

Research Article

Coastal Community Empowerment Model: The Role of Women during the Fish “Off-Season” in Building Family Food Security

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Abstract. During the fishing off-season, fishers face difficulties going to sea, causing household income to decline while daily food needs remain. Coastal women often become the main economic support, yet their role has rarely been developed into an empowerment model. This study aims to develop a coastal-community empowerment model based on women’s roles in strengthening family food security during the off-season. A qualitative case-study design was conducted in a fishing community in Sumenep Regency, East Java. Twelve informants were purposively selected, consisting of eight women from fishing families as key informants and four supporting informants. Data were collected through in-depth interviews, direct observation, and document tracing, then analysed using the Miles and Huberman interactive model, including data reduction, data display, and conclusion drawing, with triangulation used to ensure validity. The findings show that women contribute to all four pillars of food security: availability, access, utilisation, and stability, while serving as the main economic buffer when husbands cannot fish. However, their efforts remain largely survival-oriented and are constrained by limited capital, narrow market access, and double workloads. The study concludes that an off-season-adaptive women’s empowerment model aligned with the seasonal calendar is needed to support more independent and sustainable livelihoods.

Keywords: Coastal Communities; Family Food Security; Fishers; Off-Season; Women's Empowerment.

1. Introduction

Coastal community life moves to the rhythm of the sea, and no period is heavier for them than the fish off-season. When weather worsens, waves rise, and fish move away, fishers are forced to stop going to sea. Income that usually flows almost daily is abruptly cut off, even though the kitchen must keep smoking. A number of studies note that traditional fishing households are among the poorest and most food-fragile; when fishers cannot go to sea, family food availability is also threatened, and rates of child undernutrition in coastal areas are recorded as higher than in agricultural or urban areas (Wurianturi, 2024). This condition is compounded by a national food situation that has not fully recovered, with under-five stunting prevalence still at 22.6% in 2024 (Tiftazani et al., 2025). Fisher poverty rooted in limited fishing gear, middleman traps, and volatile fish prices makes coastal household economies even harder to predict (Hakim, 2021; Latief et al., 2021). An off-season that can last for months forces families to take survival measures, such as reducing food portions and quality, going into debt, or seeking other food sources such as home gardens (Wardah & Niswah, 2021; Wurianturi, 2024). The heaviest burden falls on households that live off daily catches without sufficient savings to cover periods without income. Dependence on a single source of livelihood means seasonal shocks are felt directly

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at the dinner table. The off-season is therefore not merely a matter of a falling catch, but a real test of family food security.

Amid this pressure, coastal women are often the ones who keep the family fed. When husbands lose income, they take on a dual role: managing the household while also earning a living by processing and selling seafood, opening a small business, or making do with available food ingredients (Wardhani et al., 2025). Unfortunately, although their role is widely acknowledged as significant, most research has so far only described women's economic contribution in general terms and has not yet formulated an empowerment model that specifically links their role during the off-season to family food security. This uneven attention means women's contribution is often treated as supplementary rather than a primary pillar, even though without them many fishing families would fall into food insecurity far more quickly once the season turns unfavourable. This is the gap addressed in this study: how a coastal-community empowerment model can optimise women's role as the key to family food security during the off-season. This question is consistent with empowerment theory, which views weak groups not as passive recipients but as subjects capable of independence (Afriansyah et al., 2023), as well as with the four-pillar food-security framework that emphasises availability, access, utilisation, and stability (Tiftazani et al., 2025).

The novelty of this study lies in a shift of focus, from merely describing women's economic role to developing an empowerment model suited to a seasonal crisis. Previous research has usually stopped at women's role in supplementing household income (Wardhani et al., 2025) or mapping fisher food insecurity in general (Wurianturi, 2024), rarely bringing the two together with the off-season as the pivot point. Some studies even focus more on economic-welfare aspects without linking them to family nutrition and food, so the picture that emerges remains incomplete. This study instead positions the off-season not merely as a temporal backdrop, but as the moment when food security is tested and women's capacity is most visible. From there, the proposed model is developed—one that follows the seasonal cycle, combines gender, local institutions, and food diversification, and places women at the centre rather than merely as targets of assistance.

Three theoretical foundations underpin this study. First, community-empowerment theory, which views empowerment as a process of raising awareness, strengthening capability, and fostering independence—socially, economically, and politically (Afriansyah et al., 2023). Second, the concept of food security, referring to the FAO (1996) formulation and Law No. 18 of 2012 on Food, which requires the availability of food that is sufficient, safe, nutritious, diverse, and affordable, elaborated through four pillars: availability, access, utilisation, and stability (Tiftazani et al., 2025). Third, a gender perspective explaining the shift of women's role from the domestic sphere to the productive sphere as a pillar of family economic support (Wardhani et al., 2025). The three are used together to read how women's empowerment can become a pathway to strengthening family food during the off-season.

Building on this discussion, this study has three objectives. First, to understand the role of coastal women in safeguarding family food during the off-season, in terms of availability, access, and utilisation. Second, to examine what supports and hinders their empowerment during that period. Third, to develop a coastal-community empowerment model grounded in women's role capable of sustainably strengthening family food security.

Theoretically, this study is expected to add to the body of coastal empowerment and gender studies by incorporating the seasonal factor into food-security analysis. Practically, the results can serve as a reference for local governments, extension workers, and non-governmental organisations in designing better-targeted coastal women's empowerment programmes, so that fishing families become more resilient to the off-season and the risk of food insecurity can be reduced. For coastal women themselves, a model of this kind is expected to open up space for their work and voice to be more recognised, both in household decisions and within the community.

2. Methods

This study used a qualitative approach with a case-study design. The qualitative approach was chosen because the aim was to gain an in-depth understanding of how empowerment and women's roles work to safeguard family food during the off-season, rather than to measure relationships between numbers (Sugiyono, 2022). A case-study design was used so the issue could be examined in its entirety within a single community, complete with its social, economic, and gender dynamics.

The study was conducted in Sumenep Regency, East Java, within a fishing community in the area. Sumenep was deliberately chosen because it is located at the eastern tip of Madura Island and most of its residents depend on capture fisheries, so they routinely face the off-season. Data collection took place from February to May 2026. Data consisted of primary data from informants and secondary data from village documents, monographs, statistics, and relevant literature. Informants were selected purposively, supplemented where necessary through the snowball technique (Sugiyono, 2022). There were twelve informants: eight women from fishing families as key informants—those actively sustaining the family economy and managing family food during the off-season—and four supporting informants, namely a women's group leader, a fisher figure, a fisheries extension worker, and a village official. The addition of informants was stopped once the data reached saturation.

Data were collected using four complementary methods: observation, in-depth interviews, focus group discussions, and document tracing (Sugiyono, 2022). Observation focused on women's daily activities in sustaining the family economy and food. Interviews were semi-structured with a guide, allowing informants to speak freely. Focus group discussions were used to explore shared views, while documents supplemented the data through notes, photographs, and supporting archives.

In qualitative research, the researcher is the main instrument, since it is the researcher who observes, interviews, and interprets the data. The researcher was assisted by interview and observation guides, a recording device, a camera, and field notes to keep the data accurate and complete.

Analysis used the interactive model of Miles et al. (2014), which runs iteratively throughout the study and comprises three stages: data reduction, data display, and conclusion drawing and verification. In the reduction stage, field data were selected and summarised; in the display stage, data were arranged as narrative, matrices, or diagrams; and conclusions were drawn progressively while being continually re-examined.

Data validity was maintained through source and technique triangulation, namely comparing information from various informants and from different collection methods (Sugiyono, 2022). The researcher also extended the observation period and re-checked findings with informants to ensure the results were trustworthy.

3. Results And Discussion

This study involved twelve informants, eight of them women from fishing families as key informants, with the remainder comprising a women's group leader, a fisher figure, a fisheries extension worker, and a village official. After interviews, observation, and documents were cross-checked, the picture was consistent. Following the seasonal calendar, the off-season reduces the frequency of going to sea to just once or twice a week, or even stops entirely during high waves and strong winds. Income that in a normal season arrives almost daily becomes unpredictable, and businesses reliant on fish, such as fish trading, processing, and shelling seafood, also slow down. One informant recounted that during the fish season her husband brought home money almost every day, but once strong winds hit, three to four days might pass without going to sea, so spending had to be calculated carefully, with rice and children's needs the priority (P1). This picture confirms the seasonal poverty of fishers also reported by other researchers (Hakim, 2021; Wurianturi, 2024).

When the data are read through the four-pillar food-security framework, women are seen operating across all four at once, making them the primary managers of family food during the off-season (FAO, 1996; Tiftazani et al., 2025). On the availability side, women maintain household food reserves: storing rice and dry goods, preserving fish into dried fish, floss, and sambal, raising livestock, and planting home gardens. Observation of one informant's yard found moringa, chilies, eggplant, and water spinach, plus a few chickens, which noticeably reduced spending. She admitted her garden's yield was modest, but when the shopping money ran out, at least there was still something to cook (P8). This approach is consistent with recommendations to strengthen alternative food sources for fishers when the sea cannot be relied upon (Wardah & Niswah, 2021; Wurianturi, 2024).

On the access side, women's income becomes the cushion that maintains family purchasing power when the sea is quiet. They trade, run small stalls, make food, process seafood, and work as day labourers. Food access is also helped by social networks and trust-based store credit; store records show many staple needs are bought on credit, then repaid once fishers bring home a catch again. A shop owner explained that when the sea cannot be relied on, the shop is what people turn to, and even though the profit is small, at least there is money for vegetables and children's school needs (P6). Survival strategies like this

underline just how central women are in maintaining food access during hard times (Wardah & Niswah, 2021).

On the utilisation side, women strive to maintain the family's diet, even as the variety and quality of food decline. Fresh fish is replaced by salted or processed fish, animal protein shifts to eggs, tofu, and tempeh, while milk and fruit are reduced. Notably, children are still prioritised when side dishes run low; one mother said the small portion of side dish usually goes to the children, while she and her husband make do with chili sauce or vegetable broth (P5). This shrinking food variety is a sign of food insecurity consistent with the high rate of nutrition problems in coastal areas and the national stunting rate of 22.6% in 2024 (Tiftazani et al., 2025; Wurianturi, 2024).

On the stability side, women work to keep food available at all times by setting money aside during the fish season, buying more rice, preserving fish, and joining rotating savings and loan groups (*arisan*). One informant explained that when her husband earns more, she tries to buy more rice, because if the money runs out quickly, the family will struggle during the off-season (P1). Even so, these savings are fragile, because income during the normal season is also spent on debt repayment, school fees, and repairing fishing gear, so not all families manage to save for the next off-season.

Women's economic activities during the off-season can be grouped into four categories: processing fishery products, small-scale trading, working in the informal sector, and producing household food. This range of activities marks a shift in women's role from domestic matters to productive work as a pillar of family economic support (Wardhani et al., 2025). However, in decision-making, women's authority is greater over consumption and daily needs, and more limited on major decisions such as buying fishing gear, borrowing large amounts, or selling assets, which are still decided jointly with husbands. This simultaneously shows the strength of women's role and the limits of their economic independence, a reflection of the double burden they carry.

Women's empowerment during the off-season is helped by family and husband support, processing and trading skills, the existence of women's groups, local raw materials, government and extension-worker assistance, and kinship networks. Conversely, their efforts are hampered by capital that is often mixed with household spending money, a market limited to neighbouring villages, raw materials dependent on the season, makeshift tools, a double work burden, minimal digital literacy, unlicensed businesses, dependence on aid, and training that stops without follow-up mentoring. A fisheries extension worker assessed that women's basic skills are actually already fairly good, and the main constraint lies instead in business management, product standards, licensing, financial record-keeping, and market access (PD1). Viewed through empowerment theory, which demands awareness-raising, capability strengthening, and eventually independence, this condition shows that the awareness stage and part of the skills-strengthening stage have been achieved, but independence has not, because mentoring is cut off midway (Afriansyah et al., 2023).

From all these findings, an Off-Season-Adaptive Coastal Women's Empowerment Model is formulated. This model places women as the principal actors, not merely as aid recipients, and is structured to follow the seasonal cycle. It has eight interrelated components: mapping vulnerability based on the seasonal calendar, strengthening women's capability, diversifying business and food, strengthening access to capital, improving group institutions, developing markets, reinforcing family food, and monitoring and evaluation. What distinguishes it is that the model adapts to the off-season and unites economic, food, nutritional, institutional, gender, and social-protection dimensions.

Overall, this study confirms that fishing families' food during the off-season depends heavily on women. However, the steps currently taken remain mostly limited to survival—such as economising, substituting side dishes, going into debt, and drawing on savings—so food insecurity has not truly been eliminated. This is where the added value of the proposed model lies: directing women from mere survival towards a more independent and sustainable livelihood, in line with the goals of empowerment and the strengthening of all four food-security pillars (Afriansyah et al., 2023; Tiftazani et al., 2025). In this way, this study complements previous research that typically separates women's economic role from food insecurity, by uniting the two within a single, season-based empowerment framework (Wardhani et al., 2025; Wurianturi, 2024).

4. Conclusion

Coastal women are the principal figures who safeguard fishing families' food during the off-season in Sumenep Regency. They manage the household, earn a living, and maintain social networks all at once, and their contribution is felt across all four pillars of food security. For availability, women manage reserves through storing, processing, raising livestock, and planting home gardens; for access, their income and networks sustain purchasing power; for utilisation, they manage the menu and safeguard children's nutrition even as food becomes simpler; and for stability, they save and preserve food to face an unpredictable season.

This role is supported by family, local skills, women's groups, local raw materials, and government assistance and social networks. But their capacity remains limited by small capital, a narrow market, simple technology, unlicensed businesses, seasonal raw materials, minimal business experience, and a double work burden. As a result, the steps taken generally remain limited to survival and have not eliminated food insecurity. Existing empowerment programmes are also not yet integrated and have not been designed to follow the off-season cycle.

Building on these findings, this study offers an Off-Season-Adaptive Coastal Women's Empowerment Model that positions women as the principal actors and adapts to the seasonal calendar. This model unites vulnerability mapping, capability strengthening, business and food diversification, capital and institutional strengthening, market development, family food reinforcement, and monitoring and evaluation. The hope is that women's efforts no longer stop at survival, but grow into a more independent and sustainable livelihood. Further research needs to test this model in other regions and measure its results more rigorously so that its reliability is further validated.

References

- Afriansyah, Afdhal, Mustanir, A., Faried, A. I., Mursalat, A., Kurnadi, I. H., Fauzan, R., Amruddin, Siswanto, D., Widiyawati, R., & Abdurrohm. (2023). *Pemberdayaan masyarakat [Community empowerment]*. PT Global Eksekutif Teknologi.
- Chambon, M., Miñarro, S., Alvarez Fernandez, S., Porcher, V., Reyes-García, V., Drouet, H. T., & Ziveri, P. (2024). A synthesis of women's participation in small-scale fisheries management: Why women's voices matter. *Reviews in Fish Biology and Fisheries*, 34(1), 43–63. <https://doi.org/10.1007/s11160-023-09806-2>
- Fabinyi, M., Belton, B., Dressler, W. H., Knudsen, M., Adhuri, D. S., Abdul Aziz, A., Akber, M. A., Kittitornkool, J., Kongkaew, C., Marschke, M., Pido, M., Stacey, N., Steenbergen, D. J., & Vandergeest, P. (2022). Coastal transitions: Small-scale fisheries, livelihoods, and maritime zone developments in Southeast Asia. *Journal of Rural Studies*, 91, 184–194. <https://doi.org/10.1016/j.jrurstud.2022.02.006>
- Food and Agriculture Organization of the United Nations. (1996). *Rome Declaration on World Food Security and World Food Summit Plan of Action*.
- Food and Agriculture Organization of the United Nations. (2024). *Implementing the Small-Scale Fisheries Guidelines for gender-equitable and climate-resilient food systems and livelihoods: Summary baseline report of the FAO FMM/GLO/155/MUL Project: Indonesia, Madagascar, Namibia and the Philippines*. <https://doi.org/10.4060/cd0102en>
- Hakim, R. (2021). Sistem pemasaran hasil perikanan dan pengentasan kemiskinan nelayan Desa Branta Pesisir Pamekasan [Fishery product marketing systems and poverty alleviation among fishers in Branta Pesisir Village, Pamekasan]. *Ekopem: Jurnal Ekonomi Pembangunan*, 6(3), 71–80. <https://doi.org/10.32938/jep.v6i3.1905>
- Handayati, P., Nasih, A. M., Susilowati, I., Idris, Nayak, P. K., & Narmaditya, B. S. (2025). From vulnerable to resilience: An assessment of small-scale fisheries livelihood in South Malang of Indonesia. *Discover Sustainability*, 6, Article 17. <https://doi.org/10.1007/s43621-025-00810-z>
- Latief, M. I., Hasbi, Sultan, Genda, A., & Pasmudir. (2021). Intervensi SDGs terhadap penanganan kemiskinan nelayan pada masa pandemi COVID-19 di Kota Makassar [SDGs intervention in addressing fisher poverty during the COVID-19 pandemic in Makassar City]. *Proceeding Simposium Nasional Kelautan dan Perikanan*, 8, 267–276.
- Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook* (3rd ed.). SAGE Publications.
- Stacey, N., Gibson, E., Loneragan, N. R., Warren, C., Wiryawan, B., Adhuri, D. S., & Fitriana, R. (2019). Enhancing coastal livelihoods in Indonesia: An evaluation of recent initiatives on gender, women and sustainable livelihoods in small-scale fisheries. *Maritime Studies*, 18(3), 359–371. <https://doi.org/10.1007/s40152-019-00142-5>
- Stacey, N., Gibson, E., Loneragan, N. R., Warren, C., Wiryawan, B., Adhuri, D. S., Steenbergen, D. J., & Fitriana, R. (2021). Developing sustainable small-scale fisheries livelihoods in Indonesia: Trends, enabling and constraining factors, and future opportunities. *Marine Policy*, 132, 104654. <https://doi.org/10.1016/j.marpol.2021.104654>
- Sugiyono. (2022). *Metode penelitian kuantitatif, kualitatif, dan R&D [Quantitative, qualitative, and R&D research methods]*. Alfabeta.

- Tiftazani, N. Z., Noerzaman, M. R. S., Hermawan, C. G., Askori, N., Rohmah, M. I., & Setiawan, A. (2025). Evaluasi dan perkembangan ketahanan pangan Indonesia tahun 2023–2025 berdasarkan kerangka empat pilar FAO [Evaluation and development of Indonesia's food security in 2023–2025 based on the FAO four-pillar framework]. *Jurnal Riset Multidisiplin Edukasi*, 2(12), 851–873.
- Undang-Undang Republik Indonesia Nomor 18 Tahun 2012 tentang Pangan [Law of the Republic of Indonesia Number 18 of 2012 concerning Food]. (2012). *Lembaran Negara Republik Indonesia Tahun 2012 Nomor 227* [State Gazette of the Republic of Indonesia Year 2012 Number 227].
- Wardah, O. A. N., & Niswah, F. (2021). Strategi ketahanan pangan dalam program urban farming di masa pandemi COVID-19 [Food security strategies in urban farming programs during the COVID-19 pandemic]. *Publika*, 9(1), 145–160. <https://doi.org/10.26740/publika.v9n1.p145-160>
- Wardhani, A. A., Arwinda, S., Solechan, A., Shibghatalloh, A. H., Syafrudin, H. A., & Musliha, C. (2025). Women as pillars of coastal economic resilience: Role transformation, empowerment, and gender support in the Juwana coastal community. *Jurnal Ilmu Sosial dan Humaniora*, 14(2), 396–406. <https://doi.org/10.23887/jish.v14i2.95632>
- Wurianturi, I. (2024). Ketahanan pangan rumah tangga nelayan di Indonesia [Food security of fishing households in Indonesia]. *Social Agriculture, Food System, and Environmental Sustainability*, 1(2), 53–61. <https://doi.org/10.61511/safses.v1i2.2024.1071>