



Utthan's body of work with women and rural communities in Gujarat since 1981 testifies that sustainable change within communities emerges when collective voices are heard, local knowledge is valued, and people take ownership of the solutions. This learning continues to inform our endeavour to strengthen gender-just, climate-resilient livelihoods of marginalised communities like the *Pagadiyas*, and to ensure that their voices and lived experiences are placed at the centre of development planning in coastal regions.

Pagadiyas, the shore-based, non-mechanised fishers of Gujarat, embody generations of traditional ecological knowledge. Their low-impact fishing practices help conserve marine biodiversity and sustain food security for coastal households. Typically operating in small groups of three or four, both men and women, they wade 7–10 kilometres into near-shore or intertidal waters, setting their gear according to tidal movements. Their catch is influenced by the sea's rhythms, including tidal flows, pollution levels, and cyclonic activity. Women play a central role in the post-harvest process, handling the sale of fish directly from their homes, through door-to-door hawking, or in informal market spaces. While this fishing practice requires licensing for both catching and retailing, *Pagadiya* communities currently operate without formal recognition of their customary rights.

Their livelihoods represent a unique combination of cultural heritage, ecological stewardship, and sustainable use of marine resources, yet they have historically received limited attention within mainstream fisheries policy and planning

frameworks although their contribution to sustainable fisheries and local food systems and stewardship of coastal commons is significant.

Recognising and strengthening the role of Pagadiyas and integrating their knowledge within fisheries governance and livelihood programmes is therefore vital, not only to advance social equity, but also to strengthen the long-term resilience of Gujarat's coastal ecosystems. The declaration of International Year of Artisanal Fisheries and Aquaculture (IYAFA) 2022 by the UN General Assembly, India's National Fisheries Policy 2020, and the current drive for registration under the National Fisheries Digital Platform are steps in this direction.

RESEARCH AREA: KATPAR, MAHUVA BANDAR, MAHUVA LIGHTHOUSE VILLAGES

The selection of Katpar, Mahuva Bandar, and Mahuva Light House of Katpar Gram Panchayat (~ (3/28 designated marine fishing villages¹ in Bhavnagar) was motivated by Utthan's interactions with 900 fisherwomen who are members of the local, Shakti Mahila Sangathan and the observations of the critical challenges faced by Pagadiyas, in a post COVID and Cyclone Tauktea scenario.

RESEARCH DESIGN

A shared interest of community and Utthan to better understand these intersectional challenges and identify pathways for inclusive solutions led to

- 236 household surveys (Katpar: N=102, Mahuva Bandar: N=64, Mahuva Lighthouse: N=70)
- 24 village assemblies
- 03 group discussions
- Series of action- reflection processes

KEY FINDINGS ACROSS THREE VILLAGES

Fishing remains the backbone of livelihoods in these three coastal settlements of Katpar Gram Panchayat. However, families face multiple, interlinked and intersectional challenges. The Research Findings highlight both shared vulnerabilities and key differences between the three villages, while also pointing to concrete opportunities for improvement through partnership. They have been bundled under Structural Identity, Livelihood systems, Physical Capital and Infrastructure, Social Capital, and Natural Capital, Environment & Climate.

Structural Identity

- **Strong concentration of population in the working-age group (35-54), reflecting the labour-intensive nature of fishing livelihoods**, which forms the backbone of the community's livelihood system. This segment accounts for 64.7% in Katpar, approximately 75% in Bandar, and 68.6% in Light House, underscoring the heavy dependence of

¹ 2016 Marine census, Gujarat.

fishing-based livelihoods on this economically active age group. In contrast, the elderly population (55 years and above) remains relatively small, comprising 17.7% in Katpar, 11.4% in Light House, and around 10% in Bandar. The youth population (below 30 years) represents the smallest segment across all sites-2% in Katpar, 4.3% in Light House, and about 10–12% in Bandar-indicating a gradual decline in young people's participation in traditional fishing.

- **Marriage remains a near-universal social institution, shaping both household structure and community life.** In Katpar, 83.3% of respondents were married, 15.7% widowed, and 1.0% never married, with most widows being women. Bandar showed a similar pattern, with 92.2% married, 4.7% widowed, and 3.1% never married, all widows being female. In Light House, 94.3% were married, 1.4% widowed, and 4.3% never married, with the only widow being a woman. Overall, the data reveal a near-universal prevalence of marriage, underscoring that widowhood is a distinctly gendered experience, concentrated among women across the three fishing communities.
- **Educational attainment remains low and gender disparities are stark,** with women consistently showing much higher rates of non-literacy than men. Katpar (N=102) recorded the lowest overall educational attainment among the three villages, with more than half of all respondents being non-literate. The gender gap in education was statistically significant ($\chi^2 = 17.44$, $p = 0.0016$), indicating a pronounced disparity between men and women. Among female respondents (N=60), 71.7% (43 women) were non-literate, compared to 26.2% (11 men) among males (N=42). In Light House (N=70), education levels were also low overall, with 30.0% (21 respondents) being non-literate, 67.1% (47 respondents) reporting basic literacy (ability to read and write), and only 2.9% (2 respondents) having completed primary schooling. No respondent-male or female-had attained secondary or higher education, indicating a complete education ceiling within the community. A statistically significant gender gap was observed ($\chi^2 = 24.37$, $p < 0.0001$). Among women (N=11), 81.8% (9 respondents) were non-literate. In Bandar (N=64), the educational profile revealed pronounced gender disparities, confirmed to be statistically significant ($\chi^2 = 26.46$, $p < 0.0001$). Overall, 45.3% (29 respondents) were non-literate, 29.7% (19 respondents) reported only the ability to read and write, 21.9% (14 respondents) had completed primary schooling, and just 3.2% (2 respondents) had reached secondary or higher secondary levels.
- **Varying family size and number of elderly members.** Light House had the largest families, with an average of 5.76 members, followed by Katpar (4.8 members) and Bandar (4.5 members). The share of households with elderly people was highest in Bandar (65%), showing more joint families with elderly members. Katpar had a moderate presence (32.4%), while Light House had the fewest elderly members (21.4%). In all three villages, elderly women were more in number than elderly men, showing that women make up most of the older population.

Livelihood system

- **Pagadiya fishing is the main livelihood,** engaging over 80% of households-Bandar (82.8%), Katpar (83.3%), and Light House (85.7%)-reflecting their heavy dependence on nearshore resources. Occupations are strongly gender-segregated: men dominate boat-based and mobile work, while women are largely excluded from these roles. Katpar is an exception, where women form the majority (58.8%) of Pagadiya fishers. In Bandar and Light House, men account for 82.8% of Pagadiya fishers, with women mainly engaged in post-harvest and vending activities.

- **Fishing exposure varies.** Katpar is almost entirely dependent on Pagadiya fishing, travelling an average of 9.9 km. Bandar fishers travel further, averaging 14.6 km, and frequently face net damage from trawlers. Light House fishers face the greatest risks, with some travelling up to 45 km into the sea without navigation aids, compounded by pending licence renewals.
- **Productivity is modest and highly dependent on gear type and ecology.** Pagadiyas work 16–19 days per month, while small boat owners' fish more frequently (20–26 days). Productivity is lowest in Katpar (3.9 kg/day) and highest in Light House, where boat owners catch 13.8 kg/day compared to 6.2 kg for Pagadiya fishers. In Bandar, yields are similar (6.6–7.3 kg/day) due to resource depletion. Overall, mechanization raises effort but not always returns, as ecological limits and tidal dependence keep artisanal fishing labour-intensive and subsistence-oriented.
- **Incomes are low and seasonal, reflecting the dominance of subsistence-level fishing.** Daily earnings average around ₹500 in Bandar and Katpar but drop below ₹275 in Light House. Gender gaps persist: men earn more than women in Bandar (₹525 vs ₹437) and Katpar (₹688 vs ₹483). Average annual household income across the three villages remains low and uneven. The annual family income of Pagadiya fishing households averages ₹84,000 in Bandar, ₹92,000 in Katpar, and ₹68,000 in Light House. Boat-owning households earn higher annual incomes- ₹110,000 in Bandar, ₹135,000 in Katpar, and ₹115,000 in Light House. In contrast, households engaged in fish selling or agricultural labour earn the least, typically ₹45,000–₹70,000 per year. Overall, fishing incomes are subsistence-level and stratified, with women and landless Pagadiya fishers most economically vulnerable.
- **Livelihood diversification is limited to daily agricultural labour serving mainly as a coping strategy against the seasonality of fishing incomes.** Most households depend on agricultural daily wage labour as their only secondary occupation-Bandar (82.8%), Katpar (64.7%), and Light House (84.3%)-showing limited economic depth and opportunity. Women play a central role, with participation rates of 80.8% in Bandar, 61.7% in Katpar, and 90.9% in Light House, acting as economic shock absorbers through low-capital, labour-intensive work. Overall, diversification remains narrow and insecure, reinforcing dependence on both vulnerable marine and informal land-based livelihoods.
- **Fishing license patterns reveal regulatory gaps, administrative hurdles and inequities.** Most households hold Pagadiya fishing licenses, confirming the primacy of shore-based, artisanal practices. The mean number of total licenses per household was 1.56 in Bandar, 2.61 in Katpar, and 1.96 in Light House. Pagadiya and Selling licenses are the dominant combination at the household level in Katpar (54.9%), Bandar (40.6%), and Light House (31.4%), showing the strong linkage between capture and post-harvest activities. In contrast, vessel licenses remain rare across all sites, reflecting capital barriers and limited mechanization. Pending license renewals are a major source of regulatory insecurity. Challenges in renewal of licenses affect both Pagadiya fishing and fish selling licenses, undermining livelihood stability. Bandar recorded the highest backlog (75% Pagadiya, 50% selling licenses), followed by Light House (68.6% Pagadiya, 45.7% selling) and Katpar (46.1% Pagadiya, 36.3% selling). These widespread delays reflect systemic administrative bottlenecks that restrict access to entitlements and heighten livelihood risks.
- **Women play key roles in post-harvest work yet remain undervalued.** Occupational roles are sharply gender-segregated, men dominate boat-based and mobility-driven work, while women are largely confined to post-harvest

activities. Katpar stands out as the only site where women form the majority (58.8%) of Pagadiya fishers (though literacy and credit access remain low), contrasting with Bandar and Light House, where men account for 82.8% of Pagadiya workers, reflecting the entrenched gender divide in coastal livelihoods. Literacy gaps are striking, with over 70% of women in Katpar and 82% in Light House being non-literate. Female-headed households, particularly widows, are especially vulnerable, often excluded from licensing and formal credit access.

- **Fishing functions as a shared household enterprise.** Most families have two active members engaged in fishing- 59.4% in Bandar, 34.5% in Katpar, and 36.2% in Light House-showing strong spousal or parent–child collaboration. Light House also recorded a high share of three-member households (31%), reinforcing the collective nature of work. A strong positive link exists between the number of fishing licenses and household participation ($r = 0.56$ – 0.69 , $p < 0.001$), indicating that families with more licenses mobilize more members. Overall, fishing remains a family-based occupation, dependent on pooled labour and shared resources.

Physical Capital and Infrastructure

- **Sanitation is a persistent problem**, with only about one-third of households in each village reporting access to a functional toilet (Katpar 37.3%, Bandar 34.4%, Light House 34.3%). Tap-water access varies sharply: Katpar has comparatively high coverage (87.3%), Light House has moderate access (62.9%), while Bandar remains weakest at 31.2%.
- **Housing conditions remain fragile. Families live in a mix of pucca, semi-pucca, and kutcha structures, with thatch roofing** especially common in Bandar (67%) and Light House (61%). Critically, none of the households in Katpar, Bandar, or Light House possess pattas (land, occupancy, or house site titles), leaving tenure insecure and excluding families from housing schemes.
- **Insurance coverage is almost entirely absent.** No household in Bandar or Katpar reported any coverage, while in Light House only one family (1.4%) had a private policy. This leaves families highly vulnerable to occupational risks, asset loss, and disasters.
- **Fishing assets are limited to basic gear, with minimal access to modern equipment.** Nearly all households own fishing nets-Light House (97.1%), Katpar (92.2%), and Bandar (85.9%)-but motorized boat ownership remains very low (6.9–9.4%). Access to cold chain assets such as insulated iceboxes is scarce (2.9–8.6%), and no households possess cold storage or navigation equipment. This imbalance highlights deep capital and infrastructure gaps, keeping fisher’s dependent on traditional gear and exposed to low-value, high-risk livelihoods.

Social capital

- **Membership in women’s federations is near-universal across all three villages, forming a vital source of social capital and collective strength.** The Shakti Mahila Sangathan, promoted by Utthan, includes 100% of women in Katpar and Light House, and 96.2% in Bandar. This strong network enhances women’s leadership, solidarity, and participation in governance, though the absence of fisherfolk collectives limits broader occupational representation.

- **The absence of a fisherfolk munch (collective) across all three villages is a major institutional gap.** While women are well organized through the Shakti Mahila Sangathan, fishers lack a common platform to represent their occupational interests, negotiate rights, or access government support. The reports recommend forming such collectives to strengthen fisheries governance and build on women's existing organizational strength.
- **Fishing experience shows deep intergenerational continuity.** Average experience ranges from 24.3 years in Bandar to 25.7 years in Katpar and 26.6 years in Light House, reflecting long-term dependence on artisanal fishing. Katpar shows the widest range (3–70 years), while Light House has the most experienced workforce with a median of 30 years. These patterns highlight fishing as a hereditary livelihood and cultural tradition, though the ageing workforce also signals limited entry of younger fishers and growing vulnerability to resource decline.
- **Youth outlook differs across villages, some wanting to steer away from fishing and some seeking continuity.** In Bandar and Light House, most households reported that they do not want their grandchildren to continue in fishing (70.3% and 67.1%). Katpar is more hopeful, with 58.8% wanting continuity.

Natural Capital / Environment & Climate

- **Ecological decline is severe,** with most fisherfolk reporting a sharp fall in fish diversity and populations-91.2% in Katpar, 78.1% in Bandar, and 62.9% in Light House-attributing it to overfishing and juvenile fish capture. Key species such as Pomfret, Hilsa, and Bombay Duck are becoming scarce.
- **Climate shocks such as cyclones affect most households.** 77.5% of households in Katpar, 65.6% in Bandar, and 55.7% in Light House - leading mainly to economic loss and disruption of fishing. Awareness of climate change is nearly universal (97–98%), but adaptive mechanisms remain informal.
- **Communities rely on traditional knowledge of tides and weather, is held mainly by men,** while Pagadiya fishers, women, and widows are viewed as the most vulnerable. During crises, support comes mainly from family networks, as government aid reaches fewer than 8% of households. This underscores the urgent need for ecosystem restoration, institutional support, and community-led adaptation to sustain livelihoods.

The iterative research led to notable outcomes: formation of Maachimmar Samitis, registration of 83 fishers under NFDP, scheme facilitation for 582 fishers, a seaweed seed preservation pilot with CSMCRI, crab culture training for 50 fishers with Kamdhenu University, and new collaborations with private, nonprofit, and government partners.

RECOMMENDATIONS

Sanitation and Drinking Water. A time-bound plan is needed to expand toilet coverage to every household, beginning with Bandar and Light House where access is lowest. Parallel investment in safe and reliable tap-water connections is critical, with Katpar's stronger coverage safeguarded through user-led maintenance systems.

Land Tenure and Safer Housing. Method of formal recognition of tenure is essential for security and to access housing schemes. Pattas for secure occupancy of land for housing/issuing house site pattas is a potential solution. This will also open pathways for eligibility to housing schemes. In addition, cyclone- and fire-resistant retrofits for thatch-roof homes need to be prioritised, especially in Bandar and Light House where risk is greatest.

Insurance and Financial Protection. The absence of insurance is an urgent concern. District-level insurance camps can be organised to provide low-cost cover for boats, nets, and fisher families, alongside health and accident insurance. Introducing claim facilitation mechanisms to ensure that benefits reach families quickly would be effective. Linking SHGs and fisher groups to banks can reduce dependence on moneylenders and support investment in livelihoods.

Licensing & Market Access. Mobile licensing camps, especially in Light House, will be instrumental to clear pending renewals. The creation of dedicated vending areas nearer to fishing settlements, combined with digital and direct-to-consumer market initiatives, would reduce dependence on intermediaries. Starter cold-chain facilities such as iceboxes can help reduce post-harvest losses.

Women's Empowerment. Adult literacy programmes and skills training in rope making, seaweed cultivation, and other supplementary livelihoods can reduce drudgery and enhance incomes. Crucially, formal representation of women's federations in fisheries committees, Gram Panchayat planning, and disaster response platforms will ensure that their voices shape governance.

Youth and Skills Development. Efforts to diversify livelihoods for youth must include post-training handholding, exposure visits, and mentoring so that new skills translate into sustainable employment or enterprise.

Health and Social Wellbeing. Mobile health services, including occupational health camps addressing joint pain, dental problems, and skin conditions, should be introduced. Community-led campaigns to address substance abuse like alcohol consumption reduce alcohol misuse, linked with health and social welfare programmes, are also needed to address a major social concern raised in all three villages.

Environment and Climate Resilience. Installing plastic interception systems at Malan Bandhara and promoting mangrove restoration are immediate measures that can improve the ecological base of fishing. Integrating IMD weather alerts with local ecological knowledge and providing basic safety training can enhance preparedness at sea. It would also be valuable to document the ecological and traditional knowledge of fisherfolk.

Documentation and Entitlements. Support is needed to streamline Aadhaar seeding, ration card linkage, and enrolment in fisherfolk-specific schemes. Village-level enrolment camps, prioritising widows and women-headed households, can improve coverage and transparency.

Governance and Local Convergence. A strong village-level fisherfolk platform will ensure fisherfolk priorities into Gram Panchayat Development Plans. Block-level convergence reviews with key departments-including Fisheries,

Revenue, Water Supply, Health, and Rural Development-can ensure delivery on targets for toilets, pattas, insurance, licences, and markets.

WAY AHEAD AND OPPORTUNITIES FOR COLLABORATIVE CHANGE:

The fisherfolk of Katpar, Bandar, and Light House embody resilience and deep ecological knowledge, yet face urgent challenges. These challenges, however, are not insurmountable. With coordinated action - government ensuring last-mile delivery, panchayats integrating fisherfolk needs, women's federations strengthening leadership, and civil society supporting capacity and climate adaptation and fisherfolk readiness, coastal livelihoods can become secure, dignified and resilient. The Research findings and the achievements over the year provides a concrete foundation for collaborative work at the district, state and national level.

Recent collaborations among the Fisheries Department, CSIR-CSMCRI, Kamdhenu University, Seatang, Shakti Mahila Sangathan, Katpar Gram Panchayat and Katpar Maachimar Samiti and Utthan demonstrate that multistakeholder partnerships based on solidarity, intent and accountability are key to sustained, inclusive change.

ABOUT UTTHAN

Founded in 1981, Utthan empowers rural women and girls to assert their voices, access resources, and claim autonomy. Working across Water, Livelihoods, NRM, Gender Equity, and Social Inclusion, it integrates women's leadership and climate action, reaching 1.2 million people in 10 Gujarat districts.

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