, sexual and reproductive health, women's health, elderly care, water, sanitation and hygiene (WASH), and preventive healthcare. Delivered by trained



community facilitators in the local language using multimedia tools, these programmes enhanced accessibility and participation.

Common Infrastructure Development:

Participatory assessments and transect walks revealed severe deficits in housing, drinking water, sanitation, and community facilities. Community members also emphasised the need for a common space for meetings, training, collective activities, and a safe environment for children while women engaged in livelihood activities. In response, the project developed a community pond and shallow wells (kenis) to improve access to safe drinking water, a community facility centre, a solar power unit for the centre to reduce recurring electricity costs, and household biogas units as a sustainable source of clean energy.

Co-creation of Green Homes: The project promoted environmentally sustainable housing through practical training and apprenticeship programmes in green construction. These initiatives enhanced local skills while encouraging affordable, climate-resilient housing using locally available materials. Public housing programmes in hilly tribal regions such as Mukilpeedika often

faced delays because conventional construction materials were difficult and expensive to transport, with additional costs not covered by government programmes, leading contractors to abandon houses midway. To address this challenge, MSSRF partnered with Vasthukam, a green housing architecture firm based in Thrissur, to construct organic homes. The Vasthukam team trained both women and men in green housing technologies, enabling tribal families to build their own homes. In 2012, the total cost of constructing a green home was Rs. 4.75 lakhs, of which Rs. 2.6 lakhs was returned to participating families as wages. Beyond their ecological and economic benefits, the houses reflected tribal aesthetics and the aspirations of the families, while incorporating spaces and facilities that specifically supported women's needs.

2. What Changed for Women?

The Kairali project reflected a process of empowerment that enhanced women's access to productive resources, strengthened their capacity to exercise agency, and enabled tangible improvements in their well-being and livelihoods. Naila Kabeer's (1999) empowerment framework conceptualises empowerment as the process



through which individuals who have been denied the ability to make strategic life choices acquire this capacity. It comprises three interrelated dimensions: resources (material, human, and social assets), agency (the ability to define goals and act upon them), and achievements (the outcomes of exercising agency). The Kairali project intentionally designed interventions and developed implementation strategies in ways that enabled women equal access to resources generated through the project interventions, strengthened women's voices in decision-making and ensured that they translate into achievements that women value.

Resources: Expanding Women's Access to Productive and Social Resources: Prior to the project, the Paniyan families had limited access to productive resources despite being central to agricultural production. Although the families had secured legal rights over land through the Forest Rights Act, they lacked the infrastructure, knowledge, financial resources, and productive assets necessary to cultivate the land effectively.

Women's access to resources was particularly constrained by the absence of water, agricultural inputs, livelihood opportunities, and institutional support. The project substantially expanded the resource base of women through investments in both physical and social infrastructure.

A major impact of the project on women's everyday life was through the co-construction of permanent green houses that considered the needs and aspirations of women was one of the most transformative outcomes of the project. By recognising that women are held responsible for social reproduction, and that women spend considerable amount of their time in the domestic space (more than men), the houses designed took women's suggestions, aspirations and aesthetic preferences into account to construct both eco-friendly homes.

Apart from this, renovated wells, the community pond, and biogas units improved access to essential household resources, while soil and water conservation measures enhanced the productive potential of the land. Crop diversification introduced high-value perennial crops, medicinal plants, and fodder species, while income-generating assets, including poultry, dairy, goat-rearing, apiaries, mushroom cultivation, vermicomposting, and polyhouses, all of which provided women with new productive resources. Equally important, the establishment of Self-Help Groups (SHGs), their integration into Kudumbashree, and training programmes expanded women's access to financial services, technical knowledge, government programmes, and social networks. The project therefore shifted women from being dependent primarily on wage labour (the opportunity for which was steadily reducing) to possessing a wider portfolio of productive, institutional, and knowledge resources.

Recognising that many women had spent most of their lives engaged in wage labour with limited opportunities for education or civic participation, the project also organised interaction programmes with successful tribal women leaders and elected representatives. These exchanges broadened women's aspirations, enhanced their confidence, and strengthened their leadership capabilities. As a result, women increasingly participated in discussions and decisions related to community

development. These exposure visits inspired young women from the community to become formal part of the project as community mobilisers and teachers.

Agency: Strengthening Women's Capacity to Make Choices: Access to resources alone does not necessarily translate into empowerment unless women are able to exercise meaningful choice over their use. The project consciously adopted participatory planning processes that involved women in identifying community priorities and designing interventions. Women's participation was encouraged throughout implementation, ensuring that they were not merely beneficiaries but active contributors to development planning.

The creation of livelihood opportunities within the settlement significantly expanded women's decision-making capacity. Instead of having to accept distant and poorly paid agricultural work out of necessity, women gained greater flexibility in choosing livelihood activities that aligned with their skills, interests, and household responsibilities. Leadership training, ICT programmes, exposure visits, and interactions with successful tribal women leaders further enhanced women's confidence and aspirations. This inspired young women from the community to become community trainers, teachers, green housing technology trainers as part of the project.

Collective institutions such as SHGs also strengthened women's agency by creating spaces where they could deliberate, negotiate, and collectively solve problems. As women acquired technical knowledge and economic opportunities, they increasingly participated in decisions regarding agriculture, household expenditure, children's education, and community development.

Achievement: Improvements in Livelihoods and Wellbeing: The combined effect of expanded resources and enhanced agency translated into measurable improvements in the lives of men, women and children.

- For women, having a home of their own with facilities that reduce drudgery, provide them rest and give them a sense of dignity have been one of the biggest achievements through the project.



- Diversified farming systems and multiple livelihood opportunities increased household incomes while reducing dependence on insecure seasonal wage labour.
- Nutrition gardens, mushroom cultivation, backyard livestock, and herbal gardens improved dietary diversity and food security.
- Health outcomes also improved through increased access to clean water, reduced drudgery associated with collection of firewood by shifting to biogas use, preventive healthcare programmes, and greater awareness of nutrition and reproductive health.

The restoration of degraded land and improved agricultural productivity contributed to more sustainable livelihoods, while community infrastructure enhanced access to training, childcare, and social interaction.

Importantly, these achievements extended beyond material improvements. Women experienced greater self-confidence, improved mobility within institutional spaces, stronger community networks, and increased recognition of their contributions as farmers and resource managers. Younger women also gained experience of working as community trainers and teachers which improved their status within and outside the community.



Time: Reducing Women's Time Poverty

One of the project's most significant gendered impacts was the reduction of women's time poverty. Prior to the intervention, women spent substantial portions of their day fetching water, collecting fuelwood, travelling long distances for wage labour, and performing unpaid domestic work. The construction of ponds and renovation of wells considerably reduced the time spent collecting water. Household biogas units lessened dependence on firewood and indoor air pollution, reducing both fuel collection time and cooking burdens. The establishment of livelihood opportunities within the settlement eliminated the need for many women to travel 20–30 kilometres daily for wage labour. The time saved was not merely improved their efficiency, it also enabled women to participate in training programmes, engage in diversified farming, attend community meetings, participate in SHGs, spend more time with their families, and pursue new livelihood opportunities. The project therefore transformed time from a scarce and burdensome resource into an opportunity for learning, economic participation, and community engagement.

Voice: Strengthening Women's Participation and Collective Influence

Historically, Paniyan women have had only limited opportunities to influence decisions

around community development. Social exclusion, low literacy, and economic dependency often constrained their participation in public life. The project deliberately created institutional spaces through which women could express their perspectives and contribute to collective decision-making. The community facility centre became an important venue for meetings, training programmes, and community discussions. SHGs strengthened women's collective identity and provided platforms for dialogue, mutual support, and engagement with local governance institutions.

Exposure visits and interactions with tribal women leaders and elected representatives expanded women's understanding of leadership and public participation. As women gained confidence through training and collective action, they increasingly contributed to discussions on agriculture, livelihoods, natural resource management, and settlement development. Their voices were heard not only within community organisations but also in their interactions with government agencies. In fact, through these collective experiences Paniya women were able to successfully occupy leadership positions in the Forest Rights Committees.

Bodily Integrity: Enhancing Women's Health, Safety and Physical Wellbeing

Women's bodily integrity encompasses their ability to live healthy, safe, and dignified lives free from physical hardship and preventable health risks. Prior to the project, women experienced significant physical burdens arising from long-distance travel for water and wage labour, poor housing conditions, inadequate sanitation, nutritional deficiencies, and limited access to healthcare. Several project interventions directly contributed to improving women's bodily integrity. Access to clean water reduced physical strain and improved hygiene. Nutrition gardens, mushroom cultivation, and health awareness programmes contributed to better maternal and child nutrition. Medical camps facilitated health screening and increased awareness of women's reproductive and general health. Biogas units reduced exposure to smoke from traditional cooking fuels, while improved housing and sanitation enhanced overall living conditions. By

reducing physically demanding labour, improving nutrition, strengthening preventive healthcare, and enhancing environmental conditions, the project contributed to women's physical well-being, dignity, and quality of life.

Challenging gender norms: The strategies implemented through the project played a significant role in addressing the practical challenges faced by women in the community by improving their access to water, biogas, safe pathways for easier mobility, and, most importantly, safe, secure, and sustainable housing. By mandating the equal participation of women and men in all project interventions, the project also created a strategic space in the public domain where women could participate equally in community-level decision-making processes. These experiences, combined with the skills they acquired through capacity-building programmes, strengthened their agency and confidence to engage in public life. The project also demonstrated inclusive best practices, such as organising community kitchens during full-day training programmes, enabling both women and men to participate on an equal footing. Paniya women until then were only associated with agricultural wage work, but through the project they learnt new skills that were earlier seen to largely men's work.

3. Learnings from the Project

The Kairali interventions were designed not only to improve household livelihoods but also to address the structural inequalities shaping the institutions and everyday lives of tribal women. Recognising that women carried a disproportionate burden of unpaid care work while contributing substantially to household incomes through wage labour, the project adopted an integrated approach combining infrastructure development, natural resource management, livelihood diversification, nutrition security, capacity building, and women's empowerment. Rather than treating women's empowerment as a standalone activity, it was embedded as a cross-cutting objective across all project components. Dedicated livelihood programmes for women's groups, gender and leadership training, nutrition interventions, vocational education, ICT-based

capacity building, and the strengthening of Kudumbashree institutions enhanced women's social, economic, and political participation. Exposure visits with tribal women leaders and elected representatives broadened aspirations and strengthened peer learning, while maternal and child nutrition programmes reinforced women's role in family well-being alongside their need for institutional support and services.

Although women were at the centre of the project, empowerment was approached through a gender justice lens rather than as a women-only agenda. Recognising that gender-equitable and sustainable development requires the participation of both women and men, the project ensured their equal involvement in planning, implementation, and decision-making. Consequently, the benefits of improved natural resources, enhanced agricultural productivity, and stronger local institutions accrued to the entire community.

The project also generated significant benefits for men. As ecological restoration and diversified farming created local livelihood opportunities, many reduced seasonal migration and long-distance wage labour, allowing them to invest more time in family farming and household life. This improved livelihood security while enhancing confidence and well-being. Skill development initiatives created additional employment opportunities; for example, men trained in organic architecture were subsequently employed as skilled construction workers in government and private projects. Gender-sensitisation programmes also encouraged men to reflect on prevailing gender norms and household roles. By institutionalising inclusive decision-making, the project fostered greater recognition of women's labour, traditional ecological knowledge, and contributions to household welfare and community development, strengthening cooperation within households and demonstrating that gender-transformative approaches can generate positive outcomes for both women and men.

Taken together, these interventions went beyond livelihood enhancement to address the structural conditions underpinning women's poverty and marginalisation. By reducing time poverty, improving access to productive resources, diversifying livelihoods, strengthening food and nutrition security, enhancing knowledge and



leadership, and creating spaces for collective action, the project addressed multiple dimensions of gender inequality simultaneously. Rather than positioning women as passive beneficiaries, it recognised them as central actors in ecological restoration, household food security, livelihood diversification, and community governance, demonstrating that gender equality is a non-negotiable principle of development and challenging conventional approaches to “doing” development.

However, more than a decade after the project’s completion, the experiences of participating families have evolved. While many interventions initiated under Kairali have endured, several important gains have not been sustained.

4. What aspects did not stand the test of time?

The Kairali Project demonstrated the value of microsite-specific, participatory, and gender-transformative development planning in addressing the complex and intersectional challenges faced by historically marginalised communities. It showed that meaningful and lasting gender-responsive outcomes are possible only when gender equality is treated as a core development principle and integrated throughout the project cycle—from problem identification and design to implementation, monitoring, and evaluation.

However, sustaining these gains beyond the project period proved to be a significant challenge. While the project successfully institutionalised participatory planning during its implementation, these processes were not consistently sustained after external support came to an end. As a result, community participation in development planning gradually weakened, reducing the collective ownership and institutional momentum that had been built during the project.

The changing socio-environmental context of Wayanad has further exposed the limitations of project-bound interventions. The continuing agrarian crisis, increasing climate variability, and recurrent disasters such as landslides and floods have created new livelihood vulnerabilities for households in Kairali. These evolving challenges require sustained investments in resilience-building through long-term collaboration

among the community, local governments, research institutions such as MSSRF, and other development actors. Without such continued engagement, many of the project’s achievements remain vulnerable to reversal.

The sustainability of the project’s physical and institutional assets has also been influenced by changes in the relationship between the community and the local government. A notable example is the Community Facility Centre, which suffered extensive damage during the 2018 Kerala floods. Despite its importance as a shared space for community meetings, livelihood activities, and women’s collective action, the facility has remained unrepaired. The loss of this critical social infrastructure has reduced opportunities for collective engagement, particularly for women, and illustrates how the absence of sustained institutional support can undermine the long-term benefits of otherwise successful development interventions.

The Kairali experience therefore highlights that while well-designed participatory and gender-transformative projects can catalyse significant social change, their long-term sustainability depends on institutional continuity, strong local governance, sustained financing, and adaptive partnerships capable of responding to emerging social and environmental challenges. Rather than viewing sustainability as a project outcome, the case emphasises the need to treat it as an ongoing process of collaborative governance and continuous community engagement.

References

- Swaminathan, M. S (1996). *Sustainable Agriculture: Towards an Evergreen Revolution*. New Delhi: Konark Publishers.
- Kabeer, N. (1999). Resources, agency, achievements: Reflections on the measurement of women’s empowerment. *Development and change*, 30(3), 435-464.
- MSSRF (2015). *Tribal United Development Initiative- Kairali Tribal Colony*, Final Project Report, Kerala State Tribes development Department, Government of Kerala





CHANGING NUTRITION, CHANGING COMMUNITIES

**Making the Invisible Visible: Women's Agency
in Community-Led Nutrition and Food Systems
Transformation in Koraput**

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“The first harvest in Koraput was not vegetables. It was voice.”

“Why doesn’t our village have an Anganwadi?”

FOR years, the question had gone largely unasked. When Community Hunger Fighters began discussing nutrition in Lachanaguda, Koraput, the conversation quickly moved beyond food. Mothers needed a functioning Anganwadi. Children needed a place for supplementary nutrition, growth monitoring, and early childhood care. Yet raising the issue was not straightforward. Childcare was seen as a woman’s concern, while village decisions were often made elsewhere.

The conversation began within women’s Self-Help Groups before reaching the Gram Sabha. Women persuaded the wider community that the Anganwadi was not simply a service for mothers and children, but a village responsibility. A resolution was passed; repeated follow-up with government officials followed, and community members monitored construction until the center was completed. In the process, they did more than secure a public service. They demonstrated that improving nutrition required communities that could identify problems, organize collectively, and engage with public institutions.

MSSRF did not build the Anganwadi. It helped create the conditions for the community to demand, secure, and sustain it.

This story reflects a broader journey that has unfolded across Koraput over the past fifteen years. Although blessed with exceptional agrobiodiversity, the district has long experienced persistent undernutrition, food insecurity, and poor dietary diversity. Recognizing that these challenges could not be addressed through food production or nutrition messaging alone, MSSRF began experimenting with a different approach: one that placed communities, rather than technologies, at the center of change.

The Community Hunger Fighters (CHF)1 Programme, piloted in 2010 and expanded between 2012 and 2015 across **18 settlements (12 hamlets and 6 revenue villages)**, sought to strengthen local leadership through dialogue,

nutrition literacy, and participatory learning. Communities selected **90 Community Hunger Fighters**, with **at least two women chosen from each village**, creating a local network of women and men who facilitated discussions on nutrition, health, agriculture, and public services. Rather than delivering answers, these community volunteers encouraged people to examine the causes of hunger and identify locally relevant solutions. Over time, women who had previously participated primarily within households and Self-Help Groups increasingly emerged as facilitators, community resource persons, and participants in village decision-making, laying the foundation for broader changes in local leadership.

The experiences from the Community Hunger Fighters programme would later shape MSSRF’s broader work on farming systems, nutrition gardens, women’s collectives, and livelihood diversification. Between **2018 and 2022**, these ideas informed programmes that reached **1,575 small and marginal farming households across 47 villages**, integrating nutrition-sensitive agriculture, crop diversification, and community institutions into a broader food systems approach.

This publication traces that evolution. It argues that the most enduring contribution of these interventions was not a single technology or agricultural practice, but a gradual transformation in how communities understood food, worked together, and strengthened the institutions that shape nutrition. Along the way, women became increasingly visible not only as caregivers, but also as farmers, knowledge holders, community facilitators, and local leaders. The chapters that follow explore how dialogue, collective action, diversified farming systems, and women’s participation came together to build more resilient and gender-responsive food systems in Koraput.



Fifteen Years of Learning in Koraput



2010
Pilot Community Hunger Fighters

2012-2015
Community Hunger Fighters Programme



2018-2022
Family systems for Nutrition



Nutrition Gardens

Adult Nutrition Literacy



Policy Lessons

Programme at a Glance



18
Settlements

90
Community Hunger Fighters



1748
Households

47
Villages (Farming Systems)



1575
Households (Farming Systems)

40%
Women CHFs



Minimum two women selected from every village.

1. The first intervention was not food

“Before communities changed what they grew, they changed the questions they asked.”

FOR many years, efforts to improve nutrition in rural India focused on increasing food production, expanding health services and communicating nutrition messages. These interventions addressed important dimensions of undernutrition, yet they often assumed that communities lacked information or access alone. In districts such as Koraput, where agricultural biodiversity coexisted with persistent undernutrition, the challenge proved more complex. Food was available seasonally; government programmes existed, and households possessed rich ecological knowledge. Yet diets remained monotonous; maternal and child undernutrition persisted, and many public services were underutilized. Hunger was shaped not only by what people produced or consumed, but also by how communities understood nutrition, organized around common problems, and engaged with local institutions.

Recognizing this, MSSRF chose a different point of entry. Rather than beginning with agricultural technologies or behaviour change campaigns, it began with dialogue. The Community Hunger Fighters (CHF) Programme was designed on the premise that lasting improvements in nutrition would require communities to analyze their own realities before attempting to change them. Instead of appointing external volunteers, villages selected their own CHF's, creating a locally trusted group of women and men who could facilitate discussion, encourage participation, and stimulate collective reflection. Dialogue was therefore not simply a communication tool; it became the intervention itself.

Drawing on Paulo Freire's² principles of participatory learning, the programme moved away from one-way awareness campaigns towards

processes that encouraged questioning and collective problem-solving. Residential training programmes, village meetings, role plays, street theatre, and participatory exercises created opportunities for people to discuss everyday experiences surrounding food, health, and livelihoods. Rather than asking whether families knew what constituted a healthy diet, facilitators encouraged communities to ask why good nutrition remained difficult to achieve despite the resources already available around them. As discussions unfolded, conversations that began with food naturally expanded to sanitation, childcare, women's workloads, access to public services, agriculture, and social norms. Nutrition became the lens through which communities examined the broader conditions, shaping their wellbeing.

One of the programme's most significant innovations was making undernutrition visible. Community nutrition assessments were conducted not simply to generate evidence for the project, but to generate discussion within villages. Findings were shared with communities shortly after data collection, allowing families to see, often for the first time, the nutritional status of children and women in their own village. Rather than presenting statistics in isolation, facilitators encouraged people to interpret the results collectively. Why were some children undernourished while others were not? Why were pregnant women missing antenatal care? Why were growth monitoring and supplementary nutrition services not reaching everyone? The data did not provide answers; it prompted communities to ask better questions.

This process gradually changed how hunger was understood. Undernutrition was no longer viewed solely as the result of insufficient food or individual household behaviour. Communities



increasingly recognized that nutrition was influenced by multiple, interconnected factors, including agricultural practices, childcare, sanitation, access to government services, women's participation, and local decision-making. Equally important, responsibility for improving nutrition began to shift from individual households to the community. Women, who had traditionally discussed childcare and food within households and Self-Help Groups, found new spaces to raise these concerns publicly, while men increasingly engaged in conversations that had previously been viewed as outside their domain. The programme did not seek to change gender relations directly; instead, it created opportunities for women and men to examine nutrition as a shared community responsibility.

The experience also demonstrated that participation does not emerge automatically; it must be intentionally nurtured. Residential trainings brought together women and men from different villages and social groups in ways that everyday village life rarely permitted. Learning took place through discussion rather than instruction, allowing participants to question long-held assumptions and learn from one another's experiences. Progress was gradual and uneven. Discussions around women's work, decision-making, and social norms were often difficult, while questioning existing practices required confidence that developed only over time. These experiences highlighted that improving nutrition was not simply about changing individual behaviour, but about creating the social conditions

in which communities could collectively reflect, deliberate, and act.

In several villages, discussions around the findings prompted immediate action. Severely undernourished children were referred to Nutrition Rehabilitation Centers, pregnant women began accessing antenatal services through ASHAs and ANMs, and communities made greater use of existing health and nutrition programmes. In Nuaguda, Gunthaguda and Bolliguda, discussions following the nutritional assessments were accompanied by a dramatic increase in childhood immunisation, with coverage rising from near-zero levels to complete coverage, including booster doses. Rather than directing communities towards predetermined solutions, the assessments enabled

them to recognize existing gaps and make better use of services that were already available.

The CHF programme therefore achieved something more fundamental than increasing nutrition awareness. It changed how communities understood hunger, from an individual problem requiring information to a collective challenge requiring dialogue, shared responsibility, and local leadership. Once communities began seeing nutrition differently, they were ready to move beyond understanding problems to acting on them together. That journey, from knowledge to collective action, is the focus of the next chapter.

2. Turning Knowledge into Action

“Knowledge changed individuals. Collective action changed institutions.”

BY the end of the Community Hunger Fighters training programme, villages had something they did not possess before; an understanding of why undernutrition persisted in their communities. Families began recognizing the importance of dietary diversity, childcare, sanitation, and public health services. Yet knowledge alone could not improve nutrition. A mother could understand the importance of supplementary feeding, but without a functioning Anganwadi, her child would remain underserved. Farmers could appreciate the value of diverse diets, but without access to quality seeds or technical support, production would remain unchanged. Communities could identify their challenges, but unless they could organize and engage with local institutions, those challenges would continue to persist.

As confidence grew, communities began using existing institutions to address local priorities. In Kharaguda, Community Hunger Fighters mobilized a village meeting after nutritional

assessments revealed poor utilization of the Anganwadi Centre, which lacked building, weighing equipment and regular growth monitoring. Persistent follow-up with the Panchayat and ICDS authorities resulted in the sanction of a new Anganwadi building, provision of weighing equipment, and regular growth monitoring.

Recognizing this, MSSRF treated collective action not as an outcome of the programme, but as a deliberate part of its design. Community Hunger Fighters were never intended to become permanent service providers. Instead, they became facilitators who helped villages analyze problems, bring people together, and identify locally appropriate solutions. Rather than creating parallel systems, MSSRF worked through existing village institutions. Dialogue gradually moved beyond training halls and entered Self-Help Group meetings, village gatherings, Panchayat discussions, and Gram Sabha deliberations. Nutrition was no longer discussed as a private



concern confined to households; it became a shared responsibility requiring collective decision-making.

One of the programme's most significant contributions was creating a network of local leadership that extended beyond individual villages. Between 2013 and 2022, **more than 200 women and men from over 70 villages** participated in residential learning programmes, becoming community champions who carried discussions on nutrition, agriculture, and public services back to their villages. Over the following decade, around 1,000 community members received additional training in agriculture, animal husbandry, fisheries, composting, seed treatment, post-harvest management, and value addition, gradually building a locally rooted resource base

for nutrition security rather than relying solely on external expertise.

One of the most significant lessons from Koraput is that lasting improvements in nutrition were achieved not by creating new programmes, but by enabling communities to make better use of the institutions that already existed. Community Hunger Fighters did not replace frontline workers or government systems; they helped bridge the gap between them and the people they served. Through nutrition assessments, communities identified the issues that mattered most. Self-Help Groups became spaces where women discussed these concerns and built consensus. Gram Sabhas transformed these discussions into collective decisions, while CHFs worked alongside Panchayats, Anganwadi workers, ASHAs, ANMs



and Block officials to ensure that these decisions were translated into action. Communities did not stop at demanding better services; they monitored Anganwadi centres, followed up on immunisation, revived community grain banks, tracked progress on local commitments and continued engaging with government departments until change was visible. In doing so, nutrition moved beyond the household and became a shared responsibility embedded within village institutions.

Equally important, though less visible, was the development of social trust. Regular dialogue, residential trainings and collective activities strengthened relationships within communities and between community members, CHFs and public institutions. This trust enabled knowledge to be shared, encouraged people to engage confidently with local systems and created the conditions for sustained collective action. The

Koraput experience demonstrates that lasting change is most likely when communities are equipped not only with knowledge, but also with trust, confidence, leadership and institutional pathways to influence the systems that shape their everyday lives.

3. Growing Nutrition, Not Just Food

FOR generations, farming in Koraput was organized around survival. Paddy filled the fields during the monsoon, while uplands produced a handful of seasonal crops. Vegetables appeared only for a few months of the year, fruits were scarce, and many nutrient-rich indigenous foods were gradually disappearing from farms and forests. Families were not simply choosing monotonous diets; the food system itself offered limited choices. Improving nutrition therefore required changing agriculture itself.

3.1 Looking Beyond Yields

For many households in Koraput, the changing seasons shaped what reached the plate. Rice was plentiful after the harvest, but vegetables, fruits and pulses were not always within reach. As traditional food crops and indigenous crops gradually disappeared from everyday diets,

diversity gave way to seasonality. Home gardens reflected this reality, with an average of only four crop varieties at the start of the programme.

Recognizing that nutrition begins in the field as much as in the kitchen, MSSRF shifted the focus from increasing agricultural yields to improving the nutritional quality of farming systems. Rather than asking “How can farmers produce more?,” the programme asked, “How can farming provide diverse, nutritious foods throughout the year?” This led to the Farming System for Nutrition³ approach, which integrated crop diversification, nutrition gardens, indigenous foods, livestock, fisheries, and improved soil management into a single strategy for household nutrition. Instead of treating agriculture and nutrition as separate sectors, it brought them together to create food systems that were more diverse, resilient, and responsive to local dietary needs.



3.2 Diversifying the Food Basket

Transforming diets required transforming what was available on farms. Nutrition gardens became one visible component of this effort, but they were designed as part of a broader strategy to increase year-round access to diverse foods rather than isolated kitchen gardens.

Farmers in Koraput had deep ecological knowledge and long cultivated crops suited to their landscapes. Yet farming decisions were shaped by seasonal rainfall, limited irrigation, uncertain markets, and the need to minimize risk. Paddy remained the dominant crop because it secured household food needs, while vegetables and fruits were often grown only

opportunistically. Through the Farming Systems for Nutrition approach, farmers experimented with small, manageable changes: adding pulses after paddy, establishing nutrition gardens close to their homes, integrating backyard poultry and fisheries, improving soil fertility through vermicomposting, and reintroducing locally adapted vegetables, millets and tubers alongside improved varieties. Community demonstrations, peer learning and continued technical support reduced the risks associated with trying new practices, while nutrition literacy helped families see farming not only as a source of income, but also as the foundation of healthier diets.

The result was not a shift away from traditional agriculture, but an evolution of it. Diversified farming systems increased the availability of vegetables, pulses, fruits, and millets throughout

the year, while nutrition gardens expanded from an average of **four crop varieties to more than nine**, providing households with a wider range of foods for both consumption and sale.

3.3 Farming as a Community Enterprise

Agricultural transformation was not driven through technology alone. It was sustained through collective learning.

Community Hunger Fighters became local resource persons who demonstrated new cultivation practices, experimented with diversified cropping, revived home gardens, and shared their experiences with neighbors. Learning took place in farmers' fields, village meetings, Self-Help Groups, and informal community spaces, allowing innovations to spread through observation and peer exchange rather than external instruction alone.

The programme also strengthened community seed systems and encouraged households to conserve and exchange locally adapted planting materials. Families who observed successful nutrition gardens often adopted similar practices themselves, creating a ripple effect across villages. Some households diversified cropping by bringing leased land back into cultivation, while others used previously unused spaces around their homes to grow vegetables and fruits.

3.4 Evidence of Change

The cumulative effect of these changes was visible not only in farms but also in household diets and community food systems. In the Boipariguda project villages, cropping diversity increased substantially, with many households moving from cultivating only two or three crops to growing four or five, while home gardens remained productive for longer periods each year.

Evidence from the farming systems' evaluation suggests that adoption was uneven and shaped by local realities rather than the intervention alone. Most households relied on rain-fed, single-season paddy cultivation, with limited crop diversity and low vegetable availability at baseline. Diversifying production required training, improved seeds, and sustained technical support before farmers

began adopting practices such as pulse cultivation after paddy, intercropping, nutrition gardens, and improved soil management.

The evaluation also highlights that not all interventions proved equally sustainable. Practices that built on locally available resources: such as vegetable cultivation, crop diversification and vermicomposting continued well beyond the project period. In contrast, activities dependent on external inputs or supply chains, including mushroom cultivation and intensive fish farming, declined once access to mushroom spawn or specialized fish feed became limited. These findings underscore an important lesson from Koraput: lasting change depended less on introducing new technologies than on ensuring that innovations aligned with farmers' resources, labour availability, and existing farming systems. Where this alignment existed, households progressively diversified production and diets, moving beyond mono-cropping towards more resilient farming systems.

Diversified food systems did more than improve production. They created opportunities for women to participate in household decisions, strengthened local knowledge exchange and provided the practical foundation on which later community leadership emerged.



4. Women's Participation, Leadership and Collective Agency in Koraput

4.1 Women Were Always Central, But Rarely Recognized

Women were never passive participants in Koraput's food systems. They selected seeds, collected wild foods, managed household diets, cared for livestock and worked alongside men in agriculture. Yet much of this knowledge remained confined to the household and was rarely recognized in agricultural extension or local decision-making.

Rather than creating new roles for women, MSSRF's interventions strengthened existing ones. Nutrition literacy, farming systems, and community institutions provided spaces where women's knowledge became visible, valued, and shared beyond the household. Community Hunger Fighters (CHF), Self-Help Groups (SHGs), and village meetings created opportunities for women to participate not only as beneficiaries but also as facilitators and local resource persons. Between 2019 and 2020 alone, **52 Community Hunger Fighters** facilitated **66 community meetings**, reaching **1,500 community members** through village, SHG and Panchayat discussions.

4.2 Knowledge Built Confidence and Agency

The programme was designed around dialogue rather than one-way awareness campaigns. The shift was not simply from learning to teaching. Women who participated in CHF and SHGs began facilitating discussions, mobilizing households for Village Health and Nutrition Days, monitoring Anganwadi services, and supporting the adoption of improved farming and nutrition practices. These roles strengthened women's confidence while simultaneously improving community engagement with health, nutrition, and agricultural programmes. This progression

was reinforced through continued learning.

4.3 Food Became a Space for Decision-Making

Diversified farming systems also changed everyday household decisions. As nutrition gardens, pulse cultivation, backyard poultry and vegetable production expanded, women assumed a greater role in deciding what to grow, what to consume and what to sell. The farming systems evaluation found increased participation of women in nutrition garden management, SHG enterprises and agricultural activities, alongside greater involvement in household decisions related to food and livelihoods.

4.4 From Households to Community Leadership

Perhaps the most significant changes occurred beyond individual households.

SHGs evolved beyond savings groups into platforms for learning, experimentation, and collective action, while CHF became trusted intermediaries between communities and public institutions. Women participated in Gram Sabha discussions, monitored local nutrition services, strengthened community seed systems, and helped connect households to government programmes.

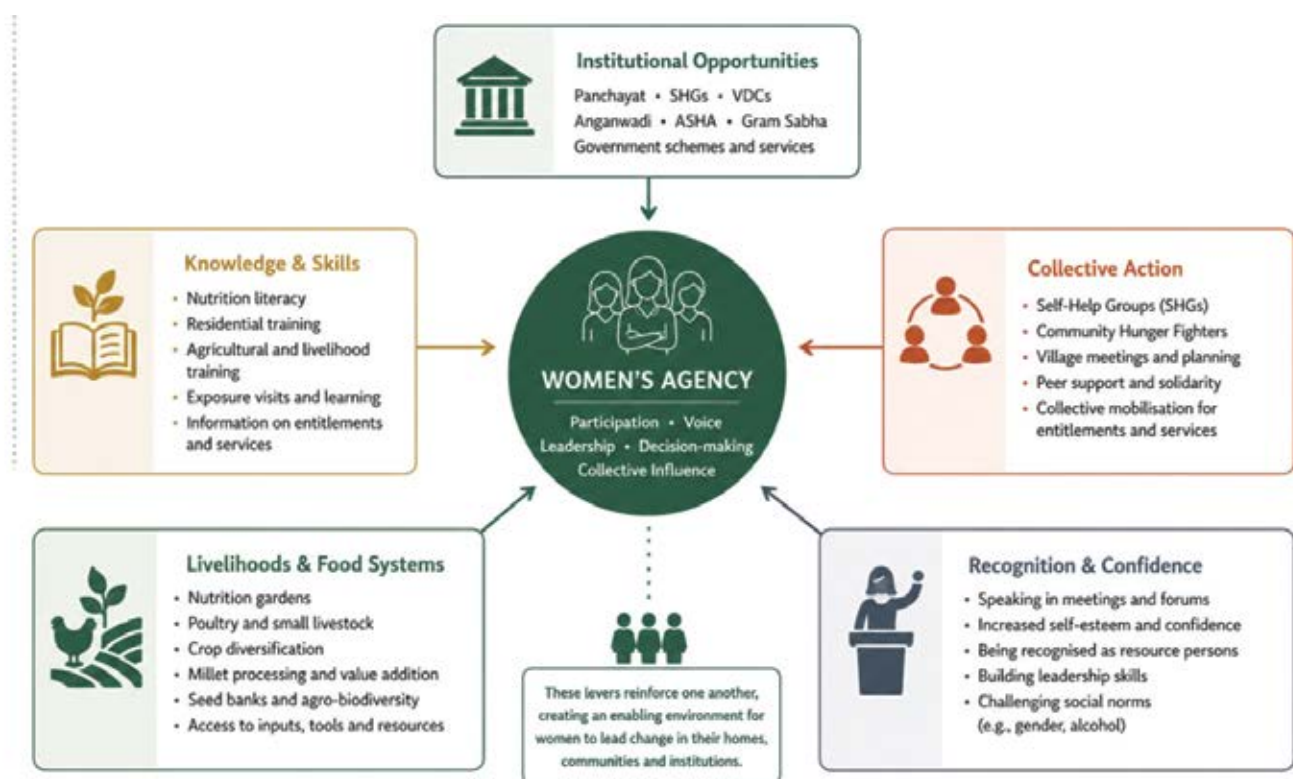
These changes did not represent a dramatic transformation in gender relations, nor did they eliminate structural barriers. Instead, they gradually expanded women's visibility, confidence, and influence within existing community institutions. The lasting contribution of MSSRF's work in Koraput lies not only in improved diets or diversified farms, but in demonstrating that strengthening food systems can also strengthen the people, particularly women, who sustain them.

The evolution of women's participation across

the Koraput interventions also reflect a progression described in gender-transformative frameworks such as the Reach–Benefit–Empower–Transform (RBET) framework. Women were initially reached through programme activities and benefited from improved knowledge, livelihood opportunities and nutrition interventions. Over time, evidence from Community Hunger Fighters, nutrition gardens and adult nutrition literacy suggests movement towards empowerment, with women increasingly facilitating discussions, participating in village institutions and influencing household

decisions. While the interventions were not explicitly designed to transform gender relations, they created opportunities that expanded women's voice, leadership and collective agency within existing community structures.

Figure 4.1. Levers Enabling Women's Agency





5. What Sustained Change? Lessons from Koraput

THE interventions implemented in Koraput over the past fifteen years demonstrate that improving nutrition required more than increasing agricultural production or expanding health services. Evidence from the Community Hunger Fighters programme, Farming Systems for Nutrition initiative, Nutrition Garden project, Adult Nutrition Literacy programme and independent evaluations suggests that sustained improvements emerged when interventions strengthened local institutions, built on existing farming systems and enabled communities, particularly women, to participate

in decision-making.

5.1 Begin with communities, not technologies

The strongest and most durable outcomes emerged where communities identified problems, interpreted evidence, and decided on local actions themselves. Participatory nutrition assessments enabled communities to recognize hidden hunger and increased utilization of existing services. The CHF programme further demonstrated the value of locally selected facilitators. Across



18 settlements, communities selected 90 CHFs, ensuring local ownership rather than dependence on external extension workers. Repeated dialogue and sustained community engagement also built trust between communities, frontline workers and local institutions, strengthening participation and collective action. Hence, community resource persons and participatory diagnosis should be treated as core investments rather than preparatory activities. Building local ownership and trust increases the likelihood that change will continue beyond project implementation.

5.2 Existing institutions proved more sustainable than parallel delivery systems

Rather than creating new governance structures, interventions strengthened existing village institutions. Community Hunger Fighters worked alongside Panchayats, Anganwadi centres, ASHAs, ANMs and Self-Help Groups to improve utilization of government services. Similarly, later farming systems interventions relied on SHGs, seed banks and village organizations to support adoption and knowledge sharing rather than project-specific committees. Therefore, strengthening institutional convergence is more sustainable than establishing parallel project structures. Investments should reinforce existing community and government institutions rather than replace them.

5.3 Diversified farming systems outperformed single-technology interventions

Crop diversification, pulse cultivation, nutrition gardens, millet processing, vermicomposting, fisheries, and backyard poultry collectively increased the availability of vegetables, pulses, millets, and animal-source foods while generating additional livelihood opportunities. Household diets that had previously been dominated by rice became noticeably more diverse.

By contrast, activities requiring regular external inputs, reliable irrigation, continuous technical supervision, or stronger market linkages were less consistently maintained. Water scarcity and

climate variability remained major constraints, particularly for nutrition gardens during summer months. Thus, Food systems programmes should prioritize low-input, locally adapted and climate-resilient interventions that communities can maintain independently over time.

5.4 Women's participation strengthened both food systems and local institutions

Although many interventions were not explicitly designed as gender programmes, women consistently emerged as key actors in sustaining change. The Community Hunger Fighters programme recommended that each village select **at least two women**, while **40% of Community Hunger Fighters were women**, and participation during residential trainings was equally shared between women and men. The Farming Systems evaluation concluded that increased participation enhanced both women's economic participation and household decision-making, while SHGs and seed banks strengthened collective action. The Adult Nutrition Literacy programme similarly documented women's increasing participation in village institutions, including **29 women among 37 participants** in a Village Development Committee meeting and the collective mobilization of around **100 women** against illicit liquor brewing. These findings suggest that food systems interventions also created spaces for wider civic participation. Hence, food systems programmes should recognize women not only as beneficiaries but also as community facilitators, knowledge holders, and institutional leaders.



Conclusion

THE Koraput experience demonstrates that lasting improvements in nutrition are achieved not through isolated interventions, but through empowered communities. By combining nutrition literacy, diversified farming systems, community institutions and local leadership, the initiatives enabled communities to identify their own priorities, strengthen collective action, and sustain change over time.

Women were at the heart of this transformation. As Community Hunger Fighters, members of self-help groups, managers of nutrition gardens and participants in village institutions, they served not only as beneficiaries but as facilitators, decision-makers, and agents of change. Their leadership strengthened household nutrition, enhanced community participation, and improved linkages with public services, illustrating the critical role of women's agency in building resilient food systems.

The Koraput experience offers an important lesson for future programmes: community ownership, women's leadership, and institutional convergence should be embedded as core design principles rather than treated as complementary components. Integrating these elements across agriculture, nutrition, and health programmes can create more inclusive, resilient, and sustainable pathways to food and nutrition security, while ensuring that communities remain central to the process of development.

References

Narayanan, R., Pandit, S., Nithya, D. J., & Bhavani, R. V. (2025). Adult nutrition literacy as part of farming system research: Insights gained in applying adult learning principles. *The Indian Journal of Nutrition and Dietetics*, 62(3), 329–350. <https://doi.org/10.21048/IJND.2025.62.3.49752>

Narayanan, R., Panda, A. K., Nithya, D. J., & Bhavani, R. V. (2022). Dialogue as a tool of nutrition literacy in an agricultural intervention programme in Odisha, India. *CABI Agriculture and Bioscience*, 3, Article 28. <https://doi.org/10.1186/s43170-022-00090-x>

Narayanan, R., Panda, A. K., & Nithya, D. J. (2025, February 21). The transformation of Koraput's tribal food basket. *The Hindu*. <https://www.thehindu.com/opinion/lead/the-transformation-of-koraputs-tribal-food-basket/article69244043.ece>

Narayanan, R., Nayak, T. R., Swain, S. K., & Tosh, R. (2015). Community Hunger Fighters: A people-centred programme focussing

undernutrition: Toolkit for implementation. M. S. Swaminathan Research Foundation.

Narayanan, R., Nithya, D. J., & Bhavani, R. V. (2025). Farming systems for nutrition: Endline evaluation report. M. S. Swaminathan Research Foundation.

Narayanan, R., Nithya, D. J., & Bhavani, R. V. (2025). Nutrition garden initiative: Endline evaluation report. M. S. Swaminathan Research Foundation.

Quisumbing, A. R., Gerli, B., Faas, S., Heckert, J., Malapit, H., McCarron, C., Meinzen-Dick, R. S., & Paz, F. (2023). Assessing multicountry programs through a “Reach, Benefit, Empower, Transform” lens. *Global Food Security*, 37, Article 100685. <https://doi.org/10.1016/j.gfs.2023.100685>

Kabeer, N. (1999). Resources, agency, achievements: Reflections on the measurement of women's empowerment. *Development and change*, 30(3), 435–464.





BEYOND THE SHORE

Women, Technology and Climate Resilience in Small-Scale Fisheries

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1. Introduction

ATdawn, long before most coastal towns stir, another economy is already at work. As fishing boats return to shore, women wait along beaches and landing centres to sort, clean, dry, process and sell the day's catch. For generations, these activities have formed the backbone of India's post-harvest fisheries economy. Men harvested fish at sea; women transformed a highly perishable resource into food, income and nutrition, connecting fishing communities with markets and households across the coast. Their labour

has sustained local economies through fresh fish vending, processing and value addition, yet it has rarely occupied the centre of fisheries policy or development.

India's small-scale fisheries support the livelihoods of nearly 28 million people, providing an important source of nutrition, employment and income for coastal households across the country. Fisheries are often viewed through the lens of marine capture, but the sector depends just as heavily on an extensive post-harvest economy



that includes sorting, processing, drying, transport and marketing. It is within this segment of the value chain that women have traditionally played a central role, turning highly perishable fish into products that sustain household incomes, local food systems and regional markets.

Women's contributions have nonetheless remained largely invisible within fisheries' development. Successive decades of modernization brought investment in mechanized fishing vessels, harbour infrastructure, navigation systems and cold chains, but this wave of technological change focused almost entirely on harvesting. The post-harvest sector, where women form the majority of the workforce, received comparatively little attention. As fisheries became increasingly centralised around larger harbours, commercial supply chains and export-oriented markets, many women who had traditionally worked as fresh fish vendors and processors found themselves pushed to the margins, concentrated instead in informal markets marked by low technology adoption, weak institutional support and diminishing control over market opportunities.

These structural inequalities have been reinforced by changes in coastal livelihoods themselves. Fish landings have consolidated at larger harbours, intermediaries have gained greater influence, and fish availability has become less predictable under climate-related disruption. Together, these shifts have deepened uncertainty across the post-harvest value chain: longer travel distances to procure fish, sharper competition for raw material, rising post-harvest losses, thinner profit margins. The daily work itself remains physically demanding. Fish is still head-loaded, dried in the open air, processed by hand and vended under difficult environmental conditions, often without adequate infrastructure, financial services or reliable market information. The result is not only occupational drudgery but persistent economic vulnerability.

A newer divide has emerged alongside these older ones. As markets, financial services and public programmes increasingly depend on digital platforms, women in post-harvest fisheries risk being excluded from opportunities that hinge on access to information and technology. Digital

exclusion, in this sense, is not simply a matter of mobile phone ownership. It restricts women's ability to access weather forecasts, market prices, government schemes, digital payments and wider business networks, and in doing so reproduces existing inequalities rather than overcoming them.

These challenges became especially visible in the aftermath of the 2004 Indian Ocean tsunami, which devastated coastal communities and exposed the many vulnerabilities facing India's small-scale fisheries. It was in this context that the Fish for All Research and Training Centre at the M. S. Swaminathan Research Foundation was established in the year 2009, as a post-tsunami rehabilitation initiative. Over the past two decades, the Centre has evolved beyond disaster recovery into a nationally recognised learning platform for strengthening climate-resilient, inclusive and sustainable small-scale fisheries. Recognising that women's resilience is inseparable from the resilience of fisheries themselves, the Centre has consistently approached technology not as an end in itself but as one element of a broader strategy combining knowledge, institutions, technology, markets and collective action. The WomenConnect Challenge grew out of this institutional journey, and it demonstrated that empowering fisherwomen takes far more than digital tools alone. It requires creating the conditions in which women can use technology to strengthen their livelihoods, expand their agency and participate more equitably in the future of India's coastal economies.

2. The Invisible Economy: Women's Work in Small-Scale Fisheries

If the fishing boat is the most visible symbol of India's coastal economy, the work that begins after the catch reaches shore is among its least recognised. Every basket of fish that reaches a household passes through numerous hands before it is consumed, sorted, cleaned, graded, dried, processed, transported and marketed, much of it by women whose labour quietly sustains both

household incomes and local food systems. Fisheries have undergone profound technological and economic transformation, yet the everyday realities of these women have changed in ways that have often increased their burdens rather than reduced them.

Unlike harvesting, where mechanisation has transformed productivity, post-harvest fisheries

Figure 1. Multiple, Interconnected Burdens Shaping Women's Livelihoods in Small-Scale Fisheries





continue to depend heavily on manual labour. Women spend long hours sorting, grading, cleaning, drying, processing and marketing fish, often under harsh environmental conditions. Fish vending frequently begins before sunrise, as women travel to landing centres to procure fresh fish before transporting heavy baskets to local markets or residential neighbourhoods. In many coastal communities, women carry 20–30 kg baskets on their heads over considerable distances, walking for several hours each day. Studies conducted in India's coastal fisheries consistently report high levels of musculoskeletal disorders, chronic back pain, neck injuries and joint problems among women fish vendors, a reflection of decades of physically demanding work undertaken with limited ergonomic support.

The transformation of India's marine fisheries has made this work even more demanding. As fish landings have shifted away from village beaches to larger fishing harbours, women increasingly travel longer distances simply to procure fish. At the same time, competition from wholesalers and larger traders has reduced their bargaining power, often leaving them to purchase smaller quantities of lower-quality fish at higher prices. Because fish is highly perishable, every delay in transport or market access increases the risk of spoilage and income loss. Limited cold-chain infrastructure, inadequate storage facilities and unreliable transport compound both the physical effort and the economic uncertainty that women face each day.

Women engaged in fish drying encounter a different, though equally demanding, set of challenges. Traditional drying practices depend on access to open coastal spaces and favourable weather, yet coastal erosion, expanding infrastructure and competing land uses have steadily reduced the availability of suitable drying grounds in many fishing villages. Fish is increasingly dried along roadsides and in open public spaces, exposing it to dust, contamination and inconsistent quality. Changing rainfall patterns and greater climatic variability interrupt drying cycles, increase post-harvest losses and



reduce the value of finished products. What were once seasonal occupational challenges have gradually become persistent livelihood risks.

Alongside these physical challenges, women now face a rapidly widening information gap. Fisheries markets have become increasingly dynamic, with prices fluctuating across locations, buyers demanding higher quality standards, and government services, financial transactions and market information moving onto digital platforms. Yet many women continue to rely on informal networks, personal contacts and middlemen for information on prices, buyers and public schemes. Limited digital literacy, restricted ownership of smartphones and low confidence in using digital technologies constrain their ability to participate fully in these emerging opportunities. Digital exclusion, in this setting, is not merely a technological disadvantage; it increasingly translates into reduced bargaining power, fewer market opportunities and diminished economic agency within an information-driven fisheries economy.

These challenges do not exist in isolation. Physical drudgery leaves little time for learning new skills or expanding businesses. Information asymmetries weaken women's negotiating power in markets. Poor infrastructure increases spoilage and reduces already narrow profit margins, leaving fewer resources to invest in improved technologies or diversify livelihoods. Climate variability amplifies each of these pressures, making fish availability, processing and marketing more uncertain. Women's livelihoods are shaped, then, not by a single constraint but by a web of interconnected challenges that reinforce one another.

Recognizing this complexity changes the way solutions must be designed. Reducing women's vulnerability in fisheries requires far more than introducing new technology or delivering a

stand-alone training programme. It demands a combination of interventions that simultaneously reduce occupational drudgery, strengthen access to knowledge, improve market participation and expand women's engagement with institutions. Technology becomes transformative only when it is embedded within this broader ecosystem of support. It is from this understanding that the Fish for All Research and Training Centre developed the WomenConnect initiative with the support of Reliance Foundation, not as a digital project alone but as an institutional response to the multiple, interconnected barriers that continue to shape women's work in India's post-harvest fisheries.

3. Building a Digital Ecosystem for Women's Coastal Livelihoods

THE barriers confronting fisherwomen were never isolated. Limited access to digital technologies, inadequate market information, physically demanding work, restricted access to finance and weak institutional support reinforced one another, creating a cycle that constrained both livelihoods and opportunity. Addressing any one of these challenges on its own was unlikely to produce lasting change.

It was from this understanding that the Fish for All Research and Training Centre designed the WomenConnect initiative. Rather than treating digital inclusion as a question of technology alone, the programme recognised that meaningful change depends on the ecosystem surrounding that technology. Digital tools become valuable only when women have the confidence to use them, access to relevant knowledge, opportunities to apply what they learn, and institutions that continue to support them long after formal training ends.

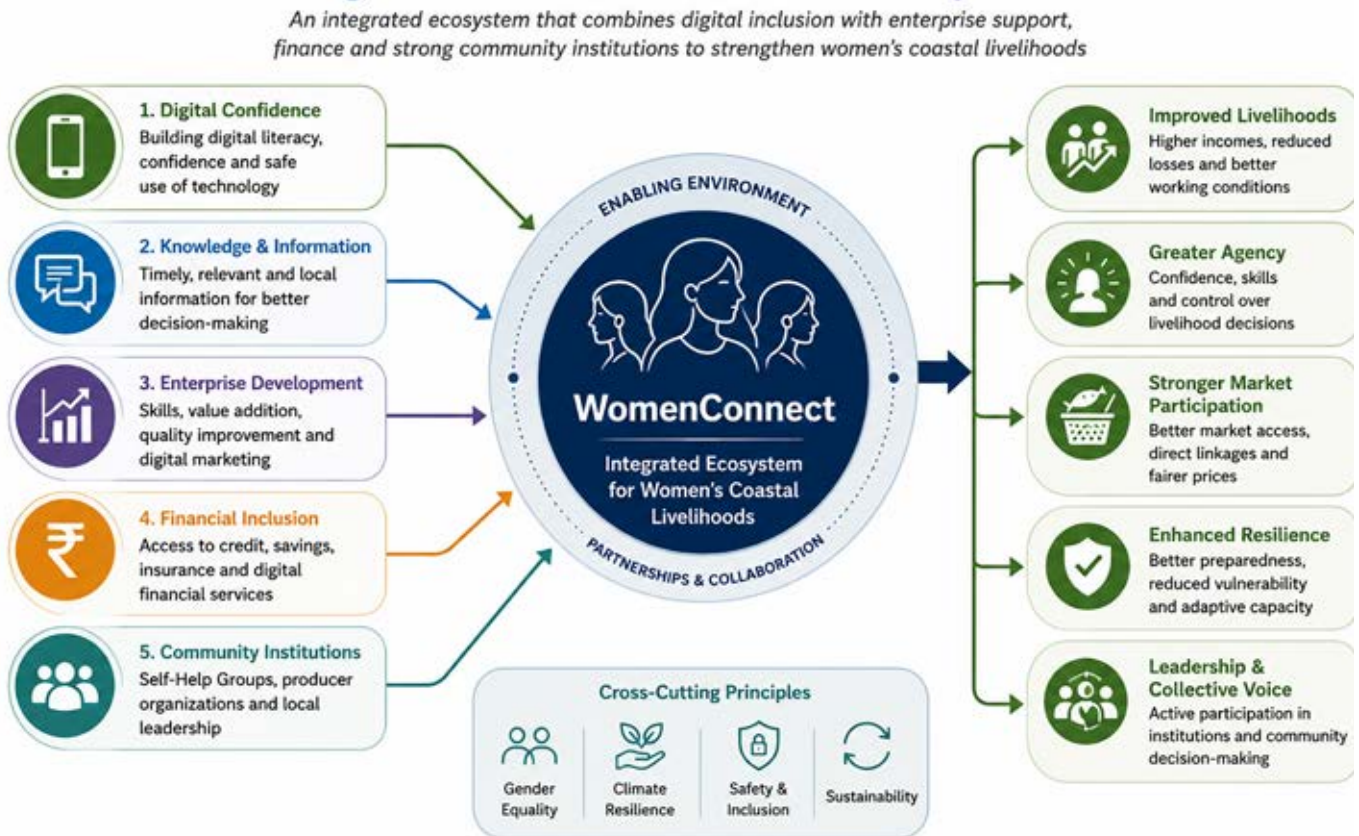
Instead of asking women to adapt to technology, WomenConnect adapted technology to the realities of women's work in post-harvest fisheries. Digital literacy was integrated with livelihood training, financial inclusion, market access and collective learning, so that each intervention strengthened the others. The result was not simply greater access to smartphones or digital platforms, but a gradual expansion of women's ability to make informed decisions, strengthen their enterprises and participate more confidently in the fisheries economy.

3.1 Access Before Adoption: Building Digital Confidence

For many participants, the first barrier was not the absence of smartphones but the uncertainty of how to use them. Many women already owned Android phones, but these were used primarily for voice calls; digital payments,



Figure 2. The WomenConnect Ecosystem: Linking Digital Technologies, Institutions and Livelihoods





Story from the Field From Processor to Entrepreneur – Valarmathi, Cuddalore

Valarmathi had spent years producing dry fish using traditional methods, selling only within nearby villages. Through digital literacy training combined with enterprise support, she learned digital marketing, business registration and food safety compliance. She soon began exhibiting her products beyond her village, expanding both her customer base and her confidence as an entrepreneur.

“Now, when I sell my products, I don’t feel like a small vendor—I feel like a businesswoman.”

Why it matters: Digital inclusion begins with confidence rather than connectivity. Technology is far more likely to be adopted when it strengthens livelihoods women already possess, rather than asking them to learn entirely new ways of working.

online searches, business applications and government services remained unfamiliar and, for many, intimidating.

WomenConnect therefore began by building confidence rather than distributing devices. More than 6,000 fisherwomen across Tamil Nadu and Puducherry participated in digital literacy programmes covering smartphone use, internet navigation, UPI transactions, WhatsApp Business, online safety and digital communication. Learning was delivered in local languages through peer mentors, repeated handholding and practical demonstrations, so that every new skill could be applied immediately to women’s daily work. Over 200 training sessions and 17 multilingual learning modules enabled participants to gradually integrate digital tools into their livelihoods, and 86 per cent reported improved digital confidence by the end of the programme.

The emphasis on confidence proved as important as the technology itself. Digital literacy was never treated as an end point, but as the foundation on which other livelihood opportunities could be built.

3.2 Making Information Work

Learning to use a smartphone is only the first step. Information creates value only when it helps people make better decisions.

Recognising this, WomenConnect moved beyond generic digital literacy to provide information directly relevant to women’s everyday work in post-harvest fisheries. The Fisherwomen Connect mobile application, multilingual audio advisories, WhatsApp groups and helpline services offered practical guidance on weather forecasts, fish handling, hygiene, value addition, market prices, government schemes and financial services.

These services evolved through continuous feedback from the women themselves. Bilingual interfaces, visual and audio learning content, transportation information, disaster alerts and simplified navigation reflected the realities of users with different levels of literacy and digital experience.

Rather than replacing local knowledge, these platforms strengthened it. Generations of experience in fish processing were complemented



with scientific guidance on preservation techniques, packaging, food safety and quality control, allowing women to improve both product quality and market competitiveness while retaining their traditional expertise.

3.3 Turning Knowledge into Enterprise

Knowledge alone rarely changes livelihoods unless women have opportunities to put it into practice. WomenConnect linked digital capability with enterprise development, financial inclusion and market access, so that learning translated into measurable economic gains.

Training extended beyond digital skills to

Story from the Field Learning that Changed Practice – Ananthavalli, Mayiladuthurai

After participating in digital literacy training and thematic video sessions on post-harvest technologies, Ananthavalli introduced hygienic drying and improved preservation techniques within her Self-Help Group. Better processing methods increased both product quality and shelf life, allowing the group to reach new markets and improve returns.

“Today, we are not just selling dry fish—we are producing high-quality products that fetch better prices and give us financial stability.”

Why it matters: Information has the greatest impact when it is timely, locally relevant and directly connected to the decisions women make every day.



include value addition, packaging, branding, costing, food safety certification and digital marketing. Women were also connected to formal financial institutions: eighty-one Self-Help Groups secured nearly 39.84 lakh in credit linkages, enabling investments in solar dryers, ice boxes, grading trays and other post-harvest equipment. Digital payments, WhatsApp Business and direct market linkages further reduced dependence on intermediaries while making transactions faster and more transparent.

Together, these investments strengthened everyday business decisions. More than half of trained women reported increased sales and profits, while improved processing practices substantially reduced post-harvest losses. Technology, in this context, was not an occasional tool but became integrated into routine business management.



Story from the Field Digital Payments, Real Independence Gunavathi, Karaikal

Before joining the programme, Gunavathi often waited several days for buyers to settle payments. After learning to use WhatsApp and UPI-based transactions, payments became immediate, and communication with buyers became easier, improving both cash flow and business planning.

“Earlier, I had to wait for days to receive my payments. Now, with GPay, I receive my money instantly and securely.”

Why it matters: Digital technologies generate the greatest economic returns when combined with finance, market access and entrepreneurship, rather than introduced as standalone innovations.



3.4 Building Institutions that Outlast Projects

Perhaps the most enduring lesson from WomenConnect is that sustainable transformation depends less on technology than on the institutions that enable people to use it collectively.

Throughout the programme, Self-Help Groups, producer organisations, community



leaders, financial institutions and government agencies became the channels through which women learned, exchanged knowledge and expanded opportunities. Peer learning emerged as one of the programme's strongest mechanisms. Women who first gained digital confidence gradually became trainers and mentors within their own communities, encouraging others to adopt new practices and reducing resistance to

Story from the Field Technology Beyond Business – Merita, Ramanathapuram

As a ward member, Merita began using WhatsApp groups and digital communication to engage more effectively with residents, reducing delays in addressing local concerns and improving coordination within her community.

“Before, I had to wait for the next meeting to discuss important matters. Now, I can communicate instantly with everyone.”

Why it matters: Technology becomes transformative when communities and institutions grow alongside it. Lasting change depends not only on digital infrastructure, but on investing in leadership, collective organizations and long-term partnerships.

change.

This institutional approach also created the foundation for WomenConnect to evolve into the broader SeaConnect initiative, extending digital services while strengthening partnerships between research organisations, government agencies and coastal communities. The programme showed, in the end, that technology is most powerful not because it replaces human relationships, but because it strengthens them, connecting women to markets, institutions, knowledge and to one another.

4. From Access to Lasting Change: Understanding the WomenConnect Journey

THE story of WomenConnect is not simply one of the digital inclusions. It is a story of how access to technology gradually evolved into stronger livelihoods, greater confidence, and more resilient community institutions. These changes cannot be understood through the number of women trained or the digital tools introduced alone. More meaningful questions ask whether women were able to translate new opportunities into improved livelihoods, greater agency and stronger participation in the institutions that shape their lives.

One way of understanding this progression is through the Reach–Benefit–Empower–Transform (RBET) framework. Rather than viewing impact as a single outcome, the framework recognises that meaningful change unfolds in stages: women first gain access to opportunities, then begin to benefit from them, gradually strengthen their agency, and ultimately contribute to changes that endure beyond the life of a project. Viewed through this lens, WomenConnect illustrates a journey from expanding access to fostering longer-term institutional transformation.

4.1 Reaching Women Who Had Been Left Behind

The programme successfully reached women who had historically remained excluded from digital services, formal financial systems and institutional support. More than 6,000 fisherwomen across Tamil Nadu and Puducherry participated in digital literacy programmes, supported by over 200 training sessions, multilingual learning modules, mobile-based information services

and community-level facilitation. Self-Help Groups served as important entry points, allowing knowledge and digital skills to spread beyond individual participants through peer learning and collective engagement.

The significance of this achievement, however, lies not simply in the scale of participation. By tailoring digital learning to women's occupations, literacy levels and local languages, the programme reduced many of the practical barriers that often prevent women from participating meaningfully in digital initiatives.

4.2 Turning Access into Livelihood Benefits

Access translated into tangible livelihood improvements because digital tools were





introduced alongside technical training, enterprise development and market support. Women adopted improved post-harvest practices, gained access to market information, diversified marketing channels and increasingly incorporated digital transactions into their businesses.

Project monitoring indicates that 51 per cent of trained women reported increased sales and profits, while improved processing methods contributed to a 41 per cent reduction in post-harvest losses. Institutional credit linkages amounting to nearly 39.84 lakh enabled Self-Help Groups to invest in productive assets such as solar dryers, grading equipment and cold storage accessories, improving product quality and reducing waste.

These outcomes suggest that digital technologies generated value because they addressed multiple livelihood constraints simultaneously, rather than functioning as

standalone innovations.

4.3 From Participation to Agency

The programme's most significant contributions extended beyond economic gains. As women became more confident in using digital tools, many also assumed more active roles in managing enterprises, negotiating with buyers, participating in Self-Help Groups and accessing financial services independently.

Programme assessments found that 65 per cent of participants actively applied ICT-based knowledge in their fisheries enterprises, while women increasingly reported greater confidence in making business decisions, engaging directly with institutions and mentoring others within their communities. Leadership emerged not as a separate

intervention, but as a natural outcome of improved knowledge, stronger networks and greater economic participation.

This progression highlights an important distinction between access and empowerment. While digital literacy provided women with new skills, empowerment emerged only when those skills translated into greater control over decisions affecting their livelihoods.

4.4 Creating Change That Lasts

The deepest changes occurred at the institutional level. Rather than creating parallel systems, WomenConnect strengthened existing community institutions by integrating digital technologies into Self-Help Groups, producer organisations and local knowledge networks. Partnerships with government departments, financial institutions and research organisations further expanded women's access to services, markets and public programmes.

Equally important, the initiative demonstrated that digital inclusion is not a one-time intervention but an evolving institutional process. The transition from WomenConnect

to the broader SeaConnect platform reflects an effort to sustain learning, partnerships and service delivery beyond the life of a single project. In this sense, the programme represents not only a digital innovation, but also a model of institutional innovation for strengthening gender-responsive coastal livelihoods.

WomenConnect demonstrates that meaningful transformation occurs when digital technologies are embedded within systems of collective learning, enterprise development and institutional collaboration. The progression from reach to transformation was neither immediate nor linear; it emerged through the cumulative interaction of digital capability, improved livelihood opportunities and stronger community institutions. While structural inequalities in small-scale fisheries continue to persist, the initiative provides evidence that gender-responsive digital interventions can expand women's choices, strengthen their resilience and create pathways towards more inclusive and sustainable coastal development.

5. Looking Ahead: Lessons for Inclusive Digital Transformation

WOMEN Connect began with a simple but important insight: women have always been central to India's small-scale fisheries, yet they remain on the margins of the systems that shape information, finance, markets and institutional support. The experience of the programme shows that improving women's livelihoods requires addressing these barriers together rather than one at a time. While implemented in coastal Tamil Nadu and Puducherry, its lessons extend well beyond the fisheries sector, offering

broader insights for designing inclusive digital development programmes.

Start with livelihoods, not technology

The programme succeeded because it responded to the realities of women's work rather than beginning with digital tools. Smartphones, digital payments and online platforms were introduced as practical solutions to everyday challenges: finding buyers, receiving payments, improving product quality and accessing



timely information. Digital adoption became meaningful because technology strengthened livelihoods that already existed, instead of asking women to adapt to unfamiliar systems.

Digital inclusion needs an enabling ecosystem

Technology alone cannot transform livelihoods. The experience of WomenConnect shows that digital skills generate lasting value only when they are accompanied by access to finance, markets, enterprise support and opportunities to apply new knowledge. Digital inclusion works best, then, when embedded within a broader ecosystem of livelihood development rather than delivered as a standalone intervention.

Community institutions are the foundation of change

Much of the programme's success rested on the strength of existing Self-Help Groups and community networks. These institutions created trusted spaces where women learned together, shared experiences and built confidence collectively. The spread of technology depended as much on relationships and peer learning as on the digital platforms themselves, a reminder of how much local institutions matter alongside digital infrastructure.

Design technology around people

The Fisherwomen Connect platform evolved



continuously through feedback from women users. Local languages, audio and visual learning materials, simplified interfaces and occupation-specific content made the platform practical and accessible. The experience reinforces a simple but powerful principle: digital solutions should adapt to the realities of communities rather than expecting communities to adapt to technology.

At the same time, WomenConnect also shows what digital interventions cannot achieve on their own. Access to technology does not eliminate the structural inequalities facing women in fisheries.

Many continue to work in low-value segments of the value chain, own few productive assets and remain underrepresented in fisheries governance. Climate variability, declining fish catches and volatile markets continue to shape livelihoods regardless of improvements in digital capability. Digital inclusion should therefore be treated as one component of a broader strategy that also invests in infrastructure, value chains, financial inclusion, social protection and women's leadership.

WomenConnect shows that meaningful transformation occurs when digital innovation is combined with sustained community engagement and institutional partnerships. Its lasting contribution is not simply that more women learned to use smartphones or digital payments, but that these tools became part of a wider process through which women strengthened their enterprises, expanded their networks and participated more confidently in the coastal economy.

As governments increasingly invest in digital public infrastructure and the blue

economy, the challenge is no longer whether digital technologies should be used in fisheries, but how they can be designed to reach those who have traditionally been excluded. The experience of WomenConnect suggests that the answer lies not in more technology, but in better integration of technology with people's livelihoods, local institutions and the realities of everyday work. When digital innovation is grounded in these principles, it becomes more than a technological intervention. It becomes a pathway towards more resilient, inclusive and sustainable coastal communities.



**Key
Insight**

**What the
WomenConnect
Experience
Suggests**

Begin with
livelihoods

**Digital technologies are most useful
when they respond to the everyday
realities and livelihood needs of women.**

Build confidence
alongside
digital skills

**Trust, repeated practice and locally
relevant learning are essential for
sustained technology adoption.**

Strengthen the
broader
support
ecosystem

**Digital inclusion is most effective
when combined with finance, markets,
institutions and enterprise support.**

Work through
community
institutions

**Self-Help Groups and local networks
play an important role in enabling peer
learning and sustaining change.**

Design with
users in mind

**Digital platforms become more relevant
and accessible when they evolve
through continuous engagement with
the communities they serve.**

References

- Food and Agriculture Organization of the United Nations (FAO). (2023). *The status of women in agrifood systems*. FAO. <https://doi.org/10.4060/cc5343en>
- International Collective in Support of Fishworkers (ICSF). (2010). *Women fish vendors in India: An information booklet*. ICSF.
- International Collective in Support of Fishworkers (ICSF). (2012). *Climate change and fisheries: Perspectives from small-scale fishing communities in India on measures to protect life and livelihood* (SAMUDRA Monograph). ICSF.
- M.S. Swaminathan Research Foundation (MSSRF). (2025). 15 Years – *Fish for All Impact Report*. Fish for All Research and Training Centre, Chennai.
- M.S. Swaminathan Research Foundation (MSSRF). (2025). *WomenConnect Challenge Brochure*. Fish for All Research and Training Centre, Chennai.
- M.S. Swaminathan Research Foundation (MSSRF). (2025). *WomenConnect Challenge: Impact Stories Booklet*. Fish for All Research and Training Centre, Chennai.
- M.S. Swaminathan Research Foundation (MSSRF). (2026). *WomenConnect Challenge India Round 2 Proposal*. Fish for All Research and Training Centre, Chennai. (Internal project document.)
- Nag, P. K., & Nag, A. (2007). Hazards and health complaints associated with fish processing activities in India: Evaluation of a low-cost intervention. *International Journal of Industrial Ergonomics*, 37(2), 125–132.
- Velvizhi, S., et al. (2025). *Chapter on gender-responsive fisheries and digital inclusion*. In Coastal Fisheries.



Conclusion

What Moved the Needle: Four Programmes, One Architecture of Change

Four programmes, four diverse agroecology landscapes — the farming villages of Puducherry, the tribal hamlets of Koraput, a forest settlement in Wayanad, the fish landing centres of Tamil Nadu — and three decades of work beginning in 1992. Read separately, each chapter examines the effects of a specific developmental project on women's lives and livelihoods; read together, they form a coherent architecture for change, highlighting clear pathways through which transformation occurs and the factors that sustain it.

Knowledge changed individuals. Collective action changed institutions.

None of these programmes began with a technology. Biovillage began by asking which livelihoods a landless woman could actually enter. The Community Hunger Fighters began not with food but with a question — why doesn't our village have an Anganwadi? — pursued through dialogue rather than nutrition messaging. The Kairali project began with transect walks and group discussions that uncovered everyday deprivations and harsh realities experienced by tribal men, women, and children that had previously been ignored. WomenConnect began with the everyday problem of finding a buyer and getting paid, not with the smartphone.

Knowledge came first, and it changed what women believed was possible. But knowledge alone did not move institutions. What moved institutions was collective action: the Self-Help Group that carried a nutrition finding into the Gram Sabha; the Biovillage council members who refused to proceed with a meeting from which a Dalit woman had been excluded; the hundred women in Koraput who organised against illicit liquor brewing; the group of Paniya women who became experts in constructing organic/green homes.

The signature: participants who become resource persons

The most distinctive and most replicable element of the MSSRF model is the conversion of participants into a local cadre of knowledge leaders. Kathanayagi joined Biovillage in 1992 as a trainee in mushroom cultivation, redesigned the rack system herself when it

failed, and went on to train more than two hundred resource-poor women. In Koraput, communities selected ninety Community Hunger Fighters — at least two women from each village — and around a thousand community members subsequently received technical training, building a local resource base rather than dependence on outside expertise. In Kairali tribal settlement, young Paniya women evolved into community trainers and teachers who were valued by both the community and the government officials alike. Along the coast, more than six thousand fisherwomen learned largely through peer networks inside their own collectives.

This is what makes reach meaningful — fifty-one per cent of trained fisherwomen reported higher sales, and post-harvest losses fell by forty-one per cent — and it is what survives the project. A trained cadre does not expire with a grant cycle.

Women's constraints are interconnected; single-input programmes under-deliver

Each chapter arrives independently at the same conclusion. Training became useful only when women could also obtain materials, seek advice and reach a market. Credit mattered when linked to productive support. Digital skills generated value only alongside finance, markets and enterprise development. In Kairali, gender equality was treated not as a component but as a cross-cutting principle, a choice made much before it gained acceptance as a standard approach in development practice.

The corollary is a hard-edged finding about durability. What endured were practices aligned with local resources and labour: vegetable cultivation, crop diversification, vermicomposting. What declined depended on external supply chains — mushroom spawn, specialised fish feed. In Kairali, the Community Facility Centre- the only space available for women's collective engagement and was damaged in the 2018 floods remains unrepaired, and the community-local government relationship weakened as leaders of institutions and their priorities changed. All four cases show that sustainability can be achieved only through continuous efforts to build shared governance and sustain community participation.

These programmes were ahead of their time

Biovillage was articulating a pro-poor, pro-nature, pro-

women and pro-livelihood philosophy in 1992, and brought information and communication technologies into rural knowledge systems before the sector had a vocabulary for digital inclusion. The Kairali project was one among the first experiments where the principles of an Evergreen Revolution, as articulated by Prof M.S Swaminathan, namely, ecological viability, economical feasibility, social and gender equity, energy efficiency and employment security were sought to be translated into action on the ground to address deep-rooted inequalities and deprivations faced by the tribal communities. The Fish for All Centre turned post-tsunami relief into a two-decade learning platform. Koraput insisted that nutrition was a food systems question, not a supplementation question, well before that became consensus. These are early statements of positions the sector has since adopted.

What we are still learning

A celebratory record is strengthened, not weakened, by naming what remains unfinished.

Access is not control. Women gained assets, income and skills. The evidence on who controlled the earnings, and on whether recognition inside the household translated into say over decisions, remains thin. Future programmes should measure control, not only access.

Care work stayed where it was. Across all four settings, women's economic and civic participation expanded while domestic and caregiving responsibilities remained unevenly shared — often adding to a woman's day rather than replacing part of it. Kairali is the instructive exception: by treating water, fuel and drudgery as first-order interventions, it made women's time valuable.

Men as part of Gender Justice: Both the experiments in Kairali settlement and in Koraput show how men matter in gender work. By ensuring equal participation of men and women in all activities and decision-making, these initiatives showed how development efforts become more effective when men participate as allies, challenge harmful attitudes, and share responsibility for change. Their involvement helps transform institutions, households, and communities, making equality more sustainable and inclusive. When the focus is only on women, then the norms held by men, and the expectations of masculinity that constrain women's mobility, ownership and voice, were addressed less systematically. This is likely the largest opportunity in the next generation of programme design.

And inclusion is uneven even within a single village: Biovillage records that twenty to twenty-five per cent of groups eventually dropped out, concentrated among landed, upper-caste and older participants — a reminder that participation figures conceal as much as they reveal.

For policymakers and partners

- Treat community resource persons and participatory diagnosis as core investment, not preparatory activity.
- Strengthen the institutions that already exist — Panchayats, Self-Help Groups, Anganwadis, federations — rather than building parallel delivery structures.
- Bundle interventions. Women's constraints are interconnected, and single-input programmes under-deliver against them.
- Prioritise innovations matched to local resource and labour availability; dependence on external inputs is the most reliable predictor of decline.
- Fund the decade after the project, not only the project. Institutional continuity is where gains are won or lost.

Across three decades, what MSSRF built was not a collection of interventions but a method: begin with what people already know, make women's knowledge visible and valued, connect the support around it, and build institutions capable of outlasting the funding that created them.

The women in these pages entered as participants. They leave these chapters as trainers, office-bearers, elected representatives and negotiators. **That is what moved the needle.**



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