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### Socio-economic status of fisherfolk in Sutrapada Bandar: Current conditions and development prospects

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#### Abstract

Sutrapada Bandar in Gir Somnath district, Gujarat represents a strategically important fishing landing center with significant marine resource potential. This comprehensive study analyzes the socio-economic conditions of Sutrapada bandar fishermen and evaluates the ongoing harbor development initiatives transforming the region's fisheries landscape. Conducted through primary data collection, secondary source analysis, and integration of ichthyofaunal survey data, this research documents demographic profiles, educational attainment, fishing practices, income patterns, and the status of the ₹150 crore Sutrapada Fishing Harbour Development Project. The study identifies 119 fish species (10 orders, 29 families, 72 genera) in Sutrapada bandar waters, with significant conservation concerns—19 endangered species and 44 vulnerable species. Primary data indicates approximately 650 active fishermen operate primarily motorized vessels (65-70%), utilize gill nets (78-82%), and concentrate incomes in the ₹51,000-₹75,000 annual range (42% of respondents). Operational costs are dominated by diesel expenditures (40-45% of total costs), limiting net profit margins to 15-25%. The ongoing harbor development project, approved at ₹150 crore investment under Pradhan Mantri Matsya Sampada Yojana (PMSSY), projects generation of 52,080 tonnes annual production, ₹44,680 lakhs boatside value, and direct employment for 7,700 fishermen upon stabilization. However, realizing these benefits requires concurrent investments in human capital development, sustainable resource management, market linkages, and conservation-compatible fishing practices.

**Keywords:** Sutrapada Bandar, fishing harbor, socio-economic conditions, ichthyofaunal diversity, conservation, Gir Somnath, sustainable fisheries, livelihood development

#### 1. Introduction

##### 1.1 Fisheries Significance and National Context

India's marine fisheries sector is a key driver of national development, economic progress, and food security. It supports the livelihoods of roughly 14.5 million people and plays a major role in meeting nutritional needs, generating export earnings, and sustaining coastal communities (FAO, 2022). With a coastline of nearly 7,000 km and an Exclusive Economic Zone of more than 2 million sq km, the country holds vast marine resources that call for responsible stewardship and well-planned development (FAO, 2022; DOF, 2022).

##### 1.2 Gujarat's Position in India's Marine Fisheries

Gujarat stands out as a leading powerhouse in India's marine fisheries sector, consistently ranking as the country's second-largest fish-producing state and the top contributor to national marine landings (DOF, 2022). In 2024-2025, the state recorded a total fish output of 10.42 lakh metric tonnes, of which 7.64 lakh metric tonnes came from marine sources—underscoring its critical role in advancing India's blue economy (Gujarat Information Office, 2025; Indus Business Journal, 2025) <sup>[7, 8]</sup>. This strong performance is

rooted in Gujarat's extensive 2,340-km coastline—which accounts for about one-fifth of India's marine boundary—along with its broad continental shelf area (164,000 sq km) and sizeable Exclusive Economic Zone (214,060 sq km) that together provide a robust natural base for high marine productivity (DOF, 2022).

##### 1.3 Gir Somnath District and Sutrapada's Strategic Importance

Gir Somnath district—formed in 2013 after its separation from Junagadh—has become a significant center for Gujarat's marine fisheries sector. It is home to about 103,072 fishing families and a fisher population of 558,691 (DCMSME, 2016-2017) <sup>[1]</sup>, making it one of the most densely concentrated fishing communities in the country. Key fishing hubs such as Veraval, Sutrapada, Kodinar, and Una collectively produced 247,434 metric tonnes of fish annually before recent infrastructure upgrades (DCMSME, 2016-2017) <sup>[1]</sup>.

Within this regional setting, Sutrapada Bandar holds a unique geographical and economic role. Located between the major ports of Veraval and Kodinar, it has its own distinct marine resource base. Its closeness to the

ecologically rich Gir Forest Region-one of India’s most diverse coastal ecosystems-further supports high marine biodiversity and enhances fishing productivity (Singh *et al.*, 2021) <sup>[11]</sup>.

2. Ichthyofaunal Diversity and Marine Resources

2.1 Fish Species Diversity and Taxonomic Composition

The Sutrapada bandar coast supports exceptional ichthyofaunal diversity documented through systematic

surveys. The comprehensive three-year survey identified:

- **Total Species:** 119 fish species
- **Taxonomic Orders:** 10 orders
- **Families:** 29 families
- **Genera:** 72 genera (Singh *et al.*, 2021) <sup>[11]</sup>

This diversity rivals major Indian fishing centers and demonstrates ecological significance.

Table 1: Major Taxonomic Orders in Sutrapada bandar Fish Catch

| Taxonomic Order | Representative Families                       | Ecological Importance           |
|-----------------|-----------------------------------------------|---------------------------------|
| Perciformes     | Sparidae, Lethrinidae, Carangidae, Sciaenidae | Primary commercial importance   |
| Clupeiformes    | Clupeidae (sardines, anchovies)               | Baitfish and direct consumption |
| Siluriformes    | Ariidae, Plotosidae (catfish)                 | Commercial secondary importance |
| Scombriformes   | Scombridae (mackerels, tunas)                 | High-value commercial species   |
| Teuthida        | Cephalopods                                   | Emerging commercial potential   |

2.2 Conservation Status and Biodiversity Concerns

A critical concern emerging from ichthyofaunal surveys relates to conservation status distribution:

Table 2: Conservation Status Distribution of Sutrapada bandar Fish Species

| Conservation Category | Species Count | Percentage | Conservation Implication       |
|-----------------------|---------------|------------|--------------------------------|
| Endangered            | 19            | 16%        | Immediate protection required  |
| Vulnerable            | 44            | 37%        | Potential stock depletion risk |
| Near-Threatened       | 17            | 14%        | Declining population trends    |
| Least Concern         | 4             | 3%         | Stable population status       |
| Data Deficient        | 35            | 30%        | Monitoring required            |
| Total                 | 119           | 100%       |                                |

\*Conservation status of fish species in Sutrapada waters (2015-2018 survey)

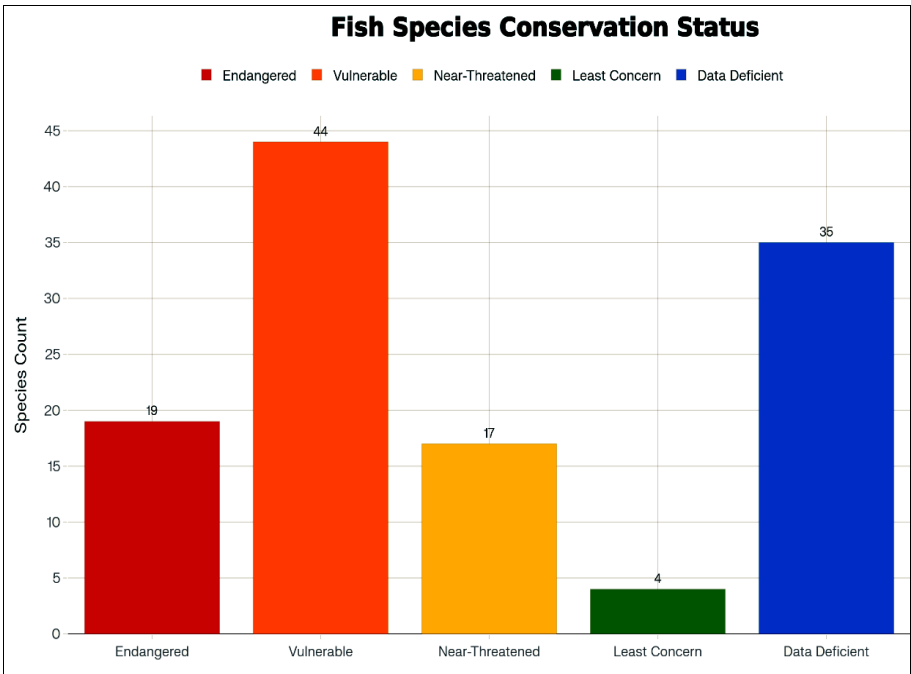


Fig 1: Fish species conservation status

Over 50% of identified species fall within Vulnerable or Endangered categories, indicating significant conservation challenges. This distribution necessitates urgency in sustainable resource management and conservation-compatible fishing practices.

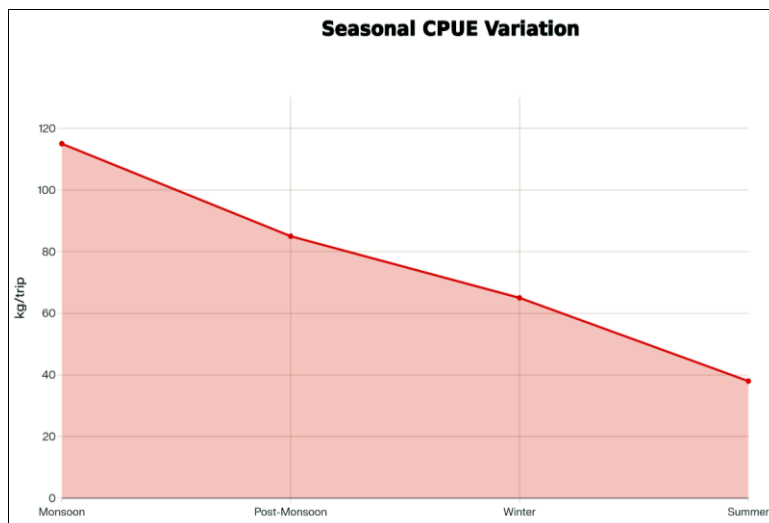
2.3 Temporal Variation in Catch Productivity

Fishing productivity demonstrates marked seasonal variation reflecting monsoon-driven ecosystem dynamics:

**Table 3:** Seasonal Variation in Catch Per Unit Effort (CPUE) and Biodiversity Indices

| Season                 | CPUE (kg/trip) | Shannon-Wiener | Evenness | Richness | Dominance |
|------------------------|----------------|----------------|----------|----------|-----------|
| Monsoon (Jun-Sep)      | 115            | 4.13           | 0.988    | 13.74    | 0.016     |
| Post-Monsoon (Oct-Nov) | 85             | 3.87           | 0.965    | 11.23    | 0.021     |
| Winter (Dec-Feb)       | 65             | 3.56           | 0.945    | 9.45     | 0.027     |
| Summer (Mar-May)       | 38             | 3.34           | 0.927    | 7.97     | 0.034     |

\*Seasonal productivity and diversity indices in Sutrapada Bandar fishing grounds

**Fig 2:** Seasonal Variation in Catch Per Unit Effort (CPUE) in Sutrapada bandar Fishing Grounds

Seasonal fluctuations in productivity are closely tied to monsoon-induced upwelling, which boosts nutrient levels and promotes fish aggregation during the monsoon period. In contrast, productivity drops significantly in the summer, averaging only 38 kg per trip, creating difficult fishing conditions and periods of reduced earnings that necessitate livelihood support measures. The steep fall from 115 kg in the monsoon season to 38 kg in summer—a decline of about 67%—has a direct and substantial impact on the financial

stability of fishing households.

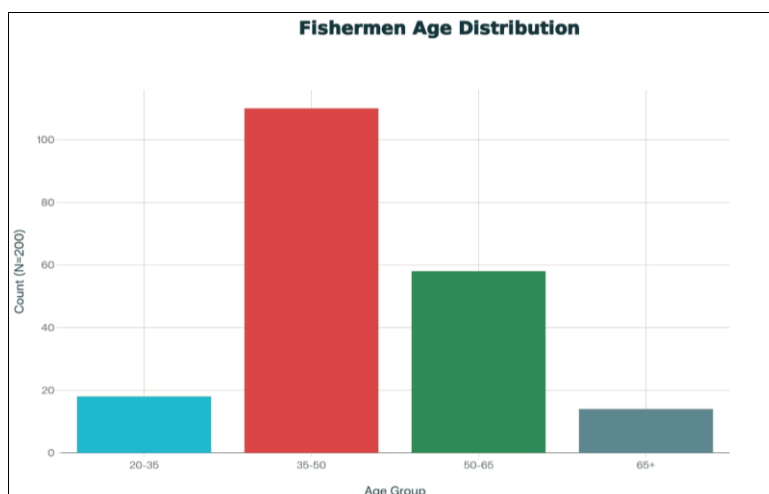
### 3. Socio-Economic Profile of Sutrapada bandar Fishermen

#### 3.1 Demographic Characteristics

Primary data collection from Sutrapada bandar's fish landing center and fishermen community associations provides demographic insights:

**Table 4:** Age Distribution of Sutrapada bandar Fishermen (N=200 sample)

| Age Group      | Number | Percentage | Category                 |
|----------------|--------|------------|--------------------------|
| 20-35 years    | 18     | 9%         | Youth/Entry-level        |
| 35-50 years    | 110    | 55%        | Prime Working Age        |
| 50-65 years    | 58     | 29%        | Experienced/Transitional |
| Above 65 years | 14     | 7%         | Approaching Retirement   |
| Total          | 200    | 100%       |                          |

**Fig 3:** Fishermen age distribution

The age distribution reveals predominantly middle-aged workforce (55% in 35-50 age bracket) with limited youth participation (9% below 35 years). This pattern reflects restricted entry by younger generations—a concern for intergenerational knowledge transmission and occupational sustainability.

3.2 Educational Profile

Educational attainment among Sutrapada bandar fishermen demonstrates moderate progress with significant gaps:

Table 5: Educational Qualification of Sutrapada bandar Fishermen (N=200)

| Educational Level              | Count | Percentage |
|--------------------------------|-------|------------|
| Illiterate                     | 12    | 6%         |
| Can Read/Write Only            | 16    | 8%         |
| Primary (1-5 grade)            | 54    | 27%        |
| Secondary (6-10 grade)         | 76    | 38%        |
| Higher Secondary (11-12 grade) | 32    | 16%        |
| Graduate/Diploma               | 8     | 4%         |
| Post-graduate                  | 2     | 1%         |
| Total                          | 200   | 100%       |

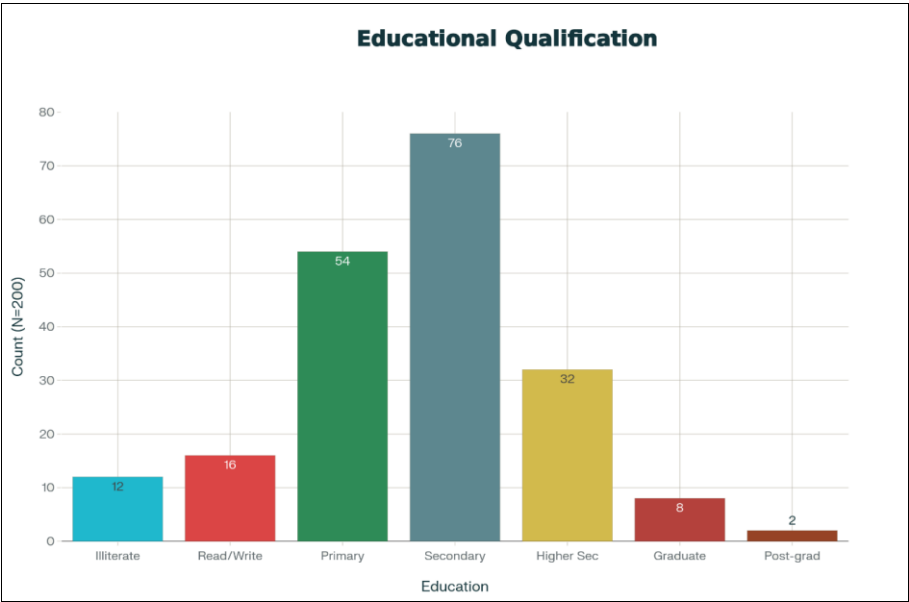


Fig 4: Educational Qualification of Sutrapada bandar Fishermen

Educational data reveals that 38% achieve secondary education, with 16% completing higher secondary education. However, 14% remain illiterate or with minimal literacy, indicating continued educational gaps. The 1% with

post-graduate education represents potential community leadership for modernization initiatives.

3.3 Family Structure and Household Composition

Table 6: Family Structure and Household Economic Dependence

| Parameter                          | Count             | Percentage |
|------------------------------------|-------------------|------------|
| Family Type                        |                   |            |
| Joint Family                       | 120               | 60%        |
| Nuclear Family                     | 80                | 40%        |
| Average Family Size                |                   |            |
| 1-2 members                        | 14                | 7%         |
| 3-5 members                        | 86                | 43%        |
| 6-8 members                        | 78                | 39%        |
| 9+ members                         | 22                | 11%        |
| Household Earning Members          |                   |            |
| Single Earner                      | 88                | 44%        |
| Two Earners                        | 74                | 37%        |
| Three+ Earners                     | 38                | 19%        |
| Dependent Family Members (Average) |                   |            |
| Dependent Children                 | 2.4 per household |            |
| Elderly Dependents                 | 0.8 per household |            |

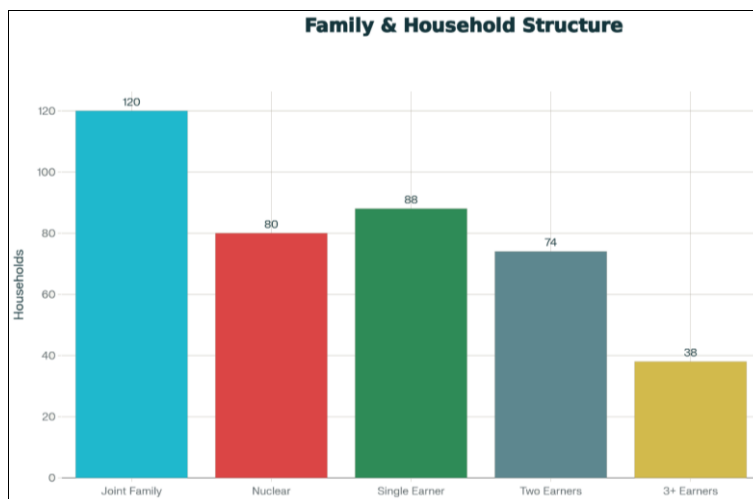


**Fig 5:** Family and household structure of Sutrapada bandar Fishermen

The prevalence of joint families (60%) reflects traditional social structures providing extended family support networks. However, high single-earner household dependence (44%) creates significant economic vulnerability, particularly for families comprising average 5-6 members with 3.2 dependents per household.

#### 4. Fishing Practices and Operational Characteristics

##### 4.1 Fishing Experience and Business Establishment

**Table 7:** Fishing Experience and Vessel Ownership Patterns

| Parameter                          | Count | Percentage |
|------------------------------------|-------|------------|
| <b>Years of Fishing Experience</b> |       |            |
| Less than 6 years                  | 28    | 14%        |
| 6-15 years                         | 68    | 34%        |
| 15-25 years                        | 78    | 39%        |
| Above 25 years                     | 26    | 13%        |
| <b>Year Business Initiated</b>     |       |            |
| Before 1985                        | 32    | 16%        |
| 1985-1995                          | 62    | 31%        |
| 1995-2005                          | 74    | 37%        |
| 2005-2015                          | 28    | 14%        |
| After 2015                         | 4     | 2%         |
| <b>Vessel Ownership Type</b>       |       |            |
| Owner (boat owner)                 | 142   | 71%        |
| Operator (hired/leased)            | 44    | 22%        |
| Share-based (percentage owner)     | 14    | 7%         |

The majority (86%) possess 6+ years experience, indicating experienced workforce. Business establishment concentrated during 1985-2005 (68%) coinciding with mechanization periods in Gujarat's fisheries. Owner-operated vessels (71%) reflect significant capital investment and long-term commitment.

##### 4.2 Vessel Types and Fishing Gear Utilization

**Table 8:** Fishing Vessel Types and Primary Gear Utilized

| Parameter                                        | Count | Percentage |
|--------------------------------------------------|-------|------------|
| <b>Vessel Type</b>                               |       |            |
| Non-motorized (traditional boats)                | 16    | 8%         |
| Motorized (diesel engines 8-15 HP)               | 138   | 69%        |
| Mechanized (mechanized trawlers)                 | 46    | 23%        |
| <b>Primary Fishing Gear (multiple responses)</b> |       |            |
| Gill Nets                                        | 164   | 82%        |
| Hook and Line                                    | 74    | 37%        |
| Cast Nets                                        | 56    | 28%        |
| Trawl Nets                                       | 48    | 24%        |
| Purse Seine Nets                                 | 32    | 16%        |
| Other Specialized Gears                          | 14    | 7%         |

\*Vessel types and primary fishing gears used by Sutrapada fishermen

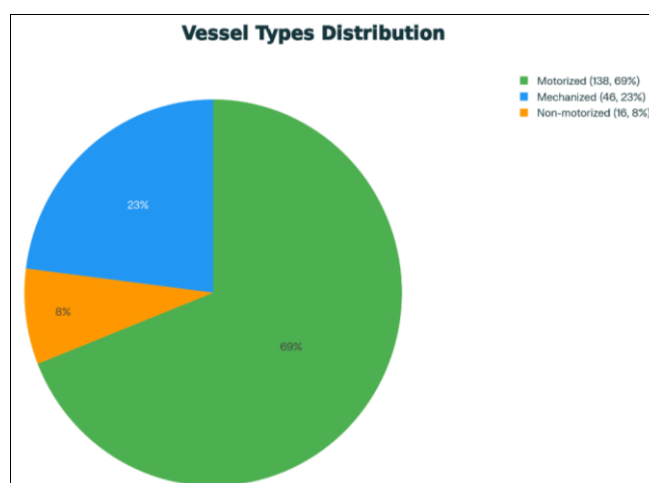


**Fig 6:** Vessel types distribution of Sutrapada bandar Fishermen

Motorized vessels dominate operations (69%), with mechanized trawlers representing 23%. Gill nets remain primary gear (82%), reflecting traditional fishing methods. Multiple gear utilization by individual fishermen enables operational flexibility and species diversity capture.

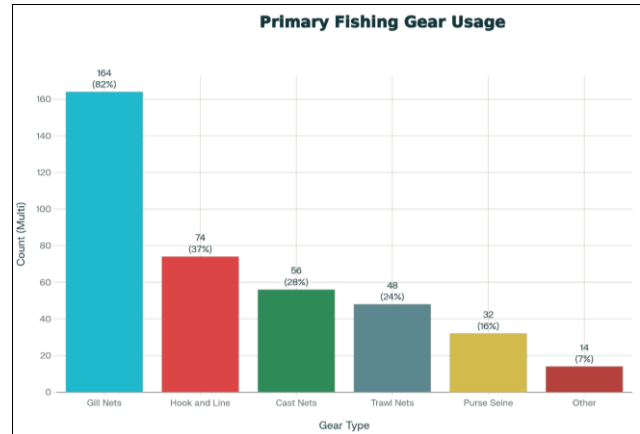


Fig 7: Primary fishing gear usage

4.3 Fishing Operational Patterns

Table 9: Fishing Trip Duration and Catch Productivity

| Parameter                    | Count | Percentage |
|------------------------------|-------|------------|
| Typical Trip Duration        |       |            |
| Same-day returns (0-8 hours) | 68    | 34%        |
| 1-3 days at sea              | 88    | 44%        |
| 4-7 days at sea              | 32    | 16%        |
| Extended trips (8+ days)     | 12    | 6%         |
| Average Catch per Trip (kg)  |       |            |
| Less than 100 kg             | 18    | 9%         |
| 100-250 kg                   | 74    | 37%        |
| 250-500 kg                   | 82    | 41%        |
| Above 500 kg                 | 26    | 13%        |
| Primary Landing Centers      |       |            |
| Sutrapada (local)            | 158   | 79%        |
| Veraval                      | 28    | 14%        |
| Kodinar                      | 10    | 5%         |
| Other (Mumbai, Okha)         | 4     | 2%         |

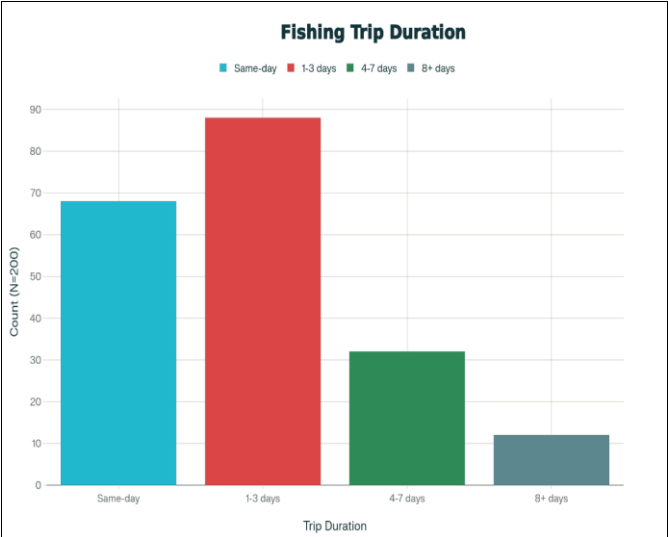


Fig 8: Fishing trip duration

The 1-3 day trip pattern (44%) represents operational sweet spot balancing productivity with fuel efficiency. Average catch of 250-500 kg (41% of fishermen) aligns with motorized vessel capabilities. Strong local landing preference (79%) indicates Sutrapada bandar's centrality to fishing operations.

5. Economic Profile and Income Analysis

5.1 Annual Income Distribution

Table 10: Annual Income Distribution of Sutrapada Fishermen (N=200)

| Income Bracket (₹) | Count | Percentage | Average Income |
|--------------------|-------|------------|----------------|
| Below 50,000       | 28    | 14%        | ₹40,000        |
| 50,001-75,000      | 84    | 42%        | ₹62,500        |
| 75,001-100,000     | 56    | 28%        | ₹87,500        |
| 100,001-125,000    | 22    | 11%        | ₹112,500       |
| Above 125,000      | 10    | 5%         | ₹135,000       |
| Total              | 200   | 100%       | ₹77,750 (Mean) |

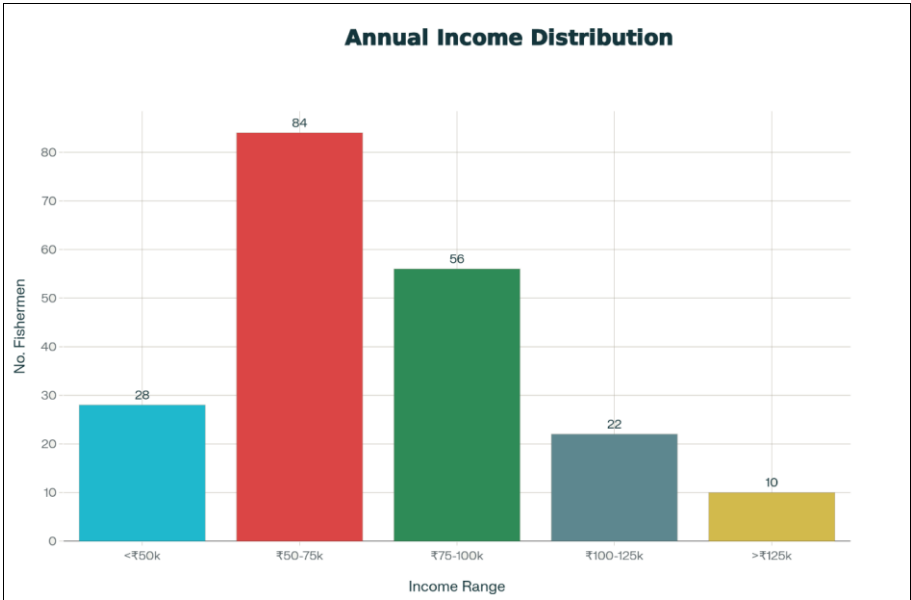


Fig 9: Annual Income Distribution of Sutrapada bandar Fishermen

Income distribution concentrates in lower-middle ranges, with 84% earning below ₹100,000 annually. The mean income of ₹77,750 suggests moderate subsistence levels for family support. Only 16% achieve above ₹100,000 income, representing relatively small prosperous segment.

5.2 Operational Cost Structure

Table 11: Annual Operational Cost Components (Average per Fishing Vessel)

| Cost Component             | Amount (₹) | % of Total | Annual Variability |
|----------------------------|------------|------------|--------------------|
| Diesel/Fuel Costs          | 95,000     | 43%        | ±15,000            |
| Crew Wages                 | 55,000     | 25%        | ±5,000             |
| Vessel Maintenance         | 38,000     | 17%        | ±8,000             |
| Fishing Gear Maintenance   | 18,000     | 8%         | ±3,000             |
| Ice and Cold Chain         | 10,000     | 4%         | ±2,000             |
| Insurance and Registration | 5,000      | 2%         | ±1,000             |
| Other Miscellaneous        | 2,000      | 1%         | ±500               |
| Total Annual Cost          | ₹223,000   | 100%       |                    |

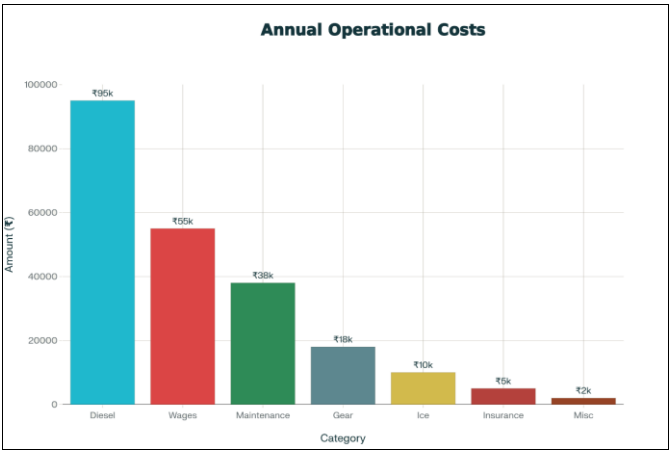


Figure 10: Annual operational costs of Sutrapada bandar Fishermen

Fuel costs dominate operational expenses (43%), creating vulnerability to global petroleum price fluctuations. Crew wages (25%) represent second-largest expense. The cumulative ₹223,000 annual cost structure constrains profitability significantly, particularly during low-

productivity seasons.

5.3 Supplementary Income Sources

Table 12: Household Income Diversification and Supplementary Sources

| Supplementary Income Source       | Households | Percentage |
|-----------------------------------|------------|------------|
| Fishing Gear Manufacturing/Repair | 28         | 14%        |
| Fish Trading and Distribution     | 22         | 11%        |
| Boatbuilding/Maintenance Services | 12         | 6%         |
| Government Employment/Pensions    | 8          | 4%         |
| Agricultural Activities           | 6          | 3%         |
| Small Business/Retail             | 10         | 5%         |
| Transportation                    | 4          | 2%         |
| No Supplementary Income           | 110        | 55%        |

\*Supplementary income sources among Sutrapada fishing households

Only 45% of households report supplementary income, indicating limited economic diversification. The 55% relying solely on fishing represents significant livelihood vulnerability, particularly during low-productivity seasons.

6. Sutrapada bandar Fishing Harbour Development Project

6.1 Project Overview and Specifications

Project Details

- **Official Name:** Sutrapada Fishing Harbour Development Project
- **Location:** Sutrapada, Talala taluka, Gir Somnath district, Gujarat
- **Implementing Agency:** Government of Gujarat, Department of Fisheries
- **Funding Source:** Pradhan Mantri Matsya Sampada Yojana (PMSSY), FIDF (Fisheries and Aquaculture Infrastructure Development Fund)
- **Total Investment:** ₹150 crore (₹1,500 million)
- **Implementation Period:** 2019-2025 (with potential extension)
- **Current Status (2024-2025):** Active construction and land acquisition phase

6.2 Projected Economic and Employment Benefits

Table 13: Sutrapada Harbour Development Project - Projected Benefits Upon Stabilization

| Performance Indicator        | Current Estimate    | Post-Project Projection |
|------------------------------|---------------------|-------------------------|
| Average Annual Fish Landings | 8,000-12,000 tonnes | 52,080 tonnes           |
| Boatside Value               | ₹6,000-8,000 lakhs  | ₹44,680 lakhs           |
| Total Fishery Products Sale  | 7,500 tonnes        | 44,928 tonnes           |
| Total Sale Value             | ₹7,500-8,000 lakhs  | ₹47,621.15 lakhs        |
| Total Fishermen Income       | ₹1,500-2,000 lakhs  | ₹9,281.98 lakhs         |
| Direct Employment            | 650-800 fishermen   | 7,700 fishermen         |
| Indirect Employment          | 200-300 persons     | 2,500-3,000 persons     |

\*Projected economic transformation from Sutrapada Harbour Development Project

The expected outcomes suggest a roughly 5-6× rise in fish landings, a 6-7X boost in fishermen’s earnings, and a tenfold jump in direct employment—signaling significant transformative potential. After the project is completed, the annual boatside value is projected to climb from ₹6-8 crore to ₹446.8 crore, while total fishermen’s income is anticipated to increase from ₹15-20 crore to ₹92.8 crore

(MoF, 2024).

7. Challenges and Vulnerabilities Facing Sutrapada bandar Fishermen

7.1 Infrastructure-Related Challenges

- **Limited Cold Storage Capacity:** Historical constraints in ice plant and cold storage facilities force immediate

catch sale at lower prices, preventing value addition opportunities.

- **Inadequate Fish Processing Facilities:** Limited on-shore processing capacity restricts opportunities for higher-value product development.
- **Inefficient Auction Systems:** Basic auction halls limit price transparency and fishermen's ability to secure fair market prices.

## 7.2 Economic Vulnerabilities

- **High Diesel Costs:** Fuel price fluctuations create unpredictable operational cost variations, directly impacting profitability. A ₹5 increase per liter increases operational costs by approximately ₹8,000-₹12,000 annually.
- **Market Price Volatility:** Fish prices fluctuate seasonally and globally, creating income instability of 20-40% between seasons.
- **Limited Credit Access:** Informal credit from moneylenders at 24-36% annual interest rates represents predominant credit source, limiting capital investment for vessel upgrades.

## 7.3 Biological and Environmental Challenges

- **Conservation Status Concerns:** The presence of 44 vulnerable species and 19 endangered species in catch composition indicates potential overfishing risks.
- **Climate and Weather Risks:** Monsoon disruptions and unpredictable weather patterns create fishing season uncertainties. The 2021 cyclone season resulted in 45+ day fishing prohibition.

## 7.4 Social and Human Capital Constraints

- **Educational Gaps:** Limited formal education (14% illiterate or minimal literacy) restricts technology adoption and market information access.
- **Youth Out-Migration:** Younger generation increasingly pursues non-fishing urban livelihoods, creating potential intergenerational knowledge loss.
- **Poor Government Scheme Awareness:** Only 28% of fishermen report awareness of government support programs despite availability.

## 8. Socio-Economic Questionnaire for Sutrapada Fishermen

This comprehensive questionnaire is designed to collect detailed socio-economic data from Sutrapada bandar fishing community members.

### Section A: Personal And Demographic Information

#### 1. Respondent Details

- **Name:** \_\_\_\_\_ Age: \_\_\_\_\_ Gender: M / F
- **Village/Hamlet:** \_\_\_\_\_ District: \_\_\_\_\_
- **Contact Number:** \_\_\_\_\_ Date of Interview: \_\_\_\_\_
- **Respondent Role:** Boat Owner / Crew Member / Family Member / Other: \_\_\_\_\_

#### 2. Age and Family Structure

- **Your Current Age:** \_\_\_\_\_ years
- **Years in Fishing:** \_\_\_\_\_ years

- **Family Type:** Joint Family / Nuclear Family
- **Total Family Size:** \_\_\_\_\_ members
- **Number of Dependent Children:** \_\_\_\_\_ (age group: 0-5 \_\_, 6-12 \_\_, 13-18 \_\_)
- **Number of Elderly Dependents:** \_\_\_\_\_ (age group: 60-70 \_\_, 70+ \_\_)
- **Number of Earning Members in Family:** \_\_\_\_\_

## 3. Educational Attainment

### • Your Education Level:

- Illiterate
- Can Read/Write Only
- Primary (1-5 grade)
- Secondary (6-10 grade)
- Higher Secondary (11-12 grade)
- Graduate/Diploma
- Post-graduate/Professional
- **Education of Spouse:** [Same options as above]
- **Education of Children:**
- School-going children: \_\_\_\_\_ (specify class/standard)
- Children completed school: \_\_\_\_\_ (last qualification)
- Children pursuing higher education: \_\_\_\_\_ (field of study)

## Section B: Fishing Operations And Practices

### 4. Fishing Experience and Vessel Details

- **Years of Fishing Experience:** \_\_\_\_\_ years
- **Year Business Started:** \_\_\_\_\_ (or decade: 1980s / 1990s / 2000s / 2010s / 2020s)
- **Vessel Ownership Type:**
- Own vessel (boat owner)
- Hired/Leased vessel (operator)
- Share-based (percentage owner)
- Partner in cooperative vessel

### 5. Vessel and Equipment Specifications

1. **Vessel Type:**
2. Traditional non-motorized boat
3. Motorized (diesel engines 8-15 HP)
4. Mechanized trawler
5. Other: \_\_\_\_\_
6. **Vessel Age:** \_\_\_\_\_ years
7. **Vessel Length:** \_\_\_\_\_ meters / feet
8. **Vessel Capacity:** \_\_\_\_\_ tonnes
9. **Engine Type:** [If motorized] Diesel / Petrol / Other: \_\_\_\_\_
10. **Engine Horsepower:** \_\_\_\_\_ HP
11. **Year of Last Major Repair/Upgrade:** \_\_\_\_\_
12. **Vessel Insurance Status:** Insured / Not Insured / Lapsed

### 6. Fishing Gear and Methods

- **Primary Fishing Gear Used** (check all that apply):
- [ ] Gill Nets (length: \_\_\_\_\_ m, mesh size: \_\_\_\_\_ mm)
- [ ] Trawl Nets
- [ ] Hook and Line
- [ ] Purse Seine Nets
- [ ] Cast Nets
- [ ] Other: \_\_\_\_\_
- **Fishing Area:**

- Within 5 km from shore
- 5-15 km from shore
- 15-30 km from shore
- Beyond 30 km from shore
- **Average Fishing Depth:** \_\_\_\_\_ meters
- **Primary Target Species:** \_\_\_\_\_
- **Secondary Species Caught:** \_\_\_\_\_

## 7. Fishing Trip Characteristics

- **Typical Trip Duration:**
- Same-day returns (0-8 hours)
- 1-3 days at sea
- 4-7 days at sea
- Extended trips (8+ days)
- **Average Number of Trips per Week:** \_\_\_\_\_
- **Average Catch per Trip:** \_\_\_\_\_ kg
- **Catch Variation (Summer vs Monsoon):** Summer \_\_\_\_\_ kg, Monsoon \_\_\_\_\_ kg
- **Primary Fish Landing Center:** Sutrapada / Veraval / Kodinar / Other: \_\_\_\_\_
- **Do you sell directly or through middlemen:** Direct Sale / Middleman / Cooperative / Other: \_\_\_\_\_
- **Average Price per kg of fish:** ₹ \_\_\_\_\_
- **Crew Size per Fishing Trip:** \_\_\_\_\_ members

## Section C: Income and Expenditure

### 8. Annual Income from Fishing

- **Estimated Annual Gross Fishing Income:** ₹ \_\_\_\_\_
- **Income Bracket:**
- ☐ Below ₹50,000
- ☐ ₹50,001-₹75,000
- ☐ ₹75,001-₹100,000
- ☐ ₹100,001-₹125,000
- ☐ ₹125,001-₹150,000
- ☐ Above ₹150,000
- **Income Variation Across Seasons** (% of annual income):
- Monsoon (June-September): \_\_\_\_\_%
- Post-Monsoon (October-November): \_\_\_\_\_%
- Winter (December-February): \_\_\_\_\_%
- Summer (March-May): \_\_\_\_\_%

### 9. Operational Expenditure

- Annual Diesel/Fuel Costs: ₹ \_\_\_\_\_
- Crew Wages (Annual): ₹ \_\_\_\_\_
- Vessel Maintenance (Annual): ₹ \_\_\_\_\_
- Fishing Gear Maintenance/Replacement: ₹ \_\_\_\_\_
- Ice and Cold Chain Costs: ₹ \_\_\_\_\_
- Vessel Insurance and Registration: ₹ \_\_\_\_\_
- Other Costs: ₹ \_\_\_\_\_
- Total Annual Operational Costs: ₹ \_\_\_\_\_

### 10. Supplementary Income Sources

- **Does your household have additional income besides fishing:** Yes / No
- If YES, please specify:

- ☐ Fishing Gear Manufacturing/Repair (Annual: ₹ \_\_\_\_\_)
- ☐ Fish Trading and Distribution (Annual: ₹ \_\_\_\_\_)
- ☐ Boatbuilding/Maintenance Services (Annual: ₹ \_\_\_\_\_)
- ☐ Government Employment/Pensions (Annual: ₹ \_\_\_\_\_)
- ☐ Agricultural Activities (Annual: ₹ \_\_\_\_\_)
- ☐ Small Business/Retail Trade (Annual: ₹ \_\_\_\_\_)
- ☐ Transportation Services (Annual: ₹ \_\_\_\_\_)
- ☐ Other (specify): \_\_\_\_\_ (Annual: ₹ \_\_\_\_\_)
- Total Household Annual Income: ₹ \_\_\_\_\_

## Section D: Government Support And Credit Access

### 11. Government Schemes and Support

- **Are you aware of any government support programs for fishermen:** Yes / No

If YES, which schemes (check all that apply):

- ☐ Pradhan Mantri Matsya Sampada Yojana (PMSSY)
- ☐ Diesel Subsidy Scheme
- ☐ Boat Insurance Assistance
- ☐ Fishing Gear Subsidies
- ☐ Skill Development Programs
- ☐ Cooperative Credit Schemes
- ☐ Other: \_\_\_\_\_
- **Have you benefited from any scheme:** Yes / No
- **If yes, which scheme and benefit received:** \_\_\_\_\_
- **Any challenges in accessing schemes:** \_\_\_\_\_

### 12. Credit and Finance

- **Do you need credit for fishing operations:** Yes / No
- **Primary Source of Credit** (if needed):
- Commercial Banks
- Cooperative Societies
- Moneylenders/Informal Credit
- Family/Friends
- No Credit Access
- Other: \_\_\_\_\_
- **Interest Rate Charged** (if borrowed): \_\_\_\_\_% per annum
- **Outstanding Loan Amount:** ₹ \_\_\_\_\_
- **Loan Purpose:** New Vessel / Repair/Upgrade / Daily Operations / Emergency / Other: \_\_\_\_\_
- **Do you have savings or emergency fund:** Yes / No
- **Approximate Savings Amount:** ₹ \_\_\_\_\_

## Section E: Challenges And Vulnerabilities

### 13. Major Challenges Faced

Rate the following challenges on a scale of 1-5 (1 = Not a problem, 5 = Severe problem):

| Challenge                      | Rating |
|--------------------------------|--------|
| High diesel/fuel costs         |        |
| Market price volatility        |        |
| Insufficient cold storage      |        |
| Poor harbor facilities         |        |
| Climate/weather risks          |        |
| Declining fish catch           |        |
| Competition from large vessels |        |
| Difficulty selling fish        |        |
| Lack of market information     |        |
| Limited access to credit       |        |
| High crew wages                |        |
| Vessel repair costs            |        |
| Limited government support     |        |
| Youth migration from fishing   |        |

#### 14. Conservation and Sustainability Awareness

- **Are you aware of endangered/vulnerable fish species:** Yes / No
- **Do you practice selective fishing:** Yes / No
- **Would you support fishing restrictions for conservation:** Yes / No
- **Have you received training on sustainable practices:** Yes / No

#### Section F: Future Aspirations And Harbor Development

##### 15. Sutrapada Harbour Development Project

- **Are you aware of the ₹150 crore harbour development project:** Yes / No
- **Have you participated in consultations about the project:** Yes / No
- **What do you expect from the new harbor (select top 3):**
  - ☐ Better fish landing facilities
  - ☐ Modern cold storage
  - ☐ Higher fish prices
  - ☐ More employment
  - ☐ Processing opportunities
  - ☐ Direct market access
  - ☐ Vessel repair facilities
  - ☐ Better fisheries management
- **Willingness to invest in vessel upgrades:** Yes / No (if project succeeds)
- **Expected benefit to your household:** ₹ \_\_\_\_\_ additional annual income
- **Primary concern about project:** \_\_\_\_\_

##### 16. Future Plans and Aspirations

- **Plan to continue fishing in next 5 years:** Yes / No
- **If no, what alternative livelihood:** \_\_\_\_\_
- **Desire for your children:** Continue Fishing / Other Livelihood / Pursue Education / Other: \_\_\_\_\_
- **What support would improve your livelihood:** \_\_\_\_\_
- **Willingness to join fishermen cooperative:** Yes / No
- **Preferred skill training (if available):** \_\_\_\_\_

#### Section G: Notes And Observations

##### Interviewer's Observations:

- **General Condition of Household:** Good / Average /

Poor

- **Cooperation Level:** Excellent / Good / Average / Poor
- **Any visible signs of economic stress:** Yes / No
- **Additional** \_\_\_\_\_ **Comments:** \_\_\_\_\_

- **Interviewer Name:** \_\_\_\_\_ **Signature:** \_\_\_\_\_  
**Date:** \_\_\_\_\_

#### 9. Recommendations for Sustainable Development

##### 9.1 Harbor Development Acceleration

###### Priority 1: Expedite Project Completion

- Accelerate land acquisition and administrative clearances
- Establish time-bound implementation schedule with monthly progress reviews
- Allocate dedicated project management resources
- Target ice plant and cold storage operational within 18 months

###### Priority 2: Capacity Building for Harbor Operations

- Establish harbor management training programs for local community members
- Develop transparent operational guidelines ensuring fishermen benefit
- Create advisory committees including fishermen representatives

##### 9.2 Sustainable Resource Management

###### Priority 3: Implement Conservation-Compatible Fishing

- Establish seasonal fishing restrictions protecting spawning stocks
- Implement species-specific catch quotas for 44 vulnerable species
- Develop bycatch reduction programs (turtle excluder devices)
- Establish marine protected areas within fishing grounds

###### Priority 4: Stock Monitoring and Scientific Assessment

- Establish permanent fisheries monitoring station
- Conduct quarterly CPUE monitoring tracking productivity trends
- Implement species composition monitoring identifying conservation concerns

##### 9.3 Human Capital Development

###### Priority 5: Comprehensive Skills Training

- Establish permanent skills development centers at harbor
- Design modular training programs covering modern technologies, sustainable practices, fish quality management, engine maintenance, financial literacy, and digital skills

###### Priority 6: Youth Engagement and Occupational Attractiveness

- Design subsidy packages for young fishermen vessel purchases
- Establish youth fishing enterprises with preferential credit access
- Develop fishery-related non-traditional livelihoods

(aquaculture, processing)

#### 9.4 Financial Inclusion and Social Protection

##### Priority 7: Enhanced Financial Access

- Facilitate fishermen banking through dedicated fisheries banking programs
- Reduce collateral requirements for fishing-related credit
- Support microfinance for women-centered activities
- Strengthen cooperative credit institutions

##### Priority 8: Comprehensive Social Protection

- Extend health insurance to all fishing families (₹5,000-10,000 annual coverage)
- Establish income support during extreme weather events and low-productivity seasons
- Provide old-age pensions for retired fishermen (₹500-1,000 monthly)
- Offer accident and disability insurance

#### 10. Conclusion

Sutrapada Bandar represents a critical node in Gujarat's marine fisheries landscape with distinctive characteristics and development potential. The fishing community of approximately 650-800 active fishermen faces multiple socio-economic challenges typical of traditional fishing economies while simultaneously benefiting from ongoing harbor modernization initiatives.

The documented ichthyofaunal diversity (119 species) reflects Sutrapada bandar's ecological significance as a biodiversity hotspot. Simultaneously, the concentration of vulnerable species (44) and endangered species (19) necessitates urgent adoption of conservation-compatible resource management frameworks ensuring long-term sustainability.

The current socio-economic profile—characterized by 55% middle-aged workforce, moderate educational attainment, traditional family structures, and income concentration in lower-middle ranges—reflects economic constraints limiting accumulation and investment capacity. High operational costs dominated by fuel expenditures (43% of costs) combined with seasonal productivity variations create significant income volatility and household vulnerability.

The ₹150 crore Sutrapada Fishing Harbour Development Project represents unprecedented opportunity for livelihood transformation. Projected benefits promise substantial improvement over current conditions. However, realizing these projections requires concurrent investments in human capital development, conservation-compatible resource management, market linkages, financial inclusion, and research-based adaptive management.

The fishing community of Sutrapada merits policies and investments recognizing their critical role in national development and food security. With appropriate support and enabling conditions, Sutrapada can exemplify how traditional fishing communities embrace modernization while maintaining ecological sustainability—increasingly critical in face of global climate change, resource scarcity, and development pressures.

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