



AIT
Asian Institute of Technology



**Gender-Inclusive Community Fishing:
Women's Role in Sustainable Fisheries and Rural Economies**

GAF 9

Session: Women/gender in the blue economy

**ICAR-Central Institute of Fisheries Education
Panch Marg,**

Off Yari Road, Andheri (W), Versova, Mumbai – 400061, India

Introduction

- **India is the second largest fish producing country, contributing 8.92 per cent to the global fish production** (DoF, 2024) and the **sixth largest marine fish producer**, accounting for 5 per cent of the global marine produce (FAO, 2022).
- With the sector contributing **6.9 per cent to agriculture GVA and 1.07 per cent to National GVA** (MoSPI, 2023), it stands as a cornerstone of India's economy, providing sustenance and livelihoods to millions while contributing significantly to the nation's food security and economic prosperity.
- **Fish production increased to an impressive 184.02 lakh tonnes in 2023–24** from 95.79 lakh tonnes in 2013–14, marking an increase of 88.23 lakh tonnes over the past decade (2014–24).

(Handbook on Fisheries Statistics, 2023)

Reservoirs

- **Reservoirs are ‘human-made lakes’**, mainly constructed to generate electricity and water storage for drinking water and irrigation.
- India accounts for a total of 73.59 lakh ha of inland water bodies, of which 42.8% (31.5 lakh ha) is under reservoir.
- The Ministry of Agriculture, Government of India classified reservoirs as small (<1000 ha), medium (1000 to 5000 ha) and large (>5000 ha) for the purpose of fisheries management.
- **India has 19,370 reservoirs covering 3.15 million ha water spread area.**
 - 19,134 small reservoirs with a total water surface area of 14,85,557 ha
 - 180 medium reservoirs with 5,27,541 ha
 - 56 large reservoirs with 11,40,268 ha

(Source: Department of Fisheries, Government of India, 2024)

Sardar Sarovar Reservoir

- **Multipurpose dam** (Irrigation, Drinking water, Hydro-electricity generation)
- **Terminal dam on the Narmada River** system situated in Kevadia of the Narmada district of Gujarat.
- *Third highest concrete dam (163 meters) in India.*
- **Second largest in the world** with an aggregate volume of 6.82 million cu.m.
- One of the dam under category of "**Dams of National Importance**" (NRLD, 2019)
- Catchments area of river above dam site- **88,000 Sq. km**
- **Length of reservoir- 214 km**
- Maximum Width- 16.10 km
- Average Width- 1.77 km

(Source- Sardar Sarovar Narmada Nigam Limited, 2024)



Sardar Sarovar Reservoir

- **Sardar Sarovar Reservoir** is one of the most important reservoirs on the Narmada River, having immense potential for fisheries.
- The Sardar Sarovar Project (SSP) is the largest water resource project in India, covering four major states. Maharashtra, Madhya Pradesh, Gujarat, and Rajasthan.
- Reservoir fisheries have been identified as one of the engines of future growth in India (DAHDF, 2019).
- Sardar Sarovar Reservoir is important in terms of capture fisheries, cage culture and community fishing as well as [traditional livelihood practices](#).

Community Fishing

- **Community fishing** refers to fishing and fish-resource management organised at the local/community level where users cooperate to access, harvest, conserve and market aquatic resources.
- It often combines traditional ecological knowledge, collective labour (e.g., joint net operations), and local management rules or co-management arrangements with government/NGO partners.
- Community fishing can be both a form of livelihood and a social-cultural event that builds social capital.

Source: Secretariat of the Pacific Community, Noumea, New Caledonia 2010

Review of Literature

Author	Key findings	Author	Key findings
Dubey and Gogoi, K., (2023)	<p>Community fishing in Assam, India is practised by Rabhacommunity's Bahow practice. It is a major cultural and social event strengthens inter-community ties. Women make up nearly 60% of participants crucial role in sustaining livelihood and the cultural tradition.</p>	Das et al., (2020)	<p>Community fishing in Assam, India acts as a major socio-economic event, drawing participants from a wide geographical area. Ecologically, these wetlands demonstrated high biodiversity supports 46 fish species. Traditional fishing gears like the Polo, Jakoi, and Porongi jal. Indigenous knowledge locally crafted technology in these collective practices.</p>
Etsoshan Ovung et al., (2022)	<p>In Nagaland, India, the Indigenous community fishing integrates cultural traditions with ecological knowledge. Fishing festivals Tribes use piscicidal plants like <i>Millettia pachycarpa</i> and <i>Derris elliptica</i></p>	Laia d'Armengol a et al., (2018)	<p>Community-based and co-management a collaborative approach involving fishers, government, and other stakeholders can lead to improved ecological and social outcomes, such as increased species abundance, enhanced participation, greater adaptive capacity and improve overall fishery outcomes was reported in Spain.</p>

Review of Literature

Author	Key findings	Author	Key findings
Asogwa et al., (2012)	<p>Argungu fishing festival in Nigeria, traditional community fishing practice major cultural and economic tourism event. Balance between sustaining local livelihoods and commercializing tradition.</p>	Dutta and Bhattacharya (2008)	<p>Wancho tribe of Tirap district, Arunachal Pradesh, India, practices traditional community fishing in the <i>Tissa river</i>.</p> <p>Water is muddied to deoxygenate pool zones, forcing fish to surface and making them easy to catch with cast nets from bamboo rafts.</p> <p>This method reflects both indigenous ecological knowledge and the tribe's cultural heritage, showing how local communities adapt fishing to hill stream environments.</p>
Dutta and Dutta (2013)	<p>Nocte tribe of Tirap district, Arunachal Pradesh, India, practices a traditional form of community fishing in the <i>Namsang stream</i>.</p> <p><i>Here</i> water flow is obstructed to trap fishes in the lower reaches. This indigenous method effectively utilizes the migratory behavior of cyprinids such as <i>Tor putitora</i>, <i>Barilius tileo</i> and <i>B. bola</i> for successful harvests. Beyond its subsistence role, the practice reflects the cultural heritage and ecological knowledge of the Nocte community demonstrates how traditional fishing integrates cultural identity with sustainable use of local biodiversity.</p>		

- **Community fishing is practiced in many countries.**
- It is important for livelihoods, food security, culture, participation of women and men, and biodiversity conservation.
- Community fishing in **Sardar Sarovar reservoir is not reported.**
- This study focuses on Community fishing **locally called as Mahajaal fishing in the Sardar Sarovar Reservoir, Maharashtra state, India.**

Objectives

1. To document operational process, techniques, and seasonal cycles of Mahajaal fishing in Sardar Sarovar Reservoir.
2. To analyze gender roles in Mahajaal fishing in Sardar Sarovar Reservoir .

Methods

1. Locale of the study
2. Focus Group Discussions
3. Key Informants Interview

Locale of the Study



Focus Group Discussion (FGD)

- **16 Focus Group Discussions were conducted.**
- Officials from the Department of Fisheries (DoF), Maharashtra.
- Chairperson and members of the Fisheries Cooperative Societies.
- Women involved in Community fishing.

Key Informants Interview

- **Insights from key informants.**
- Officials from the Department of Fisheries (DoF).
- Chairpersons of the fisheries cooperative societies.
- Members of the fisheries cooperative societies.
- Women involved in the community fishing.
- Interviews with 58 (40%) men and 86 (60%) women.
- Ensuring a representative perspective from both genders.
- **Harvard Gender Analysis Framework and CIFE's copyrighted tool Gender Analysis Tool for Fisheries and Aquaculture© (Sharma 2021) was used to examine gender roles.**
- **Role of Men and Women: Understanding the different roles, responsibilities, and access to resources that men and women have within a household or community.**
- **Activity Profile was conducted by identifying who does what: men, women, or both.**

Cooperative Society details

- Fisheries activities in the Sardar Sarovar Reservoir (SSR) are organized and managed by **16 cooperative societies established between 2014 and 2022.**
- These cooperatives are spread across the Akkalkuwa and Dhadgaon blocks in Maharashtra's tribal-majority Nandurbar district.

Each society plays a key role in:

- Planning fishing schedules and distributing nets and other gear.
- Encouraging gender-inclusive participation in both fishing and post-harvest tasks.
- Ensuring fair revenue sharing among all members.

Cooperative Society details

Sr. No.	Name of Cooperative Society	Block	Village	No. of total members	No. of men member	No. of women member
1	Narmada Navnirman Baba Gufanyadev Machhimar Sahkari Sanstha (NNBGMSS)	Akkalkuwa	Manibeli	50	45	5
2	Narmada Navnirman Machhimar Sahkari Sanstha (NNMSS)	Akkalkuwa	Chimalkhedi-1	136	120	16
3	Narmada Navnirman Ma Rewa Matsya Vyavsay Sahkari Sanstha (NNMRMVSS)	Akkalkuwa	Chimalkhedi-2	73	68	5
4	Narmada Navnirman Baha Gubol Matsya Vyavsay Sahkari Sanstha (NNBGMVSS)	Akkalkuwa	Danel-1	65	59	6
5	Revamaiyya Matsya Vyavsay Sahkari Sanstha (RMVSS)	Akkalkuwa	Danel-2	47	42	5
6	Satpuda Narmada Parisar Matsya Vyavsay Sahkari Sanstha (SNPMVSS)	Akkalkuwa	Gaman-1	100	92	8
7	Bahahiraji Matsya Vyavsay Sahkari Sanstha (BMVSS)	Akkalkuwa	Gaman-2	101	95	6
8	Bamnuja Matsya Vyavsay Sahkari Sanstha (BMVSS)	Akkalkuwa	Bamne	56	50	6

Contd...

Sr. No.	Name of Cooperative Society	Block	Village	No. of total members	No. of men member	No. of women member
9	Gangamaiyya Matsya Vyavsay Sahkari Sanstha (GMVSS)	Akkalkuwa	Sinduri	109	102	7
10	Narmada Mavnidevi Machhimar Sahkari Sanstha (NMMSS)	Akkalkuwa	Dhankhedi	30	25	5
11	Narmada Navnirman Bamanatyadev Machhimar Sahkari Sanstha (NNBMSS)	Dhadgaon	Chichakhedi	64	60	4
12	Kumbay Kundrana Narmada Machhimar Sahkari Sanstha (KKNMSS)	Dhadgaon	Khardi	51	46	5
13	Narmada Navnirman Baba Kaundradev Machhimar Sahkari Sanstha (NNBKMSS)	Dhadgaon	Shelgada	56	51	5
14	Rani Kajal Matsya Vyavsay Sahkari Sanstha (RKMVSS)	Dhadgaon	Savaryadigar	25	20	5
15	Narmada Navnirman Bhilot Baba Matsya Vyavsay Sahkari Sanstha (NNBBMVSS)	Dhadgaon	Bhadal	31	27	4
16	Thuvani Mund Narmada Matsya Vyavsay Sahkari Sanstha (TMNMVSS)	Dhadgaon	Thuvani	25	21	4

➤ **In the Sardar Sarovar Reservoir (SSR) region, data from 16 fisheries cooperatives shows that 96 women are engaged out of a total of 1,019 members, making up about 9.4% of the total membership.**

Contd...

Some key cooperatives include:

- **Narmada Navnirman Machhimar Sahkari Sanstha (NNMSS)** - 136 members (120 men, **16 women**)
 - **Satpuda Narmada Parisar Matsya Vyavsay Sahkari Sanstha (SNPMVSS)** - 100 members (92 men, **8 women**)
 - **Gangamaiyya Matsya Vyavsay Sahkari Sanstha (GMVSS)** - 109 members (102 men, **7 women**)
- The cooperative model promotes transparent and democratic decision-making, which is key to fair distribution of resources. It also strengthens community ownership and makes day-to-day operations more organized and inclusive.

Community fishing / Mahajaal Fishing

- *Mahajaal fishing*-a term that comes from the Hindi / Marathi word *Maha* (meaning big) and *Jaal* (meaning net).
- Community-based fishing plays an essential role in supporting **rural livelihoods**.
- Beyond offering food and income, **these practices help strengthen community bonds and encourage shared responsibility for managing natural resources.**

Results and Discussions

Mahajaal Fishing System:

- **Net:** Involves use of fine-mesh net specially crafted to target only small indigenous fish, while reducing the accidental catch of juveniles and other non-target species.
- This community fishing method follows a structured routine with two daily sessions:
 - Morning session: **Net is cast at 5:30 AM and pulled in by 7:00 AM.**
 - Evening session: **Net is set again at 7:00 PM and retrieved by 8:30 PM.**
- Each session typically brings in **2 to 20 kilograms** of fish
- Higher catches often recorded during the winter months
- Environmental conditions naturally encourage fish to gather.
- This approach helps maintain both steady yields and ecological balance.



Role of Men and Women in Mahajaal Fishing

- Inclusive approach to gender roles.
- **Mahajaal fishing actively involves women and men** across both fishing and post-harvest activities.

Roles

- Men handle net deployment and maneuvering in deeper waters to ensure an optimal catch.
- **Women contribute by anchoring the nets from the shore to prevent fish from escaping.** They also help retrieve the nets and sort the catch.
- Coordinated sharing of responsibilities.
- Improves the efficiency and resilience of the operation.
- Recognizing the value of both women and men's work beyond boundaries.



Role of Women in Mahajaal Fishing

- **Major role of women in post-harvest.**
- **Around 96 women** from the local cooperatives are actively involved in sun-drying of the fish.
- Sun drying process not only preserves the catch but also adds considerable market value.
- **Drying Method:** Fish are laid out to dry in the sun for about 6 to 8 hours. This reduces moisture content, helps prevent spoilage, and enhances both shelf life and texture.
- **Market Value:** Fresh fish usually sell for **₹25-30 approximately \$0.30 - \$0.36** per kilogram in local markets. Once dried, the same fish can fetch **₹100-110 approximately \$1.20 - \$1.32** per kilogram.
- This value addition, made possible through women's labour, significantly boosts household income and strengthens the overall economic sustainability of the fishing livelihood.



Nutritional Significance of Indigenous Fish Species

➤ **Mahajaal fishing** mainly targets *Corica soborna*, a small indigenous fish locally known as *Kachki* or *Bhaat Machhli*.

Though tiny in size, this fish is packed with nutrients.

- **Proteins:** Provides essential amino acids that support growth and muscle health.
- **Omega-3 fatty acids:** Known to promote heart health and support brain development.
- **Micronutrients:** A good source of calcium, iron, and vitamin D- important for bone strength and overall well-being.
- Provides market based income, food and nutritional security.



Quantifying the Nutritional Value

Nutrient	Approximate Value (per 100g dry weight)	Significance
Protein	60-70 g	Exceeds levels in many large fish; a cost-effective protein source.
Lipids (Fat)	10-20 g	Rich in polyunsaturated fatty acids (PUFAs), including Omega-3.
Calcium	2000-4000 mg	Exceptionally high compared to cultured fish; meets dietary needs.
Iron	20-30 mg	A potent source to combat iron-deficiency anemia.

Source: World Fish Centre

Contd...

Due to its rich nutritional profile, *Corica soborna* plays a vital role in **fighting hidden hunger** and improving **diets in tribal and rural communities, particularly benefiting women and children.**

- **Cost-Effective Nutrition:** Provides a highly affordable and accessible source of high-quality nutrients, especially for low-income households.
- **Fights "Hidden Hunger":** Directly addresses micronutrient (e.g., iron, calcium, zinc) deficiencies, which are a major public health concern.
- **Household Food Security:** Acts as a reliable and sustainable source of food and income, buffering against economic and agricultural shocks.
- **Crucial for Vulnerable Groups:** The dense nutrient profile is particularly beneficial for the growth of children, and the health of pregnant and lactating women.

Ecological Relevance

Selective Harvesting:

- The **fine-mesh net** is designed to catch mature **small indigenous species (SIS)**, especially *Corica soborna*, while minimizing the capture of juvenile or non-target species. This helps prevent overfishing and protects vulnerable aquatic life.

Biodiversity Conservation:

- By focusing on a native species, the method supports the reservoir's natural biodiversity and contributes to maintaining ecological balance.



Skill Development

Skill Development:

- With support from **Government programmes and CIFE intervention**, many women have received training in hygiene, improved fish drying methods, and market access.



Conclusions

- **Mahajaal fishing is a vital, community-based practice** that synergistically achieves ecological sustainability through selective harvesting and enhances local food and nutritional security by providing a rich source of essential micronutrients.
- Has a good local market and provides market based income. Connecting them to larger markets would boost income.
- The practice is fundamentally underpinned by a critical gender partnership, **where women's essential roles in harvesting and post-harvest processing not only ensure the system's efficiency but also establish a clear pathway for improving household economic security through better market linkages for dry fish.**

References

- Asogwa, B.C., Umeh, J.C. and Okwoche, V.A., 2012. Community fishing and the economics of Argungu fishing festival in Nigeria. *Asian Journal of Business Management*, 4(2), pp.192-199.
- d'Armengol, L., Castillo, M.P., Ruiz-Mallén, I. and Corbera, E., 2018. A systematic review of co-managed small-scale fisheries: Social diversity and adaptive management improve outcomes. *Global environmental change*, 52, pp.212-225.
- Das, U. and Das, J., 2020. Community fishing during Magh bihu: an age old practice in the Dimoria region of Kamrup (Metro) district, Assam.
- Dutta, R. and Bhattacharjya, B.K., 2008. An indigenous community fishing practice of Tirap district, Arunachal Pradesh. *Indian Journal of Traditional Knowledge*, 7(4), pp.624-626.

Contd...

- Dubey, S.K. and Gogoi, K., 2023. Reconciling culture, livelihood and conservation through community fishing in Assam.
- Ovung, E.Y., Kithan, L.M., Brearley, F.Q. and Tripathi, S.K., 2022. Indigenous community fishing practices in Nagaland, eastern Indian Himalayas. *Sustainability*, 14(12), p.7049.
- Rajdeep Dutta, R.D. and Amalesh Dutta, A.D., 2013. Bheta fishing-a traditional community fishing practice of Nocte tribe of Tirap district, Arunachal Pradesh.
- Sharma A (2021) Gender Analysis Tool For Fishereis and Aquaculture, Copyright granted by Indian Copyright Office.

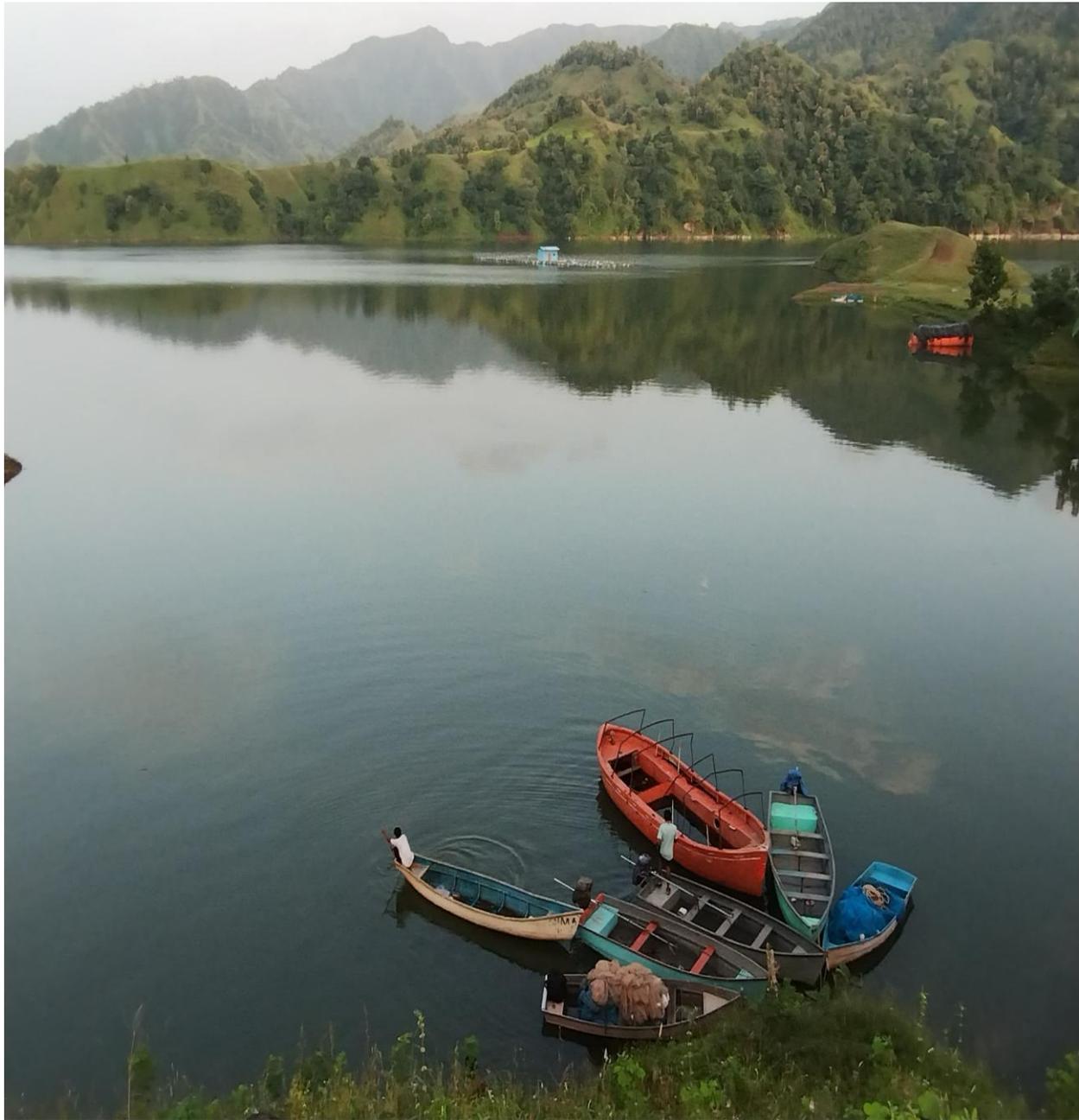
Online References

- <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=146577>
- <https://www.gujarattourism.com/central-zone/narmada/sardar-sarovar.html>
- <https://www.sardarsarovardam.org/history.aspx>
- <https://www.fao.org/3/v5930e/v5930e01.htm>
- <https://www.sardarsarovardam.org/>

Glimpse of Study









GENDER-INCLUSIVE COMMUNITY FISHING:

WOMEN'S ROLE IN SUSTAINABLE FISHERIES AND RURAL ECONOMIES

Vijendra Kumar^{1*}, Arpita Sharma¹, R.K Kurmi¹, S. Waghmare¹, S. Soni¹, Munilkumar S.¹, A.K. Jaiswar¹,

K. Sukhdhane¹, K. Ramteke¹, K. Padvi², S. Das¹

¹ ICAR-Central Institute of Fisheries Education, Versova, Mumbai, India

² Department of Fisheries, Maharashtra, India

[*vijendrakumar.fexpb402@cife.edu.in](mailto:vijendrakumar.fexpb402@cife.edu.in)

arpitasharma@cife.edu.in

THANK YOU