

## REVIEW ARTICLE

# Ecotourism as a sustainable livelihood for fishermen: A systematic review of global fishing bans and implications for the Yangtze River Ten-Year Fishing Ban

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## Abstract

Fishing bans are increasingly used to restore aquatic biodiversity, yet they often impose substantial livelihood pressures on fishing-dependent communities. This study examines whether ecotourism can function as a sustainable alternative livelihood under different fishing restriction regimes and explores the implications for China's Yangtze River Ten-Year Fishing Ban. Using a systematic literature review guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020, we synthesized peer-reviewed studies retrieved from Scopus and Web of Science, along with Chinese policy documents and China-focused academic evidence. After de-duplication, eligibility screening, and full-text review, 45 studies were included in the core synthesis. The findings show that ecological improvements are most consistent under strict and well-enforced protection regimes, especially in no-take areas, but outcomes remain context-specific. Ecotourism can provide supplementary income and strengthen conservation incentives, yet it rarely replaces fishing livelihoods on its own. Its effectiveness depends on ecological quality, market access, skills, start-up capital, and equitable benefit-sharing institutions. In some cases, poorly designed tourism transitions may even intensify overall fishing pressure. For the Yangtze River, ecotourism should therefore be treated not as a stand-alone substitute, but as part of a broader livelihood transition strategy embedded in compensation, vocational training, community-based benefit-sharing, and long-term ecological and social monitoring.

**Keywords:** Fishing ban policy; Ecotourism; Alternative livelihoods; Yangtze River

## 1. Introduction

The Yangtze River is the longest river in China and Asia, and the third-longest river in the world, extending approximately 6,300 km from the Tibetan Plateau across southwest, central, and eastern China to the East China Sea near Shanghai. Its basin covers about 1.8 million km<sup>2</sup> and forms one of China's most important ecological and livelihood regions, linking upstream mountain ecosystems, middle-reach floodplains and lakes, and highly urbanized downstream delta areas.<sup>1</sup> Beyond its hydrological and economic importance, the Yangtze River basin has long functioned as a major food-producing region. Its floodplains, lakes, wetlands, and tributaries have historically supported rice production, freshwater capture fisheries, aquaculture-related livelihoods, and fishing-dependent communities. For this reason, the Yangtze River is not only a river system of ecological significance but also a livelihood and an important area for food production and fishing livelihoods shaped by long-term interactions between aquatic resources and human use.<sup>2,3</sup>

However, the ecological functions of the Yangtze River have been increasingly threatened by cumulative pressures, including overfishing, illegal fishing, habitat fragmentation, wetland loss, pollution, shipping, hydrological alteration, and broader landscape change.<sup>4</sup> These pressures have contributed to the decline of fishery resources and aquatic biodiversity, threatening rare and endemic species as well as the ecological basis of traditional fisheries.<sup>2,4</sup> In this context, the Yangtze River Ten-Year Fishing Ban, effective from January 1, 2021, was introduced as a major basin-scale conservation intervention. The policy was designed not merely to reduce fishing activity, but to create a long recovery window for aquatic organisms to restore fishery resources, strengthen biodiversity protection, and support the broader implementation of the Yangtze River Protection Law.<sup>5</sup>

Fishing bans refer to a range of restriction measures rather than a single uniform policy. These measures may include seasonal moratoriums, spatial closures such as no-take areas and protected zones, and long-duration comprehensive bans.<sup>6,7</sup> Ecological evidence has supported the potential of strict protection to increase fish abundance, biomass, and size structure; however, outcomes vary substantially across cases due to differences in ecological context, protected-area design, enforcement capacity, connectivity, and management investment.<sup>8</sup> In other words, the ecological foundation needed for nature-based tourism is conditional: protection on paper does not automatically guarantee visible and durable ecological improvement that can be converted into stable tourism value.<sup>9</sup>

Ecological outcomes, however, are only one dimension of policy performance. For fishing-dependent households, fishing bans can trigger abrupt income losses, occupational displacement, and livelihood insecurity, especially when transition support is inadequate. These social impacts may weaken policy legitimacy and long-term compliance if alternative livelihood pathways are poorly designed. Consequently, alternative livelihoods, such as ecotourism, are frequently proposed to reconcile biodiversity conservation with livelihood security. However, systematic evidence indicates that alternative livelihood interventions often lack transparent reporting, longitudinal monitoring, and context-sensitive evaluation, making it difficult to assess their effectiveness and transferability across regions.<sup>5,10</sup>

In this review, ecotourism is not treated as a generic form of tourism. It is understood as responsible travel to natural areas that contributes to environmental conservation, supports the well-being of local communities, and involves interpretation and education. This distinction is important in the context of the Yangtze River. Ecotourism linked to the fishing ban should not merely convert restored rivers, lakes, and wetlands into visitor attractions; rather, it should help finance conservation, create locally accessible income opportunities for former fishers, and communicate the ecological value of freshwater biodiversity to visitors and residents. Therefore, the relevance of ecotourism to the Yangtze River Ten-Year Fishing Ban depends on whether it aligns with three principles: conservation of freshwater ecosystems, participation and benefit-sharing for affected fishing communities, and interpretation or environmental education based on credible ecological recovery.

The Yangtze River Ten-Year Fishing Ban represents one of the world's most ambitious basin-wide fishing restrictions, supported by strong administrative enforcement and livelihood-support measures. According to a 2025 report by China's Ministry of Agriculture and Rural Affairs, by the end of September 2025, all 142,000 eligible former fishers with the ability and willingness to work had been re-employed, and all 220,000 eligible former fishers had been enrolled in the endowment insurance scheme.<sup>11</sup> More recent official updates also report improvements in monitored indigenous fish species, biological integrity, and enforcement against illegal fishing. These figures indicate that the Yangtze River case provides not only an ecological conservation policy but also a large-scale livelihood transition context in which the potential role of ecotourism can be assessed.

## 2. Methods

### 2.1. Reporting standard and review design

This study was designed as a systematic review to examine

whether, and under what conditions, ecotourism can serve as a sustainable complementary livelihood for fishing-dependent communities affected by fishing restrictions. The review focused on three linked aspects: (i) types of fishing restrictions, including seasonal moratoriums, spatial closures, no-take reserves, marine protected areas, and comprehensive long-duration bans; (ii) ecological outcomes that may support ecotourism, such as biodiversity recovery, habitat improvement, and visible wildlife or landscape values; and (iii) livelihood and governance outcomes, including income diversification, participation barriers, benefit-sharing, compliance, and perceived fairness. Peer-reviewed studies retrieved from Scopus and the Web of Science (WoS) Core Collection formed the main evidence base. Chinese policy documents, including the Yangtze River Protection Law and official reports from the Ministry of Agriculture and Rural Affairs, were used only to contextualize the Yangtze River case and were not treated as equivalent to peer-reviewed empirical studies.<sup>11</sup>

The review is reported in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020.<sup>12,13</sup> We implemented a staged workflow (record identification, de-duplication, title/abstract screening, full-text assessment, and final inclusion) and used a structured data-extraction template to ensure traceability from synthesis claims to underlying studies.

## 2.2. Literature search and screening

We conducted a structured search for peer-reviewed studies examining fishing restriction policies and ecotourism (or closely related nature-based tourism) as an alternative or supplementary livelihood. Searches were executed in Scopus and the WoS Core Collection using combined keyword strings covering: (i) fishing restriction terms, such as fishing ban, fishing closure, moratorium, no-take reserve, marine protected area, and fishing restriction; and (ii) ecotourism and closely related livelihood terms, such as ecotourism, nature-based tourism, conservation tourism, alternative livelihood, supplementary livelihood, and livelihood transition. We selected Scopus and WoS because they are widely used multidisciplinary citation databases with complementary coverage and stable, exportable metadata that support reproducible searching, transparent de-duplication, and systematic citation tracking.<sup>14</sup> To address the risk of missing influential studies, we additionally conducted supplementary forward/backward citation checks on key included papers and highly cited records during full-text assessment (using Google Scholar as a citation-tracking aid, not as a primary database), consistent with systematic-review good practice for completeness while maintaining replicability of the main search.

The initial database retrieval produced 4,281 records (2,498 from Scopus and 1,783 from WoS). After de-duplication, 4,199 unique records remained. Title/abstract screening excluded 4,099 records as out of scope, leaving 100 articles for full-text assessment. Ultimately, 45 studies met the predefined eligibility criteria and were retained for synthesis. The workflow with counts at each decision stage is summarized in [Table 1](#) and visualized in the PRISMA flow diagram ([Figure 2](#), adapted to PRISMA 2020).<sup>12,13</sup>

Each reduction step reflects a specific decision rule applied sequentially to increase relevance and internal validity: duplicate records were removed prior to screening; titles and abstracts were screened to exclude papers that did not jointly address fishing restrictions and livelihood/tourism-relevant outcomes; and full-text assessment verified that studies contained traceable evidence on ecological, livelihood, and/or governance outcomes rather than purely conceptual discussion. Where uncertainty arose during screening (e.g., ambiguous population definitions or unclear linkage between restrictions and tourism), full-text reading was used to determine eligibility.

The eligibility criteria were operationalized according to five dimensions: population, intervention/exposure, livelihood focus, outcomes, and study types. Since the focal policy case (the Yangtze River Ten-Year Fishing Ban) is an inland freshwater intervention, we coded each included study by waterbody (inland freshwater and coastal/marine) during extraction to support explicit transferability judgments ([Table 2](#)).

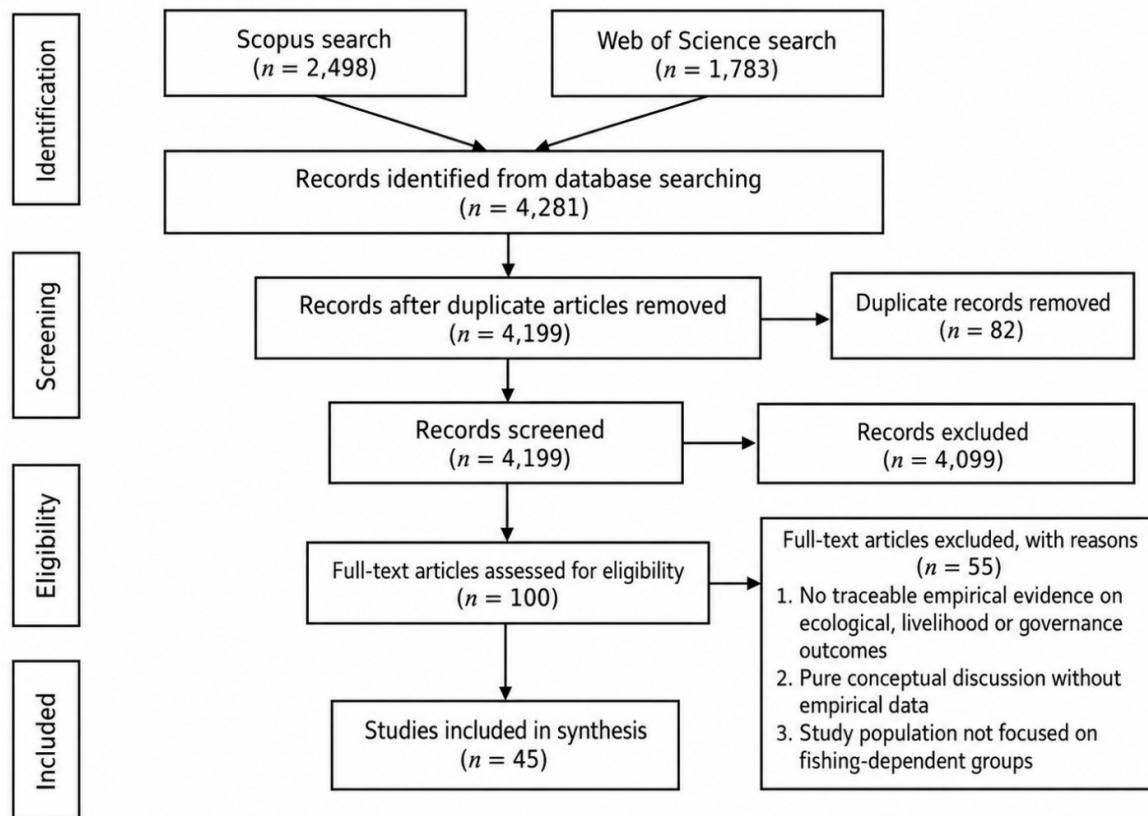
## 2.3. Evidence synthesis strategy

Evidence synthesis proceeded through thematic synthesis combined with mechanism mapping. For each included study, we extracted structured information on: study setting, restriction type, tourism/alternative-livelihood intervention (or tourism pathway), measured ecological indicators, livelihood outcomes, and governance/compliance signals. We then applied a hybrid coding approach: deductive codes reflected four mechanism domains aligned with the review question: (i) ecological preconditions, (ii) household entry constraints, (iii) benefit-sharing and equity institutions, and (iv) how livelihood outcomes may affect compliance, while inductive sub-codes captured context-specific enablers and failure modes reported across cases. Coding was iteratively refined to ensure consistent grouping across inland freshwater and coastal/marine contexts.

The coded findings were then linked into explanatory pathways to identify plausible causal chains, rather than treating ecotourism as a universal substitute for

**Table 1. Literature search and screening process for the systematic review**

| Screening stage                    | Data source                         | Initial number of records                            | Number of records after screening | Number of excluded records | Core exclusion rationales                                                                                                                                                                                    |
|------------------------------------|-------------------------------------|------------------------------------------------------|-----------------------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Database initial search            | Scopus + Web of Science             | 4,281 (2,498 from Scopus; 1,783 from Web of Science) | 4,281                             | 0                          | No exclusion (only primary literature retrieval)                                                                                                                                                             |
| Duplication removal                | Combined dataset from two databases | 4,281                                                | 4,199                             | 82                         | Duplicate published records across databases                                                                                                                                                                 |
| Title/abstract screening           | De-duplicated unique dataset        | 4,199                                                | 100                               | 4,099                      | Studies not jointly addressing fishing restriction policies and livelihood/ tourism-related outcomes                                                                                                         |
| Full-text assessment               | Title/abstract screened dataset     | 100                                                  | 45                                | 55                         | (i) No traceable empirical evidence on ecological, livelihood or governance outcomes; (ii) Pure conceptual discussion without empirical data; (iii) Study population not focused on fishing-dependent groups |
| Final inclusion for core synthesis | Full-text assessed dataset          | 45                                                   | 45                                | 0                          | No exclusion (all meet the predefined eligibility criteria)                                                                                                                                                  |



**Figure 1.** Preferred Reporting Items for Systematic Reviews and Meta-Analyses- based literature search and selection process.<sup>12,13</sup>

Abbreviations: ABS: Association of Business Schools; SSCI: Social Sciences Citation Index.

Table 2. Eligibility criteria

| Dimension             | Inclusion rule                                                                                                                                                                                 | Exclusion rule                                                                                                                                                                    |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Population            | Fishing households, small-scale fishers, fishing communities; includes inland and marine contexts.                                                                                             | Ecotourism studies without fishing-dependent groups; purely marketing/branding papers.                                                                                            |
| Intervention/exposure | Fishing restrictions: seasonal closures (moratoriums), spatial closures/no-take reserves/MPAs, comprehensive bans; includes enforcement and compensation packages when linked to restrictions. | Fisheries management topics without a restriction/ban/closure element.                                                                                                            |
| Livelihood focus      | Ecotourism/nature-based tourism, tourism participation as an alternative/supplemental income, and broader alternative livelihood projects with measurable livelihood/compliance outcomes.      | Alternative livelihood narratives without traceable evidence or outcome reporting.                                                                                                |
| Outcomes              | Ecological recovery indicators; livelihood outcomes (income stability, employment, well-being); governance outcomes (compliance, legitimacy, benefit-sharing, inequality).                     | Studies lacking any ecological, livelihood, or governance-relevant outcome.                                                                                                       |
| Study types           | Peer-reviewed empirical studies and systematic reviews; authoritative policy/legal documents for China.                                                                                        | Commentaries, editorials, policy opinions, or narrative essays that do not provide empirical data, systematic review procedures, case evidence, or traceable outcome information. |

Abbreviation: MPA: Marine protected area.

fishing. In particular, ecological-precondition coding linked restriction effectiveness and enforcement to the stability of nature-based attraction value; entry-constraint coding captured capital, skills, and access barriers shaping whether affected fishers can participate; benefit-sharing coding captured perceived fairness and legitimacy; and compliance coding captured behavioral responses, including substitution, displacement, and “exit + intensification” dynamics. This synthesis structure aligns with the Sustainable Livelihoods Framework (SLF) for capital constraints and portfolio livelihood reasoning,<sup>15,16</sup> and with the theory of planned behavior (TPB) for participation-intention drivers (attitudes, subjective norms, and perceived behavioral control).<sup>17</sup> Synthesized patterns were summarized into the conceptual figures to support adaptation of global mechanisms to the institutional conditions of China’s Yangtze River Ten-Year Fishing Ban.

### 3. Results

#### 3.1. Ecological effectiveness of fishing restrictions and why it matters for ecotourism

Existing syntheses show that ecological gains from fishing restrictions are substantial but not automatic. Global comparative studies have consistently found that fully protected no-take areas outperform partially protected

or weakly enforced protected areas in restoring fish biomass, abundance, body-size structure, and, in some cases, broader community complexity.<sup>7,18–20</sup> Evidence also indicates that ecological recovery is concentrated where strict rules are matched by management capacity (staffing, finance, monitoring, and enforcement), rather than by “designation” alone.<sup>6,21</sup>

To make these patterns analytically clearer, [Table 3](#) reorganizes the evidence by region and governance conditions rather than listing studies one by one. Importantly, the ecological basis of ecotourism should be specified more concretely. In the reviewed studies, “ecological basis” refers to whether restrictions generate (i) visitor-experiential visibility (e.g., higher encounter rates with fish schools/flagship species, improved habitat quality, clearer waters, or restored wetland scenery), (ii) durability (recovery signals sustained across seasons/years), and (iii) credibility (locally trusted monitoring/enforcement that makes ecological claims believable to both residents and visitors). Under weak compliance, ecological signals may remain uncertain or contested, undermining the plausibility of nature-based tourism narratives and weakening social support for restrictions.<sup>22,23</sup>

As indicated in [Table 3](#), the relationship between fishing restrictions and ecotourism potential is conditional rather than automatic. Ecological recovery matters for

Table 3. Global studies on the ecological outcomes of fishing restrictions and marine protected areas

| Geographical scale/<br>region                                        | Representative<br>literature                                                                                                                             | Dominant protection<br>arrangement                                                               | Synthesized ecological findings                                                                                                                                                                                      | Implications for ecotourism                                                                                                                                                   |
|----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Global multi-region<br>evidence                                      | Lester <i>et al.</i> , <sup>19</sup> Claudet<br><i>et al.</i> , <sup>20</sup> Sanabria-<br>Fernandez <i>et al.</i> <sup>7</sup>                          | No-take reserves<br>compared with<br>partially protected<br>areas or adjacent<br>fished areas    | Across syntheses, no-take regimes<br>show the most consistent increases<br>in biomass and size structure;<br>partially protected areas show<br>weaker and more heterogeneous<br>gains.                               | Biodiversity-based tourism requires<br>more than nominal protection;<br>robust and sustained recovery makes<br>wildlife-viewing/diving/fish-watching<br>products more viable. |
| Global governance<br>and performance<br>conditions                   | Gill <i>et al.</i> , <sup>21</sup> Campbell<br><i>et al.</i> , <sup>22</sup> Bergseth <i>et<br/>al.</i> , <sup>23</sup> Edgar <i>et al.</i> <sup>6</sup> | Sites differ in<br>enforcement intensity,<br>age/size, monitoring,<br>and management<br>capacity | Capacity shortfalls and weak<br>compliance explain many<br>underperforming protected areas;<br>ecological success is concentrated<br>in sites combining strict rules<br>with credible enforcement and<br>monitoring. | Governance quality is as important<br>as legal designation; tourism value<br>depends on credible, experienceable<br>ecological improvements.                                  |
| Oceania (temperate<br>reserve systems)                               | Babcock <i>et al.</i> <sup>24</sup>                                                                                                                      | Long-standing no-take<br>reserves                                                                | Direct recovery in exploited species<br>can be substantial; indirect food-<br>web responses often emerge more<br>gradually.                                                                                          | Tourism benefits may lag; ecotourism<br>planning should assume long time<br>horizons for “visible” recovery.                                                                  |
| Mexico/Gulf of<br>California                                         | Aburto-Oropeza <i>et<br/>al.</i> <sup>25</sup>                                                                                                           | Strict no-take reserve                                                                           | Strong protection can reverse<br>depletion where compliance is<br>maintained.                                                                                                                                        | Recovery of conspicuous taxa can<br>create a strong appeal for wildlife<br>tourism, but only under stable, long-<br>term compliance.                                          |
| China (Poyang Lake;<br>Yangtze River-<br>connected inland<br>system) | Yang <i>et al.</i> <sup>26</sup>                                                                                                                         | Comprehensive ban in<br>a large freshwater lake<br>system                                        | Ecosystem-model evaluation<br>suggests measurable ecological<br>changes under restriction, but the<br>metrics differ from those in the<br>MPA literature.                                                            | Freshwater ecotourism should be<br>premised on monitored recovery in<br>fish communities/habitats rather than<br>on legal prohibition alone.                                  |

Abbreviation: MPA: Marine protected area.

ecotourism in three specific ways. First, conservation outcomes provide the ecological substance of ecotourism; without recoverable fish communities, wetlands, habitats, or flagship freshwater species, ecotourism risks becoming a promotional label rather than a conservation-linked livelihood activity. Second, a visible and credible recovery provides a basis for interpretation and environmental education, allowing visitors to understand why the fishing ban was implemented and how freshwater biodiversity recovery is occurring. Third, ecological recovery affects community legitimacy: former fishers are more likely to view ecotourism as a meaningful pathway when the ecological benefits of the ban are observable and when the resulting economic opportunities are locally accessible. For the Yangtze River Ten-Year Fishing Ban, ecotourism should therefore be developed only where freshwater ecological recovery can be monitored, interpreted, and connected to local community benefits.

### 3.2. Ecotourism and alternative livelihood transition tools

Under fishing restrictions or bans, many countries attempt to alleviate livelihood pressures through alternative livelihood arrangements, such as livelihood diversification and ecotourism. However, systematic evidence indicates that outcomes vary widely across settings because success depends on governance quality, community participation, benefit distribution, capability building, and exposure to external shocks.<sup>27,28</sup> A key clarification is that much of the best-documented “ecotourism-alternative livelihood” evidence comes from coastal/marine contexts, where products often include diving/snorkeling and marine wildlife experiences. The inland freshwater contexts (river-lake and wetland systems) typically rely more on landscape amenity, wetland biodiversity interpretation, and seasonality, therefore face different market and infrastructure constraints.<sup>9,29</sup>

Some well-known coastal cases provide useful mechanistic insights. The nearshore protected-area network and fish aggregation-based tourism in Moalboal, Philippines, illustrate how diving and fish-watching can generate meaningful income streams for some households under conditions of strong local participation and benefit retention. In Cabo Verde, sea-turtle-watching ecotourism provides an example of non-consumptive income linked to conservation outcomes and willingness to pay.<sup>30</sup>

However, historical and systematic evidence demonstrates that ecotourism initiatives cannot automatically replace traditional fisheries. Empirical studies in marine protected areas show that tourism often functions as a supplementary rather than a full substitute livelihood because many households face binding constraints (education, mobility, access to credit, distance to tourism nodes, and service skills).<sup>31,32</sup> Systematic reviews further emphasize that livelihood substitution effects are often unstable due to market volatility and shocks,<sup>29</sup> and can be unevenly distributed within communities. In

China's Yangtze River-related transition setting, peer-reviewed evaluations of compensation and livelihood capital similarly point to heterogeneous transition capacity across households, suggesting that without targeted skills-building and differentiated support, tourism opportunities may concentrate among a small subset of participants.<sup>33,34</sup>

The mechanism and boundary conditions of ecotourism as an alternative livelihood are shown in Table 4. Overall, the results show that ecotourism transformation can only be effective after establishing a reasonable compensation mechanism, training system, community participation, and benefit-sharing support system.<sup>35</sup>

Table 4 shows that ecotourism is most likely to support fishing households when ecological recovery, market access, household capabilities, and fair benefit distribution coexist. The evidence therefore supports a conditional interpretation: ecotourism may supplement fishing households' income, but it is unlikely to function as a stand-alone livelihood replacement.

**Table 4. Mechanisms and boundary conditions for “ecotourism as an alternative livelihood” under fishing restrictions**

| Mechanism                                            | Preconditions/Constraints                                                                                                                                                                                                      | Examples/Comments                                                                                                                                                                                                                                                                                                   | Representative literature                                                                                   |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Diversified income source                            | Requires a visible or cultivable tourism market, basic transport/service infrastructure, skills training, and start-up capital/subsidies. Without these, tourism is likely to be an occasional source of supplementary income. | Moalboal (Philippines) fish-watching/dive product built around fish aggregation and reef quality ( <b>coastal/marine case</b> ). Cabo Verde turtle-watching illustrates conservation-linked non-consumptive revenue ( <b>coastal/island case</b> ).                                                                 | Cusack <i>et al.</i> ; <sup>9</sup> Martins <i>et al.</i> ; <sup>30</sup> Masri <i>et al.</i> <sup>27</sup> |
| Enhanced ecological attractions                      | Restrictions must generate <b>visible and credible</b> recovery (abundance/size structure/habitat condition/species visibility) and monitoring that can demonstrate gains to locals and visitors.                              | In Moalboal, tourism depends on the visibility of fish schools and reef quality ( <b>coastal/marine case</b> ). In the Yangtze River/Poyang Lake, freshwater ecotourism should rely on monitored improvements in food-web structure/habitat condition, not on legal prohibition alone ( <b>inland freshwater</b> ). | Yang <i>et al.</i> <sup>26</sup>                                                                            |
| Household capability and entry barriers              | Entry is constrained by age, education, mobility, access to credit, social networks, and entrepreneurial capability.                                                                                                           | Tourism often remains supplemental because many households cannot meet the capability requirements. China's ban-compensation evidence shows transition outcomes differ across households, implying differentiated support rather than uniform packages.                                                             | Pham; <sup>31</sup> He & Chen <sup>33</sup>                                                                 |
| Community participation, benefit-sharing, and equity | Communities must be involved in planning/management and revenue allocation; fair benefit sharing sustains legitimacy and compliance.                                                                                           | Perceptions of livelihood impacts and governance legitimacy strongly shape support for conservation rules. Inequality and uneven access can undermine social sustainability and compliance.                                                                                                                         | Bennett & Dearden; <sup>36</sup> Ostrom; <sup>37</sup> Nahuelhual <i>et al.</i> <sup>38</sup>               |
| Reinvestment and long-term sustainability            | Tourism revenues/external support should be reinvested in conservation, monitoring, site maintenance, and community development under transparent governance.                                                                  | Poorly regulated tourism can generate new environmental pressures and erode the ecological asset base. Transparent institutions reduce elite capture risk.                                                                                                                                                          | Buckley <sup>39</sup>                                                                                       |

### 3.3. Boundary evidence: Broader tourism development may increase aggregate fishing pressure

In some cases, tourism development has exacerbated fishing pressure. Miller<sup>40</sup> found that after tourism expanded along the Pacific coast of Colombia, some households reduced or exited fishing, while remaining fishers increased their intensity and invested in improved fishing methods. Consequently, total community-level fishing pressure could rise rather than fall.

The simple linear logic that “increased tourism revenue leads to decreased catch” is not generally valid. The evidence reviewed in this section should not be read as evidence about ecotourism; rather, it shows that broader tourism development may create rebound effects when visitor demand, seafood consumption, or tourism-linked income remains connected to extractive fishing activities.<sup>41</sup> This distinction is important because ecotourism, as used

in this review, is non-consumptive, conservation-oriented, and education-based. Recreational fishing and sport fishing are therefore not classified as ecotourism activities in this study. They are treated only as boundary cases that help clarify why ecotourism-based livelihood programs must be separated from tourism forms that may sustain or intensify fishing pressure (Table 5).<sup>42,43</sup>

These boundary cases are important for Yangtze River adaptation because they show what ecotourism policy should avoid. If visitor growth stimulates seafood demand, enables capital investment in fishing gear, or allows tourism income to subsidize continued extraction, the livelihood transition may undermine the conservation goals of the fishing ban. Therefore, ecotourism initiatives in the Yangtze River basin should be explicitly non-consumptive, conservation-oriented, and linked to community benefit-sharing and environmental interpretation. They should also be accompanied by enforcement against illegal fishing and monitoring of tourism-related seafood demand.<sup>40</sup>

Table 5. Boundary cases where broader tourism development increased fishing-related pressure

| Case/Location                                            | Observation                                                                                                       | Why has overall fishing pressure increased                                                                                    | Key literature source             |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| Colombian Pacific Coast                                  | Tourism expanded, and some households reduced or exited fishing, yet remaining fishers intensified their efforts. | Exit effects were offset by intensification and improved fishing methods; total fishing pressure could rise rather than fall. | Miller <sup>40</sup>              |
| Colombian Pacific Coast (capital-enabled gear upgrading) | Tourism-linked cash enabled investment in better boats/gear.                                                      | Upgrading increased catchability and operational range, amplifying extraction capacity.                                       | Miller <sup>40</sup>              |
| Fernando de Noronha, Brazil                              | Tourism demand shaped the incentives for fish trade within a mixed-zoning MPA.                                    | Tourism-driven seafood demand and value-chain incentives can increase pressure on targeted taxa and intensify conflicts.      | Lopes <i>et al.</i> <sup>44</sup> |

Abbreviation: MPA: Marine protected area.

### 3.4. China's Yangtze River Ten-Year Fishing Ban: Policy context and implications

China's national policy mandating a 10-year commercial fishing ban across the Yangtze River basin should be understood not as a stand-alone prohibition, but as a governance package that combines ecological restriction with compensation, labor transition, and social protection. Peer-reviewed analyses emphasize that the Yangtze River Ten-Year Fishing Ban is an unusually large-scale transition experiment, whose ecological credibility and social sustainability depend on consistent enforcement and well-designed compensation and livelihood-transition measures.<sup>45,46</sup>

Provincial and municipal evidence suggests that transition outcomes depend heavily on the household assets and capabilities of fishing households rather than the compensation amount alone. In Jiangsu province, a compensation-mechanism study shows that willingness to quit and post-exit livelihood sustainability are closely tied to the five livelihood capitals, implying that one-size-fits-all compensation is insufficient.<sup>34</sup> In Ma'anshan city, He and Chen<sup>33</sup> found that the fishing-ban compensation policy significantly improved livelihood-capital coordination among retired fishing households, suggesting that institutional support can reduce transition vulnerability.

Jiangxi's Poyang Lake adds an especially important intermediate case because it is ecologically connected to the middle Yangtze River and institutionally situated at the intersection of fishing-ban governance, wetland protection, and rural livelihood transition. Village-level evidence demonstrates that post-ban livelihood strategies do not converge on a single pathway; instead, they diversify into non-fishing wage employment, self-employment, public-welfare positions, and retirement, with age and education shaping feasible routes.<sup>47</sup> Recent quantitative analysis further shows that compensation may buffer short-term income more effectively than it transforms the underlying employment structure,<sup>35</sup> while evidence from Poyang

Lake-based livelihood-transition research indicates that ecological cognition and compensation design jointly shape transition choices.<sup>48</sup>

A recent lake-ecosystem evaluation also supports the view that ecotourism should be discussed only after baseline ecological and institutional conditions are established. Using an Ecopath framework, Yang *et al.*<sup>26</sup> reported measurable ecosystem-level changes following restrictions, suggesting that ecological preconditions for nature-based tourism may be strengthening. However, governance challenges remain binding, and long-term effective maintenance of the ban requires coordinated incentives and enforcement stability (Table 6).<sup>46</sup>

**Table 6. Implementation and adaptation case studies of the Yangtze River Ten-Year Fishing Ban (TYFB)**

| Policy/Case                                             | Main measures                                                                                            | Outcomes/Observations                                                                                                                                                                             | Key source(s)                    |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Basin-wide institutional logic (TYFB as policy package) | Ecological prohibition combined with compensation, social security arrangements, and transition support. | Frames TYFB as “ecological restriction + livelihood transition,” not a simple closure.                                                                                                            | Wang <i>et al.</i> <sup>45</sup> |
| Jiangsu province                                        | Compensation mechanism oriented to exit; emphasizes livelihood capital and age-specific needs.           | Willingness to quit and transition to sustainability is conditioned by livelihood capital; differentiated design is needed.                                                                       | Wu <i>et al.</i> <sup>34</sup>   |
| Ma'anshan city, Anhui                                   | Compensation policy combined with retraining and livelihood-capital improvement measures.                | Livelihood capital and coordination improved after policy intervention.                                                                                                                           | He & Chen <sup>33</sup>          |
| Poyang Lake, Jiangxi                                    | Comprehensive ban plus labor transfer/self-employment/public welfare jobs and wetland governance.        | Transition remains differentiated; compensation buffers income more than occupational replacement; cognition and compensation design matter; ecological recovery signals are becoming measurable. | Zhai <i>et al.</i> <sup>48</sup> |

In summary, China's Yangtze River Ten-Year Fishing Ban is accompanied by unprecedented ecological compensation and enforcement. The logic of adaptation is clear: replace fishermen's income with a mix of cash subsidies, social security, and new job opportunities, while simultaneously cutting illegal fishing and other riverbed exploitation. Early evidence from provinces such as Jiangsu and cities such as Ma'anshan suggests that these measures can significantly uplift fishermen's livelihoods. With the addition of Poyang Lake, the institutional baseline becomes more analytically complete, as it captures the governance realities of river-connected lake systems where ecological recovery can be visible (thus potentially marketable for ecotourism), yet enforcement complexity and livelihood heterogeneity are also higher. Importantly, the policy explicitly treats the ban as an ecological restoration effort: eliminating fishing pressure is “likely key” to the observed

biodiversity recovery, alongside parallel water-quality and habitat-restoration efforts. The Yangtze River case thus illustrates how systemic planning (financial, legal, and ecological) and lake-specific adaptive design underpin a sustainable fishing ban.

### 3.5. Conceptual framework for Yangtze River ecotourism transition

Figure 2 presents an evidence-based conceptual framework that translates the findings of this review into China's policy context. In the framework, the fishing ban functions as the core policy intervention and triggers two interrelated causal pathways. The first pathway is ecological: by substantially reducing fishing pressure, the ban creates conditions for the recovery of fish stocks, biodiversity, and broader aquatic ecosystem integrity, thereby rebuilding the natural capital on which nature-based tourism can potentially depend.

The second pathway is socioeconomic: the prohibition of capture fishing disrupts the traditional livelihood base of commercial fishers, forcing households to shift toward alternative employment and income strategies. In this branch, ecological compensation, social security, and re-employment support are not peripheral policy add-ons, but essential transition mechanisms that can buffer short-term welfare losses and improve livelihood capital during the adjustment period.<sup>35</sup> For this pathway to work, former fishers need practical support to participate in ecotourism, including interpretation, guiding, service, and small-business skills. The framework therefore treats training as one enabling condition rather than as a sufficient solution in itself.

Positioned between these two pathways, the framework emphasizes a set of enabling conditions repeatedly identified in the literature. First, governance capacity and community participation are placed at the upper level of the framework because the effectiveness of conservation interventions depends heavily on institutional coordination, local legitimacy, and the meaningful inclusion of affected stakeholders in decision-making.<sup>49,50</sup> This is especially important in fishery-transition settings, where top-down ecological objectives can only be socially sustainable if they are accompanied by inclusive participation and long-term public support. Second, market demand, ecological infrastructure, and environmental governance are placed at the lower level of the framework because ecological recovery does not automatically generate ecotourism income; rather, ecological assets must be converted into viable livelihood opportunities through access, facilities, destination management, and functioning tourism markets. In other words, improved ecosystems are a necessary but insufficient condition for successful ecotourism-based transition.

The feedback structure in [Figure 2](#) further reflects the dual nature of ecotourism observed in prior research. On the positive side, when ecotourism is properly regulated and benefits are retained locally, nature-based tourism can strengthen local conservation incentives and diversify household incomes. On the negative side, however, ecotourism is not inherently benign: if visitor growth exceeds ecological carrying capacity or if ecotourism development is weakly regulated, ecotourism may generate new environmental pressures and undermine the ecological recovery on which it depends.<sup>39</sup>

Overall, [Figure 2](#) encapsulates the central conclusion of this review: a 10-year fishing ban can produce both ecological and socioeconomic gains only when ecological restoration is institutionally linked to adequate compensation, skills training, and realistic alternative livelihood pathways. For

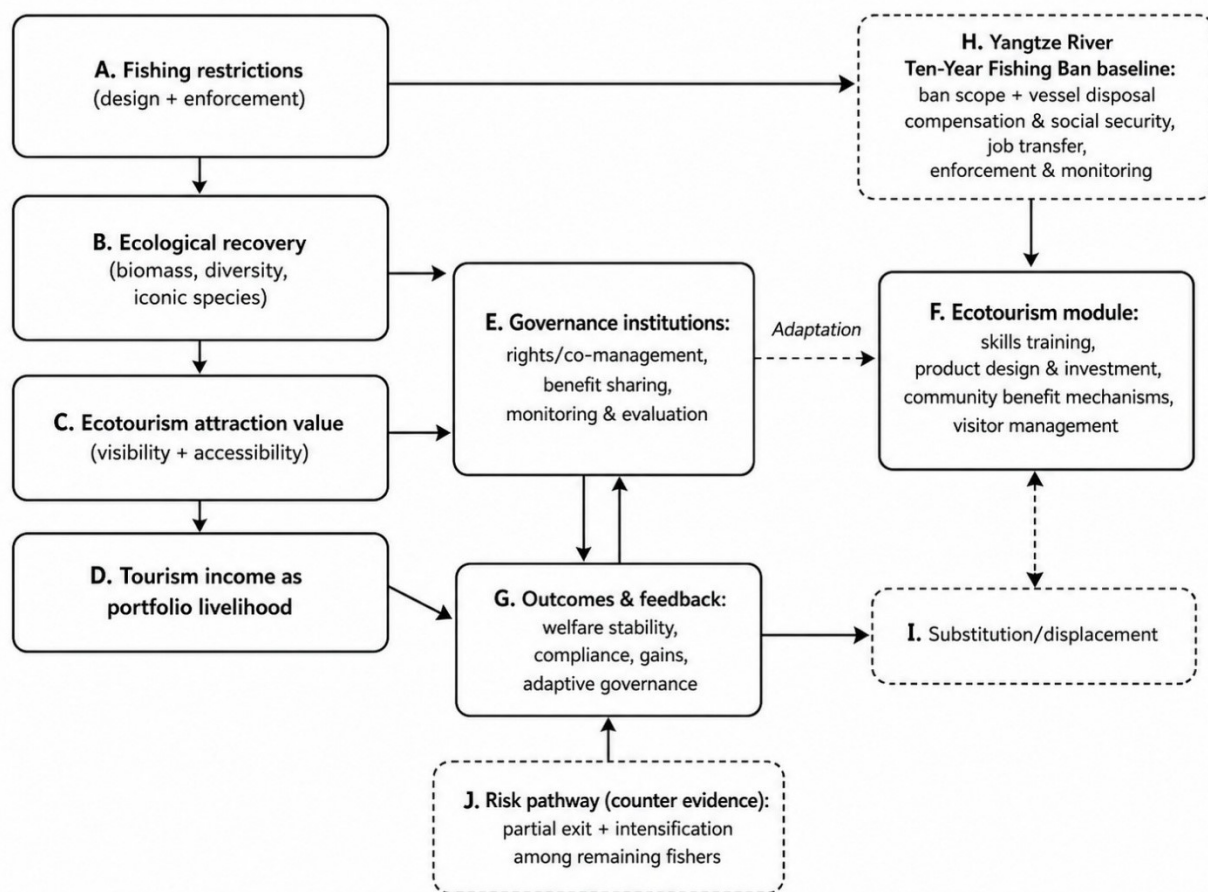
China, this implies that the adaptive model should not treat ecotourism as an automatic or universal substitute for fishing, but rather as a conditional strategy that becomes viable only where ecological recovery, governance quality, market access, and community capabilities converge.

## 4. Discussion

Fishing bans are increasingly adopted as part of broader strategies to address aquatic biodiversity loss and freshwater ecosystem degradation. The Yangtze River Ten-Year Fishing Ban is analytically important because it combines basin-scale ecological restriction with large-scale livelihood transition measures.<sup>51–53</sup> Unlike small protected-area cases, the Yangtze River case involves a long river system, multiple provinces, and a large population of former fishers. This scale makes it necessary to examine ecotourism not as a simple market opportunity, but as a conditional livelihood pathway that must be aligned with ecological recovery, community participation, benefit-sharing, and long-term governance.<sup>54–57</sup>

A key insight from the comparative ecological literature is that ecotourism cannot be taken for granted as an outcome of fishing bans; its emergence is conditional on whether the bans can foster visible, durable, and credible ecological recovery—recovery capable of supporting a nature-based tourism product. Global syntheses show that strictly protected and effectively enforced no-take regimes outperform partially protected or weakly governed arrangements in rebuilding fish biomass and restoring community structure.<sup>58–61</sup> Importantly, freshwater systems often face additional threats originating upstream and outside protected reaches, which can undermine ecological gains even when local harvest restrictions are in place.<sup>62–66</sup> In this review, the “ecological basis of ecotourism” is therefore defined operationally as (i) demonstrable recovery in fish biomass/diversity and habitat condition, (ii) ecological visibility that can be translated into non-consumptive tourism experiences (e.g., wildlife viewing, wetland interpretation), and (iii) governance credibility that makes ecological improvement believable to both visitors and residents.<sup>45,67–70</sup> Without these foundations, tourism development risks being promotional rather than evidence-based.

A second lesson concerns livelihood dynamics: the reviewed evidence supports ecotourism as a supplementary livelihood pathway in suitable sites, but rarely as a universal replacement for fishing. Successful cases show that ecotourism can become economically meaningful when ecological visibility, local governance, and benefit retention align.<sup>9,30,31</sup> However, systematic evidence cautions that alternative-livelihood interventions



**Figure 2.** Conceptual framework for the Yangtze River Ten-Year Fishing Ban and ecotourism-based livelihood transition. The central fishing ban intervention drives two main outcomes: ecological recovery (left) and fishermen's livelihood transition (right). Ecotourism is possible when effective enforcement and habitat restoration lead to greater fish abundance and greater fish biodiversity. In the meantime, social measures such as cash payments and training support affected fishermen. These pathways are shaped by key cross-cutting factors, including governance strength, community involvement, and market conditions. The model also shows a feedback: tourism revenue can reinforce conservation (if well managed) or, if poorly managed, can indirectly boost fishing effort (as discussed in Section 3.3).

have uneven welfare and conservation impacts and are often under-monitored, limiting transferability.<sup>10</sup> In addition, ecotourism-based alternatives remain exposed to seasonality, shocks, and entry barriers (e.g., skills, start-up capital, market access), which are particularly binding in aging fishing communities.<sup>28</sup>

Third, counter-evidence matters for policy design: tourism can coexist with intensified fishing pressure among remaining fishers, and seafood demand can raise aggregate extraction even when some households exit fishing.<sup>40</sup> This is especially salient when ecotourism expands restaurant/hospitality demand and indirectly reshapes local value chains.<sup>44</sup> At the same time, the study must avoid over-generalizing a coastal mechanism to the Yangtze River: the proposition “increased tourism revenue leads to

decreased catch” can hold in some coastal contexts where ecotourism is tied to regulated recreational or catch-and-release fisheries, but it is not a general law and is unlikely to map cleanly onto inland-basin ecotourism products (e.g., wetland viewing, river cruises, cultural tourism).<sup>41,71,72</sup> For the Yangtze River/Poyang Lake context, the key implication is to treat ecotourism not as “automatically substituting” fishing, but as one component of a regulated transition package that also anticipates rebound risks and monitors seafood demand channels.<sup>73</sup>

Fourth, social legitimacy and perceived fairness are not secondary—they are mechanisms. A substantial literature shows that protected areas and harvest restrictions can generate uneven social impacts across groups, and that perceived governance quality and livelihood impacts

condition support, compliance, and long-term durability.<sup>36</sup> In fishery-transition settings, stakeholder perceptions that sometimes vary by cohort and livelihood identity shape whether bans are experienced as legitimate and whether alternative livelihoods are seen as realistic.<sup>74,75</sup> Co-management and transparent benefit-sharing institutions can strengthen stewardship incentives and reduce conflict risks, whereas exclusionary governance can undermine compliance.<sup>37,76</sup>

This is where the principles of ecotourism become central to policy design. If ecotourism is reduced to visitor numbers or short-term income generation, it may reproduce the same pressures that conservation policy seeks to reduce. A conservation principle requires that ecotourism revenue and management arrangements contribute to habitat protection, biodiversity monitoring, and low-impact use of river-lake landscapes. A community principle requires that former fishers and residents are not merely service laborers, but participants in planning, guiding, benefit-sharing, and monitoring. An interpretation and education principle requires that visitor experiences communicate the ecological rationale of the fishing ban, the value of freshwater biodiversity, and the role of local communities in conservation. These principles help distinguish ecotourism from general tourism and explain why ecotourism can support both resource sustainability and livelihood transition only when it is carefully governed.

Lastly, the transition must be situated in the broader context of global change. Fisheries and aquatic ecosystems are increasingly affected by climate-driven shifts in fish assemblages and changes in water quality and habitat conditions; these pressures can reshape both conservation needs and the feasibility of livelihoods.<sup>77,78</sup> Moreover, the global transition toward climate neutrality and “just transition” agendas highlight that livelihood reconstruction in traditional sectors requires governance attention to distributive impacts, capacity building, and long-term resilience.<sup>79,80</sup> For the Yangtze River policy, this reinforces the need for training, social protection, and adaptive monitoring rather than one-off “tourism substitution” expectations.

#### **4.1. Reasons for “portfolio livelihoods” as a more defensible policy framing than “replacement livelihoods”**

The evidence supports “portfolio livelihoods” as a more defensible framing than “replacement livelihoods” for both analytical and policy reasons. Analytically, fishing households rarely respond to restrictions through a one-step occupational substitution; instead, they assemble

combinations of wage labor, self-employment, seasonal migration, public-welfare work, pensions, and, only where feasible, ecotourism-related activities to stabilize livelihood risks over time.<sup>81,82</sup> Empirical evidence also suggests that resilience and adaptation are socially differentiated rather than uniform, implying that households’ transition options depend on assets, capabilities, and institutional support.<sup>83</sup>

International cases reinforce this point. Moalboal demonstrates that ecotourism can become economically significant when ecological visibility and benefit retention align, while Cabo Verde illustrates how conservation-linked tourism can raise non-consumptive asset value and generate local income opportunities when long-term conservation investment and visitor willingness to pay are present.<sup>84</sup> However, neither case justifies a universal assumption that all fishing households can or should become full-time ecotourism workers. Systematic evidence shows that alternative-livelihood interventions vary widely in their conservation and welfare outcomes and are often poorly monitored. Ecotourism-based alternatives remain contingent on demand, seasonality, skills, start-up capital, and institutional control over leakage.<sup>85–87</sup>

The Chinese evidence points in the same direction. The large-river evaluation of the Yangtze River ban reports substantial resettlement and financing inputs,<sup>88</sup> indicating that transition is not a “market-only” process. Micro-level studies further show that compensation, social security, and retraining influence livelihood outcomes, but effects remain differentiated across households.<sup>34,35</sup> In Poyang Lake, ecological effects of the fishing ban have been evaluated using Ecopath-based approaches,<sup>26</sup> while livelihood-strategy transformation and land-use effects have been documented in village-level case studies.<sup>47</sup> Together, this evidence supports a portfolio interpretation: ecotourism should be assessed as one possible livelihood pathway within a wider transition strategy, rather than as evidence that fishers can move from fishing into a single new occupation.

#### **4.2. Policy design priorities for China’s Yangtze River context**

In the context of the Yangtze River, ecotourism policy should be organized around four risks identified in the comparative literature. The first is ecological: without measurable freshwater recovery, there is no credible ecotourism product.<sup>89</sup> The second is distributive: without fair access and benefit-sharing, ecotourism may benefit outside investors or better-positioned households rather than former fishers. The third is institutional: without co-management and transparent rules, ecotourism may become disconnected from conservation goals. The fourth

is adaptive: without long-term monitoring, policymakers cannot know whether ecotourism is strengthening livelihood security or merely creating short-term income while generating new ecological pressures.<sup>90</sup>

Table 7 translates these risks into a policy checklist. The checklist does not assume that ecotourism is suitable across the entire Yangtze River basin. Instead, it identifies where ecotourism may be appropriate, what institutional conditions are required, and how inland river-lake ecotourism differs from coastal or marine cases.<sup>91</sup>

Overall, the checklist emphasizes that the key issue for the Yangtze River policy is not whether ecotourism is desirable in principle, but whether it is institutionally aligned with the conditions documented in the literature. Success cases matter because they show that tourism can complement conservation when ecological quality is high and local benefit retention is strong, while cautionary cases matter equally because tourism can fail or even worsen fishing pressure when governance, equity, and monitoring are weak. For this reason, ecotourism should

**Table 7. Policy design checklist for aligning ecotourism with fishing-ban governance**

| Policy design element (for integrating ecotourism into fishing bans) | Rationale                                                                                                                                                                                          | Expected effect                                                                    | Implementation notes                                                                                                 | Source(s)                                  |
|----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Ecosystem-first zoning and recovery baselines                        | Fishing bans are justified by measurable biodiversity risk and recovery targets rather than only sectoral regulation                                                                               | Clear ecological benefits; transparent “why-ban/why-tourism” logic                 | Define ecological baselines, indicators, and recovery timelines before livelihood substitution programs scale up     | Sayer <i>et al.</i> <sup>51</sup>          |
| Compliance-centered design (avoid “paper protection”)                | Bans and protected areas often underperform due to noncompliance and weak enforcement, undermining both ecology and legitimacy                                                                     | Higher effectiveness; improved perceived fairness                                  | Combine monitoring, adaptive enforcement, and community legitimacy measures; treat compliance as an outcome variable | Aminian-Biquet <i>et al.</i> <sup>60</sup> |
| Regulation-informed protection assessment                            | Measuring “coverage” alone overstates protection; rule-based datasets help distinguish real restrictions                                                                                           | Prevents a false sense of protection; improves cross-case comparability in reviews | Use regulation-centered evidence for coding “ban stringency” and “tourism allowance”                                 | Favoretto <i>et al.</i> <sup>62</sup>      |
| Climate-robust management and monitoring                             | Climate change alters fish assemblages and tourism seasonality; static plans become obsolete                                                                                                       | Better long-term viability of both recovery and alternative livelihoods            | Include climate objectives/thresholds in monitoring plans where possible                                             | Bryce & Hunter <sup>63</sup>               |
| Ecotourism as a structured livelihood pathway                        | Tourism substitution works when it is institutionally supported (skills, finance, governance) and matches local assets                                                                             | Higher participation intention; reduced rebound fishing pressure                   | Embed training/certification, start-up finance, and benefit-sharing; explicitly code these in synthesis              | Wei <i>et al.</i> <sup>66</sup>            |
| Inland-wetland specificity (avoid “marine example bias”)             | Marine and inland lake/river ecotourism differ in ecological settings, visitor experience, and carrying-capacity risks; recreational fishing should not be classified as ecotourism in this review | Prevents misapplied causal claims in Table 4/mechanism statements                  | Flag which included studies are marine/coastal vs. inland; discuss mechanism boundaries explicitly                   | Singha & Pal <sup>67</sup>                 |
| China/Yangtze River-focused evidence for enforcement & transition    | TYFB shows a rapid ecological response, but also governance challenges (enforcement, clientelism, satisfaction)                                                                                    | Stronger China-specific discussion; clearer implications for other river basins    | Use peer-reviewed China evidence on outcomes + social dynamics; do not rely on gray reports                          | Wu <i>et al.</i> <sup>34</sup>             |

Abbreviation: TYFB: Yangtze River Ten-year Fishing Ban.

be integrated into the Yangtze River policy not as a basin-wide replacement sector, but as a selective and carefully governed supplement within a broader transition strategy.

### 4.3. Research gap

Despite the growing literature, several research gaps remain, and addressing them would directly strengthen the evidence base for adaptive governance in the Yangtze River basin and comparable river systems. First, long-term coupled social–ecological monitoring is still limited. Although the Yangtze River ban has emerging evidence of ecological recovery and provides unusually clear estimates of transition inputs, less is known about whether livelihood stability persists after subsidies weaken and whether ecological trajectories remain robust over the full ban period.

Second, the causal relationship between ecotourism and reduced fishing pressure remains under-tested. Existing studies show both positive and negative pathways, yet robust comparative designs that can distinguish substitution from rebound effects remain rare. This is particularly important because coastal sport-fishing or catch-and-release models may not translate to inland river–lake systems, and seafood-demand mechanisms may dominate instead.<sup>85</sup>

Third, perception, legitimacy, and cohort-differentiated acceptance remain under-integrated into transition evaluation. Evidence suggests that perceived fairness, governance quality, and livelihood impacts condition support and compliance, while fishers' perceptions and identity-linked differences can shape their willingness to comply with restrictions and adopt new livelihood pathways.<sup>75,91</sup> More policy-relevant research is needed on preparatory engagement, intergenerational attitudes, and how these interact with compensation and training design.

Fourth, inland freshwater cases remain underrepresented relative to marine ecotourism and marine protected area studies. This limits confident transfer from reefs/coasts to river–lake systems such as the Yangtze River and Poyang Lake, where ecological dynamics, tourism products, and upstream threats differ.<sup>92</sup> Finally, global-change pressures—including climate-driven shifts in fish communities and the broader transition toward climate neutrality—require stronger integration into livelihood planning and policy evaluation, as they may reshape both ecological baselines and feasible job pathways.

## 5. Conclusion

This review synthesizes the literature into three interrelated conclusions. First, ecological evidence indicates that

fishing bans can support ecotourism only when they generate visible, durable, and credible ecological recovery. For ecotourism, ecological recovery is not only a background condition; it is the basis for conservation value, interpretation, education, and visitor experience. Therefore, the Yangtze River Ten-Year Fishing Ban should not be linked to ecotourism solely on the basis of legal restrictions, but only where freshwater biodiversity, habitat quality, and ecological monitoring can support low-impact and conservation-oriented visitor activities.<sup>6,7</sup>

Second, ecotourism can serve as a supplementary livelihood pathway under favorable ecological and institutional conditions, but it should not be treated as a universal replacement for fishing.<sup>31,32</sup> The reviewed evidence shows that ecotourism benefits are shaped by market access, skills, start-up capital, community participation, and benefit-sharing arrangements. Broader tourism development may even create rebound risks through seafood demand or capital-enabled fishing intensification. For this reason, ecotourism must be clearly distinguished from general tourism and designed as a non-consumptive, conservation-linked, and community-oriented livelihood option.<sup>22,23</sup>

Third, evidence from China shows that the Yangtze River Ten-year Fishing Ban is characterized by a comparatively robust institutional framework integrating compensation, employment support, and social security. However, livelihood transitions remain heterogeneous across regions and households. Empirical studies from Jiangsu, Ma'anshan, and Poyang Lake demonstrate that while compensation mechanisms mitigate short-term vulnerability, long-term outcomes are shaped by household capabilities, demographic structure, ecological awareness, and access to diversified livelihoods. Notably, the Poyang Lake case underscores the need to analyze ecological restoration, compensation effectiveness, and livelihood transition in an integrated manner.<sup>30</sup>

Based on these findings, a one-to-one substitution of ecotourism for fishing is neither empirically supported nor policy-relevant. A more defensible model is a sequenced and diversified transition: ecological recovery should first be secured and monitored;<sup>35</sup> former fishers' livelihoods should then be stabilized through broader transition support;<sup>73</sup> and ecotourism should be developed selectively where ecological visibility, local participation, interpretation capacity, and benefit-sharing conditions are present.<sup>90</sup> Future research should examine whether ecotourism can reduce dependence on fishing over time, how benefits are distributed among former fishing households, and whether ecotourism revenue is reinvested in conservation and community development.

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The authors declare no conflicts of interest.

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## Availability of data

Not applicable.

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