



Transition from Fishing into Tourism: Fisherfolk's Perception of Occupational Inclination in Coastal Karnataka

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Abstract

Tourism has increasingly been recognised as a viable livelihood diversification option for fishing communities facing challenges of declining fish stocks, income instability, and occupational risks. This study explores the socio-economic profile, transition patterns, time-effort allocation, and income changes following a shift from fishing to tourism-based occupations in five coastal taluks of Uttara Kannada. Using purposive sampling, 120 respondents engaged in tourism activities were surveyed. Although average fishing experience outweighed tourism experience, tourism had become the primary source of income for 86.7% of respondents. Perceptions of transition indicated strong agreement on pull factors such as tourism's growth potential, lower occupational risks, reduced physical strain, and growing demand for tourism services in the area. Push factors included inconsistent income from fishing and declining fish availability. Transition scores varied significantly across activities, with fish eateries and turtle eco-tourism showing the highest scores. A significant reduction in time effort was

noted after entering tourism, with median annual labour hours declining from 5040 to 3873 hours (Wilcoxon $V = 5617$, $p < 0.001$). Income analysis demonstrated that post-tourism annual median income (₹ 281,500) was significantly higher than the hypothesised pre-tourism benchmark of ₹ 200,000 (Wilcoxon $V = 6266$, $p < 0.001$). The Ordinal logistic regression identified the share of tourism in total income as a significant predictor of inclination towards occupational transition. The findings underscore the potential of tourism in improving incomes, reducing labour burdens, and enhancing livelihood security, while emphasising the need for supportive policies, skills training, and community-driven approaches to ensure long-term sustainability and equitable benefits.

Keywords: Coastal tourism, fisherfolk, livelihood diversification, occupational transition, Socio-economic impact

Introduction

In the Global Tourism rankings published by the World Economic Forum (2024) in the biennial Travel and Tourism Development Index (TTDI), India ranked 39th, reflecting the sector's post-pandemic recovery and performance. India also ranked third among BRICS countries and first among South Asian countries in TTDI 2024. In the year 2022-23, tourism contributed 5.19% and 5.00% to India's total

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GVA and total GDP, respectively, and generated a total employment of about 605.81 million (Ministry of Tourism, Government of India, 2024). The World Travel & Tourism Council's (WTTC) (2024) Economic Impact Research (EIR) revealed that the Travel & Tourism sector's contribution to India's GDP reached just over ₹ 19.13 trillion in 2023, which is almost 10% higher than 2019 levels.

Karnataka ranks twelfth in foreign tourist visits (0.409 million), contributing 2.1% of the total among Indian States and UTs. In the Karnataka Tourism Policy 2020-26, the Government of Karnataka acknowledges the importance of the tourism sector and has identified it as a priority sector in the State (Department of Tourism, Government of Karnataka, 2022). Through the Invest Karnataka Forum (IKF), the Government of Karnataka hosted the prestigious 'Global Investors Meet - Invest Karnataka 2025', during which tourism secured significant investment (Government of Karnataka, 2025). The government aims to attract between ₹ 7,800 crore and ₹ 8,000 crore in direct private investment into the tourism sector over the next five years (Triveni, 2025). Coastal Karnataka accounts for 10.6%–15.5% of the State's total tourist footfall (The Hindu Bureau, 2025). The government also envisions the creation of integrated tourism zones and development of at least 10 mega-tourism projects along the coast within five years (Naina, 2025). India is boosting tourism along its 7,500-km coastline through integrated national initiatives. The Swadesh Darshan scheme connects destinations through "Coastal Circuits" (Sake, 2025), while the Sagarmala Programme funds tourist-centric infrastructure like cruise terminals, harbours, and lighthouses (Sagarmala, 2025).

The total marine fisherfolk population of Karnataka is estimated at approximately 1.57 lakhs, of whom about 35,000 are active fishermen, including approximately 32,000 full-time and 3,000 part-time fishermen; the remaining fisherfolk are engaged in various fishing-allied activities (CMFRI-DoF, 2020). For those not actively engaged in fishing, diversifying income sources and pursuing alternative occupations are critical for survival and stability. Theoretically, the occupational shift of coastal communities from traditional fisheries to tourism can be understood through the lens of the Push-Pull Hypothesis, a migration theory suggesting that circumstances at the place of origin (such as poverty and unemployment) repel or push people out of that

place to other places that exert a positive attraction or pull (such as a high standard of living or job opportunities) (Population Reference Bureau, 2026). For coastal fisherfolk, 'push' factors can be characterised by vulnerabilities such as climate change, overfishing, uncertain catches inherent to declining marine resources, seasonal fishing bans, and high physical occupational risks (Salgueiro-Otero, Barnes, & Ojea, 2022; Sangma et al., 2025; FRAEED, 2026). Furthermore, many fishers have been unable to improve and utilise their catch, resulting in inadequate income to meet their daily needs (Olale & Henson, 2012a, 2012b, 2013; Suharno, Anwar, & Saraswati, 2018). Conversely, the expanding coastal tourism sector generates powerful 'pull' factors, offering alternative livelihoods with potentially favourable income levels and lower physical strain (Praptiwi et al., 2021).

Tourism research has largely focused on tourists, with limited attention to service providers, including coastal fisherfolk. Filling this research gap is essential for allocating resources, designing tourism infrastructure, and implementing fisheries management measures to foster long-term socio-economic resilience and environmental sustainability along coastal states. This exploratory research aims to (i) document the socio-economic profile of tourism-dependent coastal fisherfolk, (ii) understand the possible reasons for transition, and (iii) recognise time-effort and income patterns of fisherfolk after transitioning into tourism.

Materials and Methods

Owing to the nature of the study, it was conducted using an exploratory research design. The study was conducted in Karwar, Ankola, Kumta, Honnavar, and Bhatkal, the five coastal taluks of Uttara Kannada district, Karnataka, India. The study focused on fisherfolk involved in seven tourism and tourism-related activities, namely, Boat/Cruise tourism, Mangrove tourism, Fish eateries, Scuba diving/Dolphin tourism, Adventure sports, Homestays, and turtle eco-tourism. Fish eateries were explicitly classified under the tourism sector, as they function as a secondary market driven by tourist footfall and cater to visitors seeking authentic coastal culinary experiences rather than standard local consumption. In this digital era, social media has contributed to a rapid influx of tourists to coastal Uttara Kannada, which offers a variety of tourism experiences. The tourism hotspots were identified through the

internet (including social media such as Instagram and YouTube, using keywords related to tourism activities) and through direct enquiries (local informants and travel enthusiasts). Purposive sampling was then employed to identify fisherfolk involved in tourism and tourism-related activities in these hotspots. Because the research design prioritised the specific nature of the occupational shift, sampling was driven entirely by the locations of these activity hotspots rather than proportional taluk-level or village-level geographic quotas. Primary data were collected using a semi-structured interview schedule from 120 such fisherfolk across all five taluks of Uttara Kannada district, who constituted the study sample.

Data were analysed using various statistical methods, including frequency and percentage distribution, arithmetic mean, and standard deviation for the socio-economic profiling of the fisherfolk. To analyse transition dynamics, two distinct dependent variables were constructed. Respondents' perceptions regarding fifteen push-and-pull statements were recorded on a 5-point Likert scale. The arithmetic mean of the fifteen items was calculated for each respondent to generate a composite "Transition Score." The Kruskal-Wallis test was used to compare the Transition scores across the seven different activity groups. The Wilcoxon Signed-Rank test was used to determine whether there was a change in time effort before and after individuals entered the tourism sector. It also helped determine whether post-transition income differed significantly from a specified benchmark. To quantify the determinants of these occupational shifts, an ordinal logistic regression was carried out using a cumulative link model (CLM). The dependent variable for this specific model, defined as Perceived Transition Inclination, was derived from an independent, single-item measure assessing overarching occupational sentiment ("Overall, I strongly feel to have transitioned into tourism"). While originally measured on a standard 5-point Likert scale, the complete absence of 'Strongly Disagree' responses naturally formed a four-level discrete ordinal variable utilised in the model (2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree). The independent variables included share of tourism in income, log total income, marital status, family size, gender, age, tourism experience, fishing experience, change in total effort, and willingness to trade off fishing. R statistical software (version 4.4.2), run

through RStudio (version 2025.5.1.513), and Microsoft Excel were used for data analysis.

Results and Discussion

Among all the respondents, the mean age was found to be 42 (42.3) years, ranging between 19 and 64 years. A substantial majority (73%) fell within the 30-50 age bracket, followed by 23% in the >50 age group, and 4% within the 18-30 age bracket. This age structure indicates a workforce predominantly in its prime productive years, with substantial life and work experience and significant family and financial responsibilities—factors likely to influence livelihood diversification and risk management. A previous finding showed that 53% of fishermen in Kerala belonged to the middle-aged group, followed by 27% in the old-age group and 20% in the young-age group (Immanuel, 2004).

Coastal tourism activities were predominantly carried out by the male population (97%), whereas female representation was minimal (3%). All respondents (100%) were Hindus. Respondents belonging to Other Backward Class (OBC) formed the majority (78%), followed by Scheduled Caste (SC) (8%), while there was no representation from the Scheduled Tribe (ST). The predominance of male participants (97%) in coastal tourism, with minimal female involvement, is consistent with a study in which 83% of the fishers in Ratnagiri villages were male, and the community was entirely Hindu-dominated (Yadav et al., 2020).

Most of the fisherfolk were illiterate (73%); a few received primary education (20%), while the rest had attended higher school education (7%). None of them were graduates or professionals. The high level of illiteracy noted in this study contrasts with a previous study by CMFRI-FSI-DoF (2020), in which 66% of fishermen had at least primary or higher education; however, improvement has been noted since 2010. Family structure analysis revealed that 48% of fisherfolk lived in nuclear families, 37% in joint families, and 15% in extended families. The average family size was 5 (4.6), with a mode of 4 members, ranging from 2 to 7. In terms of marital status, 96% of respondents were married, while the rest were single. The family structure results largely align with a previous study, which found that 84% of fishermen in Mumbai had nuclear families, while 16% lived in joint families (Nirmale, Sontakki, Birader, Metar, & Charatkar, 2007).

Table 1. Factors influencing occupational inclination of fishermen

Reason for transition	Questions	Mean $\pm$ SD (n=120)	Agreement Percentage (Agree + Strongly Agree)
A	I transitioned due to a noticeable decrease in the quantity or availability of fish	4.21 $\pm$ 0.92	76%
B	The income from fishing became too inconsistent and unreliable	4.58 $\pm$ 0.63	93%
C	I believed tourism offered the potential for greater overall earnings	4.55 $\pm$ 0.71	88%
D	Tourism seemed to provide a more regular and dependable source of income	4.06 $\pm$ 0.98	68%
E	Fishing provides income only during certain months, and I needed an income source for the off-season	2.22 $\pm$ 0.82	6%
F	I observed a growing demand for tourism-related activities and services in my coastal community	4.76 $\pm$ 0.48	98%
G	My existing skills as a fisherman (e.g., operating a boat, knowing local waters) were useful for tourism activities	4.28 $\pm$ 1.09	78%
H	Tourism activities seemed to be less physically strenuous or hazardous than fishing	4.83 $\pm$ 0.42	98%
I	I was interested in trying something new and expanding my professional horizons	3.28 $\pm$ 1.09	40%
J	My decision was influenced by family members or friends who may or may not already be involved in tourism	3.06 $\pm$ 1.34	39%
K	There were opportunities for training, financial support, or guidance available for starting tourism activities	2.38 $\pm$ 0.97	14%
L	I believe that tourism has a strong growth potential and a promising future in Coastal Karnataka	4.92 $\pm$ 0.26	100%
M	I believe tourism provides easy and diverse employment opportunities	4.54 $\pm$ 0.67	92%
N	Tourism activities are less risky than fishing	4.81 $\pm$ 0.54	95%
O	Tourism jobs demand fewer working hours/effort	4.76 $\pm$ 0.48	98%

Tourism was the major source of income for 87% of respondents, while 13% depended on fishing. This finding differs from previous studies, which reported greater reliance on fisheries (Shyam, Rahman, & Safeena, 2017). However, given the purposive selection of individuals already engaged in coastal tourism, this 87% figure characterises this specific respondent cohort rather than indicating a broad occupational shift across the entire regional fishing population. Similarly, 90% of the labourers in Allaipiddy village, Jaffna, were engaged in fishing year-round (Ragavan, Sivashanthini, & Sutharshiny,

2016). The purposive selection of respondents engaged in tourism can explain the divergence in the present study. The average experience in tourism was 7 (6.68) years, ranging between 1–30 years, whereas the average experience in fishing was 25 (24.72) years, ranging between 0–49 years. The average tourism experience (7 years) was much lower than fishing experience (average 25 years), indicating that fishing was the foundational livelihood and tourism represented a relatively recent shift. Similar trends were observed in Andhra Pradesh, where many fishermen reported long-term

experience in fishing (Venu, Lakshmi, & Latha, 2023). Housing conditions revealed that 56% of the respondents lived in kuccha (temporary or non-permanent) houses, while 44% lived in pucca (permanent) houses. Poor housing conditions, with a majority in kuccha houses (56%), are consistent with findings of persistent poverty and inadequate housing in fishing communities, as described by a previous study (Vichare, 2010). About 68% of respondents owned a two-wheeler, while the rest (32%) owned other means of transport, such as a bicycle. None of the respondents owned a four-wheeler. The results of the socio-economic profile analysis are visualised in Fig. 1 as a consolidated bar graph.

Table 2. Comparison between different activities

Comparison b/w activities	P _{adj}	Significance
1 vs 2	1.0000	ns
1 vs 3	3.32e-05	***
2 vs 3	1.98e-05	***
1 vs 4	1.0000	ns
2 vs 4	1.0000	ns
3 vs 4	1.02e-03	**
1 vs 5	1.0000	ns
2 vs 5	0.7874	ns
3 vs 5	5.89e-05	***
4 vs 5	1.0000	ns
1 vs 6	0.4346	ns
2 vs 6	0.4557	ns
3 vs 6	0.7461	ns
4 vs 6	1.0000	ns
5 vs 6	0.02904	*
1 vs 7	0.009406	**
2 vs 7	0.008090	**
3 vs 7	1.0000	ns
4 vs 7	0.06212	.
5 vs 7	0.001912	**
6 vs 7	1.0000	ns

Activity Codes: 1 = Boat/Cruise tourism; 2 = Mangrove tourism; 3 = Fish eateries; 4 = Scuba diving; 5 = Adventure sports; 6 = Homestays; 7 = Turtle eco tourism

*** = $p \leq 0.001$ (highly significant); ** = $p \leq 0.01$ (very significant); * = $p \leq 0.05$ (significant); . = $p \leq 0.1$ (marginal significance); ns = $p > 0.1$ (not significant)

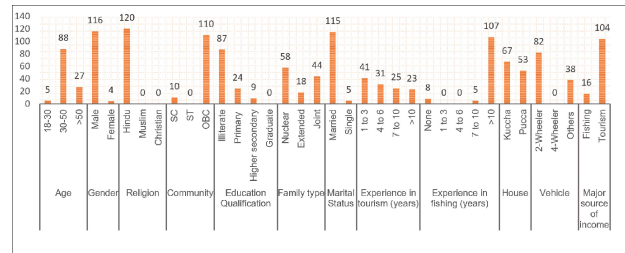


Fig. 1. Socio-economic profile of fisherfolk involved in tourism activities

The study examined respondents' perceptions regarding fifteen statements that could directly influence their willingness to transition into tourism and tourism-related activities. A five-point Likert scale was utilised to assess the level of agreement for each statement. These fifteen items (Table 1) encompassed both potential push factors from the fishing sector and pull factors that attract individuals to tourism. The results revealed several dominant factors influencing fishers' transitions toward tourism-based livelihoods in coastal Karnataka. Respondents most strongly agreed (100% agreement) that they were motivated by the promising future and growth potential of tourism in their region (mean = 4.92, SD = 0.26). The shift was also reinforced (98% agreement) by the less physically strenuous or hazardous nature of tourism jobs (mean = 4.83, SD = 0.42) and the perception (95% agreement) of lower overall risk compared to fishing (mean = 4.81, SD = 0.54), echoing studies highlighting occupational safety concerns and frequent accidents among fishing communities (Hemagiri, Chandra, Prayag, Akshay, & Ganesh, 2024; Mariadason, Preethi, & Parappurathu, 2025). A growing demand for tourism activities and services (mean = 4.76, SD = 0.48) was rated highly (98% agreement), aligning with the region's rising visitation and evolving tourism infrastructure (The Hindu Bureau, 2025). Respondents (98% agreement) also appreciated the fewer working hours/effort required by tourism jobs (mean = 4.76, SD = 0.48), reflecting tourism roles that are often perceived as less physically demanding and offer more flexible schedules than traditional fishing, which typically involves long, physically intensive hours (Fabinyi, 2020).

Economic considerations emerged as a major theme. The inconsistent and unreliable nature of fishing income (mean = 4.58, SD = 0.63) and the perceived potential for higher regular earnings in tourism (mean = 4.55, SD = 0.71), with 93% and 88%

agreement, respectively, were reported as major drivers. This observation resonates with a case study in Galicia, Spain, which emphasised diversifying the economy and income sources of fishing communities by training fishermen into tourist guides (González & Antelo, 2020). While the need for off-season alternative income (mean = 2.22, SD = 0.82) was rated lower, it nevertheless reflects some recognition of tourism's potential to provide year-round employment (6% agreement). Studies show that seasonal constraints and climate impacts significantly affect small-scale fishers in other regions, demonstrating similar push factors (Aguinaldo & Gomez, 2023).

Other noteworthy factors included the transferability of fishing skills to tourism (mean = 4.28, SD = 1.09), such as boat operation and knowledge of local waters (78% agreement), and the perceived (92% agreement) availability of easy and diverse employment prospects within tourism (mean = 4.54, SD = 0.67). In contrast, less influential factors like training and support (mean = 2.38, SD = 0.97), family/friend influence (mean = 3.06, SD = 1.34), and personal interest in new experiences (mean = 3.28, SD = 1.09), with 14%, 39% and 40% agreement, respectively, suggest that these factors played a relatively limited role in the transition. This also highlights that policy-level interventions on infrastructure development, training, and equitable benefit-sharing remain limited (Nagaraja & Siddiq, 2024).

For each respondent, the mean of all transition questions was calculated, and the resulting score was designated as the "Transition score". The Kruskal-Wallis rank sum test was conducted to evaluate differences in Transition scores across different activity groups. The test yielded a highly significant result ($\chi^2 = 48.307$, $df = 6$, $p < 0.001$), indicating that the distributions of transition scores differed significantly among the seven activity categories. The post hoc Dunn's test with Bonferroni adjustment revealed significant differences in transition scores among specific pairs of tourism activities (Table 2). Notably, fish Eateries (Activity 3) consistently showed significantly higher transition scores compared to boat/cruise tourism (Activity 1; $p_{adj} = 3.32 \times 10^{-5}$), mangrove tourism (Activity 2; $p_{adj} = 1.98 \times 10^{-5}$), scuba diving/dolphin tourism (Activity 4; $p_{adj} = 1.02 \times 10^{-3}$), and adventure sports (Activity 5; $p_{adj} = 5.89 \times 10^{-5}$). Although it is challenging to procure fish due to declining catches (Kumari et al., 2021), statistical comparisons be-

tween fish eateries and boat-linked tourism activities revealed that the former was significantly preferred as a transition pathway compared to the latter. Similarly, turtle eco-tourism (Activity 7) recorded significantly higher transition scores when compared with boat/cruise tourism (Activity 1; $p_{adj} = 9.41 \times 10^{-3}$), mangrove Tourism (Activity 2; $p_{adj} = 8.09 \times 10^{-3}$), and adventure sports (Activity 5; $p_{adj} = 1.91 \times 10^{-3}$), suggesting that lower work hours, less effort, and higher returns may contribute to its greater appeal. A study in Yasuní National Park, Ecuador, proposed conservation through tourism by providing experiential activities involving the collection of turtle eggs, nesting, and release (sponsorship) of individuals, thereby providing economic benefits to local communities (Mestanza-Ramón et al., 2022). A significant difference was also found between adventure sports (Activity 5) and homestays (Activity 6; $p_{adj} = 2.9 \times 10^{-2}$), indicating an inclination of younger fisherfolk towards adventure-oriented activities, similar to the trend observed in a previous study (Keane, Eastman, & Iyer, 2020). Other activity comparisons did not reach significance after adjustment, indicating similar transition dynamics. These findings are illustrated visually through a Raincloud plot (Fig. 2).

Measuring time effort serves as a direct proxy for the hours worked and the physical strain experienced by fisherfolk. This was calculated by assessing and quantifying: first, total hours (months $\times$ days $\times$ hours) worked per year in fishing before entering the tourism sector; second, total hours worked per year in fishing after entering the tourism sector; and third, total hours worked per year in tourism. The analysis of time effort before and after participants engaged in tourism revealed a significant reduction in time effort following tourism involvement. The

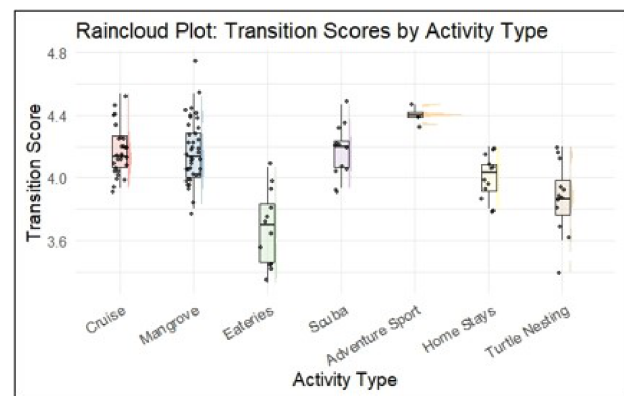


Fig. 2. Significant difference across activity types

Shapiro-Wilk test was first conducted to examine the normality of the differences between paired efforts, and the results indicated a statistically significant deviation from normality ($W = 0.969$, $p = 1.12 \times 10^{-2}$) at the 5% significance level. Consequently, the non-parametric Wilcoxon signed-rank test was applied, which confirmed a significant difference in median effort ($V = 5617$, $p < 0.001$), with the median effort decreasing from 5040 hours before tourism involvement to 3873 hours afterwards. The mean effort similarly decreased from 4886 to 4020 hours. Results are visualized in a line plot (Fig. 3). The findings clearly show that fisherfolk reduced their labour input after taking up tourism-based activities. The reduction in both median and mean effort suggests that tourism provides work opportunities that are comparatively less time-intensive. This corresponds with previous literature showing that fishers often experience long work hours, extreme conditions, more physical demands, and increased risks, often violating basic labour standards (Schilling, 1966; Lee & Lee, 2024; MacDonnell & Vandergeest, 2024).

While overall time effort has significantly decreased after transitioning to tourism, this does not automatically equate to better income. Therefore, computing and comparing the income of fisherfolk before and after entering tourism is important. A Shapiro-Wilk test indicated that the post-tourism income data were not normally distributed ($W = 0.935$, $p < 0.001$), necessitating the use of a non-parametric approach. Subsequently, a one-sample Wilcoxon signed-rank test was conducted to compare the median post-tourism income of about ₹ 2,81,500 against the hypothesised pre-tourism

benchmark income of ₹ 2,00,000. The hypothesised value was derived from several studies where the annual income of fisherfolk was recorded as less than about ₹ 1,20,000, and in very few cases ranged from ₹ 50,000 – ₹ 1,00,000 per month in the coastal districts of Karnataka (Gunakar & Bhatta, 2016; Viswambharan, Rajesh, Aswathy, & Rohit, 2022; Swathi & Vandana, 2023; Harsha, Sankangoudar, Basavakumar, Rajeshwari, & Patil, 2024). The test yielded a highly significant result ($V = 6266$, $p < 0.001$), indicating that the median income after entering tourism was significantly greater than the baseline. The accompanying violin plot (Fig. 4) further illustrates the income distribution, showing a skew towards higher income levels, with many individuals earning substantially above ₹ 200,000.

The results suggest that participation in tourism-related activities has had a positive economic impact on individuals' income levels. These results align with previous research demonstrating that participation in tourism-related activities is seen by fisherfolk as a potential source of supplemental income in response to constraints in fish catches and income variability, and can eventually enhance local resilience to shocks (Liontakis & Vassilopoulou, 2022; Aguinaldo & Gomez, 2023; Boemiya, Wahyuliyana, Mustiko, & Irawan, 2023; Suradja et al., 2024).

To quantify the determinants of these occupational shifts, an ordinal logistic regression model was estimated using a cumulative link model (CLM).

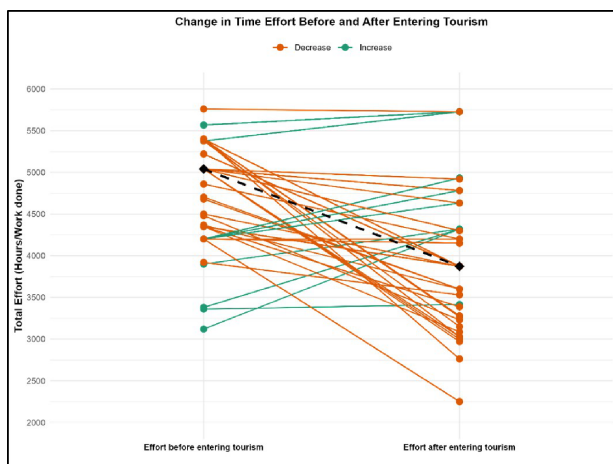


Fig. 3. Occupational inclination on Time effort

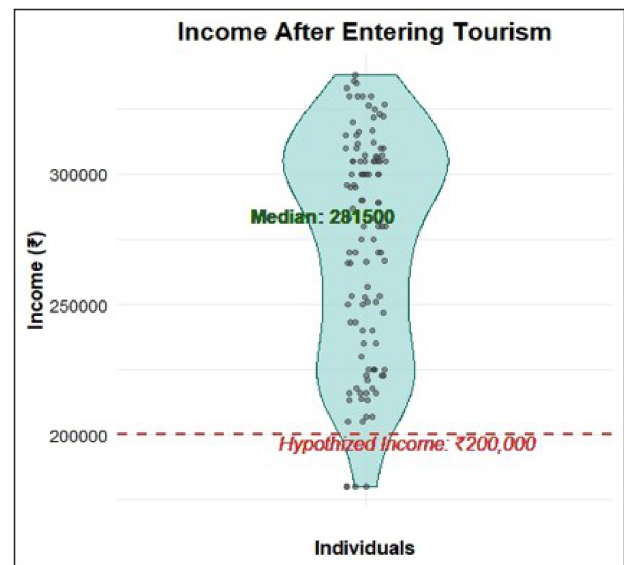


Fig. 4. Occupational inclination on income

“Perceived Transition Inclination” was the dependent variable, while the independent variables included share of tourism in income, log total income, marital status, family size, gender, age, tourism experience, fishing experience, change in total effort, and willingness to trade off fishing. Before estimation, Variance Inflation Factor (VIF) analysis was conducted to assess multicollinearity among predictors. While most predictors had acceptable VIF values (<5), variables such as gender (10.41), age (27.81), and fishing experience (32.99) exhibited very high multicollinearity. Further, the pairwise correlation matrix showed very high correlations between the share of tourism in income and willingness to trade off fishing (0.85), and between fishing experience and age (0.84), necessitating the refinement of the predictors by dropping willingness to trade off fishing, age, and gender. The Likelihood Ratio (LR) test indicated a significantly better fit of the full model compared to the null ($LR \chi^2 = 80.259$, $df = 7$, $p < 0.001$), and the proportional odds assumption was satisfied for all covariates ($p > 0.05$). Model fit statistics further confirmed adequacy, with a reduced AIC (179.60) and improved log-likelihood (-79.80) compared to the null model. The model explained approximately 33% of the variance (McFadden’s $R^2 = 0.33$). Odds ratios revealed that the higher share of tourism in income ($OR = 13.6$, $CI: 5.49 - 57.2$), higher tourism experience ($OR = 1.18$, $CI: 0.69 - 2.05$), and change in total effort ($OR = 1.22$, $CI: 0.66 - 2.45$) significantly increased the likelihood of agreeing with livelihood transitions ($p < 0.001$) (Table 3). Fig. 5 depicts the predicted probabilities of respondents’ agreement levels regarding the variable share of tourism in income, showing how the probability of being in each transition level changes with predictors.

These regression findings highlight the central role of income from tourism in shaping positive attitudes toward livelihood transitions among the sampled cohort. Individuals with greater financial reliance on tourism showed greater acceptance of transition outcomes, reflecting economic incentives as a key driver of attitudinal change. Previous findings similarly indicate that dependence on tourism can foster positive attitudes toward transition outcomes, as people see tourism as a source of income and development (Croes, Ridderstaat, Bak, & Zientara, 2021; Praptiwi et al., 2021). In contrast, fishing dependence through greater experience and reduced effort tends to moderate or dampen positive perceptions, suggesting resistance rooted in traditional livelihoods. A study involving the coastal communities of Padstow (UK) and Paternoster (South Africa) noted that small-scale fishing, perceived as a way of life for fishers, is under threat in both areas, yet there is limited evidence of concerted efforts to plan and manage potential diversification into tourism (Kimbu, Booyens, & Winchenbach, 2022), showing resistance due to generational dependencies on fishing. Socio-demographic factors such as marital status and family size exerted limited influence, underscoring the dominance of economic and livelihood-related variables in shaping the inclination of transition. The probability patterns provide further evidence of a gradual shift from resistance to strong support as tourism dependency increases. Although this study measures the empowerment of a subset of fisherfolk community rather than the population at large, the findings indicate that direct financial benefits to a community can significantly strengthen support for tourism development, consistent with previous findings (Khalid, Ahmad, Ramayah, Hwang, & Kim, 2019).

Table 3. Ordinal logistic regression results for livelihood transition values

Predictor	Odds Ratio (OR)	95% CI	p-value	Interpretation
Tourism share in income	13.6	5.49 – 57.2	<0.001	Significant positive effect
Total income (log)	0.73	0.40 – 1.27	0.274	Not significant
Tourism experience	1.18	0.69 – 2.05	0.556	Not significant
Fishing experience	0.86	0.49 – 1.51	0.594	Not significant
Change in total effort	1.22	0.66 – 2.45	0.551	Not significant
Marital status	3.32	0.09 – 127	0.485	Not significant, wide CI
Family size	0.87	0.59 – 1.29	0.499	Not significant

OR >1 indicates increased likelihood of higher transition values

The study examined the socio-economic characteristics of fisherfolk in Uttara Kannada district and their perception of transitioning from fisheries to tourism-based livelihoods. Findings revealed a respondent profile largely comprising individuals in their productive middle age, predominantly male, Hindu, and belonging to Other Backward Classes, with limited levels of formal education and modest living conditions. Despite these structural constraints, the majority of respondents demonstrated adaptability by shifting livelihoods toward tourism activities. Perceptions captured through the transition scores highlighted critical push and pull factors driving this occupational shift. Declining fish availability, income instability, and the physical hardships associated with fishing acted as strong push factors, while the assurance of steady earnings, growth potential, and relatively lower risks in tourism acted as significant pull factors. The transition was not uniform across all activities, with fish eateries and turtle ecotourism emerging as the activities with the highest transition scores. Importantly, engagement in tourism substantially reduced time effort requirements and resulted in significant income enhancement compared to pre-tourism baselines, underscoring the economic rationale behind fisherfolk's diversification choices.

Overall, the study establishes that tourism is perceived as an effective supplementary livelihood option that enhances income levels while reducing occupational risks and physical strain. These findings reinforce the potential for integrating fisherfolk into coastal tourism. Furthermore, because respondents indicated a severe lack of institutional

support, with only 14% acknowledging access to training or financial support, strengthening access to dedicated skills training and financial support can contribute to the long-term integration of fisherfolk into coastal Karnataka's tourism sector.

This study acknowledges certain methodological and sampling limitations that should be considered when interpreting the results. First, the reliance on purposive sampling to identify individuals actively engaged in coastal tourism introduces inherent selection bias. By surveying only fisherfolk who have successfully transitioned to the tourism sector, the study inadvertently omits the perspectives of those who may have attempted to transition but were unsuccessful.

Second, evaluating historical time-effort (labour hours) relies entirely on participants' memory, which inherently introduces recall bias. Finally, evaluating historical income presented significant methodological constraints. Because respondents transitioned into tourism over widely varying temporal scales (ranging from 1 to 30 years before the study), pairing current earnings with self-reported, highly volatile historical fishing income would be economically unsound.

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References

- Aguinaldo, R. T., & Gomez, A. L. V. (2023). Potential participation of fisherfolks in tourism activities in Samal Island, Mindanao, Philippines. *Philippine Journal of Science*, 152(1), 433–441.
- Boemiya, H., Wahyuliyana, I., Mustiko, B., & Irawan, L. S. A. (2023). The role of the Regional Government of Sampang Madura Regency in managing coastal tourism as an alternative livelihood for fishermen's families. *Technium Social Sciences Journal*, 50, 14–20. <https://doi.org/10.47577/tssj.v50i1.9860>
- Central Marine Fisheries Research Institute, & Department of Fisheries (CMFRI-DoF). (2020). *Marine fisheries census 2016 – Karnataka*. <https://eprints.cmfri.org.in/17503/>
- Central Marine Fisheries Research Institute, Fishery Survey of India, & Department of Fisheries (CMFRI-FSI-DoF). (2020). *Marine fisheries census 2016 – India*. <https://eprints.cmfri.org.in/17490/>

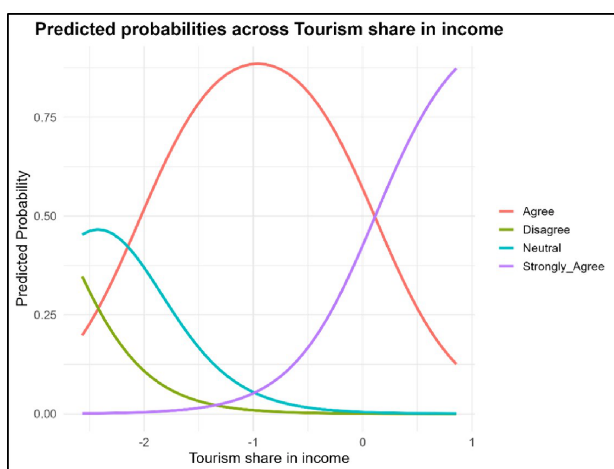


Fig. 5. Predicted probabilities of the strongest determinant across levels of ordinal scale

- Croes, R., Ridderstaat, J., Bak, M., & Zientara, P. (2021). Tourism specialization, economic growth, human development and transition economies: The case of Poland. *Tourism Management*, 82, Article 104181. <https://doi.org/10.1016/j.tourman.2020.104181>
- Department of Tourism, Government of Karnataka. (2022). *Karnataka tourism policy 2020-26*. <https://nitiforstates.gov.in/policy-viewer?id=PSS1223R000060>
- Fabinyi, M. (2020). The role of land tenure in livelihood transitions from fishing to tourism. *Maritime Studies*, 19, 29–39. <https://doi.org/10.1007/s40152-019-00145-2>
- Fishery Resources Assessment, Economics & Extension Division (FRAEED). (2026). *Marine fish landings in India 2025* [Technical Report Booklet Series No. 47/2026]. ICAR–Central Marine Fisheries Research Institute.
- González, R. C. L., & Antelo, M. A. P. (2020). Fishing tourism as an opportunity for sustainable rural development—The case of Galicia, Spain. *Land*, 9(11), Article 437. <https://doi.org/10.3390/land9110437>
- Government of Karnataka. (2025, February 14). *Invest Karnataka 2025 wraps up with ₹ 10.27 lakh Cr. commitment, Karnataka set for massive growth: MB Patil*. Invest Karnataka. <https://investkarnataka.co.in/wp-content/uploads/2025/03/Invest-Karnataka-2025-Wraps-Up-with-₹10.27-Lakh-Cr.pdf>
- Gunakar, S. & Bhatta, R. (2016). Socioeconomic status of fisher-women in segmented fish markets of coastal Karnataka. *Agricultural Economics Research Review*, 29(2), 253–266. <https://doi.org/10.5958/0974-0279.2016.00052.5>
- Harsha, G., Sankangoudar, S., Basavakumar, K. V., Rajeshwari, N., & Patil, M. (2024). Socio economic profile of fisherwomen involved in marine fisheries in Karnataka. *International Journal of Agriculture Extension and Social Development*, 7(8), 188–190. <https://doi.org/10.33545/26180723.2024.v7.i8c.900>
- Hemagiri, K., Chandra, K. R., Prayag, A., Akshay, G. L., & Ganesh, N. (2024). Health profile of working fishermen in coastal city: A cross-sectional study. *Indian Journal of Public Health and Research Development*, 15(2), 90–94. <https://doi.org/10.37506/naw8k473>
- Immanuel, S. (2004). *Linkage among research, extension and clientele systems in marine fisheries in Kerala* [Unpublished MFSc thesis]. Annamalai University.
- Keane, M., Eastman, J. K., & Iyer, R. (2020). Predicting adventure seeking of young adults: The role of risk, innovativeness and status consumption. *Sport Management Review*, 23(5), 952–963. <https://doi.org/10.1016/j.smr.2019.12.009>
- Khalid, S., Ahmad, M. S., Ramayah, T., Hwang, J., & Kim, I. (2019). Community empowerment and sustainable tourism development: The mediating role of community support for tourism. *Sustainability*, 11(22), Article 6248. <https://doi.org/10.3390/su11226248>
- Kimbu, A. N., Booyens, I., & Winchenbach, A. (2022). Livelihood diversification through tourism: Identity, well-being, and potential in rural coastal communities. *Tourism Review International*, 26(1), 25–40. <https://doi.org/10.3727/154427221x16245632411854>
- Kumari, P. V., Thomas, S., Mohanty, P. C., Jayappa, K. S., Mahendra, R. S., & Gupta, A. (2021). Effect of sea surface temperature variation on productivity and fisheries off Karnataka, west coast of India. *Journal of the Indian Society of Remote Sensing*, 49, 3027–3041. <https://doi.org/10.1007/s12524-021-01447-x>
- Lee, J. & Lee, C. H. (2024). Towards sustainable improved labor conditions for fishermen: Insights from the Republic of Korea and Norway. *Journal of Infrastructure, Policy and Development*, 8(10), Article 4976. <https://doi.org/10.24294/jipd.v8i10.4976>
- Liontakis, A. & Vassilopoulou, V. (2022). Exploring fishing tourism sustainability in North-Eastern Mediterranean waters, through a stochastic modelling analysis: An opportunity for the few or a viable option for coastal communities? *Ocean & Coastal Management*, 221, Article 106118. <https://doi.org/10.1016/j.ocecoaman.2022.106118>
- MacDonnell, M., & Vandergeest, P. (2024). Fisher experience on distant water fishing vessels: The implications of variation by vessel type for employment standards. *Maritime Studies*, 23(2), Article 24. <https://doi.org/10.1007/s40152-024-00365-1>
- Mariadason, S., Preethi, V. P., & Parappurathu, S. (2025). Assessment of occupational hazards and role of life-saving gadgets among small-scale motorised fishers on India's southernmost coasts. *Journal of Agromedicine*, 30(2), 395–406. <https://doi.org/10.1080/1059924x.2024.2449434>
- Mestanza-Ramón, C., Lara-Váscones, R., Mora-Silva, D., Milanes, C. B., Saeteros-Hernández, A., Sánchez-Capa, M., & Cunalata-García, A. (2022). Charapa turtles (*Podocnemis unifilis*), an opportunity to improve community tourism and contribute to their conservation in Yasuní National Park, Ecuador. *Sustainability*, 14(13), Article 7548. <https://doi.org/10.3390/su14137548>
- Ministry of Tourism, Government of India. (2024). *India tourism data compendium 2024*. https://tourism.gov.in/sites/default/files/202503/India%20Tourism%20Data%20Compendium%202024_0.pdf
- Nagaraja, & Siddiq, A. (2024). The role of community participation in the tourism development in coastal regions of Karnataka: An analysis of beach households. *International Journal for Multidisciplinary Research*, 6(5). <https://doi.org/10.36948/ijfmr.2024.v06i05.28245>

- Naina, J. A. (2025, February 19). *Karnataka tourism policy expects 10 mega tourism projects in coastal areas in next 5 years*. Deccan Herald. <https://www.deccanherald.com/india/karnataka/karnataka-tourism-policy-expects-10-mega-tourism-project-in-coastal-areas-in-next-5-years-3412468>
- Nirmale, V. H., Sontakki, B. S., Birader, R. S., Metar, S. Y., & Charatkar, S. L. (2007). Use of indigenous technical knowledge by coastal fisherfolk of Mumbai district in Maharashtra. *Indian Journal of Traditional Knowledge*, 6(2), 378–382.
- Olale, E., & Henson, S. (2012a). Determinants of income diversification among fishing communities in Western Kenya. *Fisheries Research*, 125–126, 235–242. <https://doi.org/10.1016/j.fishres.2012.02.029>
- Olale, E., & Henson, S. (2012b). Socio-economic characteristics of fish workers in Western Kenya. *International Journal of Fisheries and Aquaculture*, 4(7), 139–153. <https://doi.org/10.5897/ijfa11.122>
- Olale, E. & Henson, S. (2013). The impact of income diversification among fishing communities in Western Kenya. *Food Policy*, 43, 90–99. <https://doi.org/10.1016/j.foodpol.2013.08.008>
- Population Reference Bureau. (2026). *Glossary of demographic terms*. Retrieved July 9, 2026, from <https://www.prb.org/resource/glossary/>
- Praptiwi, R. A., Maharja, C., Fortnam, M., Chaigneau, T., Evans, L., Garniati, L., & Sugardjito, J. (2021). Tourism-based alternative livelihoods for small island communities transitioning towards a blue economy. *Sustainability*, 13(12), Article 6655. <https://doi.org/10.3390/su13126655>
- Ragavan, N., Sivashanthini, K., & Sutharshiny, S. (2016). Socio-economic status of fishers in Allaipiddy village, Jaffna. *Vingnanam Journal of Science*, 12(1&2), 42–48. <http://dx.doi.org/10.4038/vingnanam.v12i1-2.4116>
- Sagarmala. (2025). *Coastal community development*. Ministry of Ports, Shipping and Waterways, Government of India. <https://sagarmala.gov.in/project/coastal-community-development>
- Sake, K. (2025). *Coastal circuit development: Unlocking India's beach tourism potential*. Jaankaar Bharat. <https://www.jaankaarbharat.com/blog/coastal-circuit-development-unlocking-indias-beach-tourism-potential-cmbbsku4500coyq8mul7v63qz>
- Salgueiro-Otero, D., Barnes, M. L., & Ojea, E. (2022). Transformation in times of climate change: What makes a fisher diversify livelihoods? *Frontiers in Marine Science*, 9, Article 888288. <https://doi.org/10.3389/fmars.2022.888288>
- Sangma, A. S., Lahiri, B., Ghosh, A., Pal, P., Singh, S. K., Tengli, M. B., Meinam, M., & Chandegara, A. K. (2025). Social values of angling tourism in the Garo Hills of Meghalaya, North East India: Fish farmers' perspectives. *Journal of Fisheries*, 13(1), Article 131206. <https://doi.org/10.17017/j.fish.690>
- Schilling, R. S. (1966). Trawler fishing: An extreme occupation. *Proceedings of the Royal Society of Medicine*, 59(5), 405–410. <https://doi.org/10.1177/003591576605900504>
- Shyam, S. S., Rahman, M. R., & Safeena, P. K. (2017). Assessing the socioeconomic profile of a vulnerable coastal fishing village in India. *Asian Academic Research Journal of Multidisciplinary*, 4(2), 98–127.
- Suharno, Anwar, N., & Saraswati, E. (2018). Do fishers need to diversify their source of income? A special reference in vulnerable fishers of Cilacap Waters, Indonesia. *AACL Bioflux*, 11(5), 1605–1615.
- Suradja, I., Asih, T. S., Basir, Dyspriani, D. P., Lionata, H., Marsiyono, A., Nugraha, B. A., Palupi, T. I., Salam, I. A. P., Castillo, L. S., Toldo, A., Trisnawati, A., & Aceves-Bueno, E. (2024). Alternating livelihoods and coping with shocks: An examination of coastal tourism in Indonesia amidst COVID-19. *Marine Policy*, 170, Article 106379. <https://doi.org/10.1016/j.marpol.2024.106379>
- Swathi, & Vandana, K. (2023). A study on socioeconomic circumstances of the fishermen's community in Sasihiithu, Dakshina Kannada District, Karnataka. *International Journal of Science and Research (IJSR)*, 12(6), 2899–2901. <https://doi.org/10.21275/sr23628150134>
- The Hindu Bureau. (2025, June 10). Coastal Karnataka accounts for 10.6% - 15.5% of State's total tourist footfall. *The Hindu*. <https://www.thehindu.com/news/cities/Mangalore/coastal-karnataka-accounts-for-106-155-of-states-total-tourist-footfall/article69679162.ece>
- Triveni, S. (2025, March 7). Karnataka Budget: CM proposes to leverage coastal, heritage tourism. *Deccan Herald*. https://www.deccanherald.com/india/karnataka/karnataka-budget-cm-proposes-to-leverage-coastal-heritage-tourism-3436568#google_vignette
- Venu, A., Lakshmi, M. V., & Latha, D. A. (2023). A study on income and expenditure pattern of fishermen during fishing holiday period in Kakinada Harbour, Andhra Pradesh. *Journal of Advanced Zoology*, 44(S-7), 138–146. <https://doi.org/10.17762/jaz.v44is7.2745>
- Vichare, P. S. (2010). *A study on effect of migration on livelihood of coastal fishers in Maharashtra* [Unpublished MFSc thesis]. ICAR–Central Institute of Fisheries Education.
- Viswambharan, D., Rajesh, K. M., Aswathy, N., & Rohit, P. (2022). Utilization of marine bio-resources by fish cutting centres in Karnataka: Implications on sustainable exploitation and livelihood security of fisherfolk.

Journal of the Marine Biological Association of India, 64(2), 84–88. <https://doi.org/10.6024/jmbai.2022.64.2.2241-11>

World Economic Forum. (2024). *Travel & tourism development index 2024*. <https://www.weforum.org/publications/travel-tourism-development-index-2024/>

World Travel and Tourism Council (WTTC). (2024). *Travel & tourism economic impact research (EIR)*. <https://wttc.org/research/economic-impact>

Yadav, B. M., Patil, S. V., Mandavkar, S. S., Wasave, S. M., Shirdhankar, M. M., Chaudhari, K. J., & Naik, B. V. (2020). Socio-economic status of fishers of Ratnagiri, Maharashtra. *International Journal of Current Microbiology and Applied Sciences*, 9(9), 3011–3021. <https://doi.org/10.20546/ijcmas.2020.909.372>

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