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**Australian Centre for
International Agricultural Research**

Illegal, unregulated and unreported fishing in Indonesia



7

**ACIAR OUTCOME
EVALUATION SERIES**

Illegal, unregulated and unreported fishing in Indonesia

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2024

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Foreword

The Australian Centre for International Agricultural Research (ACIAR) is mandated under the ACIAR Act (1982) to work with partners across the Indo-Pacific region to generate the knowledge and technologies that underpin improvements in agricultural productivity, sustainability and food systems resilience. We do this by funding, brokering and managing research partnerships for the benefit of partner countries and Australia.

In 2001, illegal, unregulated and unreported (IUU) fishing was identified by the Food and Agriculture Organization (FAO) as a serious fisheries issue requiring urgent action. The issue was addressed in the *International plan of action to prevent, deter and eliminate illegal, unreported and unregulated fishing*, which called for collaboration between regions and nations to address IUU fishing, as well as submission of national plans to the FAO, biannually.

Effective management of the marine fisheries catch in Indonesia was difficult due to the many national and regional government agencies associated with the industry. As a result, IUU fishing became a major issue thwarting attempts to sustainably manage fish stocks, and new stock assessment and policy frameworks were identified as key to better management of Indonesian fisheries.

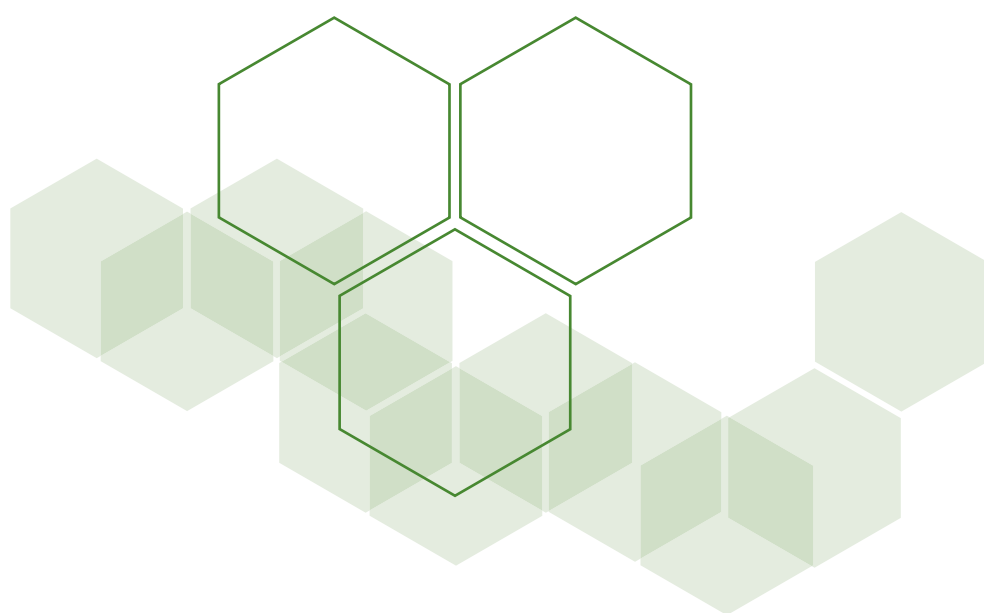
Building on established research partnerships between Indonesia and Australia, ACIAR commissioned a 4-year project in July 2008 with the goal of developing new approaches to fisheries assessment and management to improve the policy and management frameworks for dealing with the problem of IUU fishing. Ten years after completion of the project, an outcome evaluation was commissioned to understand the impact and success of the project.

This report of the outcome evaluation provides evidence that the project made a significant contribution to improvements in fisheries data, stock assessments and IUU fishing information, and developed capability among national government researchers and policymakers. The IUU fishing data generated by the project contributed to new policies and regulatory frameworks.

As a learning organisation, ACIAR is committed to understanding the factors that enable change and support the uptake of recommendations from research. This outcome evaluation is a demonstration of the ongoing commitment of ACIAR to understand and report on the value and impact of our investment of public funds, to continuously improve research design, and to maximise the opportunities to improve the livelihoods of smallholder communities in the Indo-Pacific region.



Professor Wendy Umberger
Chief Executive Officer, ACIAR



Acronyms

ACIAR	Australian Centre for International Agricultural Research
BRIN	Badan Riset dan Inovasi Nasional, the Indonesian national research and innovation agency
FAO	Food and Agriculture Organization
IUU	Illegal, unregulated and unreported
KEQ	Key evaluation question
ODI	Overseas Development Institute
RAPID	ODI Research and Policy in Development

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Summary

The Australian Centre for International Agricultural Research (ACIAR) commissioned an evaluation study of the research project 'Developing new assessment and policy frameworks for Indonesia's marine fisheries, including the control and management of illegal, unregulated and unreported (IUU) fishing' (FIS/2006/142). That evaluation was conducted as a collaboration between:

- the Indonesian Research Centre for Fisheries Conservation and Management
- the Indonesian Directorate General for Capture Fisheries
- CSIRO Marine & Atmospheric Research
- the University of Wollongong.

The research was carried out over 4 years from July 2008 until June 2012 with the stated goal of **developing new approaches to fisheries assessment and management in Indonesia to improve the policy and management frameworks for dealing with the problem of IUU fishing**. A national coordination and steering committee, made up of national and regional government officials and Indonesian fisheries experts, was established to support uptake of the research outputs and findings.

To understand the outcomes of the IUU fishing project and identify lessons learned, in May 2022 ACIAR commissioned SOLIDARITAS to conduct an ex-post evaluation of the IUU fishing project.

Evaluation approach

This study was guided by the following key evaluation questions (KEQs):

1. **To what extent does the Government of Indonesia have new fisheries policy, management frameworks and/or stock assessment processes as a result of the IUU fishing project?**

What was achieved during the lifetime of the IUU fishing project?

What intended changes have occurred since the end of the IUU fishing project?

What (if any) were the unintended changes that have occurred since the end of the IUU fishing project?

2. **What are the key pathways of change related to the intended and unintended changes that have occurred as a result of the IUU fishing project?**

How did the IUU fishing project team expect policy influence to occur at the outset of the project?

In what ways did the initial assumptions about the change process hold true in relation to the results of the IUU research?

What were the key factors that enabled or inhibited the change process in relation to the project research?

3. **How can ACIAR more effectively support policy change in Indonesia in the future?**

In order to answer these questions, the evaluation team took the following 3-stage approach:

Stage 1: Confirmation of key intended outcomes

The team confirmed the main intended outcomes of the IUU fishing project research, identified the key mechanisms through which these outcomes were supposed to be achieved, and identified initial contacts who might be willing to participate in the evaluation. This information was sourced via interviews with ACIAR staff members and a researcher from the CSIRO team, as well as written correspondence with the project lead. This information formed the basis of the working logical theory for the IUU fishing project.

Stage 2: Data collection

Data was collected to understand perceptions of the actual outcomes of the IUU fishing project and how any identified change occurred. The evaluation team conducted a citation analysis of the IUU fishing project outputs and interviews with members of the research team and the national coordination and steering committee.

Stage 3: Analysis, synthesis and presentation of key findings

After collecting the data, the evaluation team analysed and synthesised the data, then presented the findings to ACIAR, informants and other stakeholders. Inputs from the presentation were incorporated into this final report.

Findings and recommendations

1

To what extent does the Government of Indonesia have new fisheries policy, management frameworks and/or stock assessment processes as a result of the IUU fishing project?

There is evidence of significant contribution to improvements in the provision of fisheries data, stock assessments and IUU fishing information, with the data produced being used to develop regulations after the project ended, and 5 of the 6 outputs reviewed in the citation analysis receiving citations between 2020 and 2022. There is also evidence that capacity has been built among national government researchers and (to a lesser extent) policymakers, some of whom received funding for professional development and have forged careers as specialists in the fisheries they researched under the IUU fishing project. There is also evidence of contributions to new policies and regulatory frameworks, mostly via the use of IUU fishing data to determine aspects of the regulations such as catch size. There were additional unintended changes related to demonstration effects of the collaborative and consultative approach taken by the IUU fishing project research teams, the foundation for further developments in the tuna sector, as well as a journal article on South Java lobsters.

There is no evidence of broader dissemination and further refinement of resource assessment methodologies, although this could be due to the lack of regional-level informants. There were also no changes identified for the red snapper component. Initial assumptions about shared stock between Indonesia and Australia and the complexities of this fishery in Indonesia made the original plans for the red snapper component less feasible, which resulted in a refocusing on capacity-building efforts.



Findings and recommendations (cont.)

2

What are the key pathways of change related to the intended and unintended changes that have occurred as a result of the IUU fishing project?

The pathways of change related to the IUU fishing project are somewhat different to those imagined at the beginning of the project. It was hoped that involving Government of Indonesia stakeholders throughout the research process and presenting them with findings and recommendations would be sufficient to promote changes to IUU fisheries policy. However, the main pathway for change appears to have been through the Indonesian researchers, who used the data and knowledge they gained during the IUU fishing project to provide input to new fisheries policy when called upon for consultation in the years after the IUU fishing project ended. There does appear to be a demonstration effect of the approach taken by the IUU fishing project, as 2 informants noted improvements in collaboration among the departments in the Ministry and with other development actors; however, it is not clear the extent to which the IUU fishing project contributed to this change.

There is one partially achieved pathway related to uptake of IUU fishing research by third parties. Based on evidence from the citation analysis and publication of some of the lobster research in an international journal, it appears that third parties have accessed the IUU fishing project research, however it is unclear what it was then used for.

The fourth unrealised pathway related to change at the regional level. There is anecdotal evidence from national-level informants that there were improvements to data collection at the regional level; however, this and any further changes have not been possible to verify.

Based on these findings, it is possible to draw some conclusions about the situations in which policy change is likely to happen. Policy change is most likely to occur in a situation where:

1. **National research team members are retained within policymaking circles** – meaningful participation of national researchers in the project creates a sense of ownership, builds networks and develops in-depth understanding of the research. The inclusion of these researchers in future policymaking processes enables them to use this knowledge to contribute to policy.
2. **There is political will related to the research topic** – the approach and recommendations are aligned with the priorities of national and regional fisheries policymakers, plus other organisations are also contributing towards similar outcomes.
3. **The research is accessible** – enabling those not directly involved in the IUU fishing research and third parties to access the latest information.
4. **The end users (or those who will be adopting the recommendations) have the authority, ability and acceptance to enact change** – ensuring that the stakeholders involved in the project have the authority to influence policy change, accept the need for change and the type of reform suggested, as well as the time, skills and funding to implement recommendations.

3

How can ACIAR more effectively support policy change in Indonesia in the future?

The evaluation identified 7 recommendations to support fisheries policy change in the future. Due to the time elapsed since the end of the project, the recommendations are best used to aid reflection about the extent to which these suggestions have been incorporated into more recent, current or planned ACIAR research to policy projects, and why (or why not). This may support research program managers to:

- reflect on recently concluded projects
- incorporate or strengthen existing approaches in new projects.

The recommendations are grouped under 'design and preparation' and 'project implementation'.

Design and preparation

Recommendation 1: Co-create a logical model for research projects that clearly articulates how and when change is expected to occur in order to ensure buy-in and understanding of stakeholders.

Recommendation 2: Involve researchers from the level of government (national, provincial or district) that the project seeks to promote change in, and ensure these individuals are a genuine part of the team.

Recommendation 3: Conduct political economy analysis on each fishery as part of the selection process for focus areas of research, involving the ACIAR Indonesia team, as well as stakeholders where appropriate.

During and after the project

Recommendation 4: Allocate resources to directly engage regularly with decision-makers (not only their staff) at each level of government where the project expects to see change.

Recommendation 5: Consider providing a pool of advisers that can be accessed by national, provincial or district governments attempting to replicate an approach or implement recommendations to provide support or to troubleshoot issues for a limited number of days.

Recommendation 6: Continue to build relationships and provide professional development opportunities to Indonesian researchers from national and regional governments.

Recommendation 7: Upload research reports to ACIAR, the relevant Government of Indonesia and stakeholder websites, and monitor their use to gain insights into uptake by third parties, and the formats most widely accessed and by whom.





Introduction

This publication presents the results of an outcome evaluation study of the research project 'Developing new assessment and policy frameworks for Indonesia's marine fisheries, including the control and management of illegal, unregulated and unreported (IUU) fishing' (FIS/2006/142). The research project was commissioned by the Australian Centre for International Agricultural Research (ACIAR). Other ACIAR outcome evaluations are listed on page 32.

The research was carried out over 4 years from July 2008 until June 2012. The stated goal was to develop new approaches to fisheries assessment and to improve the policy and management frameworks for dealing with the problem of IUU fishing in Indonesian waters. A national coordination and steering committee, made up of national and regional government officials and Indonesian fisheries experts, was established to support uptake of the research outputs and findings. Outputs from the fishing study are listed at Appendix 1.

In May 2022, ACIAR commissioned SOLIDARITAS to conduct an **ex-post evaluation** of the IUU fishing project to understand the outcomes of the IUU fishing project and identify lessons learned. The evaluation team of Nanda Sirajulmunir (Technical Adviser) and Emma Piper (Lead Researcher) conducted the evaluation and prepared this report.

Background to IUU fishing research

ACIAR in Indonesia

ACIAR has worked in collaboration with Indonesia for 35 years. This longstanding partnership with the Government of Indonesia places ACIAR in a strategic position in relation to policy development in Indonesia. The work conducted on IUU fisheries has contributed to the ACIAR reputation with the Ministry of Fisheries. ACIAR is currently undertaking fisheries research that aims to support the Government of Indonesia to develop marine harvest strategies, primarily looking at the strategically important tuna sector.

About illegal, unregulated and unreported fishing in Indonesia

IUU fishing was identified by the Food and Agriculture Organization (FAO) in 2001 as a serious fisheries issue requiring nations to take urgent action. The issue was addressed in the *International Plan of Action to Prevent, Deter, and Eliminate Illegal, Unreported and Unregulated Fishing* released in the same year. The plan called for collaboration between countries, regions, and nations to address IUU fishing, as well as national plans to be reported to the FAO biannually (FIS/2002/019 project document).

IUU fishing is a broad term which includes:

- fishing and fishing-related activities conducted in contravention of national, regional, and international laws
- non-reporting, misreporting, or under-reporting of information on fishing operations and their catches
- fishing by 'stateless' vessels
- fishing in convention areas of Regional Fisheries Management Organizations by non-party vessels
- fishing activities which are not regulated by states and cannot be easily monitored and accounted for (FAO 2016).

At the time the research project was underway, Indonesia was **harvesting about 4.5 million t of marine fish** with a value of approximately USD3.2 billion. Effective management of this catch was difficult due to the many national and regional government agencies involved. As a result, IUU fishing throughout Indonesian waters had become a major issue that confounded attempts to manage fish stocks. To address these issues, effective **stock assessment** and **policy frameworks** were identified as key to better manage Indonesian fisheries (FIS/2006/142 project document). A stock assessment is a scientific process of collecting, analysing and reporting on the condition of a fish stock and estimating its sustainable yield. Stock assessments help to inform policy by modelling various harvest strategies and protection measures. The fisheries management frameworks are the formal, selected strategies that are used to manage fish stocks, and are ideally based on these stock assessments.

Background and management of the IUU fisheries research

The IUU fishing research was conducted as a collaboration between:

- Indonesian Research Centre for Fisheries Conservation and Management
- Indonesian Directorate General for Capture Fisheries
- CSIRO Marine & Atmospheric Research
- University of Wollongong.

Dr Ron West from the University of Wollongong led the project, alongside Dr Martin Tsamenyi, a specialist on the legal and policy aspect of fisheries from the University of Wollongong.

Prior to the IUU fishing project, Dr West and Dr Tsamenyi led a small and then medium-sized project (FIS/2000/163 and FIS/2002/019, respectively) on IUU fisheries. Both projects were focused on IUU fisheries and the development of regulatory frameworks in collaboration with the governments of Indonesia and the Philippines for the sustainable management of fish stocks in the South Sulawesi Sea. This involved researching the potential for such a project (FIS/2000/163) and the regulatory and management gaps and implications of tackling IUU fishing (FIS/2002/019). These projects resulted in both countries developing national plans and committees to address IUU fishing; however, there was no direct follow up to this project by ACIAR. Instead, the next IUU fishing project (FIS/2006/142, the subject of this evaluation) combined IUU elements with specific fisheries research.

Aside from the 2 academics from the University of Wollongong, other scientists and researchers on the Australian side were from CSIRO and included experts on sardines, lobster and sharks. On the Indonesian side, researchers and fisheries experts from the Ministry were actively involved as members of the research team.

Previous ACIAR research had identified key issues that the IUU fisheries project aimed to address, including **lack of resource data** and **poor management** of fisheries. These impacted Indonesia's ability to manage its fisheries resources, as well as the ability to export fish catch to countries or regions that required a fisheries management plan to be in place, such the European Union. The first stage of the research used existing fisheries statistics plus new data collected by the IUU fishing research team through rapid market sampling at 7 selected ports, complemented by interviews with stakeholders. Based on this data, the research team and Indonesian fisheries stakeholders (including government) held a series of workshops to select 3 fisheries to research in depth. The selected fisheries were the South Java lobster fishery, the Lombok shark fishery and the Bali Strait lemuru (sardine) fishery, plus an additional focus on red snapper fishery. These fisheries were selected because they were economically strategic and had high levels of IUU fishing. They were also suitable because the fisheries were in a specific geographic area, which allowed the project to pilot assessment methods and test the approach of breaking down large marine zones into smaller, more manageable units for assessment and management. The new data collected by the research teams on the selected fisheries was then developed into research outputs and the findings and recommendations were discussed and further refined in stakeholder workshops.



Purpose and approach

ACIAR has an interest in understanding the longer-term outcomes of the IUU fishing project and identifying the learnings related to research that aims to influence policy. As a result, ACIAR commissioned an evaluation of the IUU fishing research project, with 2 primary **purposes**:

1. To identify, document and understand the intended and unintended outcomes of the project.
2. To identify and understand the key factors that influenced these outcomes.

These 2 purposes are expected to provide input to ACIAR on ways in which to increase research uptake in the future and influence research and policy.

Objectives and approach

The **objectives** of the project were to:

- develop new, innovative fisheries policy and management frameworks
- develop new, fishery-specific stock assessment processes
- develop improved scientific and policy frameworks for sustainable management of red snapper stocks within Indonesia waters.

As such, theories about the ways in which research contributes to policy were a useful starting point to set the approach for this evaluation. The Overseas Development Institute (ODI) has worked extensively on understanding the research to policy change process and defines 'research uptake' as, 'What happens after delivering outputs or making them available. How are outputs picked up and used? How do target groups respond?' (ODI 2014).

In addition to this definition, the evaluation team borrowed several concepts developed by the ODI Research and Policy in Development (RAPID) program, including:

- focusing evaluation efforts on 4 of the 6 levels suggested for monitoring and evaluation of research: outputs, uptake, outcomes and context¹
- developing a theory of how activities lead to outcomes by focusing on the 4 different sectors to understand the causal process
- understanding the importance of relationships and the dynamics that may have contributed to particular outcomes
- emphasising learning, by understanding not just if research is used, but how, by whom, under what circumstances and why.²

This evaluation takes a theory-based approach, which involves using existing information about the project to construct a **retrospective causal theory** (sometimes also called a project/program logic, or theory of change) that explains how the project designers expected change to happen, and then testing this theory in the evaluation to examine to what extent change occurred as expected and if not, why not.³

The project documentation contains various terminology to explain what the IUU fishing project was intended to produce, including objectives, outputs, outcomes, short-, medium- and long-term impacts and goals. However, the documentation does not state how this terminology is used within ACIAR, what the differences are between the different terms, or when the various results were expected to be achieved. As such, it was difficult to identify which results were expected by the end of the IUU fishing project and which results were expected to be achieved after the project was completed. Therefore, the initial **project theory** (Figure 1) focuses on:

- what we know the team did (activities in orange boxes)
- the clear results of the project that were feasible to achieve within the timeframe (red boxes)
- the overall objectives and broader goals (blue and green boxes).

1 The other 2 levels are strategy and direction of the project, and management and governance of the project. As this is an ex-post evaluation these 2 levels are less relevant for this evaluation.

2 These concepts are taken from the ODI 2014 guidance document, *ROMA: A Guide To Policy Engagement And Policy Influence* and also have similarities with other theory-based evaluation approaches, such as Realist Evaluation.

3 The IUU fishing project did not have an existing theory of change. In cases where there is an existing theory, this would be tested in the evaluation and there would be no need to develop a retrospective logic model.

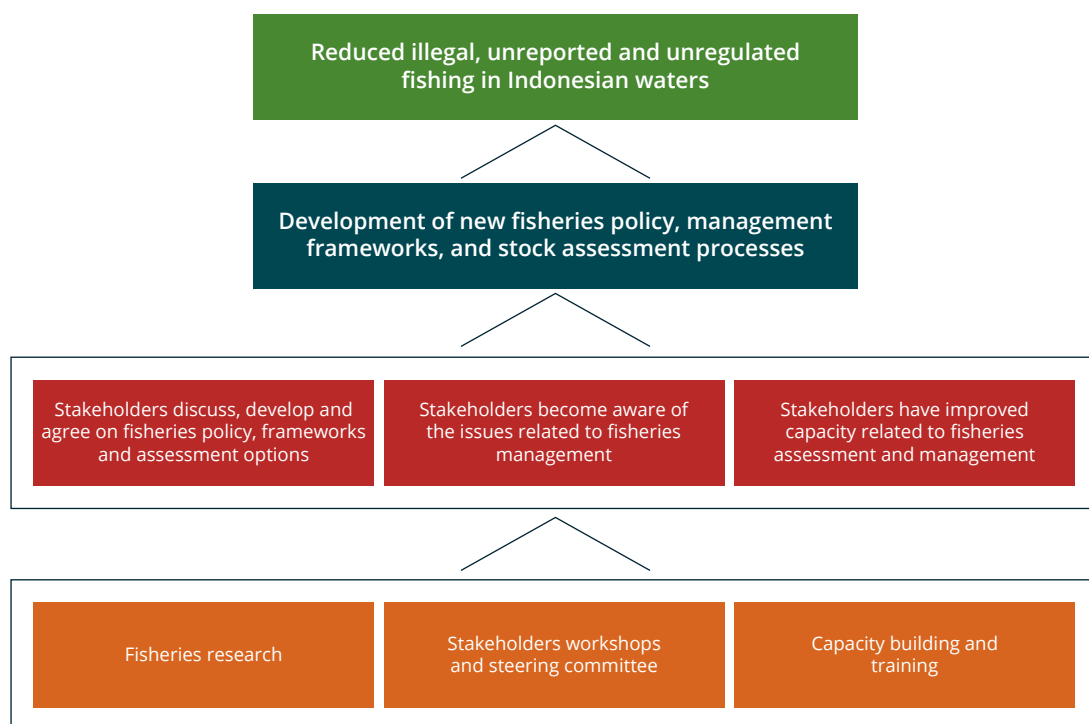


Figure 1 IUU fishing project program logic

From the project documentation it was clear that the broader goal of the IUU fishing project was to reduce illegal, unreported and unregulated fishing in Indonesia (green box in Figure 1). The way the project would contribute to this goal was to inform new Government of Indonesia policy, management frameworks and stock assessment processes (blue box in Figure 1). This would be achieved by conducting 3 main activities (orange boxes in Figure 1). The first was to conduct fisheries research to understand existing fisheries stock. The results of this research would then be discussed with national and regional government stakeholders and industry representatives in a series of workshops and project steering committee meetings, to build understanding of the research among these stakeholders and to discuss options for management of the fisheries going forward. In addition, there would be a capacity-building component, both through formal training (for example, to enumerators at the regional level) and on-the-job experience and support (particularly for the national Indonesian fisheries researchers from the Ministry who were part of the core IUU fishing research team).

By the end of the project, and as a result of these activities, it was expected that stakeholders would have:

- improved awareness of issues related to fisheries management
- improved capacity related to fisheries assessment and management
- discussed, developed and agreed on policy, frameworks and assessment options (red boxes in Figure 1).

The IUU fishing project documentation also identified 4 **short-term impacts**, which clearly identify changes that were intended to result from the IUU fishing project (see Figure 2). The wording, short-term impacts, suggests that these are results the project team expected to occur after the project ended. These short-term impacts were difficult to incorporate into the initial theory (Figure 1) as some are outputs or immediate outcomes that could be feasibly achieved in the lifetime of the project (the first and second boxes) while the second 2 boxes would likely require more time.



Figure 2 Short-term impacts

To understand what outcomes were achieved and when, this evaluation used the initial theory in Figure 1 to test whether the expected changes happened or not, whether any other unexpected changes have occurred, as well as how and why these changes did or did not happen. The evaluation also examined whether and to what extent each of the 4 short-term impacts were achieved. In the Findings section, an updated and expanded project theory shows what changes occurred and how, including to what extent the short-term impacts fit into the project theory, followed by an exploration of the contextual factors that influenced research uptake and a set of implications for future research projects.

To understand the higher-level change related to IUU fishing in the 4 target sectors that have occurred since the end of the IUU fishing project (including the 4 short-term impacts), this evaluation has taken inspiration from the Most Significant Change approach (Davies and Dart 2005), by asking key stakeholders (those people who were involved in or have an understanding of the IUU fishing project and the current status of the 4 fisheries sectors) what they believed to be the most significant change that has occurred in the 4 sectors since the end of the IUU fishing project. This helped to identify what the changes were and what contributions (if any) the IUU fishing project made to those changes, plus the factors that enabled or impeded change.

Key evaluation questions

This evaluation was carried out 10 years after the end of the IUU fisheries project. In line with the purposes, it focused on identifying outcomes that may have occurred in the intervening years, as well as understanding how these change processes happened. The nature of this study is therefore exploratory, rather than judgement driven as is usually the case with traditional evaluations. To align with these characteristics, this study prioritised **understanding** change over evaluating the quality or value of that change.

Several questions guided the collection, analysis and synthesis of data.

- 1. To what extent does the Government of Indonesia have new fisheries policy, management frameworks and/or stock assessment processes as a result of the IUU fishing project?**
 - What was achieved during the lifetime of the IUU fishing project?
 - What intended changes have occurred since the end of the IUU fishing project?
 - What (if any) were the unintended changes that have occurred since the end of the IUU fishing project?
- 2. What are the key pathways of change related to the intended and unintended changes that have occurred as a result of the IUU fishing project?**
 - How did the IUU fishing project team expect policy influence to occur at the outset of the project?
 - In what ways did the initial assumptions about the change process hold true in relation to the results of the IUU research?
 - What were the key factors that enabled or inhibited the change process in relation to the IUU research?

This question seeks to understand the changes that have happened in the 4 fisheries (red snapper, shark, sardines and lobster) as a result of the IUU fishing project.

This question focuses on the ways in which key actors within the program expected changes to policies and processes to occur and what strategies for influencing policy were implemented.

- 3. How can ACIAR more effectively support policy change in Indonesia in the future?**

This question identifies the learnings from the IUU fishing research experience and the ways in which they can be applied more generally across future ACIAR projects to increase policy influence and uptake of research.

Methodology

Data collection

After reviewing the project documentation, the evaluation team conducted semi-structured and small-group interviews with members of the IUU fishing project steering committee, researchers from the Research Centre for Fisheries Conservation and Management and an official from the Directorate General of Capture Fisheries from the Ministry of Marine Affairs and Fisheries. The interviews were designed to identify:

- the most significant change that has resulted from the IUU fishing project
- any new Government of Indonesia fisheries policy, management frameworks and stock assessment processes related to the 4 fisheries
- the relationship (if any) between these changes and the IUU fishing project
- the broader use of the outputs of the IUU fishing project, who these users were, and for what purposes the IUU fishing outputs were used.

In addition, the evaluation team conducted interviews with the project leads from CSIRO and ACIAR to understand how the policy change process was conceptualised by the IUU fisheries team at the time.

A citation analysis was also conducted as a way of identifying other users and uses of the IUU fishing research outputs.

Analysis, synthesis and verification of the data

The evaluation team analysed the findings to identify patterns or themes in relation to the type of change, the key pathways, or mechanisms and/or hindering and supporting factors. This was developed into the updated program theory and key findings. The findings were presented to ACIAR and other key stakeholders to verify and sense check them.

Reporting

The data analysis, results and final inputs from the presentation were then compiled into this report.





Limitations

The evaluation had some key limitations.

Amount of time elapsed since project end: The IUU fishing project ended over 10 years ago and as such, the evaluation team depended heavily on the recollections of informants, which were understandably vague due to the amount of time that had passed. Many people involved in the project had since changed jobs or retired, making it challenging to identify and contact potential informants.

ACIAR policy on record keeping: ACIAR projects in Indonesia follow the Australian Embassy record keeping protocol, which is to retain records for only 7 years, so there were no records of stakeholders or participants who took part in the trainings or workshops that were conducted. ACIAR itself does not have any kind of data retention policy, so the evaluation team was reliant on the 'snowball' technique to identify and contact informants, relying on informants not only remembering the names of potential useful individuals, but also having up-to-date contact details. As a result, the evaluation team was unable to contact all relevant stakeholders. There was at least one informant from 3 of the 4 key groups (Directorate General of Fisheries, the Research Centre and the steering committee), but the evaluation team was unable to identify or contact anyone from the provincial government who had a connection to the project.

Lack of information from the provincial level: It has not been possible to verify uptake of recommendations with provincial-level informants. This is a significant limitation of this evaluation. Where possible, the evaluation team attempted to verify any results identified by national-level informants with publicly available documentation (such as regulations) and noted where this was not possible.

Lack of data: It was only possible to collect a limited amount of data from which to identify findings and draw conclusions. The IUU fishing project covered 4 different fisheries and many of the researchers focused only on one or 2, plus several of the informants changed jobs or stopped working on Indonesian fisheries after the IUU fishing program and therefore had limited information on the changes that have occurred since. This means that some of the information in this evaluation has come from a single source and has not been verified by other informants or triangulated using other sources of data (such as written regulations).

Due to this limitation, the evaluation team has provided a confidence rating of LOW, MEDIUM or HIGH for each of the key evaluation questions to provide the context from which these findings were drawn. The confidence rating uses the dimensions from the GRADE CERQual method of assessing the confidence of evidence from reviews of qualitative research: methodological limitations, coherence, adequacy, relevance. The confidence rating rubric can be found in Appendix 2, along with detailed explanations of the ratings of the first 2 key evaluation questions.

Interpretation: During interviews, the evaluation team employed rapid qualitative methods of inquiry to identify key issues. Such evaluation methods are known to significantly rely on professional judgement, whereby members of the evaluation team have drawn upon their individual knowledge, experiences and assumptions.

To mitigate potential biases in interpretation, the evaluation team attempted to:

- adopt a consensus approach within the evaluation team to key findings and conclusions
- confirm key findings or interpretations with informants or ACIAR as relevant.





Findings

1. To what extent does the Government of Indonesia have new fisheries policy, management frameworks and/or stock assessment processes as a result of the IUU fishing project?

The data used to answer this question is based on:

- interviews with informants involved in the IUU fishing project, including researchers from the Research Centre for Marine Affairs and Conservation, an official from the Directorate General of Capture Fisheries, a researcher from CSIRO and the project lead from the University of Wollongong
- a review of project documents and relevant Indonesian regulations
- a basic citation analysis of the outputs of the IUU fishing project.

The answer to this key evaluation question has a **MEDIUM** confidence rating.

What was achieved during the lifetime of the IUU fishing project?

The documentation produced by the IUU fishing project at the time of project completion included over 40 written reports, at least 13 presentations from various workshops and capacity building sessions, a book on economically important teleost fish and a set of shark species identification posters and brochures (see Appendix 1). According to the project documents these outputs led to the following direct results:

- **New data** on catch composition at the 7 ports; 6 new species; IUU fishing across the 7 ports and in relation the specific shark, lobster and lemuru fisheries. New market landing data for Lombok sharks and Bali Strait lemuru. First data ever for South Java lobster.
- **Review of management strategies** for Bali Strait lemuru, Tanjung Luar (Lombok) sharks and South Java lobster.
- **Revision of stock assessment** for Bali Strait lemuru and Tanjung Luar sharks, and the first stock assessment for South Java lobster.
- **New assessment methodology** (Rapid Assessment Protocol) suitable for use across a range of markets and landing sites.

- **Training** of (an unspecified number) of Research Centre for Fisheries Conservation and Management staff and on-the-job training for junior researchers; in bio-economic and risk assessment in fisheries for 50 fisheries managers and scientists.

Many of the informants found it understandably difficult to recall the outputs or direct results of the IUU fishing research. However, of those who could recall, the majority mentioned improved data and 2 mentioned capacity building for researchers at the national level (including one Indonesian researcher obtaining the John Dillon Fellowship and another receiving support to finalise his master degree) as key results. In addition, according to several informants, many of the researchers involved in the IUU fishing project have since become specialists in the fisheries they researched during the IUU fishing project. Additional outputs or direct results mentioned by individual informants were:

- rapid survey on economic species in South Java
- documentation for input to the National Plan of Action for sharks
- posters for shark identification
- on-the-job training for enumerators (mentioned specifically in relation to sardines).

Two informants also mentioned a book on shark species (White et al. 2006). This appears to refer to a book produced before the IUU fishing project, but that was also published by ACIAR and written by CSIRO, including one of the researchers on the Australia team for the IUU fishing project.⁴

4 Published as part of the INDO-OZ Elasmobranch project, carried out between 2001 and 2006.

The above findings suggest that the first 2 short-term impacts intended at the beginning of the IUU fishing project were at least partially achieved, for instance, improvements in data, stock assessments and IUU fishing information, plus increased capacity in terms of fisheries management. In relation to capacity building, there was a particular hope that this would occur in the provincial government. While one informant highlighted capacity building for provincial enumerators in East Java in relation to the Bali Strait lemuru component, it has not been possible to verify changes at the provincial level, due to lack of provincial-level informants.

What intended changes have occurred since the end of the IUU fishing project?

Having understood the intentions of the IUU fishing project and the initial outputs and direct results, this section will examine the changes that occurred after the end of the IUU fishing project in relation to the second 2 short-term impacts:

- adoption of assessment methodologies
- new policy and regulatory frameworks implemented by the national and regional government.

Based on interviews with informants in the Government of Indonesia, there have been several changes related to the short-term impacts in subsequent years:

1. **Bali Strait Sardine Fisheries Management Plan.**⁵ According to one informant from the Government of Indonesia, the main result related to Bali Strait sardines was the development of a new Bali Strait Sardine Fisheries Management Plan⁶ that was passed as a Ministerial Decree in 2016. The decree provides limits to the size of fish, the number of vessels allowed and outlines marine closures, all of which help to reduce overfishing in the strait. Although the Fisheries Management Plan was not a direct outcome of the IUU fishing project, according to informants, the research contributed to the development of the plan as the Government of Indonesia researchers involved in the IUU fishing project were also involved in the process of developing the Fisheries Management Plan to provide scientific input and 'some of the data used in the process was from the IUU research', which was confirmed by a review of the decree.

2. **First National Plan of Action for Sharks.**⁷ In the shark sector 2 informants from the Government of Indonesia stated that a key result from the IUU fishing project was the development of the first national action plan for shark fisheries. The need for this kind of plan was already recognised by the Directorate General of Capture Fisheries, but a workshop in Lombok funded by ACIAR contributed to the development of the plan. There was a draft action plan for sharks developed for 2010, however it appears that the 2016 National Plan of Action for sharks was the first official management plan.
3. **Regulation on fishing of crustaceans.**⁸ Two informants from the Government of Indonesia shared that the lobster sector was unregulated prior to and during the IUU fishing project. However, after the project, in 2016, there was a regulation created that determined the legal catch size, among others. The IUU fishing project contributed to the development of this regulation because the Government of Indonesia IUU fishing researchers were consulted and they used data from the IUU fishing project about the length of maturity to determine the legal size. There is no reference to the IUU fishing data directly in the regulation.
4. **Improved data collection.** According to 2 Government of Indonesia informants, the IUU fishing project contributed to improvements in the quality of data collection at the regional level, including recording by species (specifically for lobster and sharks).

There was no mention of policy changes in relation to red snapper; however, informants noted that during the project the focus on red snapper was deprioritised once it became clear that there were few shared fishing grounds between Australia and Indonesia and that the red snapper sector in Indonesia was significantly more complex than in Australia. As such, the focus of this component shifted more to capacity building.

None of the interviewees stated that the assessment methods produced by the IUU fishing project had been adopted. It should also be highlighted that no provincial-level informants could be identified, who may have added information on any uptake of assessment methods at the regional level.

5 Keputusan Menteri Kelautan dan Perikanan Republik Indonesia Nomor 68/kepmen-kp/2016 tentang Rencana Pengelolaan Perikanan Ikan Lemuru di wilayah pengelolaan perikanan negara Republik Indonesia.

6 There was a previous plan developed with the FAO in the 1980s, but it was not well implemented.

7 Rencana Aksi Nasional (RAN) Konservasi dan Pengelolaan Hiu dan Pari 2016 – 2020.

8 Peraturan Menteri Kelautan dan Perikanan Republik Indonesia Nomor 12/permen-kp/2020 tentang Pengelolaan Lobster (panulirus spp.), Kepiting (scylla spp.), dan Rajungan (portunus spp.) Di wilayah negara Republik Indonesia.



What (if any) were the unintended changes that have occurred since the end of the IUU fishing project?

In addition to the intended changes, this evaluation also seeks to understand if any unintended changes have occurred, or whether IUU research has been used by other actors beyond the Ministry of Fisheries.

According to informants there were 3 unexpected changes related to the IUU fishing project:

1. **Influence on developments in the tuna sector.** One informant from the Australia team stated they believed that the IUU fishing project laid the foundations for the Marine Harvest Strategy in the tuna sector and marine closures to support tuna stocks. This is because the individuals involved in the tuna activities (on the Indonesian and Australian sides) were the same as those involved in the IUU fishing project.
2. **Improved collaboration and stakeholder involvement.** According to one informant from the Australian team, prior to the IUU fishing project, there was a lack of collaboration between the Research Centre for Fisheries Conservation and Management and the technical departments of the Ministry. The IUU fishing project brought government stakeholders together and this model has been continued in other ACIAR and Government of Indonesia projects. This was corroborated by an interviewee from the Research Centre for Fisheries Conservation and Management, who said that the project contributed to an increased awareness of IUU fishing, and the approach taken by the IUU fishing project regarding development of management strategies has led to more thorough data collection and more meaningful consultation and involvement of stakeholders in similar activities.

3. **Journal article on lobsters.** One informant mentioned a journal article on lobsters (Milton et al. 2014) that was produced in 2014 by some of the IUU fishing researchers. The article was developed after the end of the project; however, it was written by the IUU researchers using data from the IUU fishing project and, according to Google Scholar, has been cited in 14 other articles, in both English and Indonesian, with the latest citation in 2020.

None of the informants were able to identify the research being used by anyone outside of the Ministry of Fisheries. However, a citation analysis of the 6 publications provided in the appendix of the IUU fishing project Final Report shows that the research outputs have been cited numerous times over the years. A breakdown of the citations is in Table 1 (full information, including full references, can be found in Appendix 3).

Of the above publications, only the report on Market Fishes of Indonesia (White et al. 2013b) was available on the ACIAR website, which may be a factor as to why it has been cited so many times in comparison to others.

Table 1 Citations of IUU fishing research

Research output	Number of times cited	Language of citation	Year last cited
Milton et al. (2012) South coast Java lobster fishery	7	English and Indonesian	2020
West et al. (2012) The Control and Management of Illegal, Unreported and Unregulated (IUU) Fishing	4	English	2021
White et al. (2012) Tanjung Luar (East Lombok) Longline Shark Fishery	16	English and Indonesian	2021
White et al. (2013a) Rapid Assessment Protocol for Market Surveys	no citations found	n/a	n/a
White et al. (2013b) Market fishes of Indonesia	115	English and Indonesian	2022
Wudianto et al. (2012) Bali Strait lemuru fishery – final report	1	English	2022

Overall conclusions

There is evidence of at least partial achievement of 3 out of the 4 short-term impacts identified in the original project document (see Figure 3). There is evidence of significant contribution to improvements in the provision of fisheries data, stock assessments and IUU fishing information. This helped to address one of the key issues within Indonesian fisheries at the time, which was lack of resource data. As a result of the IUU fishing project there were up-to-date and more accurate stock assessments of the 3 fisheries (sharks, lemuru and lobster). There is also evidence from the citation analysis that the IUU fishing research continues to be relevant, with fisheries academics and researchers continuing to refer to the research up until 2022.

There is also evidence that capacity has been built among national government researchers and (to a lesser extent) policymakers, some of whom received funding for professional development and have forged careers as specialists in the fisheries they researched under the IUU fishing project.

There is also evidence of contributions to new policies and regulatory frameworks, mostly via the use of IUU fishing data to determine aspects of the regulations (for example, catch size). There are additional unintended changes related to:

- demonstration effects of the collaborative and consultative approach taken by the IUU fishing research teams
- providing the foundation for further developments in the tuna sector
- a journal article on South Java lobsters.

There is no evidence of broader dissemination and further refinement of resource assessment methodologies, although this could be due to the lack of regional-level informants. There were no changes identified for the red snapper component, as initial assumptions about shared stock between Indonesia and Australia and the complexities of this fishery in Indonesia made the original plans for this component less feasible. This resulted in a refocusing of work on to capacity-building efforts.

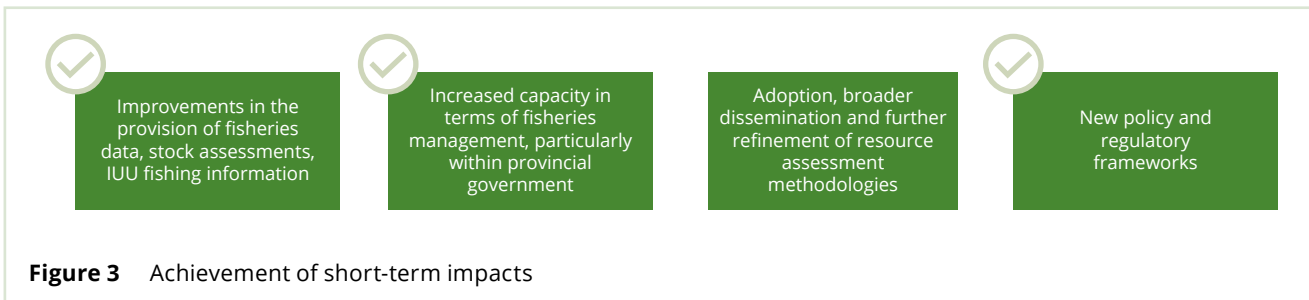


Figure 3 Achievement of short-term impacts



2. What are the key pathways of change related to the intended and unintended changes that have occurred as a result of the IUU fishing project?

Having understood the degree of change in fisheries policy, management frameworks and stock assessment processes in relation to the IUU fishing project, the following section attempts to understand **how** these changes happened and **what factors** enabled or inhibited the change process.

The data used to answer this question comes from:

- interviews with key informants
- project documentation.

The answer to this key evaluation question has a **MEDIUM** confidence rating.

How did the IUU fishing project team expect policy influence to occur at the outset of the project?

According to informants, the original plan had been to develop an understanding on the ground and communicate these findings to stakeholders from the provincial and national governments. The hope was the Directorate General of Capture Fisheries would then use the research as the basis for follow up. Two other informants added that demonstrating the approach (to data collection and collaboration and consultation with stakeholders) and ways of working (such as by focusing on specific fisheries or fishing methods) were also ways of promoting change. The idea was that demonstrating how things could be done and involving government officials and researchers in the process (as researchers on the IUU fishing project, in the stakeholder consultations and steering committee) would provide experiential learning and enable the Government of Indonesia to replicate the approach in the future.

The above is in accordance with the IUU fishing project document (developed at the outset of the project), which states:

A primary strategy to ensure the adoption of project results will be to engage the stakeholders and create an ownership over both the project and its policy and management implications ... The Project Steering and Co-ordination Committee has been designed to ensure direct communication with those responsible for implementation of revised assessment, policy and management procedures and to provide clear adoption pathways for the project outputs.

In what ways did the initial assumptions about the change process hold true in relation to the results of the IUU research?

This section provides insight into *how* uptake happened. To achieve this, the evidence above and the findings from interviews have been used to develop an expanded version of the IUU fishing logic model (original model at Figure 1, expanded version at Figure 4).

Pathways of change within the timeframe of the IUU fishing project

Based on the findings in this study, the **outcomes** achieved at the end of the project (light blue boxes in Figure 4) are:

1. Improved and updated IUU data.
2. Improved capacity of Indonesian fisheries researchers.
3. Updated fisheries knowledge available.
4. Stakeholders discussed IUU recommendations and input to fisheries policy, frameworks and assessments.

The activities of the IUU fishing project (orange boxes) remain the same as the original diagram, but with an added activity of formulating recommendations, writing reports and developing information products.

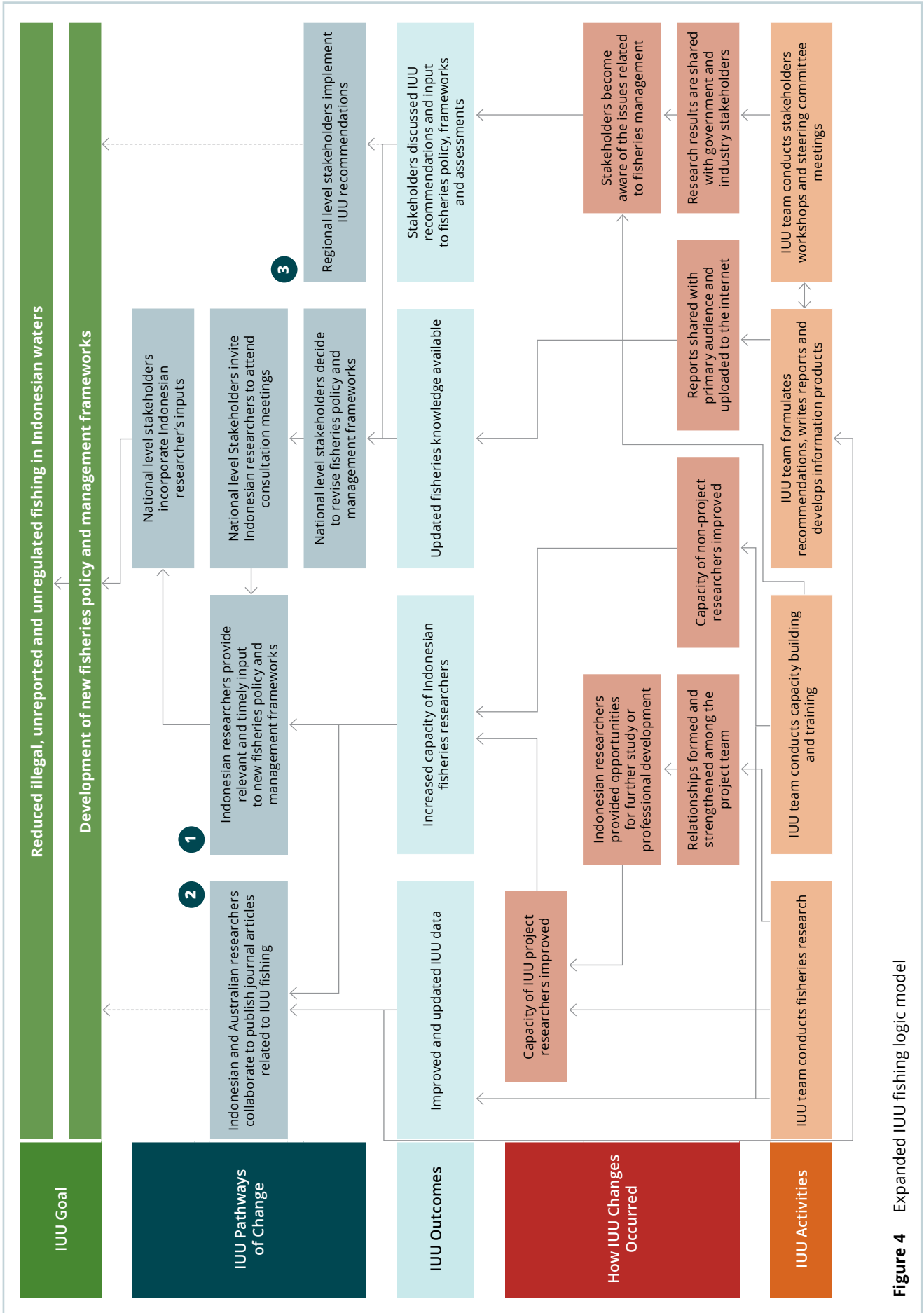


Figure 4 Expanded IUU fishing logic model

The pathways between the activities and the outcomes achieved at the end of the project have been further developed to show how these changes occurred (pink boxes). The **first outcome** (improved and updated IUU data) was achieved as a direct result of the IUU fisheries research. The **second outcome** of improved capacity of Indonesian fisheries researchers was achieved via several means:

1. As a result of being involved in the IUU fishing research team, Indonesian researchers gained skills and experience.
2. Being involved in the IUU research team built relationships with ACIAR and with the other researchers on the team. This led to some researchers accessing opportunities for further study and professional development (both as part of the training received through the IUU fishing project and external opportunities like the John Dillon Fellowship).
3. The capacity building and training conducted as part of the IUU fishing project was also made available to non-IUU researchers, which increased awareness of IUU fishing issues and the capacity of other fisheries researchers.

The **third outcome** (updated fisheries knowledge available) occurred due to the development of the research into reports and other knowledge products, which were then shared with the primary audience and uploaded to the internet so they could be accessed by third parties.

The **final outcome** (stakeholders discussed IUU recommendations and input to fisheries policy, frameworks and assessment) was achieved as a result of sharing the results of the IUU fishing research with government and industry stakeholders and through capacity-building activities, which also involved government officials. This resulted in greater awareness of issues related to fisheries management and discussions of how to address these issues through new policy, management frameworks and assessment processes.

Pathways of change beyond the end of the IUU fishing project

The above pathways help us to understand how change occurred within the timeframe of the project and how the first 2 short-term impacts (improvements to the provision of data and increased capacity) of the IUU fishing project occurred. In addition, the logic model examines how change did or did not occur in relation to the final 2 short-term impacts and some of the other unintended changes. This evaluation has identified 3 pathways for change: one main pathway and 2 alternative pathways. The **main pathway** means the change process for which there is clear evidence. The **alternative pathways** mean the change processes where uptake may have happened, but there is insufficient evidence to determine the extent of that uptake. The pathways correspond to the numbers 1–3 in Figure 4 and are explained below.

Pathway 1: National researchers

The first pathway is the **main pathway** of change related to the changes identified in KEQ1. The updated IUU fishing data, improved capacity of Indonesian fisheries researchers, available fisheries knowledge in the form of reports, and discussions of the results of the IUU fishing research by fisheries stakeholders contributed to stakeholders subsequently deciding to revise fisheries policy and management frameworks, including those for Bali Strait lemuru, sharks and lobster. Government officials conducted a collaborative process to develop the new policies and invited fisheries researchers to provide input. Based on interviews with informants, Indonesian researchers who were part of the IUU fishing research team were able to provide relevant data from the IUU fishing project as input to the policy and management frameworks, which were incorporated by stakeholders into the final versions of the regulations, contributing to the overall goal of developing new fisheries policy and management frameworks.



Pathway 2: Uptake by wider audience

The second pathway supports the first pathway by making updated and improved IUU fisheries information available for future reference. However, this information also contributes to the body of knowledge on Indonesian fisheries and has potential to be accessed by a wider audience to contribute to the development of new fisheries policy, management frameworks and assessments, or indeed for purposes beyond the scope imagined by the IUU fishing project. Based on the results of the citation analysis, it is clear that the majority of IUU fishing project reports have indeed been accessed by a wider audience, but there is no evidence of what contribution these reports may have had on further results. Similarly, the journal article on lobsters has been accessed and read by readers of the journal, but it is not clear whether this contributed to changes in policy, or other outcomes beyond the scope of the IUU fishing project, hence the dotted line between the outcome and the goal.

Pathway 3: Uptake at the regional level

The third pathway highlights an alternative pathway of change at the regional level. Evidence from informants shows that the IUU fishing project contributed to changes in fisheries policy and management frameworks at the national level. However, it is not clear if the IUU fishing project contributed to changes at the regional level (which was an intended outcome of the project). Several informants were of the opinion that data collection at the regional level had improved, particularly in the locations of the 3 selected fisheries; however, this has not been possible to verify with regional-level informants. This change is also likely to have been affected by implementation of the One Data policy (since 2019), which altered what and how data is collected. We know that IUU fishing project findings and recommendations were discussed with regional government officials and stakeholders, but it is not clear whether there was further uptake, which has been noted by the dotted line between the outcome and the goal.



What were the key factors that enabled or inhibited the change process in relation to the IUU research?

Having understood the extent of uptake of recommendations, as well as how this uptake occurred, this section attempts to understand why uptake did or did not occur as expected.

Factors that enabled change

These factors are the things that enabled the processes described in the Figure 4 logic model to happen. Each factor had a positive influence on the change process, making it more likely that the next step in the pathway would occur. Combined, these factors are key to understanding *how* and *why* change happened in the context of the IUU fishing project.

Involvement of national researchers. This factor is related to the composition of the research teams, with the intention to involve Indonesian researchers from the Research Centre for Fisheries Conservation and Management as key research team members from the beginning of the project. As a result, the informants from the research centre all had a comprehensive knowledge of the research, its findings and the theoretical approaches conducted under the IUU fishing project. This ensured that when the researchers were asked to provide input to fisheries regulations after the IUU fishing project had ended, they were able to draw on this knowledge to provide relevant and useful input.

In addition, the IUU fishing project strengthened the networks of the Indonesian researchers, several of whom received fellowships for further study during the IUU fishing project and continue to receive training opportunities. The support of Indonesian researchers by ACIAR over time has built strong relationships, which has created a mutually supportive partnership. While the aim of this support is to build the capacity of Indonesian researchers, an additional beneficial result is the creation of a strong network of Indonesian researchers, enabling sharing of ideas and information that can help to support the work of ACIAR.

Continuity of Indonesian researchers. This factor was also key in enabling Indonesian researchers involved in the IUU fishing project to be a conduit for contributing to policy change. The investment ACIAR has made in supporting the professional development of these researchers has continued to benefit ACIAR because these researchers have continued their careers in the Ministry of Fisheries. This may be unique to research, as a common inhibiting factor for many other development actors is the turnover and regular reshuffling of officials in the government departments they work with. The opposite has happened in the IUU fishing project and, with the exception of those who have passed away or retired, many of the researchers involved in the IUU fishing project continue to work on fisheries research for the government. This factor may be compromised by the advent of BRIN (Badan Riset dan Inovasi Nasional, the Indonesian national research and innovation agency), which has brought all the ministerial research functions out of the ministries and into one central agency and has potentially disrupted the relationships and influence of research on the technical ministries. The longer-term impact of BRIN remains to be seen.

Commitment of government to data-based approach and consulting researchers. A factor that enabled the IUU fishing project to contribute to policy change is the Government of Indonesia practice of consulting with researchers in the development of regulations and the requirement to have academic input to the process. This provided the space for the researchers to share their knowledge and the IUU fishing data, some of which was then incorporated into policy.

Continuation of previous projects. This factor enabled change because the IUU fishing project benefited from the work of other projects with similar goals (conducted by both ACIAR and other organisations). ACIAR has a longstanding relationship with the Government of Indonesia. The IUU fishing project itself came after a Norwegian funded project to estimate lemuru stock. Subsequent projects have continued to make similar recommendations to the IUU fishing project. This has added to the credibility of recommendations and contributed to a critical mass of support that is oriented towards the same ends, all of which contributed to policy change.

Factors that inhibited uptake

In contrast, some factors inhibited the change processes. Each of these factors had a negative influence, making it less likely that the next step in the pathway would occur. The first 2 factors are within the sphere of control of ACIAR, while the remaining 4 factors were outside the control of ACIAR but were influential in the change process and therefore may be useful for future consideration.



Lack of accessibility of IUU fishing research outputs.

Only one of the IUU fishing research outputs (the book on teleost fish) is available on the ACIAR website and none of the outputs are available via Government of Indonesia websites or platforms. This factor had a potentially negative effect on the uptake of the IUU fishing research, by making the research more difficult to access. While many researchers or stakeholders could still discover the reports via a keyword Google search, the availability of the reports on ACIAR and Government of Indonesia websites provides credibility and may have resulted in greater uptake, particularly by third parties.

Lack of involvement of regional researchers.

Researchers from the national research centre were involved as integral members of the research team from the outset of the IUU fishing project. This became a key pathway for achieving change related to policy at the national level. Involvement of regional-level researchers was not as intensive (though they were involved as enumerators and attended workshops for capacity building and dissemination) and this may have contributed to a lack of information and evidence of change at the regional level.

Political will of decision-makers and influence of industry. This factor may have had a negative effect on the immediate uptake of recommendations from the IUU fishing research. According to some informants, ministerial and provincial priorities heavily influence the degree of interest and the level of priority of projects. In addition, informants noted that industry is a powerful actor and may lobby the government to enable continued fishing of species that are vulnerable. The best example of this in the IUU fishing case is Susi Pujiastuti. During the IUU fishing project she was a business owner in the seafood sector and therefore influential in the lobster fishery, but the IUU fishing team experienced difficulties engaging with her business during the timeframe of the research. However, when she became Minister of Fisheries in 2014, action against illegal fishing became a top priority. Previous governments had supported action against IUU in the past, but during Susi Pajiastuti's tenure, this issue garnered media attention and government resources were directed towards resolving this issue. It is therefore little surprise that all of the policy change noted in this evaluation occurred after 2014.

Top-down approach. As an international project, ACIAR has to work with a national Ministry. This factor was not sufficient to totally prevent involvement and collaboration with regional governments (and additional efforts could have been made to overcome this issue), but it was likely a barrier. In addition, the data provided to the project team was from the national level where it is aggregated, but the information most useful to the IUU fishing team was the raw, regional-level data.

Ability to take up recommendations. In addition to the top-down approach, which potentially inhibited engagement with the regional governments and uptake of recommendations at the regional level, informants also noted that regional governments tend to have budgetary limitations, which also affects their ability to adopt recommendations. Furthermore, the IUU fishing reports shared information about what was done, but did not go into detail about how the research was conducted, so there were no guidance notes for any stakeholders who wished to replicate the approaches used in the IUU fishing project. Although the stakeholders involved would have understood the approach and had the experience of participating in it, this does not necessarily mean they are equipped with the knowledge of how to replicate it themselves.

Subsequent policy change. Improvements to policy are not necessarily linear and can be affected by broader political changes. In 2019, the Government of Indonesia implemented the One Data policy, which has changed not just what data is collected, but also the methodologies. According to some informants, this has undone some of the changes related to data collection that the IUU fishing project promoted.

Overall conclusions

The pathways of change related to the IUU fishing project are somewhat different to those imagined at the beginning of the project. It was hoped that involving Government of Indonesia stakeholders throughout the research process and presenting them with findings and recommendations would be sufficient to promote changes to IUU fisheries policy. However, the main pathway for change appears to have been through the Indonesian researchers, who used the data and knowledge they gained during the IUU fishing project to provide input to new fisheries policy when called upon for consultation in the years after the IUU fishing project ended. There does appear to be a demonstration effect of the approach taken by the IUU fishing project, as 2 informants noted improvements in collaboration among the departments in the Ministry and with other development actors; however, it is not clear the extent to which the IUU fishing project contributed to this change.

In addition, there is one partially achieved pathway related to uptake of IUU fishing research by third parties. Based on evidence from the citation analysis and publication of some of the lobster research in an international journal, it appears that third parties have accessed the IUU fishing research; however, it is unclear what it was then used for.

Finally, there is a fourth, unrealised pathway related to change at the regional level. There is anecdotal evidence from national-level informants that there have been improvements to data collection at the regional level; however, this and any further changes have not been possible to verify.

Based on these findings, it is possible to draw some conclusions about the situations in which policy change is likely to happen. Policy change is most likely to occur in a situation where:

1. **National research team members are retained within policymaking circles.** Meaningful participation of national researchers in the project creates a sense of ownership, builds networks and develops in-depth understanding of the research. The inclusion of these researchers in future policymaking processes enables them to use this knowledge to contribute to policy.
2. **There is political will related to the research topic.** The approach and recommendations are aligned with the priorities of national and regional fisheries policymakers, plus other organisations are also contributing towards similar outcomes.
3. **The research is accessible.** Enabling those not directly involved in the IUU fishing research and third parties to access the latest information.
4. **The end users (or those who will be adopting the recommendations) have the authority, ability and acceptance to enact change.** Ensuring that the stakeholders involved in the project have the authority to influence policy change, accept the need for change and the type of reform suggested, as well as the time, skills and funding to implement recommendations.



3. How can ACIAR more effectively support policy change in Indonesia in the future?

The recommendations and observations identified below are drawn from the data collection process, discussions with informants, as well as the evaluation team's own reflections on the evaluation process and key findings.

The IUU fishing research was carried out over a decade ago, making it difficult to account for changes in the ACIAR approach to research that aims to influence policy in the 10 years since the IUU fishing project ended. The suggestions found in this section should therefore be used to aid reflection about the extent to which these suggestions have been incorporated into recent, current or planned ACIAR research to policy projects and why (or why not). This may support project teams to:

- reflect on their recent work
- incorporate or strengthen existing approaches in new projects.

Design and preparation

Recommendation 1: Co-create a logical model for research projects that clearly articulates how and when change is expected to occur in order to ensure buy-in and understanding of stakeholders.

When reviewing the documentation for the IUU fishing project, the evaluation team found a lack of clarity about the expected changes that were intended. The use of objectives, outcomes, short- and medium-term impacts (without clear definitions of what these terms meant in the ACIAR context), made it difficult to understand when changes were expected to occur. In addition, the short- and medium-term impacts were stated, but there was no explanation about how these changes would occur and how the IUU fishing project was expected to contribute to these changes.

A logical diagram, like the ones used in this evaluation, sometimes called a theory of change or program logic, helps to articulate the intended outcomes of the program. This can be co-created with stakeholders, building ownership from the beginning and helping to ensure that all stakeholders understand and accept the need for change and the ways in which the project seeks to achieve it. It can then be used during the project to reflect on performance and identify areas where change is not happening in the ways that were predicted, as well as ways to adapt or strengthen the intervention. Finally, the model can be used in the evaluation process to understand the intended changes and change pathways, and compare those to what actually happened during and after the project.

Recommendation 2: Involve researchers from the level of government (national, provincial or district) that the project seeks to promote change in, and ensure these individuals are a genuine part of the team.

A key factor that enabled change in the IUU fishing project was the involvement of Indonesian researchers as core members of the research team from the beginning of the project (see Appendix 4 for the research team profile by gender and location). This helped to build capacity and expertise among those individuals. It also created a sense of ownership, as well as a deep understanding of the research, its findings and recommendations. This knowledge and capacity continued to be used by the researchers throughout their careers, including when they were called on to provide input on new fisheries policy. A key aspect to this is that the researchers continued their careers in the Ministry of Fisheries, which was the best outcome for ACIAR, as the investment in the capacity and knowledge of those individuals could be fully realised. In contrast, less intensive involvement of regional-level researchers could have been a factor in the lack of change identified at this level.

Recommendation 3: Conduct political economy analysis on each fishery as part of the selection process for focus areas of research, involving the ACIAR Indonesia team, as well as stakeholders where appropriate.

The informants in this evaluation highlighted the influence of national and regional leaders on policy priorities, and the importance of authority, acceptance and ability in the uptake of recommendations. In the case of the lemuru fishery, informants stated that the provincial governments of East Java and Bali had, at the time, different perceptions about the issues and how they should be resolved. Considering such factors in the planning stage of research projects could help to:

- identify important stakeholders
- select fisheries or focus areas to ensure that change is feasible in the context
- manage expectations about the degree of change that it is possible to achieve in the given context.

The Indonesia country team will likely have insights into political priorities and relationships which can be used in this process.

During and after the project

Recommendation 4: Allocate resources to directly engage regularly with decision-makers (not only their staff) at each level of government where the project expects to see change.

As noted, Government of Indonesia decision-makers tend to follow the relevant priorities of national and regional leaders. Decision-makers are often some of the busiest people and difficult to schedule time with. They may send a representative to the meeting if they are unable to attend themselves, but it is key for any project seeking to influence policy change to find ways of directly engaging with decision-makers. This is even more significant in the context of recent restructuring and management of research by moving responsibility for research out of the ministries and under the authority of BRIN. Effective engagement requires investing in building relationships with the relevant decision-maker, clearly articulating how the project will support the government's fisheries agenda (and ideally their specific contribution to this), considering existing policy processes within the Government of Indonesia, and by tailoring dissemination materials and presentations of the findings to suit their timeframes and needs. The ACIAR country office team is a key resource to achieve this aim, but additional resources may be required. Investing in personnel who have experience working with decision-makers and development actors should be considered fundamental to achieving policy influence.

Recommendation 5: Consider providing a pool of advisers that can be accessed by national, provincial or district governments attempting to replicate an approach or implement recommendations to provide support or to troubleshoot issues for a limited number of days.

The reports and recommendations from the IUU fishing project clearly articulate what was done during the project and the results of the research; however, there is little information or guidance on how to replicate the approaches used. Providing technical assistance (as well as written guidance) would support adoption of recommendations, helping to overcome the issues identified in the evaluation, such as limited involvement in the research itself and a lack of budget to implement recommendations. Uptake of this recommendation would depend heavily on the approach of ACIAR to research and its policy on providing support that goes beyond standard dissemination processes.

The approach could be as simple as providing a pool of advisers who could be contacted (via ACIAR, or other such mechanism to approve technical assistance requests) to provide a pre-determined number of days' support to a district, provincial or national government department that was attempting to replicate an approach or implement the recommendations. There may be other modalities that could support post-project technical assistance and all potential avenues for this support should be considered.

Recommendation 6: Continue to build relationships and provide professional development opportunities to Indonesian researchers from national and regional governments.

One other factor that supported change in the IUU fishing context, was the investment in, and the continuity of, relationships between ACIAR and Indonesian researchers. ACIAR has an excellent network of Indonesian researchers that have benefited from ACIAR through access to professional development and opportunities for further study. This network of highly skilled researchers with a positive experience of collaboration with ACIAR was a key vehicle for policy change in the IUU fishing project and should be considered as a key mechanism for change in future policy-related projects. One aspect to monitor is the rate of continuation of researchers in their government careers, as the high continuity rate of researchers who worked on the IUU fishing project could be an anomaly.

Recommendation 7: Upload research reports to ACIAR, the relevant Government of Indonesia and stakeholder websites, and monitor their use to gain insights into uptake by third parties, and the formats most widely accessed and by whom.

Uploading research outputs on to the ACIAR website helps to maximise the reach of the research. Tracking their use helps to identify how they are being used and by whom. An analysis of research reports or research products across the ACIAR portfolio may identify patterns about which products are accessed most often, which could provide insights into the products that are considered most accessible or appealing to ACIAR audiences. In addition to making research products available on the ACIAR website, ACIAR should consider advocating for the products to also be made available on the relevant Government of Indonesia websites, and those of other stakeholders (University of Wollongong and CSIRO in the IUU fishing case) to further increase reach and add legitimacy.

References

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- White WT, Last PR, Stevens JD, Yearsley GK, Fahmi, Dharmadi (2006) *Economically important sharks and rays of Indonesia* ACIAR Monograph No. 124, Australian Centre for International Agricultural Research, Canberra.
- Wudianto et al. (2012) Bali Strait lemuru fishery – final report.

Appendices

Appendix 1: List of IUU fishing project outputs

Based on the IUU fishing final project report, the documentation and direct results of the IUU fishing project were:

- documentation from 8 six-monthly steering committee meetings
- summary reports of workshops, which included (16):
 - 1 x provincial fisheries management workshop for lemuru
 - 5 x fisheries stakeholder workshops (2 on sharks, 2 on lobster and 1 on lemuru)
 - 7 x stock assessment workshops (2 each on shark and lobster, and 1 each for red snapper and lemuru)
 - 1 x workshop on the role of government and industry for red snapper
 - 1 x market scoping workshop to identify the selected fisheries for detailed study (shark, lobster and lemuru)
 - 1 x report on training for capacity building
- reports on (7 reports plus project reports):
 - rapid market sampling
 - IUU fishing issues for each of the 7 ports
 - 3 x fisheries data and assessment reports for shark, lemuru and lobster
 - fisheries statistics and description report
 - a summary of the current situation in regard to the National Provincial and Local Fisheries Legal and Policy Framework and IUU fishing activities
 - project reports, including annual reports and a final report
- a book on economically important teleost fish
- brochures and posters for shark identification.

Appendix 2: Confidence rating rubric

This rubric (Table A1) has been developed based on the dimensions from the GRADE CERQual method of assessing the confidence of evidence from reviews of qualitative research (GRADE CERQual 2018). This method was intended to assess reviews of qualitative research, not the evidence within a piece of research, so we have focused on the 3 of the 4 dimensions: coherence, adequacy, relevance.

Table A1 Confidence rating rubric

Dimension	Score of 1	Score of 2	Score of 3
Methodological limitations	Data has been collected using a single data collection method	Data has been collected using at least 2 data collection methods	Data has been collected using more than 3 data collection methods
Coherence	Data is contradictory and ambiguous	Data contains some ambiguity and minor contradictions	Data contains minimal contradictions and little to no ambiguity
Adequacy	Data comes from only one source or informant	Data is verified by one other source or informant	Data comes from at least 3 sources or informants
Relevance	Data has limited relevance to the evaluation question	Data is somewhat relevant to the evaluation question	Data is adequate to answer the research question

For the answers to each of the KEQs, the evaluation team gave a score for each dimension and added them up. The minimum score is 4 and the maximum score is 12. Based on the totals the answer to the evaluation question will be given a confidence rating of **LOW**, **MEDIUM** or **HIGH**, as follows:

- a score of 4–6 is a **LOW** confidence rating
- a score of 7–9 is a **MEDIUM** confidence rating
- a score of 10–12 is a **HIGH** confidence rating.

KEQ 1: To what extent does the Government of Indonesia have new fisheries policy, management frameworks and/or stock assessment processes as a result of the IUU fishing project?

The data used to answer this question (Table A2) is based on:

- interviews with informants involved in the IUU fishing project, including researchers from the Research Centre for Marine Affairs and Conservation, an official from the Directorate General of Capture Fisheries, a researcher from CSIRO, and the project lead from the University of Wollongong
- a document review of project documents and relevant Indonesian regulations
- a basic citation analysis of the outputs of the IUU fishing project.

The confidence rating for KEQ 1 is **MEDIUM**.

Table A2 KEQ 1 confidence rating score

Dimension	Notes	Score
Methodological limitations	The data has been collected using 3 data collection methods: interview, project documentation review and policy documentation	3
Coherence	There is some ambiguity regarding the outputs that were produced	2
Adequacy	Most of the data related to outcomes has been validated by at least one source	2
Relevance	The data collected for sub-question 1.1 is sufficient, but there is insufficient information to completely answer sub-questions 1.2 and 1.3	2
Total		9

Appendix 2: Confidence rating rubric (cont.)

KEQ 2: What are the key pathways of change related to the intended and unintended changes that have occurred as a result of the IUU fishing project?

The data used to answer this question (Table A3) is based on:

- interviews with key informants
- project documentation.

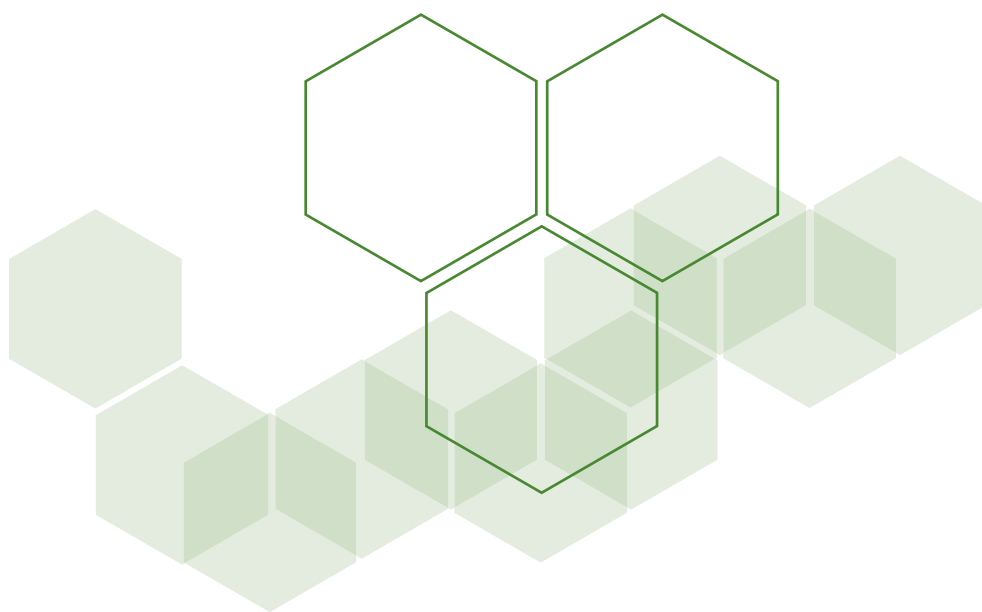
The confidence rating for KEQ 2 is **MEDIUM**.

Table A3 KEQ 2 confidence rating score

Dimension	Notes	Score
Methodological limitations	The data has been collected using 2 data collection methods: interviews and project documentation	2
Coherence	There is some ambiguity regarding the pathways that were assumed by the project at the outset	2
Adequacy	Most of the data related to pathways of change has been validated by at least one source	2
Relevance	The data collected for sub-question 2.1 is sufficient, but there is insufficient information to completely answer sub-questions 2.2 and 2.3 due to lack of information on the provincial perspective	2
Total		8

KEQ 3: How can ACIAR more effectively support policy change in Indonesia in the future?

The answer to this question used the same information and evidence from the previous 2 questions to formulate recommendations. Therefore, the confidence rating for the answer to this question is also **MEDIUM**.





Appendix 3: IUU fishing project outputs citation analysis

This citation analysis was conducted in November 2022 using Google Scholar and the citations as stated in the IUU fishing final study reports.

Documents citing IUU fishing outputs			
Title	Author	Year	Journal/Volume/Page
Milton DA, Proctor C, Satria F and West RJ (Eds) (2012) South coast Java lobster fishery , Report prepared for ACIAR Project FIS/2006/142, <i>Developing new assessment and policy frameworks for Indonesia's marine fisheries, including the control and management of Illegal, Unregulated and Unreported (IUU) Fishing</i> , Australian National Centre for Ocean Resources and Security (ANCORS), University of Wollongong, Australia. 46 pages.			
Biological aspect of double-spined rock lobster (<i>Panulirus penicillatus</i>) in Wonogiri Regency waters, Central Java, Indonesia	Beni, Zairion and Wardianto Y	2020	<i>IOP Conference Series: Earth and Environmental Science</i> , 420(012006), 2020
Biological reference points of Painted Spiny Lobster, <i>Panulirus versicolor</i> (Latreille, 1804) in Karimunjawa waters, Indonesia	Ernawati T, Priatna A and Satria F	2019	Indonesian Fisheries Research Journal, 25(2), 2019
Life history and stock status of scalloped spiny lobster (<i>Panulirus homarus</i>) in Prigi Bay, East Java Province, Indonesia: analysing the potential for stock enhancement	Suryandari A	2018	United Nations University Fisheries Training Programme, Iceland final project, http://www.unuftp.is/static/fellows/document/Astri17prf.pdf [last accessed November 2022]
Percobaan penandaan lobster pasir (<i>Panulirus homarus</i> Linnaeus, 1758) di Teluk Prigi [<i>Sand lobster tagging experiment in Teluk Prigi</i>]	Wijaya D and Nurfiarini A	2018	<i>Jurnal penelitian perikanan Indonesia</i> , 24(4), 2018 [<i>Indonesian Fisheries Research Journal</i>]
The development of spiny lobster aquaculture in Indonesia through the enhancement of puerulus catch and technology transfer	Priyambodoa B	2018	PhD thesis, University of New South Wales
Kebiasaan makanan luas dan tumpeng tindih relung beberapa jenis lobster di Teluk Prigi, Kabupaten Trangalak	Wijaya D, Nurfiarini A, Nastiti AS and Riswanto	2017	<i>BAWAL</i> , 9(3):153–161, December 2017
Environmental factors influencing the recruitment and catch of tropical <i>Panulirus</i> lobsters in southern Java, Indonesia	Milton DA, Satria F, Proctor CH, Prasetyo AP, Utama AA and Fauzi M	2014	<i>Continental Shelf Research</i> , 91:247–255, 1 December 2014

Appendix 3: IUU fishing project outputs citation analysis (cont.)

Documents citing IUU fishing outputs			
Title	Author	Year	Journal/Volume/Page
West RJ, Palma-Robes MA, Satria F, Wudianto, Purwanto, Sadiyah L, Prasetyo AP, Faizah R and Setyanto A (2012) The Control and Management of Illegal, Unreported and Unregulated (IUU) Fishing in Fisheries Management Area 573 , Report prepared for ACIAR Project FIS/2006/142, <i>Developing new assessment and policy frameworks for Indonesia's marine fisheries, including the control and management of Illegal, Unregulated and Unreported (IUU) Fishing</i> , Australian National Centre for Ocean Resources and Security (ANCORS), University of Wollongong, Australia. 56 pages.			
The eradication of IUU fishing in Indonesia for fisheries resources sustainability by the Task Force 115	Suherman A, Santosa A, Ihsan YN, Wijayanto D and Juwana S	2020	<i>AAFL Bioflux</i> , 13(5), 2020
Dampak Sosioekonomi moratorium izin penangkapan ikan dan larangan trans-shipment di Kota Bitung [<i>Socioeconomic Impacts of Moratorium on Issuance Fishing Permits and Transshipment Prohibition in Bitung City</i>]	Kondo NS, Keban YT, Rijanta R, Handoyo J and Mulyo	2019	<i>Marine Fisheries</i> , 10(1):71–82, May 2019
Estimating socioeconomic impacts of re-enacting a permit policy for foreign-made fishing vessels	Deswati RH, Muliawan I, Yusuf R and Apriliani T	2021	<i>IOP Conference Series, Earth Environmental Science</i> , 860(012053)
Indonesia's Environmental Policy Regarding the Eradication of Illegal Fishing in the Indonesian Exclusive Economic Zone in the South China Sea in 2017	Djumadin Z	2021	<i>British Journal of Environmental Studies</i> , 1(1) 2021
White WT, Dichmont C, Purwanto, Nurhakim S, Dharmadi, West RJ, Buckworth R, Sadiyah L, Faizah R, Sulaiman PS and Sumiono B (2012) Tanjung Luar (East Lombok) Longline Shark Fishery , Report prepared for ACIAR Project FIS/2006/142, <i>Developing new assessment and policy frameworks for Indonesia's marine fisheries, including the control and management of Illegal, Unregulated and Unreported (IUU) Fishing</i> , Australian National Centre for Ocean Resources and Security (ANCORS), University of Wollongong, Australia. 53 pages.			
Perbedaan hasil tangkap hiu dari rawai hanyut dan dasar yang berbasis di Tanjung Luar, Lombok	Sentosa AA, Widarmanto N, Wiadnyana NN and Satria F	2016	<i>Jurnal penelitian perikanan Indonesia</i> , 22(2), 2016 [<i>Indonesian Fisheries Research Journal</i>]
Catch and relative abundance of some sharks landing in Tanjung Luar, Lombok	Sentosa AA and Dharmadi	2017	<i>Widyariset</i> , 3(2):131–142, 2017
Species composition, CPUE and length frequency of oceanic sharks based on observer data from the Indonesian longline fishery in the Indian Ocean	Novianto D, Rochman F and Nugraha B	2014	<i>Indian Ocean Tuna Commission</i> , 2014, WPEB10-13, Rev 1
Length-weight relationship and growth parameters of Indonesian Houndshark (<i>Hemitriakis indroyonoi</i> White, Compagno and Dharmadi, 2009) caught from artisanal fisheries in Southern West Nusa Tenggara Waters	Sentosa AA and Chodriyah U	2020	<i>AAFL Bioflux</i> , 13(3):1211–1220, 2020
Analysis of spot-tailed shark and Indo-Pacific sailfish landed at Palabuhanratu fishing port as longline bycatch in the Eastern Indian Ocean	Imron M, Tawaqal IM, Yusfiandayani R, Baskoro MS and Susanto A	2020	<i>AAFL Bioflux</i> , 13(6):3470–3481, 2020



Documents citing IUU fishing outputs			
Title	Author	Year	Journal/Volume/Page
Fisheries management for the Scalloped Hammerhead Shark (<i>Sphyrna lewini</i>) in the eastern Indian Ocean	Simeon BM, Yuwandana DP, Nurdin E, Faizah R, Wahyuningrum PI, Chodrijah U and Yulianto I	2021	In Loneragan NR, Wiryawan B, Hordyk AR, Halim A, Proctor C, Satria F, Yulianto I (Eds), <i>Proceedings from Workshops on Management Strategy Evaluation of Data-Limited Fisheries: Towards Sustainability – Applying the Method Evaluation and Risk Assessment Tool to Seven Indonesian Fisheries</i> , Murdoch University, Western Australia, and IPB University, Bogor, Indonesia, pp 65–84.
Karakteristik biologi hiu dan pari appendiks II cites yang didaratkan di Tanjung Luar, Lombok Timur [<i>Biological characteristics of Appendix II cites landed at Tanjung Luar in East Lombok</i>]	Sentosa AA	2017	Seminar Nasional Tahunan XIV Hasil Penelitian Perikanan dan Kelautan, 22 Juli 2017
Laju penangkapan hiu yang didaratkan di Tanjung Luar, Lombok Timur [<i>Shark capture rate landed in Tanjung Luar, East Lombok</i>]	Arnenda GL, Jatmiko I and Fatmawati R	2019	In Seminar Nasional Perikanan Tangkap ke-8, 17 Oktober 2019 [<i>8th National Seminar on Capture Fisheries, 17 October 2017</i>]
Laju penangkapan <i>elasmobranchii</i> oleh nelayan Tanjung Luar pada berbagai alat tangkap	Sentosa AA and Haryadi J	2018	Seminar Nasional Tahunan XV Hasil Penelitian Perikanan dan Kelautan, 28 Juli 2018 [<i>15th Annual National Fisheries and Marine Research Seminar</i>]
Profil penangkapan hiu oleh kapal nelayan rawai permukaan di Perairan Barat, Pulau Sumba [<i>Profile of shark catching by surface long fishing vessels in the western waters of Sumba</i>]	Sentosa AA	2016	Seminar Nasional Tahunan XIII Hasil Penelitian Perikanan dan Kelautan, 13 Agustus 2016 [<i>13th Annual National Fisheries and Marine Research Seminar</i>]
Persepsi nelayan Tanjung Luar, Lombok Timur terhadap isu konservasi hiu dan pari [<i>Tanjung Luar fisherfolk's perceptions on shark and ray conservation</i>]	Sentosa AA	2017	Seminar Nasional Tahunan XIV Hasil Penelitian Perikanan dan Kelautan, 22 Juli 2017 [<i>14th Annual National Fisheries and Marine Research Seminar</i>]
Parameter populasi hiu martil (<i>Sphyrna lewini</i> Griffith and Smith, 1834) di perairan selatan Nusa Tenggara	Sentosa AA, Dharmadi and Tjahjo DWH	2016	Jurnal penelitian perikanan Indonesia, 22(4), 2016 [<i>Indonesian Fisheries Research Journal</i>]

Appendix 3: IUU fishing project outputs citation analysis (cont.)

Documents citing IUU fishing outputs			
Title	Author	Year	Journal/Volume/Page
Jenis dan sebaran ukuran hiu yang didaratkan di Tanjung Luar, Lombok Timur, Nusa Tenggara Barat [<i>Catch and size distribution of sharks landed in Tanjung Luar, East Lombok, West Nusa Tenggara</i>]	Sentosa AA and Hediando DA	2016	Pertemuan Ilmiah Nasional Tahunan XIII ISOI 2016, Surabaya, 1–2 Desember 2016 [<i>13th Annual National Scientific Meeting, 2016, Surabaya, 1–2 December 2016</i>]
Nishah kelamin, hubungan pangjang berat dan ukuran produksi hiu <i>Hexanchus</i> spp. di perairan selatan Nusa Tenggara [<i>Sex ration, length-weight relationship and reproductive size of Sixgill Shark, Hexanchus spp, from Southern Nusa Tenggara Waters</i>]	Sentosa AA	2019	<i>Berita Biologi</i> , 18(2), 2019 <i>Biology News</i> , 18(2), 2019
Pola Pertumbuhan dan Faktor Kondisi Hiu Merak Bulu <i>Carcharhinus brevipinna</i> di Perairan Selatan Nusa Tenggara [<i>Growth Pattern and Condition Factor of Spinner Shark Carcharhinus brevipinna in Southern Nusa Tenggara Waters</i>]	Sentosa AA, Fahmi and Chodrijah U	2018	Oseanologi dan Limnologi di Indonesia, 3(3):209–218, 2018 [<i>Oceanology and Liminology in Indonesia, 3(3):209–218, 2018</i>]
'Sharks are important, but so is rice': Opportunities and challenges for shark fisheries management and livelihoods in Eastern Indonesia	Jaiteh VF	2017	PhD thesis, Murdoch University, Western Australia, 2017
White WT, Dichmont C, Buckworth R, Last PR, Dharmadi, Raizah R and Chodrijah U (2013) Rapid Assessment Protocol for Market Surveys , Report prepared for ACIAR Project FIS/2006/142, <i>Developing new assessment and policy frameworks for Indonesia's marine fisheries, including the control and management of Illegal, Unregulated and Unreported (IUU) Fishing</i> , Australian National Centre for Ocean Resources and Security (ANCORS), University of Wollongong, Australia. 23 pages.			
No citations found.			
White WT, Last PR, Dharmadi, Faizah R, Chodrijah U, Prisantoso BI, Pogonoski JJ, Puckridge M and Blaber SJM (2013) Market fishes of Indonesia (<i>Jenis-jenis ikan yang di Indonesia</i>), ACIAR Monograph No. 155. Australian Centre for International Agricultural Research (ACIAR), Canberra. 438 pages.			
Cited by 115 articles, 11 of which are from 2022.			
Wudianto, Purwanto, Satria F, Dharmadi, Prasetyo AP, Sadiyah L, Proctor C, West RJ and Milton DA (Eds) (2012) Report prepared for ACIAR Project FIS/2006/142 , <i>Developing new assessment and policy frameworks for Indonesia's marine fisheries, including the control and management of Illegal, Unregulated and Unreported (IUU) Fishing</i> , Australian National Centre for Ocean Resources and Security (ANCORS), University of Wollongong, Australia. 31 pages.			
Smart Fisheries for Sustainable Fisheries in Indonesia: A Study of Sardine Fishery in the Bali Strait	Natsir M	2022	PhD thesis, Future University Hakodate, Japan, 2022



Appendix 4: Research team profile

The breakdown of the IUU fishing research team by gender (M/F) and location is shown in Table A4.

Table A4 Research team

Summary			
Australian	International	Male	Female
27	13	29	11

There is no final list of researchers in the IUU fishing project documentation, so the list of researchers used to collect these statistics has been created based on the reports produced by the IUU fishing project.



ACIAR outcome evaluations

No	Author(s) and year of publication	Title	ACIAR project numbers
1	Davis P (2022)	An evaluation of the ACIAR Agriculture Sector Linkages Program	ADP/2010/091, HORT/2005/153, HORT/2005/157, HORT/2005/160, HORT/2010/001, HORT/2010/006, HORT/2012/002, LPS/2005/132, LPS/2010/007
2	Hanley C and Passfield L (2022)	An evaluation of the ACIAR Transformative Agriculture and Enterprise Development Program	ASEM/2014/095, FST/2014/099, HORT/2014/094, HORT/2014/096, HORT/2014/097
3	Davis P and Hanley C (2023)	A programmatic evaluation of the TADEP and ASLP programs	ADP/2010/09, ASEM/2014/095, FST/2014/099, HORT/2005/153, HORT/2005/157, HORT/2005/160, HORT/2010/001, HORT/2010/006, HORT/2012/002, HORT/2014/094, HORT/2014/096, HORT/2014/097, LPS/2005/132, LPS/2010/007
4	Campbell J, Gimelli F, Chamberland G, Strempele A and Breen J (2022)	An evaluation of fruit and vegetable market development research in north-western Vietnam	AGB/2006/112, AGB/2008/002, AGB/2012/059, AGB/2012/060
5	Myers R and Cininta P (2023)	Improving the sustainability of cocoa production in eastern Indonesia	HORT/2010/011
6	Gimelli F, Campbell J, Chamberland G, Strempele A, Mienmany S and Zalzman E (2024)	Evaluation of village-based livestock biosecurity in Laos and Cambodia	AH/2012/067, AH/2012/068, AH/2011/014, AH/2010/046, AH/2006/159, AH/2005/086
7	Piper E and Sirajulmunir N (2024)	Illegal, unregulated and unreported fishing in Indonesia	FIS/2006/142



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