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STRC NEWSLETTER

Science & Technology Resource Centre Gondwana University, Gadchiroli

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From the CPO's Desk

Strategies for Forest-Dependent Livelihoods in Central India: The Potential of Gadchiroli

Shri Swapnil Girade
Chief Program Officer and
Head (In-Charge), STRC

Central India's forests are a lifeline for millions of tribal and forest-dependent families, providing food, income, and cultural identity. Despite this natural wealth, communities in regions like Madhya Pradesh, Chhattisgarh, and Maharashtra's Gadchiroli face persistent poverty and limited institutional support. This document outlines strategic pathways for strengthening forest-based livelihoods, drawing from successful models in Madhya Pradesh and Chhattisgarh and exploring the untapped potential of Gadchiroli.

Key strategies includes:

1. NTFPs: Sustainable Use and Value Addition

Non-Timber Forest Produce (NTFP) like tendu, mahua, chironjee, bamboo, lac, and honey contribute up to 60% of tribal household income (TRIFED, 2022) and play a vital role in sustaining tribal livelihoods particularly in forested regions of central India. To ensure both ecological suatainability and enhanced income generation. Focusing key strategies can be adopted:

- Sustainable harvesting (ecological calendars, pruning, rotational collection)
- Village-level processing (drying, grading, packaging)
- Value addition (mahua syrup, sal butter, herbal teas, bamboo crafts)
- MSP implementation to ensure fair pricing

2. Empowering Communities through CFR

The Forest Rights Act (2006) recognizes the collective rights of tribal communities over forests. In Madhya Pradesh and Chhattisgarh, over 30,000 villages have used Community Forest Resource (CFR) rights to:

- Regulate bamboo and tendu trade
- Improve conservation outcomes
- Build village funds for health, education, and infrastructure

3. Market Linkages and Enterprise Models

Overcoming market exploitation involves:

- Promoting FPOs and SHGs for collective marketing
- Leveraging digital platforms like Van Dhan Vikas, e-NAM, and Tribes India
- Enhancing branding and certification (e.g., GI tagging, tribal labels)

- Building entrepreneurial and packaging skills

Success stories include M.P. State Minor Forest Produce (Trade and Development) Cooperative Federation and 'JAWADHU' Hills, Tribal Farmer Producer Company, Chhattisgarh, which have boosted tribal incomes by up to 50%.

4. Diversification and Eco-Tourism

To reduce dependence on seasonal NTFPs:

- Encourage agroforestry, bamboo plantations, medicinal plant farming
- Promote ecotourism (forest walks, homestays, wildlife interpretation)
- Develop microenterprises (bamboo craft, honey processing, herbal medicines)

Notable is Chhattisgarh's Godhan Nyay Yojana, which monetizes cow dung for bio-fertilizer production—demonstrating scalable bio-economy models.

5. Gadchiroli: A Forest Economy in Waiting

With 75% forest cover and 38% tribal population, Gadchiroli has strong foundations:

- 1,400+ villages with CFR rights over 4.5 lakh hectares
- Rich bamboo, lac, mahua, and sal forests
- Successful examples like Mendha Lekha earning significant revenue annually from bamboo

Opportunities:

- **Bamboo:** Leverage post-2017 legal reforms for trade and crafts
- **Lac:** Utilize Kusum-Palash belts for resin, processing, and jewelry
- **Ecotourism:** Build circuits around tribal culture and tiger safari's

6. Lessons from MP & Chhattisgarh: Roadmap for Gadchiroli

State	Initiative	Outcome
Madhya Pradesh	CFR+Tribal FPOs (Dindori, Mandla)	40% rise in community NTFP income
Chhattisgarh	MSP for 67 NTFPs+Van Dhan Kendras	Better pricing, increased women's participation
Chhattisgarh	Godhan Nyay Yojana+Livelihood Clusters	Job creation via forest-linked rural enterprises

What Gadchiroli Offers

Strengthen CFR Implementation: Post-title support, management plans, training

- **Expanding Van Dhan Clusters and FPOs:** For bamboo, lac, mahua, chironjee
- **Policy Convergence:** Leverage FRA, MGNREGA and NRLM
- **Eco-Tourism Zones:** Empower SHGs and youth as guides and interpreters

Collectively Madhya Pradesh and Chhattisgarh have demonstrated that with legal recognition, market access, and policy support, forest-based economies can flourish. Gadchiroli has all the ingredients-natural wealth, community governance, and cultural richness-to lead a similar transformation. With strategic investment and convergence, it can emerge as a model for sustainable, inclusive, and tribal-led forest development in India.

Articles

Microalgae:
A Sustainable Alternative to Fishmeal

Aquaculture is rapidly evolving to meet the growing demand for sustainable and eco-friendly feed solutions. One of the most promising alternatives to traditional fishmeal is microalgae, a nutrient-rich, sustainable ingredient that supports fish growth and overall health.

Shri. J .Sivakumar
SKJ Aqua Solutions and
Former Consultant Aquaculture,
STRC

Why Microalgae?

- **High Protein & Omega-3s :** Essential for fish growth, development, and nutritional quality.
- **Eco-Friendly & Sustainable :** Reduces dependency on wild fish stocks, helping conserve marine ecosystems.
- **Improves Fish Health :** Contains antioxidants and immune-boosting compounds that enhance disease resistance.
- **Better Feed Efficiency :** Enhances digestibility, reducing waste and improving water quality in culture systems.

Nutritional Powerhouse

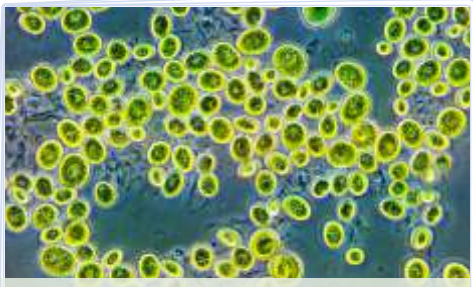
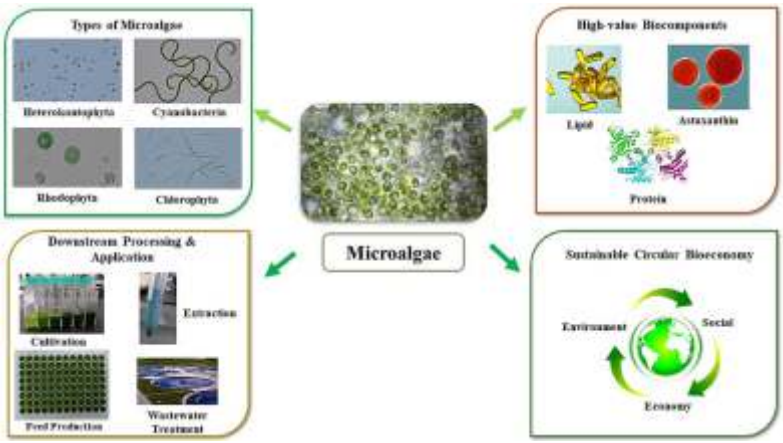


Fig: Microalgae-based fish feed



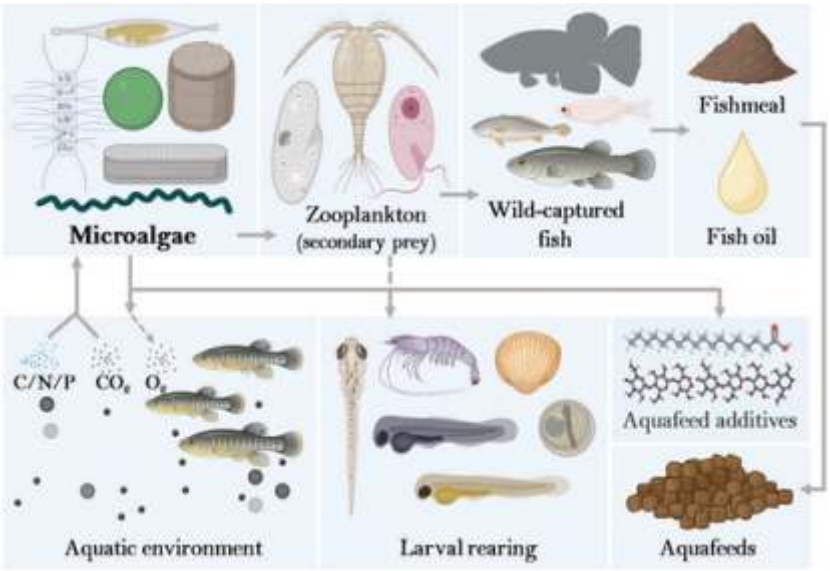
Microalgae are microscopic photosynthetic organisms naturally found in aquatic ecosystems. Species such as Nannochloropsis, Chlorella, and Schizochytrium are packed with essential nutrients vital for fish growth and health. They contain high levels of crude protein (up to 60%), essential amino acids, vitamins, minerals, and long-chain omega-3 fatty acids such as EPA and DHA.

These components are crucial not only for fish growth and reproductive performance but also for Improving the nutritional quality of fish flesh for human consumption.

The Future of Aqua Feeds

With increasing pressure on wild fisheries, microalgae based feeds offer a sustainable, cost-effective, and nutritionally balanced alternative to traditional fishmeal. The industry is actively researching scalable production methods to make microalgae a commercially viable solution for widespread adoption.

By embracing microalgae in fish feed formulations, aquaculture can move towards a greener, more resilient future—ensuring both profitability and environmental sustainability.



Environmental and Economic Benefits

Unlike fishmeal, which depends on wild fish catch, microalgae can be produced in controlled environments using photo bioreactors or open ponds. They require minimal land, can be cultivated using saline or wastewater, and do not compete with human food crops. This makes them a highly sustainable option. Additionally, the use of microalgae reduces dependency on finite marine resources, contributing to marine conservation and biodiversity protection.

Microalgae also enhance feed digestibility, resulting in lower feed conversion ratios (FCRs) and reduced nutrient waste. This not only improves farm productivity but also helps maintain better water quality in Recirculating Aquaculture Systems (RAS) and other intensive setups.

Health and Performance Booster

Beyond basic nutrition, microalgae contain pigments (e.g., astaxanthin), antioxidants, and immune-modulating compounds that:

◎ **Improve fish immunity** | ◎ **Enhance stress resilience** | ◎ **Reduce disease susceptibility**

These benefits position microalgae as an ideal **functional feed ingredient** in modern aquaculture systems.

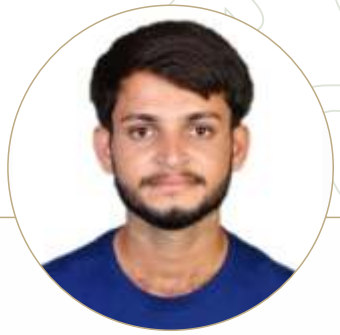
Conclusion

Integrating microalgae into aqua feeds is not just an innovation-it's a necessary evolution for sustainable aquaculture. By offering a high-quality, eco-friendly alternative to traditional fishmeal, microalgae support fish health, reduce environmental footprint, and decrease dependence on wild marine resources. This approach strengthens the economic and ecological foundation of the aquaculture industry. Embracing microalgae-based feeds will enable producers to meet rising seafood demands while protecting marine ecosystems and enhancing feed security. It is a strategic step toward building a resilient, responsible, and regenerative blue economy-where profitability and sustainability go hand in hand.

Team Corner Update

Crop Diversification in Gadchiroli:
A Strategic Shift Toward Sustainable Livelihoods

Many agrarian regions globally face significant challenges due to their historical reliance on monoculture, which leaves farming communities vulnerable to climate change and economic instability. This dependence on a single primary crop, often rainfed, leads to risks like soil degradation, pest outbreaks, and fluctuating market prices. To counter these issues, innovative agricultural initiatives are now championing targeted crop diversification strategies. These efforts aim to move beyond monoculture's limitations, fostering enhanced income security, mitigating environmental hazards, and restoring ecological balance within farming systems.



Shri Vinod Varthya
Junior Scientific Officer,
Agriculture Extension, STRC

The Imperative for Diversification

Monocropping, while culturally significant, causes agronomic and economic strain. Continuous cultivation depletes soil nutrients, fosters pest outbreaks, and increases chemical dependency. Unpredictable weather, exacerbated by climate change, renders such systems unsustainable. Farming communities with limited adaptive capacities are disproportionately affected, highlighting the urgent need for a more diversified and resilient agricultural framework.

A Holistic Approach: Integrating Diverse Crop Groups

Successful crop diversification models blend scientific recommendations with traditional ecological knowledge. They introduce complementary crop groups:

- **Legumes and Pulses:** Enhance soil fertility through nitrogen fixation and contribute to household protein intake.
- **Cereals and Millets:** Climate-resilient, water-efficient, and nutritionally rich, ideal for diverse agro-climatic conditions.
- **Vegetables:** Offer short production cycles and immediate market returns, improving cash flow and household nutrition.

This integrated approach optimizes land-use efficiency, reduces environmental degradation, and bolsters food and income security for smallholder farmers.

Strategic Implementation and Profound Impacts

Effective implementation involves a phased, systematic approach focusing on scientific validation,

farmer engagement, and long-term sustainability. Key milestones include comprehensive soil health assessments, ensuring access to quality seeds and inputs (including biofertilizers), and empowering farmers through extensive training and field demonstrations on mixed-cropping and organic farming practices.

Diversification Initiatives Consistently Demonstrate Multifaceted Benefits

- **Income Diversification:** Mitigates market and weather-related risks, offering short-term cash from vegetables and medium-term food security from legumes and millets.
- **Soil and Water Conservation:** Legumes enrich soil organic matter, while millets promote moisture retention and reduce erosion.
- **Enhanced Climate Adaptation:** Provides insurance against crop failure due to climatic irregularities, with drought-tolerant varieties ensuring partial yields.
- **Improved Nutrition:** A diverse crop portfolio translates into enhanced dietary diversity, addressing malnutrition.

The Role of Science and Technology Resource Centers (STRC) in Driving Change

Organizations like the Science and Technology Resource Center (STRC) are instrumental in bridging scientific knowledge with practical, community-level implementation. Their operational model harnesses scientific expertise and technological resources to address socio-economic and environmental challenges in rural and tribal communities. STRC's approach is built upon several foundational pillars:

1. **Rigorous Research and Scientific Validation:** Initiates and supports comprehensive research, including soil health mapping, and fosters collaborations with agricultural research institutions to adapt climate-resilient crop varieties and sustainable farming practices.
2. **Effective Technology Transfer and Capacity Building:** Transfers knowledge and technology through robust capacity-building programs, hands-on training, field demonstrations, and facilitating access to critical resources like quality seeds and bio fertilizers.
3. **Deep Community Engagement and Participatory Approaches:** Emphasizes active engagement, integrating indigenous knowledge systems with new interventions, and supporting community-based farmer collectives for peer-to-peer learning and resource sharing.
4. **Strategic Market Linkages and Economic Empowerment:** Focuses on enhancing farming's economic viability by establishing market linkages for agricultural produce, especially organically grown millets and pulses, helping farmers secure better prices and reduce reliance on intermediaries.

Cover Story

Joint meeting of the Governing Body and Program Advisory Board, STRC

Nagpur | July 15th, 2025

The joint meeting of the Governing Body (GB) and Program Advisory Board (PAB) of Science & Technology Resource Centre (STRC), Gondwana University, Gadchiroli was held at Rajiv Gandhi Science and Technology Commission (RGSTC), Nagpur Office in the august presence of Padma Vibhushan Dr. Anil Kakodkar, Chairman, RGSTC, Mumbai, Govt. of Maharashtra.

Chairman, Governing Body - STRC, Dr. Charudatta Mayee, briefed the members on the actions taken under the project, highlighting the steps implemented based on suggestions and decisions from the previous meeting. Chief Program Officer & Head (In-Charge) and Member Secretary, GB-PAB, STRC, Shri Swapnil Girade, presented an overview of the significant progress and key developments, and detailed the project's 'sustainability plan' for the board's discussion. Dr. Anil Kakodkar highly appreciated the dynamic leadership of Vice Chancellor, Gondwana University, and Chairman of the Program Advisory Board, STRC, Dr. Prashant Bokare, for his guidance in steering the project forward.

Pro-Vice Chancellor, Gondwana University, Dr. Shriram Kawale; Member Secretary, RGSTC, Mumbai, Govt. of Maharashtra, Dr. Narendra Shah; Head, CTARA, IIT-B, Prof. Anand Rao; Principal Advisor, BAIF, Shri. Girish Sohani; Registrar, Gondwana University, Dr. Anil Hirekhan; Finance & Accounts Officer, Gondwana University, C.A. Bhaskar Pathare; Advisor and Office In-Charge, RGSTC, Nagpur, Govt. of Maharashtra, Smt. Pragati Gokhale and along with other eminent members, provided important insights on the development and future growth of the project during the meeting. The collective suggestions of the members and decisions taken based on the agenda points were recorded in the proceeding of the meeting.

The board members unanimously expressed their satisfaction with the recent growth and the positive impact achieved through the project. They also congratulated the STRC team on receiving the prestigious 'वसंतराव नाईक सामाईक पुरस्कार २०२५', awarded by the Vasantrao Naik Agricultural Research and Rural Development Foundation, Mumbai.

What's Making News

Inmates Gain Sustainable Livelihood Skills through Monitored Aquaculture Project

Gadchiroli | July 2nd, 2025

In a collaborative effort to create future economic opportunities for the inmates of the Gadchiroli District Open Jail through skill-based training, a new aquaculture initiative has been launched in partnership with the Science & Technology Resource Centre (STRC), Gondwana University, Gadchiroli, and Maharashtra Animal & Fisheries Sciences University (MAFSU), Nagpur University.

Under this initiative, STRC and MAFSU have identified four ponds within the jail premises for fish farming. On July 7, 2024, Dr. Niteen Patil, Vice-Chancellor of MAFSU, Nagpur, visited the Gadchiroli District Open Jail and released 30,000 Indian Major Carp fry into these ponds, marking the beginning of this livelihood enhancement project.

Fish sampling is being conducted at the site to monitor the growth and health of the fish seeds. This collaborative project aims to provide inmates with practical training in aquaculture, equipping them with valuable skills for sustainable livelihood opportunities after their release.

STRC Strengthens Bamboo Sector with Common Facility Centre at Maldugi, Kurkheda

Kurkheda | June 26th, 2025

Under the Manav Vikas Mission, Government of Maharashtra funded project the Bamboo Common Facility Centre (B-CFC) at Maldugi, Kurkheda Block, has been made fully functional and is now equipped with modern bamboo processing machinery and tools.

The centre houses essential machines such as a cutoff machine, belt and disk sander, handheld drill machine, grinder, and other necessary tools that will enable local artisans to add value to bamboo resources efficiently.

Through this initiative, around 63 households of the village are set to benefit directly, creating new avenues for sustainable livelihood and self-reliance. The B-CFC is expected to boost local bamboo-based enterprises, enhance skill development, and strengthen the region's traditional craftsmanship with modern technology.

STRC Organizes One-Day Training of Teachers on 'Environment Education for Tribal School Children'

Gadchiroli | July 23rd, 2025

Science and Technology Resource Centre (STRC) organized a one-day workshop for teachers under its 'Environment Education for Tribal School Children (EES)' initiative. The session focused on exploring effective strategies for enhancing students' participation and implementation of environment education activities. Facilitated by Dr. Asmita Redij, Academic Consultant, STRC, the program brought together teachers from selected Ashramshalas and Zilla Parishad schools.

The workshop emphasized recognizing students' existing knowledge and exploring methods to design lessons that align with their cultural context. In the earlier session, teachers were encouraged to actively engage with students' prior understanding and collaboratively create concept maps as a foundation for culturally relevant lesson planning.

In this phase of the workshop, topics such as water bodies and ecosystems, forest fires, and forests and medicinal plants were finalized, and lesson plans were developed accordingly to ensure cultural relevance.

STRC Conducts Training on Climate-Smart and Regenerative Farming for Agri Students

Gadchiroli | June 27, 2025

Science and Technology Resource Centre (STRC), Gondwana University, conducted a training programme on Climate Smart and Regenerative Agriculture for students of Kewalramji Harde College of Agriculture, Chamorshi under the Rural Agricultural Work Experience (RAWE) initiative. The training was focused on practical and sustainable farming practices including High-Density Planting Cotton (HDPC) with intercropping, preparation of organic Kasthayas, use of green manures, nursery management for disease control, and vermicompost production.

A total of 11 students actively participated, engaging with local farmers to gain hands-on experience. The programme aimed to equip future agricultural professionals with climate-resilient skills and promote sustainable farming methods for soil health improvement and climate change adaptation.

Maharashtra Krishi Din Celebrated at Chamorshi

Chamorshi | July 1st, 2025

Science and Technology Resource Centre (STRC), Gondwana University, Gadchiroli, successfully organised an event on the occasion of Maharashtra Krishi Din at Grampanchayat, Kokurdi (Block Chamorshi) to promote sustainable agricultural practices among local farmers. The programme was held in the presence of local community, agricultural officers, and subject matter experts, who shared valuable insights and interacted directly with the farmers.

Our Latest Publications

Monthly Newsletter

Our 2024 Story
A Pictorial Representation

Techno-Social Tapestry
By Shri Ashis Gharai,
Former CPO & Head, STRC

- Executive Editor -

Shri Swapnil Girade

Chief Program Officer and Head (In-Charge), STRC

- Graphics and Design -

Ms Priyanka Durge

Scientific Officer, Communication for Development through ICT, STRC

- Contribution -

Team STRC

Science & Technology Resource Centre
Gondwana University, Gadchiroli

Conceived and funded by Rajiv Gandhi Science and Technology Commission (RGSTC), Mumbai, Government of Maharashtra, Science & Technology Resource Centre (STRC) is an autonomous institute established in concurrence with Gondwana University, Gadchiroli in 2014. As a centre of excellence for sustainable value creation, STRC is leveraging local resources, relevant knowledge and appropriate technologies for human capacity development. STRC acts as a catalyst to science and technology based development of the under-served tribal communities of the Gadchiroli region and as a bridge between knowledge activities of the University and enhanced livelihoods in the neighborhood.

'Science & Technology Resource Centre Foundation Gadchiroli', registered under the Societies Registration Act, 1860 (XXI of 1860).

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