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1 Acknowledgments

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1.1 Declarations

1.1.1 Funding

The study was funded by the Australian Government through the ACIAR Social Systems Program small research and development activity (SRA) project **SSS/2022/117 Towards improved livelihoods for Indonesian fishers in Nusa Tenggara Timur Province, Indonesia**. The views expressed in this publication are the authors' alone and are not necessarily the views of the Australian Government.

1.1.2 Ethics approval

Ethical clearance for the research activities was obtained in both Australia and Indonesia, through the Charles Darwin University Human Research Ethics Committee (approval number H23055) and the Ethics Committee on Social Studies and Humanities, National Research and Innovation Agency (BRIN), Indonesia (approval number: 505 /KE.01/SK/07/2023).

1.1.3 Competing interests

Three of the authors (Stacey, Adhuri, Ninef) have longstanding prior research relationships with some members of some of the communities in Rote Island and West Timor, Indonesia, where this research was conducted.

2 Executive summary/Ringkasan eksekutif

2.1 English

Since the start of the COVID-19 pandemic in 2020, Australia experienced a new surge in levels of illegal Indonesian small-scale fishing in the Australian Fishing Zone. In the financial years 2020/21 and 2021/22, 85 and 337 boats were intercepted, respectively.[1] Both Australia and Indonesia have previously identified the need to find more effective means to manage this illegal activity,[2] but also the need to provide long-term solutions to support the sustainable livelihoods and wellbeing of rural coastal-fishing communities in the Nusa Tenggara Timor province, Indonesia.[3]

However, as this research has shown, these issues are longstanding, despite receiving detailed scholarly attention for at least 30 years (but with limited attention in the last 10–15 years), and are socially, economically and politically complex. Therefore, identifying mechanisms to achieve enduring solutions has proven challenging.

This project (a small research and development activity) aimed to address this challenge by engaging Australian and Indonesian multidisciplinary social science research teams to: explore the numerous drivers and conditions that have led to the recent increase in illegal fishing activity in Australian waters, present an analysis of the results, evaluate opportunities for addressing behavioural drivers in the context of potential livelihood improvements for selected communities, and build research capacity and knowledge about the topic. Five project objectives guided the research approach, design, results and analysis.

The project adopted a co-designed mixed methods methodology, where we:

- reviewed studies about Indonesian fishing in Australian waters
- collated illegal fishing data and trends over time
- reviewed past livelihood programs implemented in affected communities and potential broad approaches to enhance livelihoods of coastal communities engaged in illegal fishing
- conducted a review of theoretical approaches used to understand the causes of illegal fishing and behavioural science approaches to address noncompliance
- characterised fishery livelihoods of four selected communities in West Timor and Rote Island, Nusa Tenggara Timor province
- developed a conceptual framework of noncompliance for theorising actor-based drivers and enablers/drivers of illegal fishing to capture the dynamic interplay of drivers that appear to facilitate the recent spike in illegal small-scale fishing in the Australian Fishing Zone, and to provide a deeper nuanced understanding of recent illegal activity
- applied social research methods led by an Indonesian research team to collecting field data in four selected locations in West Timor and Rote Island to identify actor

[1] Source: Australian government data supplied to the ABC News (Parke 2022).

[2] A recent summary of the 2025 Annual Leaders' Meeting Joint Communique did not specifically identify livelihoods improvement in participating fishing communities as a priority area for cooperation, but did identify other related area such as collaboration on poverty alleviation and marine resource management.

[3] The province of NTT and islands of Rote and West Timor – where many of the fishers originate from, or use as a base camp for fishing activities into the AFZ – is as one of the poorest provinces in Indonesia (Robins et al. 2020).

(fishers, boat owners, traders, village leaders, and women)-based and opportunity-based social, economic and political enablers that appear to underpin illegal fishing, livelihood decision-making, and risks and impacts of illegal fishing.

The literature reviews confirmed that the recent period of increased levels of illegal Indonesian fishing incursions into the Australian Fishing Zone since COVID-19 began (continuing into 2024–25) is a trend Australia has experienced at different times over the last 50 years as a result of significant events and the reactions of fishers to a complex mix of drivers and enablers. Continued surges in illegal activity in the future are almost inevitable, given the healthy fish stocks on the Australian side and overfished stocks on the Indonesian side of the border. The surveillance, compliance and deterrence policy response has resulted in forfeitures, apprehensions and prosecutions of thousands of fishers, boats, catches and equipment. But, in general, we conclude that this has not been a sufficient response to stem the tide of incursions. Further, compliance policy results in adverse impacts on fisher crews and members of their households – including women, who are often then burdened with extra workloads and financial debt.

Despite the longstanding issue of illegal fishing and the commitments under the 1989 Memorandum of Understanding Agreement Guidelines for ‘alternative livelihoods’, there have been surprisingly few impactful initiatives for improving livelihoods in target communities. Our research shows that within the four locations covered in this research, transboundary fishing activity (illegal and legal) remains a key livelihood strategy for many people, and that no significant change in the importance and role of this activity has occurred over recent decades, before or since COVID-19.

Drawing on behavioural change frameworks (Oyanedel et al. 2020) to investigate gendered, actor (fishers crews, boat owners, village leaders, and female family members)-based drivers (*underlying motivations that drive behaviour*) of illegal Indonesian transboundary fishing since COVID-19 with opportunity-based approaches (*enablers that create opportunities for noncompliance*), our research has expanded the drivers identified in previous behavioural drivers models to identify seven Level 1 drivers: economic and livelihood, COVID-19-related, psychological, environmental, social, cultural and historical, and policy and management. We also identified 28 Level 2 dimensions. Some of these drivers may be more important than others for different fisher groups, within the enabling context of each community and group. However, financial difficulties alone are not sufficient to entirely explain the strong resurgence of illegal fishing, which was likely prompted by a combination of financial hardship, the discovery of new fishing grounds abundant in trepang, and willing patrons to support such ventures into the AFZ. The drivers, although difficult to disentangle and with a degree of overlap, do indeed work together to inform human behaviour.

People's perceptions of risk (e.g. lower likelihood of getting apprehended given changes in apprehension policy during COVID-19) did appear to contribute to increases in illegal fishing activity during COVID-19. Within the drivers and enabling contexts framework, a set of risks identified by actors also exist. Most research to date has identified broad impacts of apprehensions, natural disasters, death at sea, low catch rates, or unsuccessful voyages. However, we identified 3 main themes including: health, accident and safety; economic and livelihood; and apprehension-related risks. The resulting impacts of the consequences of getting caught identified are: types of punishment, economic and livelihood impacts, and gendered impacts on family/household members. Research participants also shared their positivity about Australian apprehension policy (e.g. legislative forfeitures than prosecution) during COVID-19 years, although for some groups the current MOU agreement fishing arrangements continue to be a source of contention.

The apprehension and detention of fishers for illegal fishing can result in flow-on, gendered impacts on families; in particular, exerting more pressure on women that results in implementing coping strategies to make ends meet in various ways. These include sourcing extra work or income to meet household needs or debts, experiencing mental

health and stress, getting further into debt by borrowing more money to pay for travel costs of repatriated family members inside Indonesia or to make ends meet, and changing gender roles and norms so women become the main household income-earner.

It was beyond the scope of this study to consider all broader enablers that create opportunities for noncompliance, but three key enablers we examined are:

- patron–client relations supporting fishing activity – articulated by fishers themselves as a bond which is hard to extract themselves from, and which limits opportunities for fishers and families to pursue other economic choices (McWilliam et al. 2020)
- high international market demand for target species
- the continued existence of the MOU agreement (under which some currently 'illegal' fishers previously operated legally) and limitations of the 50-year agreement
- the continuing role of transboundary fishing in the livelihood portfolios of many groups, and limited livelihood opportunities available within fishers' communities.

Added to these enablers are a wider range of livelihood constraints and vulnerabilities experienced by fishers which push them to engage in transboundary fishing, embedding their families and communities in a wider network of patron–client relations. The root causes of international illegal fishing are numerous and diverse, predominantly framed in the literature and media as a security threat and/or crime. This casts illegal fishers as rational decision-makers who perceive the benefits of engaging in unlawful fishing as likely to outweigh the perceived risks and costs. However, a growing scholarship indicates that fisher decision-making is likely to be much more nuanced and be motivated by much more specific illegal fishing drivers. Our research results highlight the need to move beyond fishers' noncompliance as the main approach to managing illegal fishing and instead focus on factors which most strongly drive illegal behaviour within their broader enabling environment. Within this approach, however, we acknowledge that drivers are not homogeneous across fishers and communities, and that context-specific factors are crucial for considering the design of any interventions.

We recommend a future research agenda and Australia–Indonesia government investment to tackle the question of noncompliance, and associated livelihood constraints and vulnerabilities in communities with a historic interest in the Australian Fishing Zone (including 'legal' MOU fishers, as well as more recent entrants). There is little evidence-based guidance in the literature as to how to address noncompliance by drawing on behavioural or other community development or livelihood approaches – making an appealing test case for a future research-for-development intervention to improve livelihoods and reduce illegal activity.

If governments give greater attention to supporting sustainable community livelihoods and priority social, cultural and economic drivers of illegal fishing, we believe this will provide for longer term reduction in illegal fishing by some of the communities who participated in this research and for communities who have a historic interest in the region, as per the 1974 MOU agreement. Given the significant investment in research-for-development programs in operation in the Asia-Pacific region (including Eastern Indonesia), there are opportunities to build on the lessons and approaches, and to create closer links with existing ACIAR programs and approaches in its Fisheries and Social Systems projects in operation in Indonesia, Timor Leste, and some Pacific Islands. This is because the problem of illegal fishing and the communities who do it have largely been left out of any programs.

Our literature review identifies design features that should be considered in a future intervention. Firstly, the program should be a co-designed participatory community and stakeholder program (Battista et al. 2018), and be designed to address a particular livelihood diversification goal. For example: (i) improving the production of an established

(legal) activity, (ii) adding a new activity within an established livelihood strategy, or (iii) adding a new activity not currently part of an existing livelihood portfolio (Roscher et al. 2022a). A mixed approach is needed rather than a single focus on 'alternatives', alongside the need to recognise the roles, contribution and relationship of gendered household livelihoods activities and outcomes (Stacey et al. 2019). Another factor, drawing on the results of previous ACIAR studies, is the need for long time frames and funding (5–10 years) to support the social change needed for long-term livelihood improvements (Stacey et al. 2021). Many of the community members surveyed for this study are maritime and fishing peoples, and a singular focus on non-maritime/non-fisheries 'alternative livelihoods' may not work. A key lesson from the literature is the need for local, context-specific interventions (Steenbergen et al. 2017) because different localities and fisher families have specific contextual, historical and economic factors that determine their participation in legal or illegal fishing.

Given the contextual challenges and multiple drivers, we recommend a future research agenda that tackles the question of whether addressing a smaller suite of drivers and priority enabling contexts associated with that driver can contribute to: reducing ongoing illegal fishing by certain groups, and creating positive, measurable livelihood impacts for families and households through increased assets and outcomes (e.g. income stability and generation, diversification, sustainable resource use, and other measures in health and education). A future research agenda should be informed and grounded in conceptual underpinnings and principles from behavioural science (and change) approaches; incorporate aspects of a new "agency and behavior change framework for transforming agri-food systems" (after Freed et al. 2025) and theory of change for supporting behaviour change in agricultural research; and integrate sustainable livelihoods diversification approaches to co-design a program to address specific drivers and broader enabling context factors (especially market- and economic-based) related to illegal fishing and livelihood vulnerabilities of selected communities.

We note that such a research agenda will likely lead to relevant theories and findings relevant to noncompliance in other natural resource management settings. It may also provide further evidence towards whether livelihood diversification does in fact lead to reduced pressure on natural resources, and how it addresses livelihood vulnerability and poverty "but under what circumstances, how and for whom" (Roscher et al. 2022b, 922). Further, it could address the "conceptual ambiguity stemming from a lack of attention and awareness to the complexity of livelihood diversification. Conventional understandings and definitions of livelihood diversification typically fail to capture this complexity due to pre-conceived ideas about material assistance and "livelihood projects"", as Roscher et al. (2022a, p.2114) and others (e.g. Stacey et al. 2021) have shown exist in demonstrating 'success' in coastal livelihood programs in Indonesia and, more broadly, the Asia-Pacific region.

This agenda should:

- Work with fishery value-chain actors and actor groups (individuals, households, groups or organisations).
- Identify the priority individual- and system-level (e.g. governance, economic, resource, social/relationship) behavioural drivers to be addressed and consider the factors enabling or impeding them.
- Identify the desired outcomes through a logic model/impact pathway to identify and address the behavioural changes, goals and type of livelihood interventions (e.g. the opportunities available, such as asset-based or institutional or other vulnerability-reducing actions).
- Test and trial desired interventions, changes or mechanisms with individuals and small groups, then evaluate and modify.

- Be supported by a range of learning-focused (versus one-off) training and workshops, and livelihood-support activities (e.g. financial programs; value-chain improvement, programs, education opportunities) to enable change.
- Scale up and establish monitoring and evaluation systems to provide evidence.

Fishing rights are generally considered foundational elements for successful fisheries management, which are mostly non-existent under the 1974/1989 MOU agreements. Providing access rights within or around the area permitted as per the MOU for people with a historic right might reduce some illegal fishing by regular fishers and provide some sustainable livelihood benefits. A range of engagement and management actions could support compliance among some fisher groups.

There are also opportunities to improve compliance and fishing data and management – such as consistent, standardised reporting and data-keeping across both Australia and Indonesian agencies, and working more closely together, given the likelihood that illegal fishing (based on the last 50 years of evidence) is likely to continue.

If greater attention is given to supporting sustainable community livelihoods and socio-economic arrangements, we believe there will be more opportunities to reduce illegal fishing in the long term for some of the communities who participated in this research or who have a historic interest in the region/MOU agreements – and ultimately to address some of the vulnerabilities present in the 'hyper-precarious' livelihoods of communities in Nusa Tenggara Timur and beyond.

2.2 Bahasa

Sejak awal pandemi COVID-19 pada tahun 2020, terjadi lonjakan tajam dalam aktivitas penangkapan ikan skala kecil ilegal oleh nelayan Indonesia di Zona Penangkapan Ikan Australia. Pada tahun anggaran 2020/2021 dan 2021/2022, masing-masing sebanyak 85 dan 337 kapal berhasil dicegat. Sebelumnya, kedua negara, Australia dan Indonesia, telah mengidentifikasi kebutuhan tidak hanya menemukan cara yang lebih efektif untuk mengelola aktivitas ilegal ini, tetapi juga solusi jangka panjang untuk mendukung keberlanjutan mata pencaharian dan kesejahteraan masyarakat pesisir perikanan di Provinsi Nusa Tenggara Timur, Indonesia.

Namun, sebagaimana ditunjukkan dalam penelitian ini, meskipun telah mendapat perhatian akademik secara rinci selama setidaknya 30 tahun terakhir (tetapi perhatian terhadap isu ini menurun dalam 10–15 tahun terakhir), permasalahan tersebut telah berlangsung lama, dan memiliki kompleksitas sosial, ekonomi, serta politik yang tinggi. Oleh karena itu, identifikasi mekanisme untuk mencapai solusi yang berkelanjutan terbukti sangat menantang.

Proyek ini (kegiatan penelitian dan pengembangan skala kecil) bertujuan untuk menjawab tantangan tersebut dengan melibatkan tim peneliti ilmu sosial multidisiplin dari Australia dan Indonesia untuk: mengeksplorasi berbagai faktor pendorong dan kondisi yang menyebabkan peningkatan dalam aktivitas penangkapan ikan ilegal di perairan Australia akhir-akhir ini, menyajikan analisis atas hasil temuan, mengevaluasi peluang untuk merespon faktor-faktor pendorong dalam konteks peningkatan penghidupan (*livelihood*s) bagi komunitas, serta membangun kapasitas dan pengetahuan riset terkait topik ini. Lima tujuan projek telah memandu tim peneliti untuk menetapkan pendekatan, desain, hasil, dan analisis penelitian ini.

Proyek ini mengadopsi metodologi campuran (*mixed-methods*) yang dirancang bersama dengan melakukan kegiatan-kegiatan berikut:

- Melakukan review terhadap studi tentang aktivitas penangkapan ikan oleh nelayan Indonesia di perairan Australia;
- pengumpulan data dan tren penangkapan ikan ilegal dari waktu ke waktu;
- mengevaluasi program-program peningkatan penghidupan (livelihoods) terdahulu yang telah dilaksanakan di komunitas terdampak, serta pendekatan luas yang potensial untuk meningkatkan kesejahteraan komunitas pesisir yang terlibat dalam aktivitas penangkapan ikan ilegal;
- melakukan kajian terhadap pendekatan teoritis yang digunakan untuk memahami penyebab penangkapan ikan ilegal serta pendekatan ilmu perilaku untuk mengatasi ketidakpatuhan;
- mendalami pemahaman tentang karakter penghidupan di empat komunitas terpilih di Timor Barat dan Pulau Rote, Provinsi Nusa Tenggara Timur;
- mengembangkan kerangka konseptual tentang ketidakpatuhan untuk menelaah faktor-faktor pendorong bagi aktor (actor-based driver) dan peluang yang mendorong aktivitas penangkapan ikan ilegal, guna menangkap interaksi dinamis antar faktor yang tampaknya mendorong lonjakan aktivitas penangkapan ikan ilegal skala kecil di Zona Penangkapan Ikan Australia baru-baru ini, serta memberikan pemahaman yang lebih mendalam dan bernuansa terhadap fenomena ini;
- penerapan metode penelitian sosial oleh tim peneliti Indonesia dalam pengumpulan data lapangan di empat lokasi terpilih di Timor Barat dan Pulau Rote, guna mengidentifikasi faktor sosial, ekonomi, dan politik berbasis aktor (nelayan, pemilik kapal, pedagang, pemimpin desa, dan perempuan), serta berbasis peluang yang mendasari aktivitas penangkapan ikan ilegal, pengambilan keputusan terkait mata pencaharian, serta risiko dan dampaknya.

Tinjauan pustaka mengonfirmasi bahwa peningkatan aktivitas penangkapan ikan ilegal oleh nelayan Indonesia di Zona Penangkapan Ikan Australia sejak awal pandemi COVID-19 (yang berlanjut hingga tahun 2024–2025) merupakan suatu tren yang telah beberapa kali dialami Australia dalam 50 tahun terakhir, sebagai respons terhadap berbagai peristiwa besar dan reaksi nelayan terhadap kombinasi kompleks dari faktor pendorong dan peluang. Lonjakan aktivitas ilegal serupa di masa mendatang hampir tidak dapat dihindari, mengingat ketersediaan stok ikan yang melimpah di perairan Australia dan stok ikan yang telah dieksploitasi secara berlebihan di sisi Indonesia. Respon berupa kebijakan pengawasan, penegakan hukum, dan tindakan yang diharapkan mendatangkan efek jera, telah menghasilkan penyitaan, penangkapan, dan proses hukum terhadap ribuan nelayan, kapal, hasil tangkapan, dan peralatan. Namun secara umum, kami menyimpulkan bahwa pendekatan ini belum cukup untuk menghentikan gelombang pelanggaran. Lebih jauh, kebijakan kepatuhan ini juga menimbulkan dampak negatif terhadap awak kapal dan anggota keluarganya termasuk perempuan, yang sering kali harus menanggung beban kerja tambahan dan utang finansial.

Meskipun isu penangkapan ikan ilegal telah berlangsung lama dan telah terdapat komitmen dalam Pedoman Perjanjian Nota Kesepahaman (MoU) tahun 1989 mengenai ‘alternatif mata pencaharian’, sangat sedikit inisiatif yang berdampak nyata untuk meningkatkan kesejahteraan di komunitas sasaran. Penelitian kami menunjukkan bahwa di keempat lokasi yang tercakup dalam studi ini, aktivitas penangkapan ikan lintas batas (baik legal maupun ilegal) masih menjadi strategi penghidupan utama bagi banyak masyarakat, dan tidak terdapat perubahan signifikan dalam peran dan pentingnya aktivitas ini selama beberapa dekade terakhir, baik sebelum maupun sesudah pandemi COVID-19.

Merujuk pada kerangka perubahan perilaku (Oyanedel et al. 2020), penelitian ini menyelidiki faktor-faktor pendorong yang berbasis aktor (awak buah kapal/ABK, pemilik kapal, tokoh masyarakat/desa, dan anggota keluarga perempuan) dan berperspektif gender, (yang mendorong aktivitas penangkapan ikan ilegal lintas batas) oleh nelayan Indonesia sejak masa pandemi COVID-19, serta pendekatan berbasis peluang (*enabler*) (yang menciptakan kondisi bagi ketidakpatuhan), penelitian kami mengembangkan model faktor pendorong perilaku sebelumnya dengan mengidentifikasi tujuh pendorong pada Tingkat 1 yaitu: ekonomi dan penghidupan (*livelihood*), hal-hal terkait COVID-19, psikologis, lingkungan, sosial, budaya dan historis, serta kebijakan dan pengelolaan. Kami juga mengidentifikasi 28 dimensi pada Tingkat 2. Beberapa pendorong mungkin lebih berpengaruh dibandingkan yang lain bagi kelompok nelayan tertentu, tergantung pada konteks peluang dan kondisi komunitas masing-masing. Namun, kesulitan ekonomi saja tidak cukup untuk menjelaskan secara keseluruhan maraknya kembali aktivitas penangkapan ikan ilegal, yang kemungkinan besar dipicu oleh kombinasi antara tekanan ekonomi, penemuan lokasi penangkapan baru yang kaya akan teripang, dan adanya patron yang bersedia mendukung usaha penangkapan di Zona Penangkapan Ikan Australia (AFZ). Meskipun sulit untuk dipisahkan secara tegas dan cenderung saling tumpang tindih, faktor-faktor ini saling berinteraksi dalam memengaruhi perilaku manusia.

Persepsi masyarakat terhadap risiko (misalnya, anggapan bahwa menurunnya kemungkinan ditangkap karena perubahan kebijakan penanganan pelanggaran selama COVID-19) tampaknya turut berkontribusi terhadap meningkatnya aktivitas penangkapan ikan ilegal selama pandemi. Dalam *framework* konteks pendorong dan peluang ini, terdapat pula serangkaian risiko yang diidentifikasi oleh para pelaku. Sebagian besar penelitian sebelumnya telah mengidentifikasi dampak secara umum dari penangkapan, bencana alam, kematian di laut, hasil tangkapan yang rendah, atau pelayaran yang gagal. Namun, kami mengidentifikasi tiga tema utama risiko: kesehatan, kecelakaan, dan keselamatan; ekonomi dan mata pencaharian; serta risiko yang terkait dengan penangkapan. Dampak yang dihasilkan dari konsekuensi penangkapan antara lain: jenis hukuman, dampak ekonomi dan penghidupan (*livelihoods*), serta dampak berperspektif gender terhadap anggota keluarga atau rumah tangga. Para partisipan penelitian juga menyampaikan pandangan positif mereka terhadap kebijakan penangkapan Australia selama masa COVID-19 (misalnya, penerapan sanksi berupa penyitaan aset alih-alih penuntutan hukum), meskipun bagi sebagian kelompok, pengaturan penangkapan dalam kerangka MoU saat ini tetap menjadi sumber perdebatan.

Penangkapan dan penahanan nelayan karena penangkapan ikan ilegal dapat menimbulkan dampak berantai, dampak terhadap keluarga dalam perspektif gender; khususnya, meningkatnya beban pada perempuan yang harus menjalankan berbagai strategi bertahan hidup untuk memenuhi kebutuhan. Strategi ini termasuk mencari pekerjaan tambahan atau sumber pendapatan lain untuk mencukupi kebutuhan rumah tangga atau membayar hutang, mengalami tekanan mental dan stres, menambah utang dengan meminjam uang demi membiayai biaya perjalanan anggota keluarga yang dipulangkan di Indonesia atau memenuhi kebutuhan hidup. Menyesuaikan peran dan norma gender sehingga perempuan menjadi pencari nafkah utama dalam rumah tangga.

Studi ini tidak mencakup semua faktor peluang yang menciptakan kondisi untuk ketidakpatuhan, namun kami mengkaji tiga *enabler* utama, yaitu:

- Hubungan patron-klien yang mendukung aktivitas penangkapan ikan-- diungkapkan oleh nelayan sendiri sebagai ikatan yang sulit dilepaskan dan membatasi peluang bagi nelayan dan keluarga mereka untuk mencari alternatif ekonomi lainnya (McWilliam et al. 2020);
- Tingginya permintaan pasar internasional terhadap spesies target;

- Keberadaan perjanjian MoU yang masih berlangsung (di mana beberapa nelayan yang kini dianggap 'ilegal' sebelumnya beroperasi secara legal) serta keterbatasan dalam perjanjian yang telah berlangsung selama 50 tahun;
- Peran yang terus berlanjut dari aktivitas penangkapan ikan lintas batas dalam portofolio mata pencaharian pada banyak kelompok, serta terbatasnya pilihan penghidupan di komunitas nelayan itu sendiri.

Selain faktor-faktor pendorong tersebut, terdapat berbagai keterbatasan dan kerentanan penghidupan yang lebih luas yang dialami oleh para nelayan, yang mendorong mereka untuk terlibat dalam aktivitas penangkapan ikan lintas batas. Hal ini juga menempatkan keluarga dan komunitas mereka dalam jejaring hubungan patron-klien yang lebih luas. Akar penyebab dari aktivitas penangkapan ikan ilegal lintas negara sangat beragam dan kompleks, yang dalam literatur dan media umumnya dibingkai sebagai ancaman keamanan dan/atau tindakan kriminal. Pendekatan ini menggambarkan nelayan ilegal sebagai pengambil keputusan rasional yang menilai bahwa manfaat dari keterlibatan dalam penangkapan ikan ilegal lebih besar dibandingkan risiko dan biayanya. Namun demikian, kajian akademik yang berkembang menunjukkan bahwa pengambilan keputusan oleh nelayan jauh lebih bernuansa, dan sering kali dimotivasi oleh faktor-faktor spesifik yang mendorong aktivitas ilegal. Hasil riset kami menekankan perlunya menggeser pendekatan pengelolaan penangkapan ikan ilegal dari yang hanya berfokus pada ketidakpatuhan nelayan, menuju pada pemahaman terhadap faktor-faktor utama yang mendorong perilaku ilegal dalam lingkungan yang memungkinkan terjadinya hal tersebut. Dalam pendekatan ini, kami juga mengakui bahwa faktor pendorong tidaklah homogen di antara nelayan maupun antar komunitas, sehingga faktor-faktor kontekstual sangat penting untuk dipertimbangkan dalam merancang intervensi yang tepat.

Kami merekomendasikan agenda riset di masa depan serta investasi dari pemerintah Australia–Indonesia untuk menangani persoalan ketidakpatuhan hukum dan berbagai kendala serta kerentanan penghidupan di komunitas-komunitas yang secara historis memiliki ketertarikan terhadap Zona Penangkapan Ikan Australia (termasuk nelayan 'legal' dalam skema MOU, maupun pendatang yang lebih baru). Saat ini, masih sangat sedikit panduan berbasis bukti dalam literatur yang membahas bagaimana mengatasi ketidakpatuhan dengan pendekatan perilaku, pengembangan komunitas, atau penghidupan. Hal ini menjadikan situasi ini sebagai studi kasus yang menarik untuk intervensi riset-untuk-pembangunan di masa depan yang bertujuan meningkatkan penghidupan dan mengurangi aktivitas ilegal.

Jika pemerintah memberikan perhatian lebih besar terhadap dukungan untuk penghidupan berkelanjutan dan pada faktor sosial, budaya, serta ekonomi yang menjadi pendorong utama penangkapan ikan ilegal, kami meyakini hal ini akan berkontribusi terhadap pengurangan jangka panjang aktivitas penangkapan ilegal oleh sebagian komunitas yang menjadi bagian dari studi ini, maupun oleh komunitas-komunitas lain yang memiliki keterikatan historis terhadap wilayah tersebut sebagaimana tercantum dalam perjanjian MOU tahun 1974. Mengingat besarnya investasi dalam program riset-untuk-pembangunan yang sedang berjalan di kawasan Asia-Pasifik (termasuk Indonesia Timur), terdapat peluang untuk memanfaatkan pelajaran dan pendekatan yang telah ada, serta membangun keterkaitan yang lebih erat dengan program-program dan pendekatan ACIAR yang sedang berlangsung di bidang Perikanan dan Sistem Sosial di Indonesia, Timor Leste, dan beberapa negara di Pasifik. Hal ini penting karena masalah penangkapan ikan ilegal dan komunitas yang terlibat di dalamnya selama ini sebagian besar belum menjadi sasaran program-program tersebut.

Tinjauan pustaka kami mengidentifikasi beberapa karakteristik desain yang perlu dipertimbangkan dalam intervensi mendatang. Pertama, program harus dirancang secara partisipatif dan kolaboratif bersama komunitas dan pemangku kepentingan (Battista et al. 2018), serta diarahkan untuk mencapai tujuan diversifikasi penghidupan tertentu. Contohnya: (i) meningkatkan hasil dari aktivitas yang sudah legal dan mapan, (ii) menambahkan aktivitas baru dalam strategi penghidupan yang sudah ada, atau

(iii) memperkenalkan aktivitas baru yang belum menjadi bagian dari portofolio penghidupan yang ada (Roscher et al. 2022a). Pendekatan campuran diperlukan, bukan hanya berfokus pada “alternatif”, dan harus mempertimbangkan peran, kontribusi, serta hubungan aktivitas mata pencaharian rumah tangga yang dibedakan berdasarkan gender dan hasil (Stacey et al. 2019). Faktor penting lainnya, berdasarkan hasil studi ACIAR sebelumnya, adalah perlunya dukungan jangka panjang dan pendanaan (5–10 tahun) untuk mendorong perubahan sosial yang dibutuhkan demi peningkatan mata pencaharian yang berkelanjutan (Stacey et al. 2021). Banyak anggota komunitas yang diwawancarai dalam studi ini merupakan masyarakat maritim dan nelayan, sehingga fokus eksklusif pada alternatif yang bukan berbasis laut atau perikanan kemungkinan besar tidak akan berhasil. Pelajaran penting dari literatur adalah perlunya intervensi lokal yang kontekstual (Steenbergen et al. 2017), karena setiap wilayah dan keluarga nelayan memiliki faktor-faktor kontekstual, historis, dan ekonomi yang khas yang menentukan keterlibatan mereka dalam penangkapan ikan legal maupun ilegal.

Mengingat tantangan kontekstual dan banyaknya faktor pendorong, kami merekomendasikan agenda riset ke depan yang berfokus pada pertanyaan apakah dengan menangani sejumlah kecil faktor pendorong utama dan konteks pendukung prioritas yang terkait dengan faktor tersebut dapat berkontribusi terhadap: pengurangan aktivitas penangkapan ikan ilegal yang terus berlangsung oleh kelompok tertentu, serta penciptaan dampak positif dan terukur terhadap mata pencaharian keluarga dan rumah tangga melalui peningkatan aset dan capaian (misalnya stabilitas dan peningkatan pendapatan, diversifikasi, pemanfaatan sumber daya secara berkelanjutan, serta indikator lain dalam bidang kesehatan dan pendidikan). Agenda riset ke depan sebaiknya didasarkan pada landasan konseptual dan prinsip-prinsip pendekatan ilmu perilaku (dan perubahan perilaku); mengintegrasikan aspek dari kerangka kerja baru “agen dan perubahan perilaku untuk transformasi sistem pangan-pertanian” (mengacu pada Freed et al. 2025) serta teori perubahan untuk mendukung perubahan perilaku dalam riset pertanian; dan menggabungkan pendekatan diversifikasi mata pencaharian berkelanjutan untuk bersama-sama merancang program yang menangani faktor pendorong spesifik serta faktor konteks pendukung yang lebih luas (terutama yang berbasis pasar dan ekonomi) terkait dengan praktik penangkapan ikan ilegal dan kerentanan mata pencaharian komunitas-komunitas terpilih.

Kami mencatat bahwa agenda riset semacam ini kemungkinan akan menghasilkan teori dan temuan yang relevan terhadap isu ketidakpatuhan dalam konteks pengelolaan sumber daya alam lainnya. Agenda ini juga dapat memberikan bukti tambahan terkait apakah diversifikasi penghidupan benar-benar dapat mengurangi tekanan terhadap sumber daya alam, serta bagaimana diversifikasi tersebut menangani kerentanan dan kemiskinan “namun dalam kondisi apa, bagaimana, dan untuk siapa” (Roscher et al. 2022b, hlm. 922). Lebih lanjut, agenda ini juga dapat menjawab “ambiguitas konseptual yang berasal dari kurangnya perhatian terhadap kompleksitas diversifikasi penghidupan”. Pemahaman dan definisi konvensional mengenai diversifikasi penghidupan umumnya gagal menangkap kompleksitas tersebut karena asumsi-asumsi awal mengenai bantuan material dan ‘proyek penghidupan, (sebagaimana ditunjukkan oleh Roscher et al. 2022a, hlm. 2114) dan peneliti lainnya (misalnya Stacey et al. 2021) dalam mendemonstrasikan 'keberhasilan' program-program penghidupan pesisir di Indonesia dan secara lebih luas di kawasan Asia-Pasifik.

Agenda riset ini sebaiknya mencakup hal-hal berikut:

- Melibatkan aktor dan kelompok aktor dalam rantai nilai perikanan (individu, rumah tangga, kelompok, atau organisasi).
- Mengidentifikasi faktor pendorong perilaku pada tingkat individu dan sistem (misalnya tata kelola, ekonomi, sumber daya, sosial/relasi) yang menjadi prioritas untuk ditangani, serta mempertimbangkan faktor-faktor yang mendukung atau menghambatnya.

- Menentukan hasil yang diharapkan melalui model logika/jalur dampak guna mengidentifikasi dan menangani perubahan perilaku, tujuan, dan jenis intervensi penghidupan (misalnya peluang yang tersedia seperti berbasis aset, institusional, atau tindakan lain yang mengurangi kerentanan).
- Menerapkan dan menguji intervensi, perubahan, atau mekanisme yang diinginkan pada individu dan kelompok kecil, kemudian mengevaluasi dan memodifikasi pendekatan tersebut.
- Didukung oleh rangkaian pelatihan dan lokakarya yang berorientasi pada pembelajaran (bukan satu kali) serta aktivitas pendukung mata pencaharian (misalnya program keuangan; perbaikan rantai nilai; program-program; kesempatan pendidikan) guna memungkinkan terjadinya perubahan.
- Melakukan perluasan skala serta membangun sistem pemantauan dan evaluasi untuk menyediakan bukti.

Hak penangkapan ikan secara umum dianggap sebagai elemen dasar dalam keberhasilan pengelolaan perikanan, yang sebagian besar tidak ada dalam perjanjian MOU 1974/1989. Penyediaan hak akses di dalam atau sekitar area yang diperbolehkan berdasarkan MOU bagi masyarakat dengan hak historis mungkin dapat mengurangi sebagian aktivitas penangkapan ikan ilegal oleh nelayan reguler dan memberikan manfaat mata pencaharian yang berkelanjutan. Sejumlah pendekatan keterlibatan dan pengelolaan dapat mendukung kepatuhan di antara kelompok nelayan tertentu.

Terdapat pula peluang untuk meningkatkan kepatuhan, data penangkapan, dan pengelolaan perikanan seperti pelaporan dan pencatatan data yang konsisten dan terstandarisasi antara lembaga-lembaga di Australia dan Indonesia, serta peningkatan kerja sama mengingat fakta bahwa penangkapan ikan ilegal (berdasarkan data selama 50 tahun terakhir) kemungkinan akan terus terjadi.

Apabila perhatian yang lebih besar diberikan pada dukungan terhadap penghidupan komunitas yang berkelanjutan dan pengaturan sosial-ekonomi, kami meyakini akan ada lebih banyak peluang untuk mengurangi penangkapan ikan ilegal dalam jangka panjang, khususnya bagi beberapa komunitas yang terlibat dalam penelitian ini atau yang memiliki keterkaitan historis dengan wilayah/perjanjian MOU dan pada akhirnya menjawab sebagian kerentanan yang melekat pada penghidupan komunitas-komunitas ‘sangat rentan’ di Nusa Tenggara Timur dan wilayah sekitarnya.

3 Background

Both Australia and Indonesia have identified the need to address high levels of illegal Indonesian small-scale fishing occurring in the Australian Fishing Zone (AFZ) since the start of the COVID-19 pandemic in 2020. Both governments have also recognised the need to provide long-term solutions to support sustainable livelihoods of rural coastal-fishing communities in eastern Indonesia. However, how best to achieve enduring solutions is not considered to be easy or straightforward.

This small research and development activity (SRA) project was initiated by ACIAR at the request of Australian Fisheries Management Authority (AFMA) in 2021 to provide insights for the Australian and Indonesian governments to better understand the recent resurgence of illegal fishing incursions and identify long-term solutions. It has been more than a decade since high numbers of Indonesian boats were last engaged in illegal activity inside Australian waters, and there was concern as to what was driving this latest round of activity. Further, at the 22nd Indonesia–Australia Fisheries Surveillance Forum (IASFS) in Darwin, Northern Territory, Australia in October 2022, both the Australian and Indonesian governments agreed to strengthen cooperation to address illegal fishing in their border regions. The areas for cooperation included joint public information campaigns, surveillance and law enforcement, and development of alternative livelihoods for fishers from the Nusa Tenggara Timur (NTT) region of eastern Indonesia. The issue of illegal or transboundary (TBF) (and legal) fishing by small-scale or artisanal fishers from mostly impoverished communities in eastern Indonesia has proved to be an ongoing challenge for both Australia and Indonesia. The issues are longstanding; diverse; complex socially, economically and politically; and subject to significant media attention. While the topic has been the subject of detailed scholarly attention for at least 30 years, it has been some years since any dedicated social research has been conducted into the topic.

This project aimed to address this gap by engaging Australian and Indonesian multidisciplinary social science research teams to explore the numerous drivers and conditions that have led to the recent increase in illegal activity in Australian waters, identify potential livelihood improvements for selected communities, and build research capacity and knowledge around the topic. The province of NTT and islands of Rote and West Timor – where many of the fishers originate from, or use as a base camp for fishing activities into the AFZ – is ranked as one of the poorest provinces in Indonesia (Robins et al. 2020). Although much has been documented about the demographic characteristics and broad livelihood practices of fisher communities engaged in illegal and legal fishing in the AFZ, there remains a need to situate this knowledge in the shifting environmental, legal and economic context which produces this fluctuation in illegal fishing trends and to explain recent developments. This project builds on existing literature through field-based research (conducted mostly during 2023) to ask why and how incursions are re-emerging and changing, in the context of local livelihoods and drivers.

The knowledge contribution of this project is to produce evidence for viable community development and policy alternatives to the enforcement of Australia's borders. It is anticipated this knowledge will be used to support actions arising from discussions on livelihood improvements for fishing communities, which could consequently reduce numbers of future illegal fishing incursions. Livelihood sustainability and wellbeing should also be a long-term outcome of any future research. Potential long-term outcomes will be supported by the readiness of the Australian and Indonesian governments to support a livelihood-development program for affected communities in NTT Province or elsewhere.

Support for the development of sustainable coastal livelihoods is critical in supporting people to move out of poverty, and to achieve broader economic, social and environmental goals. Small-scale fisheries (SSF) make critical contributions to the

livelihoods, food and nutritional security, and wellbeing of individuals and households. Considerable investment has been directed to enhance, diversify and/or develop alternative livelihoods for rural coastal households engaged in SSF in Indonesia (Stacey et al. 2021). However, sustaining current fisheries and marine-based livelihoods, or developing new activities outside traditional or established livelihoods in rural coastal populations, poses significant social, economic and cultural challenges. Although many attempts have been made to develop new or improve livelihoods for coastal communities, the documentation of these initiatives is generally poor – particularly their successes and failures (Stacey et al. 2021). One reason that many projects have failed is due to a poor understanding of the needs, aspirations, capacities and goals of target communities by organisations implementing development projects. Our SRA results present the voices of fishing actors from NTT to gain a deeper understanding. The literature has emphasised the benefits of diversification as a means of achieving increased and livelihood security in SSF contexts (Brugere et al. 2008). However, evidence to support this is also not well documented (Roscher et al. 2022). This research aims to contribute to this issue as well as respond to calls for “encouraging more targeted and deliberate research into livelihood diversification processes and outcomes”, including engaging with social and cultural factors (Roscher et al. 2022, p.922).

4 Objectives

This project explores livelihood expressions of groups of Indonesian fishers operating out of NTT Province in Indonesia. The overarching aim of the project is to identify multiple drivers of illegal (and legal) Indonesian fishing in the AFZ, and opportunities for gendered livelihood improvement to reduce future illegal activity and improve the wellbeing of selected fishing communities in NTT, Indonesia.

The project engages Australian and Indonesian multidisciplinary social science research teams to build capacity and knowledge to: (a) situate illegal and legal fishing activities within a place-based assessment of livelihood trajectories, (b) identify the changing conditions that have led to the recent increase in illegal activity in Australian waters as a viable livelihood pathway in response to numerous drivers, and (c) present an analysis of the research and evaluate opportunities for addressing behavioural drivers in the context of future livelihood interventions.

The project objectives are to:

- Review past research reports and government data on fisher activity, apprehensions, and prosecutions (2002–23) to identify trends in illegal and legal fishing in the AFZ.
- Identify and contract an Indonesia research team and partners to co-design[4] a research approach and participatory methodology, engage in training and undertake field research in selected sites with an Australian research team.
- Define direct and indirect drivers and behavioural contextual factors of illegal fishing (e.g. social, cultural, economic, policy, environmental) within the context of current gendered household livelihoods and recent disruptions (e.g. changed patron–client relations, economic impacts of COVID-19, resource scarcity in Indonesia, fisheries compliance, and enforcement policy).
- Present an analysis of research and evaluate opportunities for addressing behavioural drivers, livelihood improvements and their likelihood of success in reducing illegal fishing in selected NTT communities (e.g. household identified livelihoods improvements, fisheries management policy, micro-financing) to inform future interventions.
- Engage with key Australian and Indonesia government agencies, NGOs and other stakeholders on research results and potential interventions to reduce illegal fishing in key communities.

The project objectives were intended to be achieved through a phased set of research activities (see Table 1) commencing in March 2023 and ending in late 2024. A no-cost extension to the project was granted by ACIAR to the end of February 2025. Refer to section 6 for actual activities and outputs completed for each objective.

Table 1. Proposed project activities and deliverables from SRA proposal

Activity	Deliverable
Phase 1 (6–8 months) March–October 2023	
Review AFMA and other relevant Indonesian and Australia government data, reports and publications on illegal fishing/apprehensions since 2002 to inform research design, methods and field sites	Document summarising information and data available

[4] A list of key questions guiding the research design and findings was presented in the SRA proposal, and reviewed and revised during the research-design stage. A final list of questions was developed (see the methodology section).

Activity	Deliverable
Recruit Australian and Indonesian research teams and partners; and secure agreements, contracts and start-up meetings	Subcontracts in place
Establish linkages with current initiatives in the region related to supporting fishery livelihoods in NTT (e.g. Arafura Timor Seas Ecosystem Action (ATSEA) 2 Project in Rote Ndao) Establish Australian and Indonesia communication updates for stakeholder engagement	Key stakeholders identified Project stakeholder communication and engagement plan created
Do a rapid review of past research/information on illegal/legal fishing and past livelihood programs in affected communities	Summary review document on livelihood learnings/approaches written, and information gathered to inform selection of sites and methods
Co-design preliminary research design and approach with Australian and Indonesian lead partners/research teams and preliminary fieldwork plan and budget Submit CDU human ethics application, prepare updated community engagement and communication plan, and prepare data management plans	Workshop report written Methods drafted Work plans and budget created Communications and engagement and data management plans updated Ethics approval obtained Summary progress report 1 on findings and approach submitted
Phase 2 (4–6 months) (October–March 2024)	
Use workshops (online, in person) with research teams to test and finalise research methods; identify locations for field research; conduct training on research ethics and consent, obtain local approvals for data collection	Workshop report written Finalise data collection, analysis methods, and fieldwork plan and budget
Conduct data collection with key communities (2–3 months); analysis and write-up of draft results with research team	Draft progress report 2 on approach, research findings and future intervention options to enhance livelihoods of coastal communities (literature review, fishers and families identified)
Return to target communities to validate information and undertake further consultations (as required) on potential opportunities for innovative livelihood options in select communities	Field trip report on consultations submitted Updates to draft progress report 2 written
Phase 3 (4–6 months) (March–September 2024)	
Concept note for Future Livelihoods Project drafted for discussion with stakeholders	Concept note drafted
Final report drafted and finalised with recommendations	Final report finalised Final ethics report written
Other research outputs prepared and communicated to key government, community, and other stakeholders through various methods	Emails, meetings, workshops, information sheet summaries in English and Indonesian sent to key stakeholders Journal article drafted and submitted on drivers of fishing and livelihood vulnerabilities

Definitions

We recognise fishers have different views on illegality (Stacey 2007) but for this report, in line with the project's objectives and to provide clarity throughout the document, we use the following terms.

We use the term 'illegal fishing' to refer to fishing-related behaviour or activity deemed illegal and against the rules, laws and regulations governing maritime activity in Australian waters. Indonesian activity inside the AFZ (Australian Government waters from 3–200 NM) can include actions that are not permitted under the 1974 and 1989 Memorandum of Understanding (MOU) agreements between Indonesia and Australia or are considered illegal under the *Australian Government's Fisheries Management Act* (1991) (Fisheries Act 1991) or the *Australian Government's Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (e.g. relating to Ashmore Reef and Cartier Island marine parks) or other state- or territory-related biodiversity offences. Illegal fishing generally covers fishing activity in an area of the AFZ using motorised boats without a licence or harvesting protected species. In this report, we often use the term 'noncompliant' to refer to illegal activity.

The term 'legal fishing' is generally used concerning fishing activity consistent with the MOU 1989 arrangements (such as the use of sail-powered vessels and fishing only in permitted areas as per the agreement).

'Transboundary fishing' or 'transboundary activity' is used more broadly to refer to the actions or activities of fishers who travel across the maritime border between Australia and Indonesia to engage in fishing, whether it be deemed legal or illegal. There are two boundaries: the northern seabed boundary (continental shelf), and the fisheries boundary (Exclusive Economic Zone 12–200 NM) covering seabed and water column (see Figure 3).

See also Appendix 9: Glossary.

5 Methodology

5.1 Overview of the research approach and study design

Project objectives were achieved through a phased set of research activities (Figure 1) commencing in March 2023, and ending in late 2024. The study adopted a co-designed mixed methods methodology, where we:

- conducted literature reviews on behavioural aspects of noncompliance in fisheries
- reviewed studies on Indonesian fishing in Australian waters
- reviewed past livelihood programs in affected communities and potential intervention options to enhance livelihoods of coastal communities
- collated illegal fishing data and information from media reports and AFMA supplied
- applied social research methods and data collection focusing on behavioural factors as drivers of illegal activity and livelihood decision-making.

Two main data-collection trips focused on a range of fishing actors in selected villages in West Timor and Rote Islands using focus group discussions (FGDs), small group interviews (SGIs), and key informant interviews (KIIs). We also conducted community visits to share and generate feedback on the results (in October 2024).

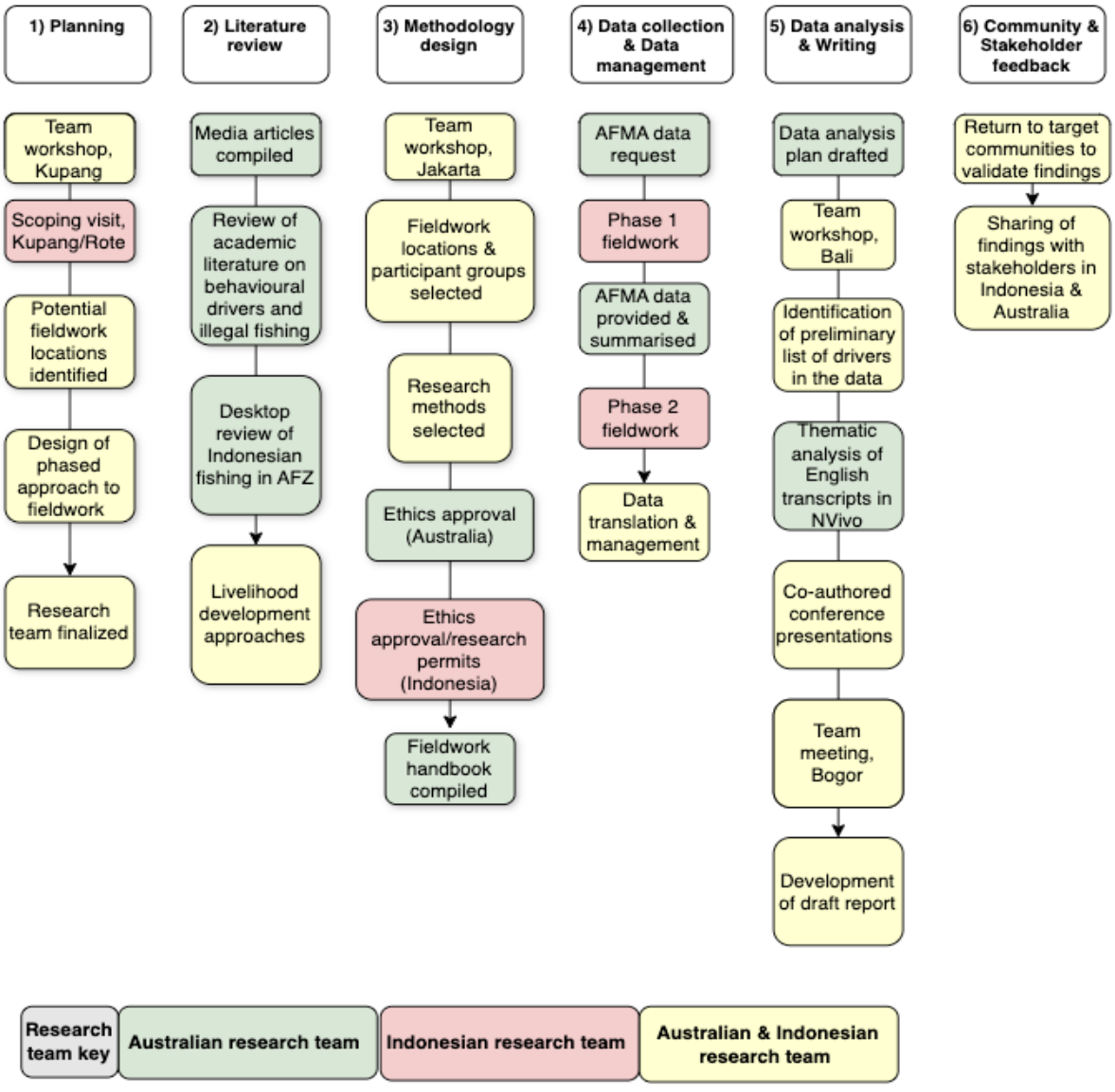

Figure 1. Research phases and activities process map

5.1.1 Research partnership and team

The Australian lead researcher (Stacey) and Indonesian lead co-researcher (Adhuri) established the project research teams in March 2023. For establishing the Indonesian team, we drew on existing networks and relationships between Charles Darwin University (CDU), Badan Riset dan Inovasi Nasional (BRIN, Indonesia's National Research and Innovation Agency), and Nusa Cendana University. The research teams (Table 2) comprised a research leader for both countries (Adhuri and Stacey), an Indonesian gender and social inclusion expert (Fitriana), 2 teams of between 2 and 4 researchers from an Indonesian partner agency – Nusa Cendana University in Kupang (Ninef, Nalle and Lasmi) – with skills in qualitative social research methods and community development in the context of coastal livelihoods. An Indonesian field-research logistical support person (Safitri) was also recruited to support the fieldwork given the remote locations where some research activity occurred. Once the teams were assembled, a collaborative co-design process took place to refine and finalise the broad project methodology outlined in the SRA proposal.

Table 2. The Indonesia and Australia research teams

Indonesia	Team member	Role
	Dr Dedi Supriadi Adhuri (BRIN)	Team leader, co-lead researcher
	Dr Ria Fitriana (consultant)	Gender, fisheries and value chain expert
	Dr Achmad Zamroni (BRIN)	Research associate
	Mr Jotham Ninef (Universitas Nusa Cendana/UNDANA)	Fisheries and community engagement researcher
	Mrs Lasmi (UNDANA)	Casual research associate
	Mr Tegar V. Nalle (UNDANA)	Casual research associate
	Mrs Widya Safitri (BRIN)	Research assistant
Australia	Prof. Natasha Stacey (CDU)	Project leader, team leader
	Dr Kylie McKenna (CDU)	Research associate

Members of the Indonesian and Australian teams during the data-analysis workshop in January 2024. L to R: Dr Achmad Zamroni (BRIN), Mr Jotham Ninef (UNDANA), Dr Dedi Adhuri (BRIN), Prof Natasha Stacey (CDU), Ms Widya Safitri (BRIN), Dr Ria Fitriana (consultant), Dr Kylie McKenna (CDU), Mr Tegar Nalle (UNDANA). (Mrs Lasmi from UNDANA was not present.)

Members of the Indonesian and Australian teams during the field trip in October 2023. Back L to R: Mr Jotham Ninef, Dr Kylie McKenna, Dr Ria Fitriana, Dr Achmad. Front L to R: Dr Zamroni, Mrs Lasmi, Ms Widya Safitri, Mr Tegar Nalle, Dr Dedi Adhuri.

5.2 Conceptualising drivers of transboundary Indonesian fishing

To develop the conceptual framework for theorising the drivers of transboundary SSF from Indonesia, the research teams first began by exploring existing behavioural science approaches to illegal fishing (as discussed in section 7.4), as well as broader behavioural change frameworks not specifically focused on fisheries. To help balance the focus on individual motives while recognising the contextual 'enablers' of Indonesian fishing, the study adopts the conceptual framework of Oyanedel et al. (2020) which distinguishes between two main approaches to the study of noncompliance in SSF: 'actor-based' and 'opportunity-based'.

Firstly, actor-based approaches "address the underlying motivations for people to comply or not with regulations" (Oyanedel et al. 2020, p.1120). Drawing primarily on economic, behavioural and psychological theories, these approaches aim to identify the complexity of factors influencing noncompliance. In this report, we refer to these factors as 'drivers', as they refer to the *underlying motivations driving behaviour.*

Opportunity-based approaches, in contrast, "assume that non-compliance is not distributed randomly across space and time and focuses on the role that the immediate environment plays in the performance of non-compliant behaviours" (Oyanedel et al. 2020, p.1120). Informed by criminological literature, these approaches see noncompliance mainly as a product of opportunity rather than underlying motivation. In this project, we use the term 'opportunities' to refer to *enablers that create opportunities for noncompliance*.

In combining these two approaches, we frame noncompliance in this report "as the interaction of a motivated actor and an opportunity" (Oyanedel et al. 2020, p.1121). As Oyanedel et al. (2020, p.1122) write, however, we recognise that the line dividing the two may at times blur:

> For instance, actor-based approaches may (unintentionally) place the "burden" on the individual fisher – whilst opportunity-based approaches seek to understand how situations create opportunities for noncompliance. Combining these approaches, therefore, can enable researchers to better understand noncompliance, by tackling both the individual theoretical drivers of behaviour and the situations that, in practice, bring opportunities for noncompliance in small-scale fisheries contexts.

One framework the teams found particularly useful to identify underlying motivations driving TBF is the Behavioural Drivers Model (BDM) (Petit 2019) which emerges from an attempt to answer the question, "Why do people do what they do?" (Petit 2019, p.6) Drawing on an analysis of 25 existing decision-making and behavioural theories and frameworks, the BDM incorporates three main categories that classify human behaviour. Referred to as the 'Level 1' or "higher-level or main drivers" (Petit 2019, p.19), these include:

- psychology, individual cognitive and emotional drivers (e.g. seeing others return with big catches to home villages)
- sociology, for determinants related to interactions within families, communities, groups and society at large (e.g. individual characteristics e.g. young, unmarried, no children, at a transition time in life)
- environment, for structural elements such as institutions, policies, systems and services, infrastructures and information (Petit 2019, p.19).

Beneath these Level 1 drivers, the BDM lists a larger number of 'Level-2 dimensions', whereby "each driver category is unpacked into the several dimensions of which it [is] composed" (Petit 2019, p.19). For example, the Level 1 driver 'psychology' is comprised

of 7 dimensions in the BDM. In conducting our study on the behavioural drivers of transboundary Indonesian SSF, the research teams have similarly identified 'Level 1 drivers' and 'Level 2 dimensions' that appear to inform us about illegal activity in the AFZ.

During the co-design activities in July 2023 prior to commencing fieldwork, we developed a list of Level 1 drivers which includes the same three main factors comprising the BDM above (see Appendix 1: Phase 1 Fieldwork Handbook (August 2023) for the project).[5] We also made several additions in consultation with the literature on behaviour change and existing knowledge of some authors – informed by our long-term fieldwork and research experience about Indonesian TBF, and prior research (e.g. Stacey 2007; Adhuri and Visser 2007). The final Level 1 drivers of Indonesian fishing, which emerged during data analysis, are presented in Figure 2.

5.2.1 Planning, co-design and collaborative activities

A co-design process took place with the teams to refine and finalise the broad project methodology outlined in the SRA proposal. The study design and subsequent finalisation of data collection and analysis focused on a set of higher-level research questions (developed in the SRA proposal) which were refined during phase 1 (March to August 2023). Appendix 1 provides the key project research questions, topics, methods, sources of information, and research instruments.

A key emphasis of the project was co-designing the research instruments and Indonesian research team leadership of the data collection in selected villages in Indonesia. This includes collaboration on the development of tools to guide the FGDs, SGIs and KIIs, drawing on the conceptual framework and identification of the broad topics and questions each of these activities was seeking to answer. The Australian team did not participate directly in any field data collection (as per ACIAR requirement), instead supporting the design of research instruments, data management, analysis and write-up of the final report. One Australian team member did, however, attend part of field trip 2 activities to observe, and both members attended the community feedback meetings in the target villages in 2024.

This approach throughout the project duration resulted in a highly collaborative project, exchanging skills and knowledge via fortnightly online team meetings, sharing documents and drafts during the project, and attending a series of face-to-face meetings/workshops held in Indonesia. All members of the Indonesian research team have a high level of English language skills. Only one member of the Australian team had conversational Indonesian. During team interactions, communication was mostly conducted in English, and the Indonesian team communicated and held discussions in Indonesian.

During the project, the following workshops and meetings were held to finalise the methodology, data collection, analysis and write-up of the results and final report:

- 3-day research planning workshop in Kupang and informal scoping visit to Rote Island (April 2023). Indonesian research team members met with Indonesian government officers and community representatives during this visit. This scoping visit informed the choice of fieldwork locations (see Appendix 7), the design of a phased approach to the field research, and initial identification of data collection topics across a range of actors and fieldwork/travel budgeting.
- 5-day research methodology workshop in Jakarta (July 2023), during which the teams further developed the co-designed methodology focusing on addressing the research questions, identifying drivers and livelihood assessments, and field research instruments to engage diverse groups in targeted NTT communities.

[5] Our framework uses the term 'environmental' as relating to conditions in the physical environment, rather than the broader context in which people live, as per the Behavioural Drivers Model (Petit 2019, p.23).

These research instruments were compiled in a fieldwork handbook (Appendix 1) containing guidance on facilitation of each data-collection activity and method.

- 5-day data analysis workshop in Bali, during which the teams collated and organised all translated transcripts of FGDs, SGIs and KIIs; developed a data analysis plan; and identified preliminary themes and reflection on capacity building and collaboration (January 2024).
- 5-day writing workshop in Bogor (June 2024) during which the teams focused on refining the results of the fieldwork research; cross-checking the translations of transcripts from FGDs, SGIs and KIIs; and ensuring we covered any observations of the Indonesian research team members during their fieldwork that were not captured in the transcribed data.
- 1-day team meeting in Rote Island (October 2024) to discuss final findings and recommendations.

5.2.2 Ethical consent and permits

Ethical clearance for the research activities was obtained in both Australia and Indonesia, via the Charles Darwin University Human Research Ethics Committee (approval number: H23055) and the Ethics Committee on Social Studies and Humanities National Research and Innovation Agency, Indonesia (approval number: 505 /KE.01/SK/07/2023).

5.2.3 AFMA fishing data

The Australian research component activities included a data request submitted to the AFMA in May 2023 regarding the numbers of illegal fishing apprehensions – including legislative forfeitures at sea and prosecutions for the period 2012–23; reports on special operations such as Operation Jawline patrols; actions taken at sea to combat illegal fishing; or education and awareness campaigns in Indonesia. We had initially hoped the data would be provided before commencing data collection in Indonesia to assist with the finalisation of study locations; however, data was not provided until September 2023 (and court file information in February 2024) as per an information disclosure Deed of Confidentiality between CDU and AFMA. Site selection was thus based on the research team's prior knowledge and current information on illegal fishing activity as reported through the media. We were also not aware of any public information campaigns (PICs) that were held in Indonesia during our phase 2 data collection activity.[6] We subsequently found out through the staff at the Australian Embassy in Jakarta of a PIC held on 27 June in Kupang. This would have been a good opportunity to observe a PIC session.

Information supplied by AFMA as per our data request included the following:

- total boat apprehensions (1999–2023) (including total apprehensions by boat type[7] from 2012 to 2023) (and specific data on apprehensions and legislative forfeiture from 13 August 2020 to 21 May 2023)
- legislative forfeiture numbers (2020–23) (by location, boat type, fishing gear, target catch, adult/juveniles on board boats, and number of boat disposals from 2021–23 at sea or under tow)

[6] *Australia-Indonesia Partnership Shares Dangers of Illegal Fishing* https://www.afma.gov.au/news/australia-indonesia-partnership-shares-dangers-illegal-fishing

[7] Boat type here refers to a form of categorisation used by Australian authorities. There are three main categories: Type 1 *perahu* are those with a traditional lateen rig such as *lete-lete*, sailed by the Madurese; Type 2 *perahu* are those with a western sailing rig, most commonly *lambo*; and Type 3 *perahu* are motorised, either with a sail and auxiliary motor (*perahu motor layar*), or with a motor only (*perahu motor*) (Stacey 2007).

- legislative forfeitures (2020–23) regarding location of incursion and boarding, vessel name and home port of vessel, catch, gear, on board or forfeited, and status of vessel (e.g. disposed, directed to leave AFZ or other) (the AFMA data covers 13 August 2020 – 7 June 2023).

We also intended to interview AFMA or Australian Border Force staff who play a role in illegal fishing surveillance, apprehension and prosecution, and education activities about broad trends they have observed in recent illegal fishing incursions. Access to AFMA staff, however, was declined and AFMA instead suggested we submit a written list of questions for consideration by AFMA, which we did not pursue. We provided updates to AFMA throughout the project.

5.2.4 Data collection and participants

Fishers who engage in illegal activity in the AFZ originate from many different islands and ethnic groups from Indonesia. These include Rotenese (Rote Island), Butonese (South-East Sulawesi, Rote and Timor), Madurese (East Java), Alorese and Pantarese (Alor and Pantar Islands), Timorese (West Timor), Sama-Bajo (Sulawesi and NTT provinces). There are also specific connections between groups from certain villages such as between Pepela in Rote and Mola in South-East Sulawesi. The Oelaba-Pantar/Alor fishers are almost entirely from Blagar. The Pepela–Pantar/Alor fishers are mainly Baranusa. Some villages in the islands of Rote and Timor act as staging posts or base villages from which some fishers launch from. Different groups access different products such as sea cucumber, reef fish and sharks, and use different technology and boats. A summary of engagement in TBF pre-, during and post-COVID-19 (see section 7.2) was compiled during a scoping visit in April 2023 to selected communities (Oesapa in Kupang, West Timor; Tanjung Pasir and Pepela, Hundihuk and Oelaba villages in Rote Ndao).

The community sampling strategy of this study gave attention to inherent cultural, geographic, ethnic and historical differences between a wide group of locations of fishers active in the AFZ over time. Given the time and resource limitations, but with known legal and illegal fishing occurring out of communities in Kupang, West Timor and Pepela/Tanjung Pasir in Rote Island we selected the following four main locations for fieldwork by the Indonesian research team:

- Oesapa (Kupang), West Timor
- Pepela, Rote Island
- Tanjung Pasir (Pepela), Rote Island
- Oelaba (Oelua), Rote Island.

More information on the locations, basic demographic data and broad livelihoods is provided in the results. These communities were chosen because each represents different types of engagement in TBF. For example, Oesapa was chosen because of their use of compressors for diving and motorised boats to fish in the border area. Pepela was chosen because of the strong traditional claims people there have to the AFZ, particularly in the area where fishing is permitted as per the 1974 MOU agreement. Tanjung Pasir is a special settlement established by the Bajo from Wakatobi specifically to engage in TBF. Oelaba was selected due to the high compliance of fishers departing this location fishing in the MOU box. Oelaba is also unique due to the involvement of fishers from Pantar and Pura. We visited Oenggai village in Rote Island during fieldwork trip 2 because of team knowledge of fisher involvement in illegal TBF during COVID-19. We made a brief visit to the Oelibu hamlet in Oenggai and held an FGD. Two informal visits were also made to Tablolong in West Timor, but no formal data-collection activities were held. Most of those engaged in TBF from Rote/West Timor are “immigrants” from elsewhere in eastern Indonesia. As these fishers have limited access to land-based resources, their livelihoods are mostly based on marine resources.

As the methodological aim of this study was to capture the perspectives and experiences of a diversity of people and groups involved in legal and illegal fishing, rather than a specific percentage of the population, a range of participant groups were identified for inclusion in research activities:

- crew (men) (including young, single and married men)
- boat captains (men)
- boat owners (men/women)
- women (household members/wives/widows of the above categories)
- seafood traders and collectors (men/women)
- moneylenders and kiosk owners (men/women)
- village elders and leaders (men/women).

To recruit participants, the Indonesian research team collaborated with three fisheries extension workers (from the Ministry of Marine Affairs and Fisheries, or MMAF) in Oesapa, Pepela and Oelaba responsible for engaging with villages in the four communities (it is common for extension workers to be responsible for multiple locations). The Indonesian research team provided the fisheries extension workers and the head of each village (in all areas except Oesapa) a list of selection criteria (e.g. engagement in TBF, apprehended or jailed, women whose family members are involved in TBF) and then identified potential informants. We then asked the extension worker and the head of the village to invite those identified to participate in an FGD, SGI or KII.

Each FGD, SGI and KII was targeted at a particular group of actors (e.g. boat owners and captains, crew, women, etc.). This was intended to capture the drivers according to the specific functions people play in the TBF actor network. Participants were also segregated into specific groupings to minimise the risk of unbalanced power relations among the actors and their potential to marginalise or undermine powerless actors (e.g. crew in the presence of bosses).

Due to ethical sensitivities, we did not request participants to disclose any detailed information regarding illegal activity such as details on where actual crimes may have been committed (under Australian law). This was emphasised at the consent phase of each fieldwork activity, and participants were asked not to disclose any specific information regarding illegal activity in Australian waters where this was not publicly available information. If a participant or respondent did inadvertently disclose information specifically relating to unprosecuted crimes, this information was not documented by the research team, nor included in our raw data or written research results. Data on broad-level drivers of noncompliant behaviour were carefully assessed and are presented in this report at a cluster or generic level to ensure participant protection.

While men usually crew Indonesian fishing vessels, this project attempted to be more gender inclusive than past research into the topic of illegal fishing by incorporating women's perspectives on the drivers of and risks to their husbands and children associated with TBF. We refer to gender as "the social attributes, roles, activities, and responsibilities which are associated with being men and women in a particular community at a given time. These are determined by social norms, power, and institutions. There are a wide variety of gender identities between and beyond the binary of men and women" (cited in House et al. 2023, p.301). The research questions contained gender-disaggregated questions, as perceptions of risk and reward were anticipated to differ between men and women. Past research on illegal fishing has generally not considered the perspectives of women. Research participants in key village locations included a range of fishers (based on location/target species/equipment/boat used) and their families (wives and other women members of fisher households) and fisheries value chain actors. Several individuals interviewed in this research have been previously detained for their involvement in illegal fishing, while others have experienced the

destruction of their boats at sea, confiscation of fishing gear and catch at sea, transfer to another boat at sea and ordered home, prosecution process through Darwin or other locations and held in immigration detention, time in jail, repatriation to Indonesia – or have never been caught.

In total, 211 people participated in data-collection activities in West Timor/Rote Island, comprising 153 men and 57 women (the gender of one participant was not recorded). By village location, the sample (based on information as recorded by the Indonesian research team in participant registers) is summarised below.

- **Pepela:** 55 people participated in fieldwork activities in Pepela, comprised of 43 men and 12 women. The youngest participant recorded was 20 years old, and the eldest was 68. The most represented participant groups in the Pepela data are crew (13) and women (12), followed by captains (8) and leaders/elderly (8). Alor (12) or Rote (11) ranked as the most common places of origin/ethnic affiliation among Pepela participants. Regarding boat type, most respondents in Pepela said their household had access to a *bodi* (21), or both a *bodi* and *lambo* (11). Ten respondents said they had access to a *lambo* only.
- **Tanjung-Pasir:** 47 people participated in fieldwork activities in Tanjung, comprised of 30 men and 17 women. The youngest participant recorded was 22 years old, and the eldest was 58 (however, the research team did not record the ages of all participants in Tanjung). The most represented participant groups in the Tanjung data are crew (12) and women (12),[8] followed by captains (9) and boat owners (6). Most participants in Tanjung recorded Bajo (21) or Bajo Wanci (10) as their place of origin/ethnic affiliation. Regarding boat type, most respondents in Tanjung said their household had access to a *bodi* (18) or *bodi jolor* (7).
- **Oelaba**: 63 people participated in fieldwork activities in Oelaba, comprised of 45 men and 18 women. The youngest participant recorded was 29 years old, and the eldest was 74 (however, the research team did not record the ages of all participants in Oelaba). The most represented participant groups in the Oelaba data are women (19) and crew (15), followed by captains (8). Most participants in Oelaba recorded Alor (22) or Rote (12) as their place of origin/ethnic affiliation. Most respondents in Oelaba said their household had access to a *lambo* (33).
- **Oesapa (Kupang):** 46 people participated in fieldwork activities in Oesapa, comprised of 35 men and 10 women (and one person's gender was not recorded). The youngest participant recorded was 24 years old, and the eldest was 64 (however, the research team did not record the ages of all participants in Oesapa). The most represented participant groups in the Oesapa data are crew (17) and women (10). Most participants in Oesapa recorded Bugis (8), Rote (5) or Alor (5) as their place of origin/ethnic affiliation. Regarding boat type, most respondents in Oesapa said their household had access to a *bodi* (40).

The table below summarises the dot points above.

Participants	Age	Role	Access to boat/s
Pepela			
55; 43 men, 12 women	20–68	13 crew, 12 women, 8 captains, 8 leaders/elderly	21 *bodi*, 11 *bodi* and *lambo*, 10 *lambo* only
Tanjung-Pasir			
47; 30 men, 17 women	22–58	12 crew, 12 women, 9 captains, 6 owners	18 *bodi*, 7 *bodi jalor*
Oelaba			
63; 45 men, 18 women	29–74	15 crew, 19 women, 8 captains	33 *lambo*
Oesapa (Kupang)			
46; 35 men, 10 women, 1 no data	24–64	17 crew, 10 women	40 *bodi*

[8] Another 5 participants were women, but they were indicated as representatives of the "trader, collector and moneylender" participant category.

The Indonesian research team facilitated the FGD, SGI and KII activities during two periods of fieldwork, with trip 1 conducted 5–21 August 2023 and trip 2 conducted 1–10 October 2023. To safeguard participants' confidentiality while also providing readers of this report with an indication of the location, role and gender of the source of each piece of information, each participant was assigned a unique and abbreviated identifier. For example:

- An FGD held in Fieldwork Trip 1 with Crew in Oesapa is indicated with (FGD1_Oes_Crew).
- An SGI held in Fieldwork Trip 2 with Captains and Crew in Oelaba is indicated with (SGI2_Oel_Captain& Crew).
- A KII held in Fieldwork Trip 1 with a Captain in Pepela is indicated with (KII1_Pep_Captain1).

Focus group discussions

The research team conducted 12 FGDs involving 120 participants across 5 village locations targeting fisher crew, boat owners and captains, and women. Each FGD comprised 5–15 participants and lasted up to 2 hours (see Appendix 1 for the discussion guide).

While the objectives for each FGD differed slightly according to the participant group, the common aims were to:

- understand the broad livelihood activities of groups engaged in TBF
- develop a timeline of changes and trends in TBF activity since 2000
- understand the recent (2020–23) and diverse drivers of TBF since the COVID-19 pandemic
- identify the gendered impacts of fishing apprehensions on families/households and their coping strategies
- identify women's perspectives about opportunities for improving the outcomes of existing livelihoods and activities.

Small group interviews

In total, the research team conducted 6 SGIs involving 31 participants across 4 village locations with seafood traders, collectors, and village elders and leaders. On one occasion, a KII involving more than one person was conducted in Oelaba, and is therefore listed here as an SGI. The SGIs aimed to identify perspectives on TBF activity, the market and value chain of target species, and community TBF livelihood impacts and opportunities.

Key informant interviews

The data also includes 60 one-to-one KIIs with participants across all fishers, boat owners, captains and women group categories in the 4 targeted village locations. KIIs lasted for up to 2 hours.

5.2.5 Language

The research instruments, information and consent forms were translated into the national language, Bahasa Indonesia, from English by Indonesian team members. A clear explanation of the research was given to gain consent, and nontechnical language was used for the information and consent forms (see Appendix 1 for information flyers and consent forms used). All data was collected in Bahasa Indonesia and translated into English by qualified translators in Kupang funded by the project. Research result summaries were prepared in both English and Bahasa Indonesia (see Appendix 4).

5.2.6 Data management and analysis

All recordings and transcriptions from the FGDs, SGIs and KIIs were translated and uploaded to Google Drive. To protect the anonymity of participants, each file was attributed with an identifying code (e.g. KII1_Pep_Captain1).

Data analysis for this project commenced with a 5-day workshop in Bali facilitated by the Australian research team members. During this workshop, the teams developed an initial coding framework for analysing the following key results:

- drivers of illegal Indonesian fishing
- opportunities that enable illegal Indonesian fishing
- risks from engaging in illegal fishing
- decision-making on risks of engaging in illegal fishing
- impacts of apprehensions on livelihoods
- perspectives on government policy (about Indonesian and Australian fisheries management)
- development and livelihood opportunities; specifically, recommendations and past project experiences to improve livelihood conditions.

During the workshop, the research teams compiled an initial list of drivers and brainstormed the key findings of the project. The English translations of the data were then analysed (in Australia) using NVivo software by a member of the Australian research team who shared and discussed the preliminary results with the Indonesian research team.

To analyse the FGD, SGI and KII data, the teams followed the four basic steps of thematic data analysis outlined by Green et al. (2007): data immersion, coding, creating categories and identifying themes. This was achieved by analysing written transcriptions translated into English using NVivo software, then cross checking against the Bahasa Indonesia transcripts through research team meetings online and a face-to-face 5-day writing workshop in Bogor. We further developed the results through online collaboration and joint delivery of conference presentations.

The seven Level 1 drivers (Figure 2) and 29 Level 2 dimensions (see Figure 21) emerged inductively from the fieldwork data and were named to accurately reflect the language used by participants in FGDs, KIIs and SGIs (see Appendix 2). We have also included any drivers previously identified from past studies and reports to supplement this data, and provide a comprehensive set of results.

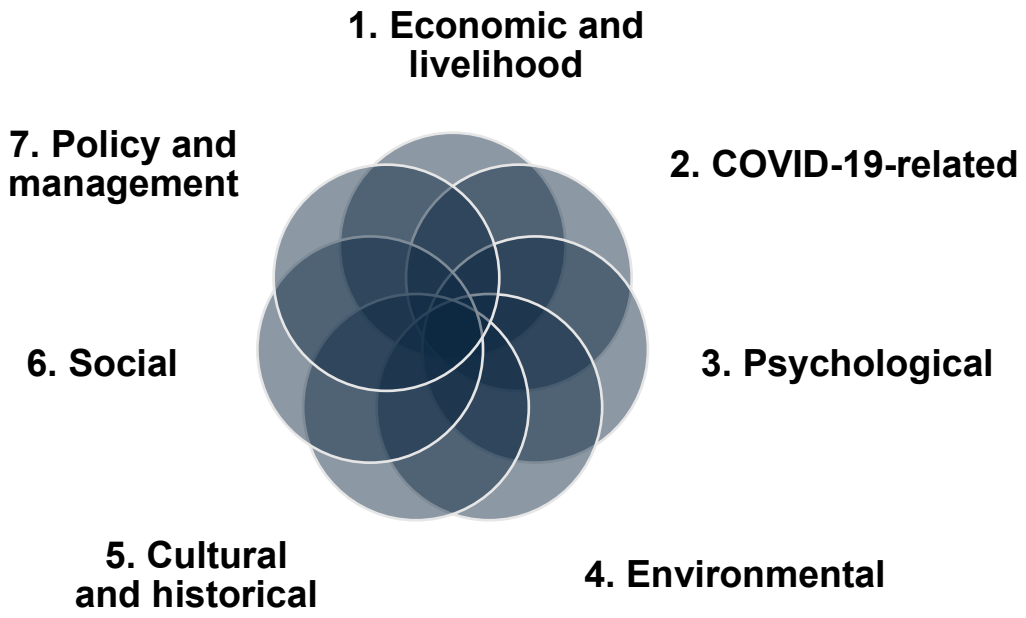

Figure 2. Level 1 drivers of Indonesian fishing which emerged during data analysis (adapted from Petit 2019)

It is important to note that although the results identify different kinds of drivers, each is interrelated, and they work together to inform human behaviour within a wider opportunity context. The research teams considered the possibility of 'weighting' the importance of these different drivers. However, we concluded that the importance of a particular driver is likely to change over time. Moreover, even in instances where a driver may appear very important, it is not necessarily a sufficient explanation in isolation. For example, during the COVID-19 pandemic, economic hardship among fishing communities increased, but financial difficulties alone are not sufficient to explain the resurgence of illegal fishing, which was more likely prompted by a combination of financial hardship and the (re)discovery of new fishing grounds abundant in trepang. Another example is the compliance of fishers in Oelaba who might be driven by the same economic and livelihood factors as fishers in Pepela, but their assessment of the risks involved in getting caught and losing their boats appeared to outweigh these economic incentives (FGD1_Oel_BoatOwners&Captains).

5.2.7 Community and stakeholder feedback

Following preparation of draft results, the Australian and Indonesian teams returned to the 4 target communities in Kupang, West Timor, and Rote Island between 30 September 2024 to 5 October 2024 to share results with research participants and other government stakeholders. The aim of the visit was to validate information and invite further discussions on potential strategies for addressing TBF and potential livelihood improvements in communities. Workshops were organised with assistance from the Secretary of the NTT Provincial Marine and Fisheries Office, a staff member of the Rote Ndao Marine Affairs and Fisheries Department office, and extension workers. The activities were conducted in four locations: Oesapa (CFB1_Oes) (held in government Fisheries Office in Kupang), Oelaba (CFB1_Oel), Pepela (CFB1_Pep) and Tanjung Pasir (CBF1_Tan).

Attendees – selected by head of villages as requested by Rote Ndao fisheries staff – represented a selection of the people who had participated in phase 1 and 2 fieldwork FGD, SGIs and KIIs. A 5-page summary document of the results was prepared in English and Bahasa Indonesia (Appendix 3 and Appendix 4), and shared with each attendee (see

Appendix 5 for participant information). The workshop discussions were led by the Indonesian research leader, who provided a summary of our findings (based on a Bahasa Indonesia summary document) and opened the floor to invite discussion and comment from research participants, community and government representatives. One notable observation was that in all locations attendees noted how unusual it was for researchers to return to communities to share results and greatly appreciated the visit.

Following finalisation of this report in early 2025 the results will be shared with numerous stakeholders including Australian and Indonesian governments in various ways (see Communication and dissemination activities).

5.3 Limitations

Some of the limitations we experienced in our research are listed below.

- In some instances, due to ethical issues around illegal behaviour, we were not able to undertake deep discussions with key informants.
- In some interviews, it was not always easy or obvious to differentiate whether people were talking about TBF or about illegal fishing, and part of that relates to the need for ethical sensitivity in discussing this topic.
- It was difficult to meet with and interview seafood traders and bosses, and identify more drivers associated with the value chain and patron–client relations due to sensitivities around illegal fisheries and trade.
- It was also difficult to obtain accurate information on income by gender from different livelihood activities, such as income from illegal fishing or because of difficulty confirming the location of harvested trepang in Australian or Indonesian waters. However, informal conversations with fishers revealed extremely high earnings of some crew from successful voyages.
- Some of the actors engaged in illegal fishing post-COVID-19 originate from other areas of Indonesia such as the island of Maginti in South-East Sulawesi. While outside of the scope of this project, they and their drivers are certainly important regarding current illegal fishing.
- Gender and social inclusion: While we engaged women in the research, we did not specifically target genders other than women and men due to cultural protocols. We also did not specifically target people living with a disability. We were also not able to go in depth into gendered livelihood improvement options in selected villages due to a range of reasons. However, there is no doubt there are significant needs and vulnerabilities around existing livelihoods that could be addressed to improve the general condition of households – including single woman-headed households – who have been impacted by illegal fishing accidents, prosecutions and debt.
- Due to sensitivities around the topic of illegal fishing, MMAF staff of the Indonesian government were involved in some of the participant recruitment, which was outside of the control of the research team.
- Identifying many Level 1 drivers and associated Level 2 dimensions was a challenging process given the interrelationship between drivers and the influence of the wider enablers or opportunity context.
- We anticipated that we would be able to access more information from AFMA on apprehensions, legislative forfeitures and prosecutions before commencing the field data collection, but this information came after commencement and was generally limited to broad numbers of apprehensions and locations. This meant we

were not able to detect any specific patterns in the data relevant to our research or to inform our sampling.

- Due to the complexity of each target location and the size of local population in each village, it was beyond the scope of the research to obtain more detailed information on livelihood strategies and constraints. However, it was clear that TBF – both legal and illegal – was an essential component of most people's livelihood portfolios. People do also pursue a range of other domestic fishing and associated activities, but are often constrained in terms of their earning capacity and sustainability in a few ways.
- Identifying solutions or strategies to reduce illegal fishing proved quite challenging. This is due to the difficulties people experience in being asked to identify a solution or in imagining alternatives on the spot. Identifying ways to strengthen existing legal maritime livelihood strategies or find new opportunities is a separate program of activity (e.g. Stacey and Govan 2020) outside of the scope of this research. As also documented in our results, people in these study locations have had limited previous engagement in alternative or supplementary livelihood programs.

6 Achievements against activities and outputs/milestones

Objective 6.1: Review past research reports and government data on fisher activity, apprehensions and prosecutions (2002–23) to identify trends in illegal and legal fishing in the AFZ

No.	Activity	Outputs/milestones	Completion date	Comments
1.1	Review of AFMA and other relevant Indonesian and Australia government data on illegal fishing/apprehensions, reports, and publications on illegal/legal fishing since 2002 to inform research design, methods, and field sites and analysis.	Deed of Confidentiality signed between CDU and AFMA Two spreadsheet documents provided by AFMA: *Illegal Indonesian Fishing Apprehensions and Legislative Forfeitures: 13/8/2020-25/5/2023*; *Vessel Disposals* CDU drafted a data summary document, with follow-up questions responded to by AFMA (June and August 2023)	September 2023	Final data summary document shared with AFMA in May 2024 for approval to include basic information on apprehensions over time as background to the project; however, approval not granted
		Additional data request to AFMA for updated data for period July 2023 to end of 2024, and permission to publish basic apprehension data made on 1 May 2024	May 2024	No response from AFMA
1.2		Compilation of media articles from Australian and Indonesian sources	Ongoing – updated throughout project cycle	media articles used to supplement apprehension data results
1.3		EndNote library on past literature and reports on legal and illegal fishing and summary document compiled	June 2024	Summary literature review document included in final report results sections

Objective 6.2: Identify and contract an Indonesian research team and partners to co-design a research approach and participatory methodology, engage in training, and undertake field research in selected sites with an Australian research team

No.	Activity	Outputs/milestones	Completion date	Comments
2.1	Recruit Australian and Indonesian research team and partners; secure agreements, contracts and start-up meetings	Subcontracts in place Letter of Agreement signed between CDU and BRIN Research support staff recruited	May 2023	
2.2	Co-design preliminary research design and approach with Australian and Indonesian lead partners/research team and preliminary fieldwork plan and budget	Team planning meeting and workshop report (includes initial data-collection methods, work plan/budget) (Kupang 11–15 April 2023) Scoping field visit to Rote Island and Kupang communities completed by Indonesian team (14–17 April) Monthly online team meetings commenced, with actions recorded	April 2023 Ongoing throughout project	See Methodology section of report for detailed information
2.3	Submit human ethics applications; prepare updated community engagement and communication plan, and data management plans	Humans ethics applications prepared and approved (CDU and BRIN) Information flyers and consent forms translated for community engagement Pre-fieldwork scoping visit completed by Indonesian team prior to Phase 1 fieldwork	July/August 2023	See Methodology section of report for detailed information
2.4	Workshops (online, in person) with research teams to test and finalise research methods; identify locations for field research; conduct training on research ethics and consent; obtain local approvals for data collection	Team meeting in Jakarta (19–21 July) to finalise research design, methods and research instruments Fieldwork handbook developed to guide Indonesian team fieldwork/data collection Work plans and budget updated Local NTT Government approval obtained for Indonesian field visits	July 2023	See Methodology and Appendix 1 section of report

	Conduct data collection with key communities (2–3 months); analysis and write-up of draft results with research team	Completed fieldwork in target communities: Field trip 1 – August 2023 Field trip 2 – October 2023 Transcribed and translated data compiled and coded on shared Google Drive Field data–analysis plan completed Team Bali data-analysis workshop 13–19 January 2024 Field data analysed and coded in NVivo and Excel First draft of project results and discussion sections prepared (e.g. fisher origins and networks; behavioural drivers, impacts, risks, enablers; fisher perspectives, gender issues; methodology section) Final human ethics report submitted to CDU and accepted	January 2024 March 2024 March 2025	See Methodology and Appendices section of report

Objective 6.3: Define direct and indirect drivers and behavioural contextual factors of illegal fishing (e.g. social, cultural, economic, policy, environmental) within the context of current gendered household livelihoods and recent disruptions

No.	Activity	Outputs/milestones	Completion date	Comments
3.1	EndNote library and literature review of academic literature on livelihoods, behavioural drivers, and noncompliance in fisheries	EndNote libraries/reference list Draft behavioural drivers review results document	May 2024	
3.2	Rapid review of past research/ information on illegal/legal fishing, and past livelihood programs in affected communities	Draft results document on Indonesian fishing in AFZ, and past livelihood programs Summary document prepared	July 2024	
3.3	Further drafting of results with research team	Draft results document reviewed and updated at team workshop in Bogor, Indonesia, (July 2024) and shared with teams online	July–December 2024	

Objective 6.4: Present an analysis of research and evaluate opportunities for addressing behavioural drivers, livelihood improvements and their likelihood of success in reducing illegal fishing in selected NTT communities

No.	Activity	Outputs/milestones	Completion date	Comments
4.1	Return to target communities to validate information and undertake further consultations (as required) on potential opportunities for innovative livelihood options in select communities	NTT community and stakeholder consultations visit plan and agenda prepared and circulated Summary results document (in English and Bahasa Indonesia) prepared and shared with community and government stakeholders Record of community workshops results prepared	October 2024	Updates incorporated into draft report results section
4.2	Establish linkages with current initiatives in the region related to supporting fishery livelihoods in NTT (e.g. Arafura Timor Seas Ecosystem Action (ATSEA) 2 Project in Rode Ndao)	List of relevant active projects and reports obtained and livelihood activities reviewed Meeting with Rote Ndao Government	October–November 2024	Information gleaned included in final report results and discussion sections
4.3	Final report drafted and finalised with recommendations	Draft final report sections Final report accepted Final human ethics report submitted to CDU and BRIN and accepted	2025 2025	

Objective 6.5: Engage with key Australian and Indonesian government agencies, nongovernment organisations and other stakeholders about research results and potential interventions to reduce illegal fishing in key communities

No.	Activity	Outputs/milestones	Completion date	Comments
5.1	Establish Australian and Indonesian stakeholder engagement communication updates	Ad hoc project email updates to Australian Government Department of Foreign Affairs and Trade (DFAT); Australian Government Department of Agriculture, Fisheries and Forestry (DAFF); ACIAR; AFMA and MMAF	Ongoing during major milestones and Australian team visits to Indonesia	Meeting with DFAT and DAFF in Jakarta (July 2023; face to face) and (November 2023; online) Project draft results update shared to ACIAR and AFMA (30 April 2024)
5.2	Concept Note for Future Livelihoods Project drafted for discussion with stakeholders		TBC	See report recommendations/executive summary
5.3	Final report communicated	Final report accepted by ACIAR and shared with stakeholders Bahasa Indonesia and English information sheet summaries shared with key stakeholders	2025 2025	
5.4	Other research outputs prepared and communicated to key government, community and other stakeholders by various methods	Paper 1 accepted for publication in *Maritime Studies Journal* Paper 2 to be drafted Presentation to Indonesian and Australian government stakeholders Conference/seminar presentations News updates published in CDU Research Institute for the Environment and Livelihoods News, and CDU E News	May 2025 late 2025 TBA	See communication and dissemination section of final report

7 Key results and discussion

7.1 Introduction

7.1.1 Part 1a, 1b and 1c: Literature reviews about Indonesian fishing in the AFZ

In this section we present results of background reviews that informed the methodology, data collection in Indonesia, and our key results, discussion and recommendations. Results part 1a offers a concise overview of other research to address drivers of illegal and legal Indonesian fishing. Results part 1b identifies key points emerging from livelihood diversification studies, then reviews past livelihood (and other) initiatives implemented in Indonesian communities engaged in legal/illegal fishing in Australian waters to reduce illegal fishing, or aimed at improving livelihood conditions. A brief coverage of other initiatives implemented in Rote Ndao is also presented. Results part 1c then reviews the international literature on theoretical approaches to the deterrence and prevention of illegal fishing.

7.1.2 Part 2: Fisher origins, networks and livelihoods

This section provides information on the origins, networks, and broad livelihood characteristics of people and communities involved in TBF in the research locations of this study.

7.1.3 Part 3: Behavioural drivers, enablers and fisher perspectives

This section provides the main body of results from the fieldwork completed by the Indonesian team during two main periods of work – August and October 2023. It presents information on actor-based and location-based drivers of TBF, enablers of illegal Indonesian fishing, risks from engaging in illegal fishing, decision-making on risks of engaging in illegal fishing, impacts of apprehensions on fishers/families, and perspectives on government policy and livelihood enhancements (fisher-identified past project experiences/programs implemented).

7.1.4 Part 4: Discussion

This section brings together the project results to address the project objectives.

7.2 Results part 1a: Overview of Indonesian fishing in the AFZ

7.2.1 Introduction

This section provides a brief overview of the activity of Indonesian fishing in what are now Australian waters, or the AFZ (Figure 3).

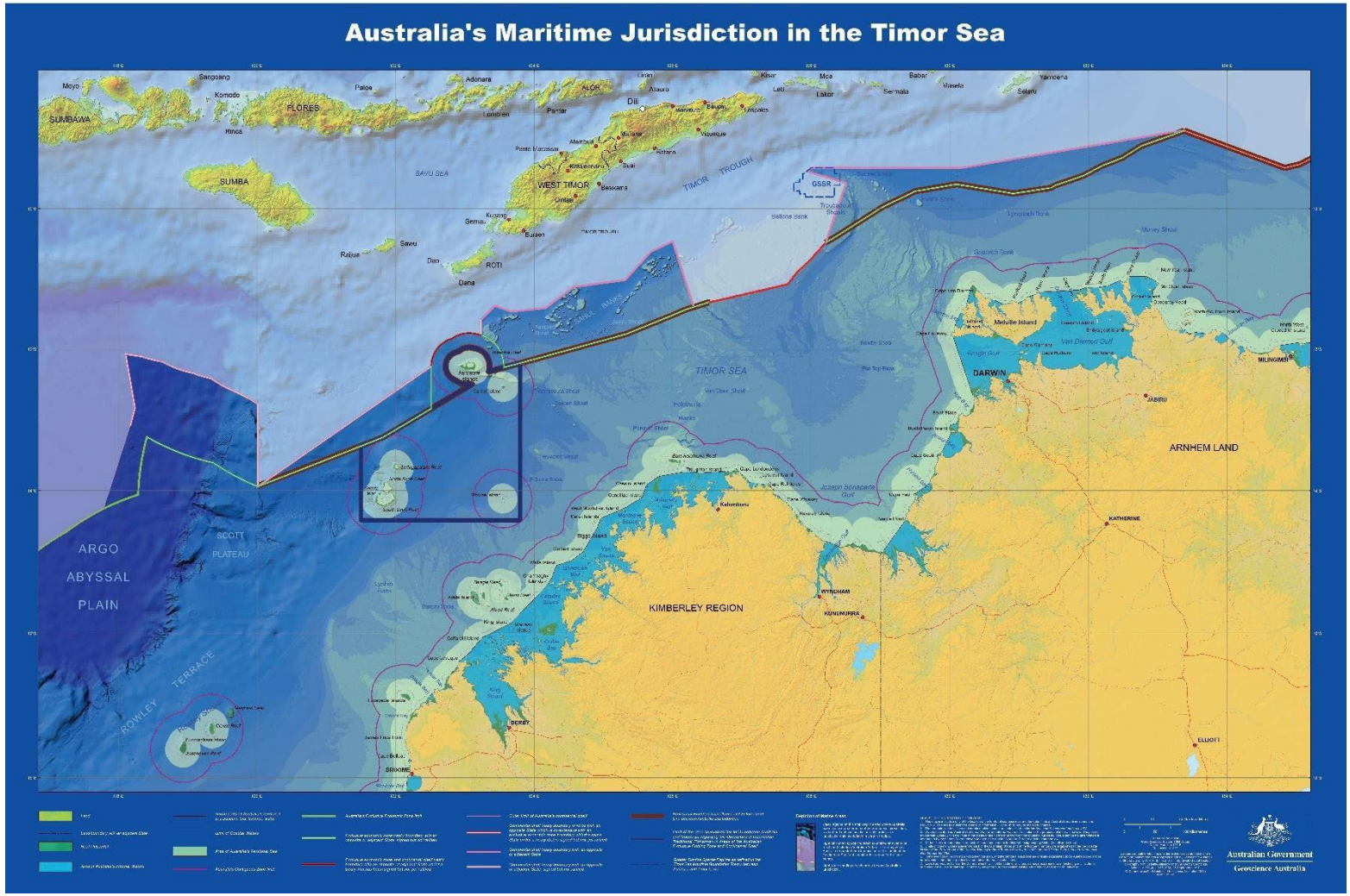

Figure 3. Australia's maritime jurisdiction in the Timor Sea

This section touches on the activities of various groups over the twentieth century to the current period (2023–24), including major maritime jurisdictional claims and formal agreements that regulate continued Indonesian traditional fishing activities in Australian waters. It is to be noted that this is a complex and diverse history which has been well documented by past researchers; only major milestones and events are noted here to give context for the current-day situation and drivers of illegal fishing.

Three key points are emphasised. Firstly, many present-day legal and illegal fishers have decadal or longer traditions of voyaging to coastal waters, islands and reefs as well as offshore islands, reefs and shoals in what is now part of Australian waters (coastal, territorial, fishing zone and seabed). Secondly, fishing is still permitted in the MOU box (as per the 1974 and 1989 bilateral agreements that allow traditional fishing to continue in a defined area in the outer region of the Timor Sea) which is conducted by some fishers from groups with a historic interest in the region, and conducted in fisheries if sail-powered vessels are used. Thirdly, illegal activity has been occurring for decades by groups with a historic interest in the region, as well as by groups without, and over decades there have been peaks in the numbers of incursions.

We also provide coverage of trends in illegal fishing activity (1970s to 2024-25), Australian policy responses to illegal fishing, and brief coverage of drivers of fishing previously identified in the literature. This is then followed by a summary of past initiatives, proposals and bilateral discussions on livelihoods, and alternatives for MOU box and/eastern Indonesian fishers.

7.2.2 Maritime developments impacting legal and illegal Indonesian fishing in Australian waters

Fishers from various islands and ethnic groups in the Indonesian archipelago have engaged in fishing and sailing to coastal areas of the north and north-west mainland of Australia and offshore islands, reefs and shoals in the Timor and Arafura seas for centuries. Following the end of Macassan voyages to select locations in north and north-west Australia to harvest trepang and other marine resources in the early 1900s, Indonesian fishing activity continued to coastal and offshore islands and waters by different groups originating from several islands and regions during the twentieth century to target species across a wide area (Campbell and Wilson 1993; Stacey 2007).

Over the latter half of the twentieth century,[9] these activities have been impacted by a range of maritime jurisdictional claims and changes by federal, Western Australian and Northern Territory governments. The Australian Government laid claim to the Territory of Ashmore and Cartier Island in 1931 (known to Indonesians as *Pulau Pasir* or Sand Island). The continental shelf (which extends past the 200 NM limit) was the first maritime zone expressly claimed by Australia (in 1953, originally to protect pearl shell resources from Japanese fishing).

Following jurisdictional claims over 12 NM territorial seas and national fishing zones in the 1960s by Indonesia and Australia, in 1968 the Australian Government decided traditional Indonesian fishing would be allowed to continue in territorial waters now claimed by Australia adjacent to Ashmore Reef and Cartier islands, Seringapatam Reef, Scott Reef, Browse Island located offshore, and Adele Island closer to the mainland (approximately 100 NM off the north-west coast, north of King Sound).

Following concerns about the activities of Indonesian fishers in the 1970s, the Australian and Indonesian governments – in recognition of this tradition of ‘subsistence’ (as it was

[9] For comprehensive information on these sailing patterns, traditions and fishers in the post-Macassan period and throughout much of the twentieth century, refer to accounts by Campbell and Wilson (1993), Stacey (2007) and Fox (1977; 1992; 1996; 1998).

then incorrectly characterised as) voyaging and fishing activity in the Timor Sea[10] – signed an MOU agreement in 1974 (officially: Australia–Indonesia Memorandum of Understanding regarding the Operations of Indonesian Traditional Fishermen in Areas of the Australian Fishing Zone and Continental Shelf – 1974; see Appendix 6). Under the agreement, traditional fishers were permitted to operate in the same offshore areas (except Adele Island and Rowley Shoals[11] which had been visited by Indonesians for more than a century) under a number of conditions that are: the use of only nonmotorised vessels, restrictions on taking some target species, and no landings on two islets at Ashmore Reef (where water was available).

At this time other areas of the Timor Sea remained accessible to fishers until 1979 when Australia declared a 200 NM Exclusive Economic Zone resulting in a 1982 agreement with Indonesia for a Provisional Fisheries Surveillance and Enforcement Arrangement in the Timor and Arafura seas for a provisional fisheries surveillance and enforcement line that defines the water column boundary between the two countries for fisheries management. Resultant jurisdictional claims meant that significant fishing grounds once considered international waters were now off limits to Indonesian fishers.

In 1983 Ashmore Reef was declared a national nature reserve (see Stacey 2007) and reported violations under the existing MOU, and concerns of Indonesian activity on the reserve along with other developments since the 1974 agreement led to 1989 amendments to the 1974 MOU agreement (within Appendix 6: 1989 Annex II: Practical Guidelines for Implementing the 1974 MOU). This resulted in some new conditions of access, prohibition on additional species and establishment of a larger MOU box area within the AFZ where Indonesians could fish (Appendix 6, Annex 1). Aside from declaration of some additional marine parks in the Timor Sea region[12] by the Australian and Western Australian governments, no other regulations or changes regulating access have occurred in the region since 1989. Current arrangements are shown on an AFMA (2020) map of Australian Fisheries Enforcement Arrangements in the Timor and Arafura Seas.[13]

Over the period from 1960s to late 1980s, the Timor Sea area was visited by many different ethnic groups from island communities in NTT, Sulawesi and Madura – so, many had and still have historic interests in the area prior to 1974 MOU agreement. These include actors belonging to Bajo, Bugis, Butonese, Rotenese and Madurese fishers (for coverage of these groups and activity see Fox and Sen 2002, Prescott et al. 2016, 2017; Stacey 2007; Stacey et al. 2017).

The centuries-old and continuous presence of Indonesian fishing activity in what is now part of the AFZ has been recognised to some extent through the 1974 MOU agreement, which attempted to allow some form of traditional fishing activity to continue as per the technology in use at the time (1960s – early 1970s). However, since this time, while legal activity has continued with the allowed areas under the 1974 MOU agreement and subsequent amendments as per the 1989 Guidelines amendments, a range of illegal activity by different ethnic groups has prevailed.

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10 Refer to Campbell and Wilson (1993) for comprehensive coverage of this issue.

11 Rowley Shoals and Imperieuse, Clerke and Mermaid reefs are now part of the Western Australian Marine Parks Network declared in 1990, and Mermaid Reef Marine Park is managed by the Australian Government North-west Marine Parks Network.

12 Cartier Island Commonwealth Marine Reserve was declared in 2000 – later renamed Cartier Island Marine Park in 2017 – and is managed by the Australian Government. Hibernia Reef, located to the north-east of Ashmore Reef, is also an important fishing ground.

13 Available at: https://www.afma.gov.au/sites/default/files/2023-02/fisheries_enforcement_chartlets_-_arafura_and_timor_seas_-_english_-_17_march_2020.pdf

Broad trends in illegal fishing activity from the 1970s to 2024

There are three key points relating to illegal activity. Firstly, some of the original traditional fishers have continued to operate both legally and/or illegally inside and outside the 1989 MOU box and other areas of the AFZ because of restricted access to fishing grounds and technological limitations. For example, some of the more profitable shark grounds are located outside of the MOU box (Stacey 2007) which is generally considered a relatively poor shark-fishing ground (Wallner and McLoughlin 1995, p.34). This has been well documented in past studies (e.g. Fox and Sen 2002; Fox 1992, 1998; Stacey 2007).

Secondly, those with historic interests have continued to engage in fishing using other boats and equipment, switching target species over time, and the region has attracted a wider cohort of entrants/participants into the fishery. Thus, one consequence of providing for legal traditional fishing to continue in AFZ through the MOU agreement is that legal fishing can also be a gateway to illegal fishing (Fox 1998).

Thirdly, some of the fishers from Rote Island and West Timor in NTT Province, Madura region in East Java, and part of Sulawesi and who have been active in the region over much of second half of the twentieth century (including along the Kimberley Coast in the 1970s and early 1980s, and offshore areas in the 1990s) and during 2000–06 also are some of the participants in current activity from 2020 to 2024. Fishers from other ethnic origins, geographic locations and seafood market networks in Indonesia have engaged in illegal fishing opportunistically, driven by market demand and high prices available and thus the prospect of earning high incomes in relatively short periods of time.

During the last five decades, there have been years with high numbers of illegal Indonesian fishing incursions in the AFZ by different groups, targeting different areas for high-value species of shark, trepang and previously trochus shell. Australian responses to illegal activity have included detections; boat boardings; legislative forfeitures of boats, catch and equipment (since 1999); apprehensions and prosecutions. Much of the illegal activity and policy responses prior to 2000 were linked to changes in access to coastal areas along the north-west coast and offshore island and reefs, in response to changes from 1968 to the 1974 MOU agreement and later 1989 changes; expansion of the AFZ from 12 NM to 200 NM in 1979; declaration of Ashmore and Cartier marine park reserves in 1984 and 2000, respectively; and high international demand for certain marine products such as shark fin and trepang.

During the period 2000–06 – the last period of high incursion numbers before COVID-19 – hundreds of boats and crews were apprehended, detained and charged under various illegal fishing provisions under the Australian Government *Fisheries Management Act 1991* and for environmental crimes under environmental legislation including the Australian Government *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

7.2.3 Australian policy responses to illegal foreign fishing

Surveillance and enforcement program

Since the late 1970s, Australia has implemented a compliance and enforcement program for surveillance and foreign fishing/illegal, unreported, and unregulated (IUU) to detect and prosecute illegal foreign fishing activity in Australian waters. The extent of the enforcement program and penalties have been dependant on funding, available resources and departmental arrangements. It was noted by Baird (2008) the extent of Australia's ability to intercept, investigate and apprehend boats "is explained partially by the increased surveillance"; that is, more surveillance and enforcement operations result in more interceptions and apprehensions.

The surveillance program comprises a range of activities, including:

- aerial (involving Maritime Border Command, Australian Maritime Safety Authority, charter flights, state government partnership arrangements and, more recently, unmanned drone vessels such as in 2024)
- vessel patrols and boardings (Australian Border Force, Maritime Border Command, and state government partnership arrangements[14])
- Indigenous Land and Sea Rangers and Traditional Owners in remote coastal areas who also undertake patrols and provide information to the Maritime Border Command and AFMA on any suspected illegal activity
- dedicated larger operations from time to time (e.g. Operation Jawline in 2021,[15] and Operation LEEDSTRUM[16] and Operation LUNAR[17] in 2024) especially in years of high incursions, such as the current period, targeted at specific areas in the AFZ.

Boats and crew detected as potentially engaged in a range of suspected noncompliant activities under the Fisheries Act 1991, EPBC Act or other legislation are boarded, investigated and can be subject to several different enforcement actions.[18] The law enforcement process (under fisheries, environment or quarantine legislation) engaged for a range of suspected noncompliant activities can involve different enforcement actions: surveillance, investigation and apprehension at sea; identification of the master and nationality of a boat; seizure and forfeiture of the boat and transport (usually to Darwin) for processing; immigration detention (usually in a hotel in Darwin under immigration security) of captain and crew pending charges and court hearings.[19] During this legal representation to attend a court case, repatriation can include support from the Indonesian consulate, a Bahasa translator at certain points in the process and legal aid representation (Nguyen 2022). In most cases, sentencing involves a guilty plea by fishers, a conviction and fine (up to $5000 good behaviour bond) with a long timeframe (e.g. up to 5 years) as it is recognised that fishers cannot afford to pay a fine. Fishers are returned to Indonesia within 28 days (Nguyen 2022). If a fisher re-offends within the bond period, then

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[14] From the *Australian Marine Parks Quarterly Compliance Report July, August and September 2023* (Parks Australia 2023, p.15) that reports that "[Maritime Border Command] conducts investigative boardings of FFVs in the MOU box to ensure compliance with Australian laws. FFVs found to be compliant with Australian laws will generally be provided with educational materials. Non-compliant FFVs may be issued warnings for minor breaches whereas more serious matters may lead to criminal prosecutions and forfeiture/destruction of the fishing vessel involved in the offence. AFMA leads investigations and prosecutions into illegal fishing matters in AMPs with support from PA for EPBC Act offences."

[15] *Australian Border Force targeting illegal foreign fishing in Australia's Northern waters* https://www.abf.gov.au/newsroom-subsite/Pages/targeting-illegal-foreign-fishing-8-11-21.aspx

[16] *Operation LEEDSTRUM: Offenders prosecuted and sentenced in Darwin* https://www.abf.gov.au/newsroom-subsite/Pages/Operation-LEEDSTRUM-Offenders-prosecuted-and-sentenced-in-Darwin.aspx

[17] *Australian Border Force launch Operation Lunar to target illegal boat arrivals in the NT* https://www.abc.net.au/news/2024-12-10/border-force-launch-operation-to-target-foreign-boats-in-nt/104706236

[18] The terminology for the enforcement actions can be confusing. Some statistics on illegal FFV activity are often reported as "interceptions", "interdictions" or "apprehensions", which could include a boarding, investigation and a warning and directive to leave the area; result in a seizure of a boats, catch gear and/or boat; or result in an apprehension and transit of crew and/or boat back to the Australian mainland for processing. Further, some statistics on compliance actions reported by AFMA or in the media previously often do not specify the country of origin (e.g. Indonesia) of the total number of interceptions by year. Thus, in some cases some statistics could represent interceptions of boats originating from countries other than Indonesia.

[19] Before 2005, fishers were detained on their boats pending deportation and prosecution.

default imprisonment follows if they are caught and charged for a repeat offence. Penalties are often higher for fishers caught fishing illegally in territorial waters (up to 12 NM from the mainland/or islands) due to biosecurity risks for the Australian mainland.

At-sea legislative forfeiture involving seizure of catch, gear or vessels[20] is a policy which has been implemented officially since 1999 under the Fisheries Act 1991 (section 106) (in response to High Court of Australia decisions that pecuniary penalties are not enough to deter; see Baird 2008) until 2006 as a form of deterrence; and applied again since 2020 to minimise exposure between fisheries officers, border force officers and fishers, due to COVID-19 (including disruptions to international travel and repatriations). The forfeited catch, gear and/or vessel at sea becomes the property of the Australian Government. Crew are not detained, but directed out of Australian waters, or put on another boat and directed out.

But when this boat forfeiture occurs at sea (Figure 4) and two or more boats are apprehended, the crew from one boat are transferred to the other boat, one boat is destroyed, and the other boat and two sets of crew are ordered home to Indonesia. In doing so, the officer at sea must have reasonable grounds and demonstrate elements of proof of illegal activity under the Fisheries Act 1991 regarding using a boat for fishing, being in charge of boat and having a boat equipped for fishing. At sea, fishers are given information at the time of apprehension and forfeiture, and the right to challenge this decision through a process from Indonesia (and there have been some instances where challenges have taken place such as during the peak apprehensions in the 2000s). There is little information available about the impact of this approach on crews transferred to another boat and what happens when they return to Indonesian waters.

During COVID-19 from 2020 to May 2023, there were only 6 cases of apprehensions and prosecutions through the courts in Darwin under the *Fisheries Management Act 1991 (Cth)*, sections 100, 101. Most cases during this time resulted in legislative forfeiture of catch, gear and/or vessel at sea. However, given more illegal activity from 2023–25 and closer to mainland areas in Western Australia and the Northern Territory, there has been a noticeable increase in boat apprehensions (see section below).

The AFMA annual report (AFMA 2023, p.43) notes that “legislative forfeiture (seizing gear and catch) has a lower deterrence effect than previous approaches of apprehension, prosecution, and repatriation. Some [foreign fishing vessels] subject to a legislative forfeiture return to Australian waters soon afterwards.” Thus, seizure of catch, equipment or vessels does not seem to deter fishers from repeat offending.

20 Statistics on the different types of legislative forfeitures are not often provided in government statistics (i.e. the number of gear, catch and boat disposals per boat interceptions).

Figure 4. Examples of interceptions, boardings and at-sea destruction of boats under legislative forfeiture

Source: Australian Border Force Facebook posts[21]

Public information campaigns

Other initiatives to deter fishing have involved PICs implemented collaboratively between the Australian and Indonesian government departments – including AFMA, DAFF and Indonesian Ministry of Marine Affairs and Fisheries – in selected districts and villages in Indonesia known to be locations of the origin villages of artisanal fishers. It is not known when the first PIC took place, but they have been held since 1995 (see Stacey 1999 for a detailed analysis of campaigns during the 1990s, including related discussion of alternative livelihoods at some of these events at the time).[22]

Once COVID-19 ended, the PICs restarted in late 2022. The goal of the 2022 campaigns was to "educate Indonesian fishers and the wider fishing community on Australia's and Indonesia's fishing rules and the consequences of engaging in illegal, unreported, and unregulated (IUU) fishing" (AFMA 2022, p.2). PICs are described as a "preventative tool within a multifaceted compliance strategy to combat IUU fishing at the source, focus [*sic.*] on education and promoting voluntary compliance" (AFMA 2022, pp.2–3). As noted in the

[21] *Australian Border Force Facebook page* https://www.facebook.com/photo.php?fbid=534720395505624&set=pb.100069030045813.-2207520000.&type=3&locale=he_IL; https://www.facebook.com/photo.php?fbid=530542232590107&set=pb.100069030045813.-2207520000.&type=3&locale=he_IL; https://www.facebook.com/AustralianBorderForce/posts/310536351257364

[22] Following the last surge period in illegal activity, PICs were run 2006–13, then stopped because there was no dedicated funding for them until 2022 (AFMA Compliance Program, personal communication, August 2023).

PIC strategy document from 2022, recent high levels of illegal fishing incursions during COVID-19 according to AFMA reflect (AFMA 2022, p.2):

> Economic and environmental pressures in eastern Indonesia including natural disasters (Cyclone Seroja),[23] the impacts of the COVID-19 pandemic and high prices for sea cucumber. These factors, combined with Australia's policy to limit interactions with foreign nationals during the COVID-19 pandemic which constrained effective compliance action, continues to drive illegal operations. The incentive to engage in illegal fishing currently outweighs the possible risks and deterrence factors.

There were two joint Australia–Indonesia government PICs held in November 2022 in Papela and Ba'a, Rote Island, and 26–27 June 2023 in Oesapa and Tenau (Kupang, West Timor). Village leaders and PSKPD staff identified people/fishers to attend these meetings (including all actors as well as families of fishers, community members and government officials). There was a sign-in sheet (name, crew, vessel owner/master, what kind of fishing they do) and a survey at end of workshop to complete to get an attendance fee covering transport (as per Indonesian government regulations). Each workshop agenda presented information on maritime boundaries and sustainable fisheries management, Indonesian penalties for nationals engaged in IUU fishing, consequences of illegal fishing, risks, safety issues and some entertainment and catering (AFMA 2022).

In June 2023, 186 people attended and 296 people attended in November 2022. Each participant received a t-shirt, lunch box of food and IDR150,000 participant payment. The survey asked: fisher's name, have they even been engaged in illegal fishing, what have they learned from attending the PICs, and will they go illegal fishing again. The information shared at the workshops tended to focus on compliance fishing information. Fishers asked for a second MOU box to be established, and about licensing and renegotiation of the marine boundaries. There is no bilateral operational budget ongoing for PICs – most government funding is used to support joint capacity-building exercises and joint patrols (AFMA Compliance Team personal communication, August 2023). During 2024, other PICs were held, such as those in West Timor, Rote,[24] and South-East Sulawesi (Figure 5).[25]

Figure 5. Images of an AFMA and MMAF PIC in South-East Sulawesi in December 2024

Source: N. Yanti

[23] Cyclone Seroja formed as a tropical low in southern Indonesia around West Timor, moving towards Rote Island on 2 April 2021 as a category 1, then south into the Timor Sea and north-west region of Australia before making landfall as a category 3 in WA.

[24] *Fisheries Partnership Stopping Illegal Fishing At Its Source* https://www.afma.gov.au/news/fisheries-partnership-stopping-illegal-fishing-its-source

[25] *Sepanjang 2024, 103 Nelayan Sultra Jadi Pelaku Illegal Fishing di Australia* https://kendariinfo.com/sepanjang-2024-103-nelayan-sultra-jadi-pelaku-illegal-fishing-di-australia/

Illegal Indonesian fishing data and trends

Information on illegal fishing is recorded and collated by different agencies, including Australian Border Force and AFMA. It is outside of our scope to detail data collection, but a number of challenges exist around recording correct information of fishers/boats intercepted at sea, accurate recording of fisher names (including some fishers known to provide incorrect names) and their origin villages, names of boats and origin ports by officers and agencies, and how the information has been collated over time within a broader cross-cultural language context.

Some data on illegal fishing from government agencies (e.g. AFMA annual reports), media reports (e.g. Australian Broadcasting Corporation using government-supplied data) and researchers (e.g. Campbell and Wilson 1993; Stacey 2007; Fox and Sen 2002; Baird 2008; Lewis 2003; Vince et al. 2021) covering the suite of detections, interceptions, boardings, legislative forfeitures, apprehension and prosecution has been publicly available, or published in past research/studies as supplied to researchers by AFMA. Some data is published by calendar year and some by financial year. In some cases, foreign fishing vessel (FFV) incursion data does not distinguish between Indonesian and other foreign vessels for some periods.[26] Further, some published data represents total foreign fishing vessels, not just Indonesian. Some data is presented in various sources/reports as total (FFV) interceptions and may not always distinguish between legislative forfeitures and apprehensions. Some information from Indonesian fishing prosecutions is available in the form of court transcripts which can be requested from Australian courts.

This made it difficult for this study to identify in detail the illegal fishers, origin and transit villages, for example, from 2020 onwards based on comparison of prior activity from previous decades (e.g. 2004–07). Thus, as highlighted in the recommendations of this report, more consistent and standardised reporting and data-keeping going forward would support documentation and assessments/evaluation, help detect subtle trends and changes in fisher operations over time (especially given the likelihood that illegal fishing, based on the last 50 years, and other drivers identified through this study are likely to continue), and allow for more targeted actions in community and market networks.

Major periods of illegal activity

Based on some of the published information available and some data supplied to the project by AFMA we can provide some general information. In the 1970s following the establishment of the 1974 MOU agreement, the Australian Government launched campaigns of surveillance and enforcement at different times in response to spikes in illegal incursions which involved the Royal Australian Navy and Royal Australian Air Force. This included Operation Trochus in 1975 and 1976, which were aimed at informing Indonesian fishers – from Rote, Madura and Sulawesi and operating along the Kimberley Coast – of the new MOU agreement and permitted areas to the north of the coast. No apprehensions were made (Campbell and Wilson 1993, p.64).

From the 1980s to 1990s, more regular patrols and surveillance of the north-west region were introduced. The late 1980s and early 1990s saw apprehensions of fishers targeting trochus and shark from Rote, South-East Sulawesi, Madura and other regions. Small numbers of boats from Pepela targeting trochus were apprehended along the Kimberley Coast in 1980 (Campbell and Wilson 1993). In 1987, more than 70 motorised trochus boats were apprehended off the north-west coast (Campbell and Wilson 1993, p.134). During November 1990 – March 1991, 31 artisanal shark boats were apprehended in the

[26] See, for example, a list of FFV interceptions supplied by AFMA to ABC News (for this article *Illegal foreign fishing crews blamed for killing protected turtles on Australian islands* https://www.abc.net.au/news/2022-06-20/turtles-killed-by-illegal-fishermen-off-wa-coast/101153722) for the year 2016/17: the total inceptions shows 15, but according to AFMA annual report 2022, only 6 of these were Indonesian vessels (AFMA 2023, p.40).

part of the AFZ south of the Indonesian Aru Islands targeting shark (Campbell and Wilson 1993, p.166; Fox 1992). Reid (1992) reported on 35 vessels apprehended from 1988 to mid-1990 targeting illegal trochus activity in King Sound and along the Kimberley Coast. The majority were originating from South-East Sulawesi – small islands in Buton and Muna in South-East Sulawesi (Masaluka Kasihputih; Maginti in Muna and Kadatuang, Buton) – and a few Rotenese trochus boats were apprehended in 1991, including some repeat offenders who had served prison sentences.[27] Table 3 summarises these apprehensions.

Table 3. Number of Indonesian boat apprehensions and number of Type 2 (unmotorised) boat apprehensions per year (1975–2006)

Year	Total number of boat apprehensions	Total number Type 2
1975	3	3
1976	0	0
1977	0	0
1978	0	0
1979	0	0
1980	2	2
1981	0	0
1982	0	0
1983	0	0
1984	0	0
1985	5	5
1986	0	0
1987	1	0
1988	46	3
1989	29	0
1990	43	4
1991	38	5
1992	15	3
1993	23	9
1994	111	12
1995	76	8
1996	97	49
1997	122	31
1998	62	20
1999	60	35

[27] However, from this period the apprehensions – handled by WA Fisheries – do not appear in some previously published statistics, potentially as most were motorised boats (Type 3). See, for example, Campbell and Wilson (1993, p.135, 158, 164) for data on apprehensions in the late 1980s to 1992.

Year	Total number of boat apprehensions	Total number Type 2
2000	78	24
2001	80	13
2002	111	16
2003	139	8
2004	161	9
2005	281	8
2006	365	6
Total	**1,948**	**273***

** Note: Of the total number of Type 2 boats, 62 boats overall are reported to belong to the Bajo ethnic group (Stacey 1999). Source: Unpublished data compiled in 2007 by Stacey from numerous data sources including Stacey (1999, p.286; 2007; AFMA-supplied data; NT and WA Fisheries files.*

The most significant period of illegal Indonesian fishing activity in Australian waters until the post-COVID-19 period occurred during the years 2000–07, particularly during 2005–06: there were 607 reported interceptions of foreign fishing boats in northern waters in 2005, of which 361 were Indonesian boat apprehensions (Table 4). Table 4 illustrates the increase in apprehensions and legislative forfeitures under the post-1999 regime with the formal introduction of legislative forfeitures under the Fisheries Act 1991 in the northern AFZ during 2000–06. However, comparing this data to AFMA annual reports, there is some discrepancy in numbers due to AFMA reporting on financial years. Baird (2008) notes the practice of legislative forfeiture at sea, whereby the vessel's gear and equipment were seized as forfeited and the vessel was shepherded out of the Australian Exclusive Economic Zone (EEZ), was no longer undertaken by the Australian authorities in 2006 onwards – most vessels are brought to Darwin (unless unseaworthy or hazardous) where they are usually forfeited and/or destroyed – until this practice was used more comprehensively again during COVID-19.

Table 4. Foreign fishing vessels intercepted in the northern AFZ (2000–06)

Year	Vessels apprehended	Legislative forfeitures	Total
2000	78	23	101
2001	80	39	119
2002	109	35	144
2003	138	56	194
2004	161	128	289
2005	280	327	607
2006	365	No figure available	365

Source: Adapted from Baird (2008, p.100), who notes some figures were sourced from a media release by I. Macdonald, former Australian Minister for Fisheries, Forestry and Conservation (January 2006).

While the level of activity by Indonesians was particularly high at this time, the apprehension rate was consistent with a significant investment in financial resources by the Australian Government (Baird 2008; Vince 2017; Commonwealth of Australia 2010).[28] This period saw significant government and media attention and investment. At the time, hundreds of boats and thousands of Indonesian crews were involved in incursions into the AFZ for shark fin (and, to a lesser extent, trepang). This included fishers originating and departing from Pepela, Tanjung Pasir communities, Kupang ports in West Timor, several ports in South and South-East Sulawesi, and the Aru Islands. A significant amount of the illegal artisanal Indonesian activity at that time was in small, motorised boats targeting shark as far south as Rowley Shoals, an area most recently targeted for trepang in the COVID-19 period (Adhuri et al. 2021).

Some research contracted by the Australian Government was conducted during and shortly after this period to understand the drivers of this surge in illegal fishing across the Arafura and Timor seas region to estimate impacts on shark resources.[29] Despite the extent of the problem, and the thousands of fishers and boats detained and prosecuted, there is little detailed published information on the fishers' origins; socio-economic context; and drivers and impacts of boat apprehensions, prosecutions and repatriations on fishers, families and wider communities of origin.

In 2010 the Australian National Audit Office published a report on the program (*Illegal Foreign Fishing in Australia's Northern Waters*) and stated (Commonwealth of Australia 2010, p.18):

> The Government's expectation in 2006–07 was that the injection of funding through the whole of government program would lead to a doubling of FFV apprehensions, initially to 717 per year for the first two years, and to 650 for the final two years of the program. The fact that the program has had the **opposite effect** [*authors' emphasis*] indicates a gap in agencies' strategic understanding at that time of the drivers of illegal foreign fishing activity. While agencies' understanding of the nature of foreign fishing activity has improved since 2006, its drivers and dynamics are still not well understood.

The report also notes "rather, the decline reflects a retreat of foreign fishing activity from well within the [Australian EEZ] to outside the [Australian EEZ] boundary, and a reduced number of incursions by FFVs into the northern waters [Australian EEZ]" (Commonwealth of Australia 2010, p.32). Since 2006, there was large decline in the number of apprehensions of illegal vessels in Australia's northern waters, from 367 apprehensions in 2005–06 to 27 apprehensions in 2008–09 (Commonwealth of Australia 2010, p.32).

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28 The ANAO Report (Commonwealth of Australia 2010, p.13) states: "In 2005–06 and 2006–07, in response to the increase in FFV incursions, the Australian Government committed additional funding totalling $543 million to combat the problem of illegal foreign fishing in Australia's northern waters. The largest component was the appropriation in the 2006–07 Budget of $388.9 million over four years for the program titled 'securing borders against illegal foreign fishing'. Described by Ministers as 'an integrated whole of government plan' the program comprised additional resourcing to a number of agencies including Customs and Border Protection; the Australian Fisheries Management Authority (AFMA); the Australian Quarantine and Inspection Service (AQIS); the Department of Agriculture, Fisheries and Forestry (DAFF), the Department of Defence (Defence), the Department of Immigration and Multicultural Affairs (DIMA, now DIAC); the Great Barrier Reef Marine Park Authority (GBRMPA); the Attorney-General's Department; the Australian Federal Police; and the Commonwealth Director of Public Prosecutions (CDPP)".

29 Key references from this period include Lack and Sant (2008) on drivers of illegal shark fishing, Commonwealth of Australia (2010), Widdall (2006), Baird (2008), and some confidential reports contracted by the Australian Government including by Fox and Meekan (2006) and Fox (2005). Lack and Sant (2008) cite an unlocated report by Wheeler (2006).

As part of the Australian Government investment program, Widdall (2006) notes this included a government allocation of funding for complementary initiatives including:

- $2 million towards an Australian Agency for International Development project "Proposed Alternative livelihoods Program" in August/September 2006
- a project led by the Australian National University and implemented through the Australian Government Department of Environment and Heritage[30] "Alternative Livelihoods for Traditional Indonesian Fishers (Rote and Kupang Bay)".

These initiatives are discussed further in section 3 of the report.

Following this massive campaign of apprehensions and legislative forfeitures as part of the ongoing compliance program, it is only since the COVID-19 pandemic from late 2020 onwards there has been a resurgence of illegal Indonesian fishing incursions in Australian waters, during 2021–24 (Table 5). This situation sparked concern as to what has driven this latest round of incursions, what can be done in the future to offer solutions to not only minimise the impact of apprehensions and other social and economic impacts on fishers and their communities, but also more cost-effective approaches from the Australian government perspective.

Descriptive summary of the AFMA-supplied 2020–23 apprehension data

The 2020/21 financial year saw significant number of illegal fishing incursions – the highest since 2005–08. As noted in the methodology section of this report, we did obtain some data[31] from AFMA for the purposes of this study, but we did not have permission to include our analysis and summary of that data in this report – aside from total apprehension data from 2020–23 supplemented with more recent information for 2024 provided through other sources.[32]

In 2020/21 there were 85 legislative forfeitures, and in the financial year 2021/22 there were 337 incidents of legislative forfeitures. During 2022/23 there were 116, and 6 boat apprehensions and convictions in Darwin court. In the 2023/24, this increased to 22 boat apprehensions, with the majority still legislative forfeiture incidents, continuing to rise steadily with high numbers for the 2024/25 financial year (currently more than 20 boat apprehensions to date) (Table 5).

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[30] However, this development investment is not noted as part of the program investment in the Australian National Audit Office's 2009–2010 audit report (Commonwealth of Australia 2010). Widdall (2006, p.72) notes the first program "is ongoing and has not been completed … and information regarding this activity is difficult to obtain" via the "AusAID Annual Procurement Plan 2006-2007". For the second initiative, she notes that "as of August 2006, this pilot project endeavours to develop strategies based on two methods of seaweed cultivation and establish an experimental nursery for sponges. The project is also looking into the possibilities of trepang, mud-crab and sea urchin ranching and cultivation. This project is being funded by the Australian Department of Environment and Heritage and is being implemented by Tom Therik and James J. Fox from the ANU Resource Management in Asia-Pacific Program".

[31] This data included information on: (AFMA data covers the period 13 August 2020 – 7 June 2023.)

- total boat apprehensions (1999–2023) (including total apprehensions by boat type from 2012 to 2023) and specific data on apprehensions and LF from 2020–23 covering 13 August 2020 to 21 May 2023
- legislative forfeiture numbers (2020–23) by location, boat type, fishing gear, target catch, adult/juvenile [people] onboard, and number of boat disposals from 2021–23 (at sea, or under tow)
- legislative forfeitures for the period 2020–23 regarding location of incursion and boarding, vessel name and home port of vessel, catch, gear, on board or forfeited, and status of vessel (e.g. disposed, directed to leave AFZ, other).

[32] As noted in the methodology section, although we did obtain data from AFMA for the purposes of this study on this information from 2020–23, we did not have permission to include our analysis of that data in this report.

Table 5. Total Indonesian fishing interdictions (apprehension and legislative forfeitures) (2013 – Jan 2025)

Year	Interdictions
2013/14	33
2014/15	7
2015/16	22
2016/17	15
2017/18	14
2018/19	5
2019/20	4
2020/21	85
2021/22	337
2022/23	125
2023/24	237
2024/25*	172

** Note: Figures for the 2024/25 financial year are incomplete and only reflect interdictions up to 7 January 2025.*

*Source: ABC News using AFMA-supplied data (*Authorities investigate 'unprecedented surge' in foreign boats entering Australian waters *https://www.abc.net.au/news/2025-01-15/authorities-investigate-surge-in-foreign-boats-australian-waters/104783448)*

In summary, since 2020–23, there has been a significant increase in illegal activity in the AFZ using motorised boats and targeting mostly sea cucumber in territorial and coastal waters, and protected areas (from Rowley Shoals to the south and inside the MOU box and parks; east of the MOU box fisheries; towards the mainland of the Kimberley Region; areas close to NT; the Torres Strait Islands; and south of Papua New Guinea).

Drivers of legal and illegal Indonesian fishing from past studies and research

Since the 1970s research studies have documented direct and indirect drivers of legal and illegal Indonesian fishing – including the broader enabling, opportunity or livelihood vulnerability context in which legal and illegal Indonesian fishing by diverse groups takes place in Australian waters, and factors influencing fisher decision-making to participate in illegal activity. These include very specific drivers identified through detailed social, economic and fisheries research assessments linked to the activities of specific groups. A range of drivers have also been identified in media reports, of which there is a significant collection over decades. At times we can see a direct link between the extent of research conducted into the 'problem of' or trends in legal and illegal fishing to better understand the causes, such as:

- from when the 1974 MOU agreement was established (e.g. Fox 1977)
- significant research in 1990s (e.g. Campbell and Wilson 1993; Stacey 1999, 2007)
- research in the late 1990s/early 2000s (e.g. Fox and Sen 2002) during high periods of illegal activity
- again during 2010–15 when the last major period of research and focus on MOU box fishing was conducted by AFMA-led initiatives (e.g. AFMA 2013; Prescott et al. 2016, 2017)
- other researchers (e.g. Adhuri and Visser 2007; Stacey 2017; Stacey and Allison 2019).

As discussed in results section, while discrete drivers influencing fisher behaviour have been identified, most fisher behaviour and activity is based on a combination of drivers and broader enabling environment and opportunities, and can vary across groups. A summary of past drivers and enabling factors from the literature is provided next, with further discussion of these combination of drivers in the results and discussion section.

Historical and cultural

The longstanding historical and cultural connections to the Timor and Arafura seas region is a key driver for continued activity in the region, with evidence of ancestors of current fishers fishing in what is now Australian waters since the early 1900s (Stacey 2007), and some evidence for as far back as the 1700s (Fox 1977). Historical narratives shared across generations of some groups such as the Sama-Bajo and Rotenese present a commonly held history of past voyaging to the Timor Sea by ancestors, and reinforce a continuation of current fishing and sailing activities in the AFZ despite a range of ongoing restrictions and policies of enforcement by the Australian Government (Stacey 2000, p.5).

Livelihood strategy

Long-distance sailing and voyaging to the AFZ region is supported by the livelihood strategy mobility, flexibility and adaptability features of some fishing groups rooted in tradition (Stacey and Allison 2019; Fox and Sen 2002). Mobility extends to migration as an important livelihood strategy of fisher groups with temporary or longer-term migration from home villages to base camps as key (historical) features of some groups (Sama-Bajo, Butonese, Bugis) active in the AFZ (Stacey and Allison 2019). A key livelihood strategy is long-distance fishing and migration to follow opportunities based on spatial and temporal movements of fish populations (Stacey and Allison 2019), but also for other reasons such as targeting regions with high abundance of species such as trepang in the AFZ. An important characteristic of this fisher adaptability is the capacity to switch target species quickly in response to direct and indirect drivers of change – for instance, switching from shark to trepang, or sail to motorised boats. Livelihood mobility as a strategy is facilitated through fisher seafaring, navigation skills and knowledge, and access to watercraft and fishing technology – allowing them to develop a specialised niche, as shown for example by the divers from Alor with free diving skills. In the past there has been no shortage of fisher labour (human assets) – availability of young men to crew boats to participate in a fishing opportunity (Fox et al. 2009). Associated with these drivers has been technological changes over time, commencing in the 1970s to the 1990s with a gradual increase in motorised boats used in AFZ fishing and, in the last 10–15 years, the use of global positioning system (GPS) – both of which have enabled other groups to enter the fisheries. GPS is now in common use to navigate to fishing grounds instead of compasses and traditional knowledge, and use of kerosene pressure lamps for night fishing for trepang (Prescott et al. 2017).

Economic

Fishing in Australian waters is and has always been economically attractive (Prescott et al. 2019). TBF is sought after either as the main income earning or as a potential supplementary income to domestic fishing or trade activities at other times of the year (Fox 2002). The economic incentive to engage in MOU box trepang fishing, for example, is driven by high exploitation rates and good prices for product, which can result in higher incomes compared with other livelihoods such as domestic fishing in rural NTT or eastern Indonesia (Prescott et al. 2017) even within patron–client contexts (indebtedness and inequitable shares systems) (Briggs 2003).

Patron–client relations

It has been well documented in past studies (Stacey 2007; Fox and Sen 2002; Jaiteh et al. 2017) that the patron–client system of relations between fishers, crews, captains, boat owners, marine-product traders, kiosk owners and/or moneylenders plays an important role in facilitating engagement in legal and illegal fishing in the AFZ. Patrons (or

bosses) provide credit in the form of operational costs and fishing assets to crew to engage in fishing in exchange for sale of product. Few fishers anywhere can market their catches directly to the end markets or consumers and – even though that is where the highest prices are paid – this is not always the most efficient or profitable strategy anyway. Patrons provide fishers with direct links to distant markets especially relevant in the case of AFZ for those products so desired on international markets (shark fin, trepang, etc.). (Stacey et al. 2011). Many commentors have discussed the patron–client relations as a livelihood strategy of the poor resulting in recurring cycles of debt where fishers and households cannot escape. A recent project by McWilliam et al. (2020) provides a useful summary of the survival of patron–clientelism within Sama-Bajau Sulawesi-based communities who cannot access other forms of financial support. On patron–client relationships, they state: “The relationship expresses the idea of an economic safety net but also a form of market based, inter-dependency founded on debt, one that continues over many years in what can be characterized as a maritime oriented moral economy” (McWilliam et al. 2020, p.4). Patrons support their fishers to provide “regular supplies of high value fish deliveries to willing buyers enables small scale and otherwise economically marginal artisanal fishing households to sustain themselves, and even prosper when conditions are conducive” (McWilliam et al. 2020, p.14). This system, however, “is also a major factor that restricts client choices to turn to alternative non-fishing income-generating activities” (McWilliam et al. 2020, p.14), and “comes at the cost of autonomy and the freedom to pursue alternative economic choices and options” (McWilliam et al. 2020, p.15).

Livelihoods vulnerability

The issue of limited livelihood alternatives for maritime and often-marginalised fisher groups has been also emphasised in the literature (e.g. Briggs 2003; Fox and Sen 2002; Jaiteh et al. 2017; Stacey et al. 2021), although in general this has not been thoroughly investigated in previous studies.

There is evidence to suggest that livelihood vulnerability and associated conditions (e.g. economic hardship, illness) and social and political marginalisation can lead to some fishers taking on other activities and migrating to seek other employment options (Gaynor 2005), engage in illegal activity such as using illegal fishing methods (Barratt and Allison 2014) or people-smuggling across the permeable sea boundaries between Australia and Indonesia (Missbach 2016). Missbach (2016, p.749) calls this “hyper-precarious livelihoods” wherein the heavily exploited fisheries of eastern Indonesian fishers play an important factor in decision-making to engage in illegal behaviour, be it illegal fishing or people-smuggling. Some fisher groups also have no or very limited rights of access to natural resources, which can contribute to ongoing engagement in illegal behaviour (Stacey et al. 2017 FAO Report).

Environment and resource management

Other broad-level factors identified in the literature include the depleted status of Indonesian fisheries, pollution, habitat destruction, and coastal development encroaching on coastal fishing grounds. Some commentators have also noted that the conservation agenda such as establishment of Marine Protected Areas and their associated tourism (e.g. in Wakatobi National Park of South-Eeast Sulawesi) has had a negative impact on fishers (Stacey et al. 2017).

With so many fishers in Indonesia, there is competition over limited resources, allowing those fishers with the skills and economic backing to engage in distant-shore fishing in the AFZ (Briggs 2003). In Indonesia, geographical mobility among groups can be necessary to sustain an income from ever-diminishing resources within a competitive environment among more-mobile maritime fisher groups. This is further challenged by competition among artisanal (‘small boat’) (Fox et al. 2009) and industrial fishing groups and sectors (limited resource availability and depletion of localised resources) (Stacey et al. 2011; Fox et al. 2009) in the Arafura and Timor seas region of Indonesia. Additionally, there is acute

pressure on resources in parts of eastern Indonesia – especially Sulawesi – which can be responsible for mobile groups of fishers to travel to strategic island locations in southern Indonesia either seasonally or permanently (Fox et al. 2009). Lack of specific rights of access and quotas or licencing for traditional legal fishers has also been identified as a contributing factor towards illegal fishing (Stacey 2007). However, designation of fishing access rights as a means to reduce the vulnerability of fishing communities may alone not be enough to ensure improved economic conditions for vulnerable fishers because the host of other factors noted may also contribute to their vulnerability (Allison et al. 2012).

7.2.4 Summary

Transboundary Indonesian fishing activity in Australian waters is both complex and diverse. Both traditional legal and illegal activities occur under Australian law and the 1974/1989 MOU agreement between Australia and Indonesia allowing traditional fishing to continue in the defined area of the MOU box in the outer region of the Timor Sea.

The recent period of illegal activity during and post-COVID-19 (2020–24) is consistent with trends in illegal activity over the last 50 years by various fisher groups driven by a range of factors including market demand, opportunity, impacts of maritime boundary changes and MOU amendments. The increasing use of motorised vessels over time and GPS have supported illegal activity, and decreases in fish abundance in areas within the MOU box have no doubt caused some fisher groups to seek a livelihood outside of the box.

The Australian Government has had a defined surveillance, compliance and enforcement policy to detect, apprehend and prosecute Indonesian fishers for decades and has, in response to peak periods of illegal activity, invested millions of dollars of resources to curb this illegal activity. More surveillance and enforcement investment generally results in increased apprehensions. PICs have been used in eastern Indonesia to deter illegal fishing. In summary, the most common identified drivers of illegal fishing in the literature and media include:

- historic
- cultural
- those related to livelihood strategies and vulnerabilities associated with existing livelihoods, including poverty; marginalisation; limited opportunities for the potential to earn equivalent or higher incomes; and competition among Indonesian fishers for limited, depleted or poorly managed resources
- resource abundance in Australian waters
- lucrative prices offered for export products such as shark fin, trepang and trochus
- overfishing in Indonesia
- lack of access rights
- fisheries management in MOU box area.

7.3 Results part 1b: Past livelihoods support for Indonesian fishers

This section provides a brief review of past livelihood and other initiatives implemented in Indonesian communities engaged in legal and illegal fishing in Australian waters to reduce illegal fishing and/or aimed at improving livelihood conditions. It is based on a review of existing literature (unpublished and published reports and documents), building on the authors' knowledge of events and activities which have occurred over the last 2–3 decades.

7.3.1 Livelihoods and diversification

The topic of SSF coastal livelihoods in Indonesia has been substantially reviewed and explored with recommendations for future projects by Loneragan et al. (2018 SRA Final report to ACIAR Part B 171-185) and in subsequent publications arising from that project SRA (Stacey et al. 2019, 2021). As summarized in Stacey et al. (2021, p.2):

> A livelihood in its simplest sense "is a means of gaining a living", but is more than having a job. A broader understanding of rural livelihoods is reflected in the Sustainable Livelihoods Approach and Framework, which provide an integrated view of the processes through which households achieve, or fail to achieve, sustainable livelihoods. The livelihood activities pursued depend upon the livelihood assets (broadly: human, physical, natural, social and financial) that the household owns, controls, claims, or otherwise accesses (including open access resources such as fishing grounds). These assets and activities are in turn enabled or hindered by policies, institutions and social processes, as well as the broader vulnerability context (encompassing shocks, trends and seasonality). The combination of livelihood strategies employed by a household is sustainable if the household maintains or improves its standard of living in 'outcome areas' such as more income, increased well-being, improved food security, reduced vulnerability to external shocks and trends, while not undermining the natural resource base.

Key points emerging from the previous SRA and other publications include:

- There have been considerable program and financial efforts to enhance, diversify or implement alternative livelihood activities in marginalized coastal communities to ease reliance on deteriorating coastal resources, reduce poverty and improve well-being.
- The approach to improving coastal livelihoods has often drawn on development practices in agricultural settings, with livelihoods interventions often grounded in the Sustainable Livelihoods Framework (DFID 1999), which provides a conceptual framework of the process by which people combine their capabilities, skills and knowledge with the assets at their disposal to create activities that will enable them to make a living. Application of the Sustainable Livelihoods Framework also focuses attention on how the institutional and vulnerability context mediates people's ability to achieve a desired livelihood outcome from a given bundle of assets.
- Livelihood interventions typically pursue one of three approaches
  - enhancing livelihoods: improving current livelihood strategies to make them more productive and/or sustainable
  - supplementing or diversifying livelihoods: adding new components to current livelihood strategies
  - finding alternative livelihoods: opportunities for adopting new strategies to support household livelihood diversification[33]

[33] Roscher et al. (2022a, p.2109) describe these as "i) improving the production of an already established activity through a livelihood enhancement; ii) adding a new activity within an established sector of the livelihood portfolio or iii) adding a new activity in a new sector not previously in the livelihood portfolio."

> In most cases, these approaches have an objective of both improving incomes and relieving pressures on coastal resources, with attention directed to improving men's and women's asset endowments to support livelihood activities in a given context.

- The study findings note that, for the most, part programs and initiatives have focused on introducing alternative livelihood activities in preference to enhancing existing strategies that were more likely to threaten sustainability. However, there has been little evidence of success in these initiatives.[34]

Several recommendations were presented in Stacey et al. (2021) for future applied research to address the immediate and longer-term outcomes of sustainable coastal livelihood projects in Indonesia. These are discussed in the recommendations section.

Since this study was completed, two recent papers on sustainable livelihoods were published by Roscher et al. (2022a; 2022b), supporting the findings of Stacey et al. 2019 and 2021, that noted the need to "articulate more deliberately the goals to which livelihood diversification should contribute" (Roscher et al. 2022a, p.2114). Further, a need exists "for more rigorous evaluation of both exogenous and endogenous diversification processes that assesses their effectiveness to enable sustainable livelihoods in a variety of contexts. This includes engaging with the social and cultural contexts that … are often overlooked but inherently impact livelihood outcomes" (Roscher et al. 2022b, p.922).

7.3.2 Improving livelihoods initiatives for Indonesian fishing communities in the NTT Province

The 1989 Agreed Minutes of Meeting Between Officials of Australia and Indonesia on Fisheries (within Appendix 6) regarding the 1974 MOU agreement identified the need for alternative income-generation projects for fishers displaced through changed arrangements (see Appendix 6; quoted from the Agreed Minutes 1989 Point 8):

> The Indonesian and Australian Officials agreed to make arrangements for cooperation in developing alternative income projects in Eastern Indonesia for traditional fishermen traditionally engaged in fishing under the MOU. The Indonesian side indicated they might include mariculture and nucleus fishing enterprise scheme (Perikanan Inti Rakyat or PIR). Both sides mutually decided to discuss the possibility of channelling Australian aid funds to such projects with appropriate authorities in their respective countries.[35]

In 1997, the Australian National University was commissioned by the Australian Government's overseas aid program (AusAID) to conduct a desktop review of

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34 An important recommendation from Stacey et al. (2021, p.9) is "Recommendation 5 – Applied research capacity building for impact studies" which articulates for new tools and resources for application in Indonesian SSF livelihood-improvement programs, and feasibility assessments in the early stages of community engagement to lead to more targeted impact pathways. It is also noted, "given that social change (e.g. behaviour and/or adoption of livelihood practices) happens slowly, longitudinal, applied research studies offer better means to assess livelihood intervention impacts and generate empirical evidence for success factors leading to reduced pressures on marine resources. To enable this, funding structures need to accommodate longer program time frames. Where funding initiatives beyond 5 years may entail too much risk for donors, project design may instead be approached in a multi-phased programmatic way that allows opportunity for continuity while including opportunity periodic review and adjustments".

35 The Nucleus estate and smallholder system is a transmigration program in fisheries used to shift the rural and/or fisher population from densely populated areas to islands where density is low. The program involves both fisheries and aquaculture schemes. It was not considered a potential solution to illegal fishing activity identified in Stacey (1997).

aquaculture-based livelihood alternatives for eastern Indonesian fishers.[36] The report provided a brief overview of Indonesian fishing, identified 19 broad causes of illegal fishing, and identified some community groups that could be considered for aid. The report also noted that several DFAT-supported small aid activities had been implemented in 1994/95 and 1997, and that this aid had not been directed to fishers referred to in the MOU agreement, but to other artisanal fisheries such as fishers from Sinjai region in South Sulawesi. The success of these initiatives in dealing with illegal fishing was also noted as unknown. A discussion on aquaculture options was provided, and several potential proposals for Australian assistance in aquaculture development in eastern Indonesia presented. The report was tabled and endorsed at an Interdepartmental Committee on Illegal Fishing on 24 November,1997,[37] and advice prepared for Australian Government Department of the Prime Minister and Cabinet, but what transpired is not known.

Since 1997 to the time of this SRA, the topic of alternative livelihoods for legal and illegal Indonesian fishers in the AFZ has been raised in numerous social, economic, fisheries and policy research studies, including commissioned reports, government-to-government discussions at bilateral fishery meetings and MOU Box–management workshops that have taken place. Topics have covered potential solutions to MOU Box fisheries management for fishers with a historic right/interest in waters now part of the AFZ, including those displaced by the creation of the MOU Box in 1989. Other topics have covered commitments to identify options for alternative livelihoods for MOU Box and other illegal fishers. In fact, in a 2013 MOU Box unpublished discussion paper circulated to a limited group of people, it was noted that in the past, “alternative livelihoods are a feature of every MoU Box discussion with Indonesia” (AFMA 2013, p.8). Attention by governments on alternative livelihood options has also occurred during periods of much illegal activity – such as in the mid-2000s and more recently during the COVID-19 pandemic.

A brief review of initiatives over the last 25 years follows.

In 2001, Environment Australia staff at Ashmore Reef prepared a proposal for AusAID in two activity areas: socio-economic study of traditional Indonesian fishers; and an assessment of alternative livelihoods (in particular, aquaculture), and a pilot project for Indonesia to develop and trial viable aquaculture seaweed and sponge, and a beach school.

In 2002, following the establishment of an MOU Box working group, James Fox and Sevaly Sen were commissioned by the Australian Government’s Environment Australia (responsible for Ashmore Reef and Cartier Island Marine Parks, and concerned about protection of resources targeted by Indonesians inside the marine parks) to prepare a report *A study of socio-economic issues facing traditional Indonesia fishers who access the MOU Box*. They reported the study was part of a “longer term strategy to manage MOU box resources and develop alternative incomes for Indonesian fishers who fish in the box” (Fox and Sen 2002, p.3).

The report provided recommendations for alternative income strategies noting “any strategy … must be multi-focussed and must differentiate among the various fishers from eastern Indonesia” (Fox and Sen 2002, p.56). They noted some generic prerequisites for “any successful alternative income strategy”, including the involvement of vessel owners, traders and middlemen; incomes should be equal to or exceed current income; alternative product/incomes for the handicraft industry should be included (referring to alternatives to trochus shell); markets should be identified; and effective extension support should be provided. The report also highlighted the experiences of the Indonesian government’s ‘Indonesian Government Economic Empowerment of Coastal Community Programme

36 A copy of this unpublished report (Stacey 1997) is held by the author.

37 Source: Stacey, personal email files

(EECC)', noting 5 critical factors contributing to the success of the program that should be adopted as part of any introduction of any alternative income activities.[38] The report makes a number of recommendations specifically for the Rote and Oelaba fisher network; including "targeted educational assistance as an investment in the future" (p.59) and " provision of adequate local credit in fishing communities", "marine based alternative income opportunities" (e.g. seaweed), and "tourism" (pp.59–60). It was noted the Bajau Laut is a special case and require a detailed needs assessment and separate strategy for livelihood improvements (Fox and Sen 2002).

The report recommendations led to a funded Environment Australia project (February 2004 to June 2005) implemented by Australian National University, led by James Fox and Tom Therik (deceased), and titled 'Alternative Livelihoods Project for Fishers on Rote and in Kupang Bay focussed on the Papela Network in NTT'. The long-term objective of the project was "to create a 'menu' or 'suite' of alternative livelihood strategies for fishermen in eastern Indonesia" (Fox 2005, p.2). The project focused on seaweed cultivation with 30 Tanjung Pasir families in Pepela and 30 Rotenese families in I'a (Lifudale) in the vicinity of Papela. After 2–3 successful harvests (and families repaying instalments on their credit), an outbreak of ice-ice disease affected harvests and the project activities were cancelled. Some further attempts were made with new technology for seaweed cultivation and a Rotenese cooperative was formed (*Tasi-Tasi*) by fishermen. A list of 12 communities in Rote Timor where seaweed farming had been initiated is provided in the report. While the project had potential to generate some new income for fishers, families and households, neither baseline assessment information (e.g. on incomes) was reported, nor the impact of the project within the broader livelihood portfolios and TBF activity of fishers and families (either men or women). Sponge cultivation was also trialled in Kampung Baru, at Bolok, in Kupang. The report notes the project had had limited success working with Bajau Laut people in Tanjung Pasir because some bosses had undermined the involvement of some families in the seaweed activities. A cooperative *Sama Turo* (Bajau unit) was established reportedly to focus on grouper aquaculture. Some additional products such as trochus shell, tropical abalone, and hard and soft corals were identified for a possible phase III project. Therik also established a beach school to raise awareness among Bajau fishers about new livelihood strategies, marine conservation and marketing – in consultation with government officials. The report also notes the opportunity for the program to adopt components of a World Bank–Government of Indonesia Coral Reef Rehabilitation and Management Program (COREMAP) training and awareness program into the curriculum. No further information is available, but anecdotally the ongoing activities of the beach school were reported to have been impacted by financial issues and ceased.

Interest in the issues particularly related to the ecological impact of Indonesian activity was the topic of discussion at a 2006 National Fishing Advisory Council/CSIRO (Commonwealth Scientific and Industrial Research Organisation) workshop called

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38 These 5 factors are listed as follows quoted in Fox and Sen (2002, p.57):

"(1) Local people should objectively identify the target group and beneficiaries using participatory methods and reliable data and information.

(2) Agents of change should be recruited from local youth and work as mediators, catalysts and extension agents to help people to solve their problems.

(3) Local management consultants should be hired by the project to help people during the project and prepare them to run their businesses after the project ends.

(4) An advisory group at village level should be established which consists of formal and informal leaders that work voluntarily to help people during and after the project.

(5) Micro-financial institutions should be established at village, sub-district, or district level which are able to release project money to the beneficiaries, run a revolving fund, collect repayments, and redistribute the money to new beneficiaries in the same village. The body and structure of the institution should be flexible enough to account for different requirements in different places, but needs to be totally owned by the project beneficiaries.

"Understanding the impacts of IUU and domestic fishing on key species – a way forward" held at AFMA, Canberra, in May that year. In the workshop summary document, a large list of agreed projects (and a list of past research and studies) is provided about illegal Indonesian fishing, species catches, fisher interviews, some ACIAR-funded projects in Indonesia, and identification of to-be-determined projects by AusAID to fund scoping studies on alternative livelihoods.[39,40] A series of consultancies and reports were then commissioned through the 2006 working group comprised of government agency staff and researchers.

In the minutes of the sub-working group on the MOU Box within the 2007 Annual Meeting of the Working Group on Marine Affairs and Fisheries in Canberra, it was noted that (WGMAF 2007, p.3):

> Australia will continue to identify projects to develop alternative livelihoods for traditional fishermen in conjunction with efforts to promote sustainable fisheries management in the MOU Box. The aim of the projects would be to help reduce the reliance of Indonesian traditional fishermen on the harvest of the fisheries resources in the MOU Box.

A 2008 case study report on IUU shark fishing in Australian waters (Lack and Sant 2008) provides a list of Australian initiatives to address IUU shark fishing as of 2007, noting ongoing work on an Indonesian catch monitoring study conducted with ACIAR, AFMA and Jim Fox (of Australian National University) to "examine landed quantities of catch in the Indonesian market and compare with official landing records to improve knowledge of catch composition and routes of fish product through south-east Asia". It also notes that an AFMA-funded pilot study "involving interviews with illegal Indonesian fishers in detention will obtain information on illegal catches, species, fishing hotspots, ports used" (Lack and Sant 2008, pp.54–55). It was noted in 2008 that interviews had commenced and a report would be finalised upon completion of interviews. The report also notes the existence of a 2005 report by James Fox, *Report on Illegal Fishermen in Australia Waters: Shark Fishermen from Merauke, Dobo, Saumlaki and Papela* (unpublished report to Australian Government DAFF). It is noted this document reports on the scope of illegal foreign fishing efforts by Indonesian shark fishers based on surveys of detainees and fishing communities in Indonesia. The Lack and Sant (2008) TRAFFIC report also notes the existence of some other "joint initiatives with Indonesia" to "educate fishers about the impacts and consequences of illegal fishing".

When Jim Prescott took over as AFMA MOU Box manager in Darwin in 2007, he led a significant suite of projects, research and engagement with Indonesian fisheries staff and MOU Box 'legal' fishers to better understand the status of stocks. The aim was to monitor stocks, involve fishers in MOU Box management, and build capacity for the Indonesian government to be involved in fisheries management and socio-economic assessments of the MOU Box fisheries. This included training on fisheries and socio-economic survey techniques with Indonesian government fisheries staff to collect information on MOU Box fisheries (Prescott et al. 2016, 2017); development of a draft *Strategic Plan of Research for the MoU Box Traditional Fisheries: 2011–2015* (AFMA 2010 unpublished document).

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39 Helen Moody, then Director of Indonesia Section at AusAID, is listed as the contact person in the 2006 workshop summary document. In Results part 1a, we noted the existence of a report commissioned linked to this initiative (Wheeler 2006), but we have not been able to locate this report.

40 In the 2007 assessment of Indonesia's development strategy, the following is reported: "Providing alternative livelihoods for illegal fishers in Australian waters was not a focus of either strategy but has recently emerged as a priority issue. This is being addressed specifically through a pilot activity on Rote Island and through initiatives such as the Smallholder Agribusiness Development Initiative and the Australian Nusa Tenggara Assistance for Regional Autonomy Program, which focus on rural livelihoods, including in coastal areas. Initiatives in this cluster are at too early a stage to assess" (AusAID 2007, p.30).

This and a 2013 AFMA discussion paper *The MOU Box Traditional Fishery: Some of What's Known And What Australia Should Do And How It Might Go About It* provided background context for a DAFF- and MMAF-hosted MOU Box research workshop held in Bali on 14–15 May 2013. The aim of the workshop was to turn the plan into reality by developing an integrated, collaborative research program which would ultimately lead to improved MOU Box fisheries management and livelihoods for Indonesian fishers reliant on the resources. If the concept was of interest, the workshop would be the first step towards establishing an Indonesian and Australian research consortium or partnership to advance a program proposal. A report on the workshop was prepared.

After the workshop, Fox (2013) shared an unpublished discussion paper to a limited group of key researchers and government management at the time of the last major meetings on the MOU Box agreement and fisheries between Australia and Indonesia: *What Should Be Done: A Discussion Paper And Proposal On Mou Box Management.* In the paper Fox outlined the "Twenty-Five Years of Bureaucratic Inertia" (2013, p.1) on a bilaterally agreed management plan for the MOU Box to accommodate allocation of access rights and fishing quotas for approximately an estimated 1,000 identified traditional fishers from a few locations in Rote Island and Madura to fish for some limited species such as trepang in managed way rather than the current 'open to any fisher with no management' that has been in place for 50 years. Other issues such as seasonal closure of access to the MOU (although difficult to manage) had also been raised in the paper.

In 2022 at the 22nd Indonesia-Australia Fisheries Surveillance Forum in Darwin, Australia, and Indonesia and Australia signed a new agreement to establish at least 3 working groups to focus on PICs, surveillance and law enforcement, and the opportunities to create alternative livelihoods for those crewing Indonesian fishing vessels engaged in illegal fishing.[41]

Following this, the Indonesian Government Ministry of Marine Affairs and Fisheries held a FGD in May 2022 in Jakarta to discuss *Mata Pencaharian Alternatif Nelayan Pelintas Batas Indonesia-Australia* (alternative livelihoods for Indonesian–Australian cross-border fishermen). The aim of the FGD was to identify and provide recommendations for several alternative livelihoods for Indonesian–Australian cross-border fishers that take into account all related aspects, including economic, sociocultural, political and physical/geographical conditions of the local area.[42] We have not been able to ascertain information on developments since then.

7.3.3 Other development initiatives in Rote Ndao, NTT

In the last 15 years, there have been several large development programs initiated in the NTT region which have had goals and activities focused on improving the coastal livelihoods of communities, including improving people's participation in fisheries value chains, including activities specifically focused on women, and marine management.

[41] *Sustainable catch: better Indonesia-Australia cooperation on fishing* https://www.lowyinstitute.org/the-interpreter/sustainable-catch-better-indonesia-australia-cooperation-fishing

[42] Unpublished Indonesian Ministry of Marine Affairs and Fisheries agenda for the focus group discussion, supplied to the authors.

These include:

- *Regional Fisheries Livelihood Program for South and South Asia* implemented by FAO (2009–13) which covered 6 countries and included programs in locations in NTT, Indonesia.[43]
- The Nature Conservancy–led Australian Government–funded project *'Planning for Sustainable Use: Developing coastal and marine spatial plan to inform investment plan and sustainable use of marine resources that benefits people and biodiversity in Rote-Ndao district of East Nusa Tenggara Province t'*, (2013–15). It was funded though Department of Environment funding as part of Australian Government support to the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security.[44]
- Coral Reef Rehabilitation and Management Program - Coral Triangle Initiative (COREMAP-CTI), funded by the Global Environment Facility (GEF) through the World Bank, and executed by the Indonesia Climate Change Trust Fund (2020–22). The locations of the project in Rote were Oelua, Kecamatan Loaholu and Sotimori Kecamatan Landu Leko. PILI was the implementing organisation that conducted strengthening of customary institutions in Oelua regarding marine management and community-based surveillance. Livelihoods activities included ecotourism in Oelua, training on fish products[45] and marketing. Other partners were Yapeka, Reef Check, and Terangi. Note: not sure if the beneficiaries also included the family of transboundary fishers.
- The Global Environment Facility and United Nations Development Programme *Arafura and Timor Seas Ecosystem Action Program (ATSEA) Program Phases I and II* (2010–24) involving governments of Indonesia, Timor Leste, Papua New Guinea and Australia – Phase I and Phase II Implementation of the Arafura and Timor Seas Regional and National Strategic Action Programs (2010–24).[46]

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[43] A number of reports on the Regional Fisheries Livelihood Program activities related to gender, fisheries and livelihoods from NTT are available via FAO Knowledge Repository pages, such as a gender impact assessment of field activities conducted in NTT Province and recommendations; a situation analysis report opportunities for the program on co-management, safety at sea, post-harvest and marketing, livelihoods enhancement, diversification and micro-finance services; Indonesia baseline survey against the five Regional Fisheries Livelihood Program national level outputs namely co-management, safety at sea and vulnerability reduction, post-harvest and marketing, livelihoods enhancement and diversification and micro-finance service; and a report on applying a sustainable livelihoods approach (SLA) to country livelihood activities.

[44] A 2014 Commonwealth Government brochure described the project activities: "This project, implemented by The Nature Conservancy, aims to support the district to pursue this goal through the: development of a district-scale marine plan to guide the sustainable use of marine resources for social and economic benefits, and biodiversity conservation; running a pilot program on the Territorial User Rights Fisheries management approach; provision of training and technical support to improve mariculture practices; and development of a coastal and marine tourism strategy for the district government."

[45] https://rotendao.victorynews.id/rote-ndao/pr-3422704526/yayasan-pili-tetap-komitmen-lakukan-pendampingan-di-rote-sampai-tahun-depan

[46] Information about the Phase 1 terminal evaluation can be found at ATSEA (2021). According to the ATSEA Phase II 2017 Project Document (UNDP 2022, p.2), the ATSEA-2 project "is designed to enhance regional collaboration and coordination in the Arafura and Timor Seas (ATS) region. ATSEA-2 will specifically focus on supporting the implementation of the endorsed strategic action program (SAP), a 10-year vision for the Arafura-Timor Seas with the long-term objective to promote sustainable development of the Arafura-Timor Seas region to improve the quality of life of its inhabitants through restoration, conservation and sustainable management of marine-coastal ecosystems. The GEF alternative establishes a regional governance mechanism that strengthens the enabling policies and capacities of institutions and individuals, including the integration of

All three programs (except for ATSEA Phase II) have been reviewed as part of the Loneragan et al. (2018) coastal livelihoods program evaluation report; information on achievement towards improving coastal livelihoods can be found in that report. In general, activities under these three major projects have included livelihood-enhancement activities in West Timor and Rote Ndao regions, but did not target fishers or communities in the Papela/Rote or Kupang network.

Regarding ATSEA Phase I, the issue of unsustainable TBF activities (legal and illegal) was identified as a priority in the 2011 ATSEA Transboundary Diagnostic Analysis (Stacey et al. 2011) (and subsequent the updated analysis in 2019) including concerns of exploitation of trepang, shark fin and shared snapper resources. To the best of our knowledge, the issue of (and solutions to) illegal and legal Indonesian fishing in the Arafura and Timor seas including in Australian waters has not been a specific focus of any of the project activities or outcomes of ATSEA Phase I or II. In terms of capacity building and livelihood-enhancement activities for communities participating in ATSEA II: little detailed information appears available, however the ATSEA II terminal evaluation report notes women benefited through financial support and alternative livelihoods.[47] In a recent paper by Sustanto et al. (2024) on the achievements of ATSEA Phase II, it is noted that over 5,000 men and women from the 3 participating countries had aspects of their livelihoods improved through capacity building and training in ecosystem approach to fisheries management; integrated coastal management; monitoring, control and surveillance; marine protected areas management; climate change; rights-based fishery management; sea turtle protection; and alternative livelihood support. Livelihood training in and support was provided for sustainable aquaculture, seaweed soap making, virgin coconut oil coffee making, plastic recycling, resilient home gardens, business and financial management, and mangrove and coastal restoration. However, the ATSEA Phase II terminal evaluation report (Sustanto 2024; p.37) notes a “lack of baseline data monitoring at household level at project sites, in particular in Indonesia and Timor-Leste, to assess the success of project livelihoods in terms of percentage change of incomes. Similarly, there is also a lack of data collection at individual level to monitor the level of knowledge acquisition from capacity building programs”. This is a similar finding to Loneragan et al. (2018) and Stacey et al. (2019; 2021) where livelihood success in past programs has generally been measured by the participation targets of men and women, rather than by specific livelihood assets or strategy improvements.

At the closure of ATSEA Phase II Program in December 2024, ministers of all four countries[48] signed the Sydney Declaration,[49] confirming commitments to continue to work together to address priority concerns in the Arafura and Timor seas region, including formation of an Arafura and Timor seas regional governance mechanism and updated Strategic Action Plan for 2024–33.

Papua New Guinea, resulting in a sustained transboundary response to over-exploited fisheries and increased pressures on the globally significant biodiversity in the ATS region, including the impacts of climate change. Integrated approaches are designed to incentivize local communities to more sustainably use coastal and marine resources, enhancing their own livelihoods while safeguarding the ecosystem goods and services that are the backbone of their socio-economic well-being.” Source: https://info.undp.org/docs/pdc/Documents/TLS/Prodoc%20-%20ATSEA%202019-2021.pdf.

47 The ATSEA Phase II Terminal evaluation report (UNDP 2022) notes that in Indonesia and Aru Islands and Rote Ndao, some livelihoods of women were improved.

48 Australian representation within the ATSEA Program is through its Department of Climate Change, Energy, the Environment and Water (DCCEEW).

49 The declaration can be accessed at https://atsea-program.com/publication/sydney-declaration/.

7.3.4 Summary

Our brief review of past livelihood programs and other initiatives to address legal and illegal Indonesian fishing in Australian waters has shown that despite numerous commitments, discussions and some initiatives over the last 4 decades there has been no significant, long-lasting community development, poverty reduction, behavioural change or supplementary livelihood development projects implemented in any of the main communities in the Rote/West Timor region for people who are engaged in legal and illegal fishing since the 1974 MOU agreement was implemented.

While the Australian National University–implemented project in 2002–05 had good intentions and support from Environment Australia and AusAID, it was impacted by numerous implementation challenges. Further, it was neither implemented with a baseline assessment to assess change, nor appears to have been grounded in a particular theory of change or specific goal associated with best practice in rural livelihood development approaches such as the Sustainable Livelihoods Approach. Since then, other recently supported DFAT/ACIAR programs in neighbouring countries, such as Timor Leste and Pacific Islands, have applied best practice livelihood, fisheries development and management approaches in coastal community contexts to address a range of coastal livelihood, wellbeing and management issues. Moreover, within the Arafura and Timor seas region, several international development initiatives have been implemented in the last decade or so with the goal to improve coastal community livelihoods. However, there appear to have been no awareness of or limited linkages between these initiatives – in particular with ATSEA – and key Australian and Indonesian stakeholders with an interest in addressing issues associated with legal and illegal fishing.

From this brief review, the focus has been on alternative livelihoods in isolation from the much broader livelihood context and portfolios of fishers and communities, and it appears with limited expertise in community development and sustainable rural livelihoods, making the challenge of achieving outcomes even more difficult. This provides substantial argument for a significant long-term, large-scale, multidimensional, comprehensive livelihood-support program of activity to be implemented in selected NTT communities – notwithstanding the remaining unknown question of whether a significant and substantial program of activity would make a difference. The question exists, however, that even if there were some improvements, would small-scale (legal and illegal) TBF in AFZ continue as an important seasonal livelihood strategy as part of community livelihood portfolios? The AFMA 2013 MOU Box discussion paper provided some commentary on alternative livelihoods options and success factors for legal fishing.[50] The report also noted that “for fishers who derive much of their livelihood from fishing in the MOU Box there is unlikely to be a better alternative than having access to a “well managed fishery” that can produce a sustainable catch and income stream well into the future” (AFMA 2013, p.52). This is an important consideration in any discussion on alternative livelihoods for coastal fishing communities where, rather than discussing alternatives, opportunities are considered for improving fisheries engagement in existing domestic fisheries and addressing barriers to improved financial and social outcomes of fishery value chains (see section 7.5). A variety of such programs are implemented in other parts of eastern Indonesia such as by ACIAR and other NGOs working to improve fisher outcomes in tuna fisheries in eastern

[50] The unpublished AFMA MOU Box discussion paper notes in relation to MOU box fishing that “many alternatives are only likely to be attractive to the less efficient and less profitable crews. The data also show that good fishermen are still able to achieve profits that would be difficult to achieve via another (likely) alternative. More importantly, the discussion about alternatives needs to be based around the fact that until and unless there is a defined group of fishermen to whom access to the MoU Box would be granted then it would be impossible to achieve the desired outcome with an alternative livelihood strategy, i.e. presumably to re-direct fishers to new livelihood occupations and thereby reduce fishing pressure. Naively executed, there is evidence that alternative livelihood programs can worsen the fisheries situation as “alternatives” become “diversifications” that end up supplementing unsustainable and unprofitable fisheries” (2013, p.8).

Indonesia. This offers a potential avenue to explore further how such initiatives may be adapted to the case of fishers in the Rote/West Timor and Sulawesi networks.[51]

There is great potential to develop closer links with any future ATSEA or other related initiatives to address TBF through domestic livelihood enhancements to address the question above. Given the past gaps and limited initiatives implemented, as Australian and Indonesian researchers tasked with tackling the issue of alternative livelihoods for illegal fishers, we cannot help but ask if substantial longer-term commitments and support will be provided in the future, or if the inertia will continue.

7.4 Results part 1c: Theoretical approaches to understanding the causes of illegal fishing

7.4.1 Theoretical approaches to understanding the deterrence and prevention of illegal fishing

This section reviews relevant academic literature on international illegal fishing, focusing on papers published within the past 10 years relevant to the AFZ. In doing so, we set the scope of global literature relevant to fisheries defined as industrial, artisanal, and/or small-scale. We identify five themes in previous studies pertinent to the focus of this study:

- key concepts applied in understanding the causes of illegal fishing
- enforcement approaches
- theoretical explanations of noncompliance
- drivers of illegal fishing
- designing behaviour-change interventions.

Key concepts applied in understanding the causes of illegal fishing

The root causes of illegal fishing are numerous and diverse, encompassing individual, community and environmental aspects. Belhabib and Le Billion (2020, p.1), in discussing illegal fishing globally and with hotspots in West and East Africa, North Pacific, and South-East Asia, for example, summarise these causes to include:

- cost/benefit analysis by offenders
- moral, societal, economic and cultural factors (including feelings of entitlement or ownership over the resource)
- resistance to impoverishing exclusionary conservation
- coercive enrolment
- the hold of organised crime and moral norms within fishing communities
- overcapacity, ineffective fisheries management, and subsidies
- poverty and economic desperation, especially in contexts of crisis.

Due to this complexity and breadth, scholars have employed a range of terminology and conceptual approaches to explore the causes of illegal fishing and potential solutions.

[51] Such as the ACIAR-supported program on vulnerable communities and tuna fisheries in eastern Indonesia. Yayasan Masyarakat dan Perikanan Indonesia (MDPI) is a national NGO focusing on improving the livelihoods of coastal fishers in eastern Indonesia reportedly working in Kupang.

As a security threat and/or (transnational) crime

The dominant conceptual approach is understanding illegal fishing as a security threat or crime (Lindley et al. 2019; Österblom et al. 2011, p.261; Nahuelhual 2023, p.3), marked by fisheries management measures, which in spaces such as the Philippines "have over time more actively regulated fishing access" (Fabinyi 2024, p.160). For example, Österblom et al. (2011, p.261), define illegal fishing as a nontraditional (nonmilitary) security threat synonymous with organised crime. Although unlawful fishing does not jeopardise a state's physical survival, the authors argue, it will likely impact on its quality and identity (Österblom et al. 2011, p.261). In the context of the AFZ, this is reflected in narratives linking illegal fishing to a breach of Australian sovereignty, and a highly securitised media discourse of unlawful fishing "as urgent and requiring extreme measures" (Österblom et al. 2011, p.26).[52]

The relationship between illegal fishing and other organised criminal activities (Mackay et al. 2020, p.2) is described as cyclical (Okafor-Yarwood 2020). Firstly, organised crime's involvement in illegal fishing is said to be "resulting in the mixing of these activities" (Mackay et al. 2020, p.2). Second, unlawful fishing is seen as providing "the ideal (illegal) environment for fisheries crimes and other forms of transnational organized crimes[53] to flourish" (Chapsos and Hamilton 2019, p.255). Commonly cited examples of crimes linked to illegal fishing include:

- drug smuggling (Liddick 2014; Telesetsky 2014; Widjaja et al. 2023; Lindley et al. 2019)
- human trafficking and people smuggling (Missbach 2016; Chapsos and Hamilton 2019)
- weapon smuggling (Lindley et al. 2019)
- customs and tax evasion (Widjaja et al. 2023; Chapsos and Hamilton 2019)
- document fraud (Chapsos and Hamilton 2019)
- human rights abuses such as slavery and child labour (Chapsos and Hamilton 2019; Mackay et al. 2020; Widjaja et al. 2023; Belhabib and Le Billon 2020, p.1)
- piracy (Mackay et al. 2020; Widjaja et al. 2023).

These examples, together with the unique transnational dimensions of illegal fishing[54] (de Coning and Witbooi 2015, p.209), have led a growing number of authors to classify

52 This is evident in Australian media articles documenting illegal Indonesian-fisher incursions in the AFZ since the start of the COVID-19 pandemic, with headlines such as "Pandemic-fuelled wave of illegal fishing boats prompts call to diver Border Force resources" (Parke and Brann 2021), "Blitz at sea: Boats burnt, crews sent home as illegal fishing off WA skyrockets" (Prestipino 2021), "Desperate Indonesian fishermen are risking their lives to sneak into rough Australian waters and plunder sea treasures" (Barker et al. 2022).

53 A broad definition of organised crime is that it "consists of networks of individuals who converge and collaborate over time to commit crime" (Shaw and Kemp 2012, p.5, cited in Witbooi et al. 2020).

54 Examples of the transnational dimensions of illegal fishing include: "vessels illegally fishing outside their home country, affected fish stocks crossing national EEZ, globalized seafood supply chains processing and retailing illegally harvested fish and vessel involvement in other transnational crimes, such as drug trafficking" (Belhabib and Le Billon 2020, p.1).

the issue as a transnational crime[55] (Chapsos and Hamilton 2019; Belhabib and Le Billon 2020; Yuliantiningsih et al. 2022; Österblom et al. 2011; Liddick 2014).[56]

The actual links between illegal fishing and crime; however, are contested due to "a paucity of empirical evidence on actual links" (Mackay et al. 2020, p.2), and disparities in the underlying business models of the varied illegal activities taking place on the ocean (Mackay et al. 2020, p.5). One challenge is the diversity of recipients involved in illegal fishing, which can "range from small scale vessels operating out of distant home ports to sophisticated vertically integrated structures" (Vince et al. 2021, p.520). This not only makes transnational illegal fishing activities difficult for state authorities to track but also carries the risk of "inappropriately targeting small-scale fisheries (SSF), at times violently" (Song et al. 2020 p.831).

As a 'wicked problem'

An emerging counter-narrative to the narrow focus on individual fishers as offenders or law violators (Nahuelhual et al. 2020, p.105) can be found in attempts to reframe illegal fishing as a wicked problem (Aceves-Bueno et al. 2021; Luomba et al. 2016; Nahuelhual et al. 2023). Proponents of this approach argue that the wicked problem concept offers more nuanced explanations of the nature, scope and causes of illegal fishing, as well as potential solutions (Nahuelhual et al. 2023).

Originating in broader critiques of a "perceived dominance of rational-technical or 'engineering' approaches to complex issues of social policy and urban planning" (Head 2008, p.101), wicked problems are typically defined as complex, open-ended and intractable (Head 2008, p.101). In contrast to tame or benign problems tackled by science, "both the nature of the 'problem' and the preferred 'solution' are strongly contested" (Head 2008, p.101). Wicked problems are thus not only difficult to manage but "incorrigible" (Rittel and Webber 1973; Duckett et al. 2016, p.45). As stated by Head (2008, p.103):

> "The attraction of the 'wicked problem' concept is that it seems to provide additional insights concerning why many policies and programs generate controversy, fail to achieve their stated goals, cause unforeseen effects, or are impossibly difficult to coordinate and monitor."

Rittel and Webber (1973) initially formulated 10 characteristics[57] of wicked problems, which have subsequently been reduced to six by Duckett et al. (2016, p.45, see Table 6) to eliminate repetition and informed by other literature in the field.

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55 Defined as "cross-border misconduct, which entails avoidable and unnecessary harm to society, which is serious enough to warrant state intervention and similar to other kinds of acts criminalized in the countries concerned or by international law. Crime will be viewed as cross-border when the offenders or victims are located in or operate through more than one country" (Passas, 1999, p.401).

56 This was demonstrated in an ABC News media article where an AFMA representative comments illegal fishing potentially linked to organised crime: *Authorities investigate 'unprecedented surge' in foreign boats entering Australian waters* https://www.abc.net.au/news/2025-01-15/authorities-investigate-surge-in-foreign-boats-australian-waters/104783448

57 Rittel and Webber (1973): 1. There is no definitive formulation of a wicked problem, i.e. even the definition and scope of the problem is contested; 2. Wicked problems have no 'stopping rule', i.e. no definitive solution. 3. Solutions to wicked problems are not true-or-false, but good-or-bad in the eyes of stakeholders. 4. There is no immediate and no ultimate test of a solution to a wicked problem. 5. Every (attempted) solution to a wicked problem is a 'one-shot operation'; the results cannot be readily undone, and there is no opportunity to learn by trial-and-error. 6. Wicked problems do not have a clear set of potential solutions, nor is there a well described set of permissible operations to be incorporated into the plan. 7. Every wicked problem is essentially unique. 8. Every wicked problem can be considered to be a symptom of another problem. 9. The existence of a discrepancy representing a wicked problem can be explained in numerous ways. 10.

Table 6. Wicked problems

Short description	Long description
Indefinable (and nongeneralisable)	The formulation of a wicked problem is the problem. Stakeholder contestation abounds, hampering all attempts to reach agreed or definitive problem formulations and making each wicked problem unique and resistant to general strategies of mitigation.
Ambiguously bounded	Wicked problems can usually be considered symptoms of a different problem, often at a different scale. The resultant inter- and intra-connectedness of issues problematises the isolation of manageable components. Boundaries are hard to establish and unstable. There are problems within problems and strategies to address one can spawn other single or interlocking problems.
Temporally exacting	Time is often running out where wicked problems are concerned. There is generally no stopping rule. There are no ends to the causal chains linking open systems involved. Persistence and longevity confound intervention strategies, and mitigation efforts often only cease because of the intervention project's own material limitations. System relationships are frequently nonlinear, exhibiting disproportionate and unpredictable changes. Co-evolution occurs both in the overall system and the agents within it.
Repercussive	Proposed solutions to wicked problems are entangled with value conflicts and ideological/cultural constraints, often with side effects that may themselves be profoundly problematic. They neither have an enumerable or an exhaustively describable set of potential solutions, nor is there a well-described set of permissible operations that may be incorporated into any plan. There is no ultimate validity test for solutions. A proposed solution to a wicked problem is often a 'one-shot operation' with the problem resisting a return to square-one, having often been transformed by attempts to tackle it.
Doubly hermeneutic	There is a two-way relationship between analysis and the social world. Understandings of wicked problems cannot be pinned down, but are constantly challenged by active subjects who, unlike rocks or chemicals under the gaze of the natural scientist, can change their practices just as understandings of those practices are developed condemning to failure the attempts to solve wicked problems based on a specific understanding of the behaviours involved. The information needed to understand a wicked problem depends upon initial framing, which itself is co-dependent on a wide range of contextual factors – human and nonhuman; adaptive agents react to the system and to each other. System behaviour is emergent from the interaction of the parts, such that the whole is different from the sum of the parts. The problem is not understood until after the formulation of a solution.
Morally consequential	Wicked problems demand action while displaying great resistance to change. They exist in social systems where mistakes are unacceptable in contrast to controlled environments. This can create significant moral dilemmas that pose individual risks for would-be problem solvers who may be held to have no right to be wrong, yet may be morally obligated to act. Outcomes can always be contested. Those seeking to solve the problem may also be causing it or inadvertently causing another wicked problem.

Source: Duckett et al. 2016, p.46

The planner has no 'right to be wrong', i.e. there is no public tolerance of initiatives or experiments that fail."

Drawing on a qualitative analysis of illegal fishing in 3 Chilean small-scale fisheries, Nahuelhual et al. (2023, p.504) contend that illegal fishing aligns with most of these characteristics:

- it is indefinable and nongeneralisable, with different representations and uncertainty about its nature, magnitude and effects
- depictions of the nature of the problem vary from a lack of regulations' legitimacy to a 'combat' to be won
- it is ambiguously bounded, caused by interrelated subproblems (e.g. poverty, access), involving multiple policy sectors, administrative scales and actors
- it is also temporally exacting and repercussive as it lacks criteria to prove that a solution has been reached, and the implications of alternative solutions (e.g. self-regulation) are unknown.

While it is not clear "that labelling a problem as 'wicked' will readily assist in solving it" (Head 2008, p.103), Nahuelhual et al. (2023, p.507) contend that recognising illegal fishing as a wicked problem has numerous strengths, including:

- highlights the need for current research approaches to move beyond fishers' noncompliance as the single or main aspect of the problem
- helps transcend the view of illegal fishing as merely a management and compliance problem
- encourages scholars and problem solvers to revise the chief regulatory governance strategy employed today for addressing illegal fishing in SSF (e.g. governmental rules and regulations with a central or exclusive role of the state, through command-and-control mechanisms)
- provides some guidance on preventing "governance traps"[58]
- emphasises that no single solution exists and a transdisciplinary approach is required (Brown, Harris and Russell 2010).

Conceptualising Indonesian fishing activity in Australian waters as wicked problem and identifying potential strategies would thus appear a necessary step and a recommendation of this research study. But as Nahuelhual et al. (2023, p.517) state in their paper, "diagnosing a wicked problem is a wicked problem in itself" (cited by Yawson 2013). Further, they state that "assessing the wickedness of illegal fishing in SSF is essential to design alternative and innovative policy responses. As long as illegal fishing is recognized as a wicked problem, policymakers can also recognize that there are no perfect solutions but only clumsy interventions that can nonetheless be more successful" (Nahuelhual et al. 2023, p.518). Based on their case studies of Chilean fisheries, they argue their framework is suitable for assessing other small-scale illegal fishing elsewhere. Their key emphasis is the need for research approaches to move beyond fishers' noncompliance as a key explanation of the problem – an instrumental approach by rational decision-makers – to one that focuses more on conceptualising behavioural drivers (actor- and opportunity-based approaches).

[58] Governance traps occur "when the ability to address the problem becomes constrained by a misdiagnosis of the nature of the problem and a miscalculation of the social actors responsible for its solution" (Morrison et al. 2020, p.67).

7.4.2 Enforcement approaches

Enforcement approaches[59] to prevent and control illegal fishing are usually contained within the national fisheries legislation of individual nation-states, and in a tapestry of binding and nonbinding regional and global instruments (Kuemlangan et al. 2023). A range of authors have attempted to summarise these measures by categorising them into themes. For example, Vince et al. (2021, pp.519–24) identify four main approaches:

- legal and economic strategies (e.g. improving the global legal framework, increasing the scope and level of sanctions, reducing the reward by safeguarding internationally attractive species)
- technological tools (e.g. increasing risk of detection by improving monitoring, control and surveillance)
- collaboration between state and nonstate actors (e.g. environmental NGOs, market-based organisations, industry and third-party certifiers)
- bilateral and multilateral agreements with neighbouring states (e.g. the 1974 MOU agreement between the governments of Australia and the Republic of Indonesia; and joint PICs targeting fishing groups and communities).

In contrast, Kuemlangan et al. (2023, pp.1–4) reduce this list to just two main approaches:

- the administrative enforcement approach (e.g. fines, denying entry to the port, detaining and blacklisting repeat offenders)
- the criminal enforcement approach (e.g. punishments available under a criminal system such as prosecution, conviction and imprisonment).

The administrative enforcement approach, which is the dominant method applied internationally (de Coning and Witbooi 2015, p.209), regards transgressions of fisheries-related laws "as (primarily) an administrative law matter and seeks to prevent such behaviour by strengthening fisheries management and conservation rules and stepping up compliance via increased monitoring, control and surveillance (MCS) of vessel activities and complementary port state measures."

Critics of the administrative enforcement approach argue that the persistence of illegal fishing internationally demonstrates that these management tools have "clearly been insufficient to address the problem" (de Coning and Witbooi 2015, p.210). While the possible obstacles to the administrative enforcement approach are many and varied,[60] de Coning and Witbooi (2015, p.210) contend that a more fundamental problem constraining its success is the misdiagnosis of illegal fishing as a fisheries management problem. This misdiagnosis, the authors argue, results in an almost exclusive focus "on fishing vessel's [*sic*] activities at sea and in port and the fish on board these vessels rather than on the individual persons engaged in activities in the fishing sector" (de Coning and Witbooi 2015, p.210).

Similarly, Nahuelhual et al. (2020) apply the socioecological trap concept to counter what they refer to as the 'deterrence dogma' underpinning enforcement approaches. Using the Chilean king crab fishery as a case study, the authors describe illegal fishing as "a

[59] Common examples include coastal surveillance and policing, policies and regulation, education, and joint efforts with neighbouring states (Vince et al. 2021, p.518).

[60] Such as poor availability of financial resources dedicated to enforcement activities; the high risks to life and wellbeing that are or can be suffered by enforcement agents; the difficulty in detecting and responding to evolving and diverse types of illicit fishing activities; and strong incentives for rule-breaking (Kuemlangan et al. 2023).

relational phenomenon distributed on a series of interactions, practices, and actors[61] entrenched in a particular geographic, cultural, and economic context" (Nahuelhual et al. 2020, p.106). From this standpoint, illegal fishing cannot be solved through enforcement or punishment alone (Nahuelhual et al. 2020, p.113):

> Since changes do not depend on the ideal behavior of one actor—the ethical, law-abiding fisher—but on deep transformations of intertwined practices of all actors across the value chain.

Echoing narratives linking illegal fishing to organised crime,[62] a key debate has thus emerged on the question of whether criminalising or subjecting illegal fishing to criminal law processes would result in better compliance with fisheries legislation (Kuemlangan et al. 2023, p.1).

Proponents of the criminal enforcement approach advance a two-pronged argument as to why it may be more effective. Firstly, the criminalisation of fisheries violations laws is said to be "better equipped to investigate (through established internal and external networks) individuals, who they claim are the true perpetrators of illegal fishing" (Kuemlangan et al. 2023, p.4). Secondly, "the punishments available under a criminalized system are more effective than those available under the fisheries management lens" (Kuemlangan et al. 2023, p.4). As de Coning and Witbooi (2015, p.210) reason:

> Unless the tools to uncover and penalise illegal fishing are used strategically as part of a well-informed and coordinated cross-border intelligence-led law enforcement operation, they are simply too weak and haphazard to have a deterring impact.

In practice, however, the distinction between administrative and criminal approaches is blurred as most countries already follow a dual-enforcement approach (Kuemlangan et al. 2023, p.2). Australian fisheries legislation, for example, "ascribes criminal responsibility to all offenders, but also allows for certain classes of offences (e.g. offences in relation to returns, general offences, and strict liability offence) to be paid via a specified sanction to the fisheries authority, as an alternative to prosecution" (Kuemlangan et al. 2023).

7.4.3 Theoretical explanations of noncompliance relevant to the AFZ context

The instrumental approach

As explained above, policymakers and fishery managers have historically relied on monitoring, control and surveillance as enforcement strategies in their efforts to reduce illegal fishing (Cepić and Nunan 2017, p.104). These methods reflect what is referred to in the literature as the 'instrumental approach' to noncompliance, based on the rational choice framework (Cepić and Nunan 2017, p.104).

[61] This can include "a multitude of persons, corporations and government agencies, ranging from the fishers themselves, to the masters of the fishing vessels, to the vessel owners, to vessel financiers and insurers" (de Coning and Witbooi 2015, p.208).

[62] Such narratives on organised crime have been echoed by AFMA in a January 2025 media report: *Authorities investigate 'unprecedented surge' in foreign boats entering Australian waters* https://www.abc.net.au/news/2025-01-15/authorities-investigate-surge-in-foreign-boats-australian-waters/104783448

The instrumental approach focuses primarily on the decision-making processes of individual offenders. According to rational choice theory, noncompliant behaviour is based on an assessment of "whether the perceived benefits of committing the crime will outweigh the perceived costs" (Petrossian 2015, p.40). Factors influencing the cost–benefit analysis (Cepić and Nunan 2017, p.104) of fishers to engage in illegal fishing might include, for example:

- the degree of effort involved in getting the illegally caught species to the intended markets
- the availability of the resource sought, regardless of the effort
- the possible risk of being caught (Petrossian 2015, p.40).

In framing noncompliance as driven by rational actors, the corresponding goal of enforcement is to increase the costs of breaking the rules and the likelihood of getting caught. Most commonly, this results in regulatory methods that prioritise "perfect monitoring, enforcement, and prosecution, coupled with sufficiently severe penalties" (Battista et al. 2018, p.2).

The broad suite of deterrence approaches by the Australian Government; however, has demonstrated limited long-term success in reducing illegal Indonesian (small-scale or sometime referred to in the literature as 'artisanal' to separate the practice from industrial fleets) fishing in the AFZ. As demonstrated below on the extent and patterns of illegal fishing activity in the AFZ over time, noncompliant activity continues to occur. Two key challenges of applying the instrumental approach to fisheries include, firstly, limitations in the severity of sanctions that government authorities can apply to the violation of fishing regulations, and secondly, the complexity and expense involved in the surveillance of remote TBF grounds (Battista et al. 2018, p.2; Kuperan and Sutinen 1998, p.310). This is evocative of the location and breadth of the AFZ and Timor and Arafura Seas region as a remote and expansive area to practice enforcement (i.e. stretching from Western Australia's Kimberley region, across the Top End of the Northern Territory, to the Torres Strait Region north of Cape York in North Queensland and 200 NM EEZ). The inherent personal safety risks associated with Indonesian TBF, and the uncertainty of the income it might generate, also show that *illegal fishing does not only occur when the potential benefits outweigh the costs.*

Behavioural science approaches

Cognisant of these limitations, the academic literature on illegal fishing is increasingly shifting away from a focus on rational decision-making towards models that widen and diversify understandings of noncompliant behaviour (Cepić and Nunan 2017, p.104) and the broader socioecological contexts underpinning illegal fishing (Vallejos et al. 2024, p.1). A recent trend in the literature is the application of behavioural science approaches to illegal fishing (Battista et al. 2018; Mackay et al. 2018; Vallejos et al. 2023, p.1). Drawing from research in several disciplines (e.g. psychology, sociology, biology and anthropology), behavioural science has previously been applied to many wicked problems and sectors, including in health, finance, transportation and public utilities (Wallen and Daut 2018, p.56). However, their use in SSF, and conservation more broadly (Wallen and Daut 2018, p.56), is neither well documented, nor is their application mainstream.

In contrast to the emphasis on rationality underpinning the instrumental approach, behavioural science conceives of human activity as predictably irrational (Ariely 2008). Human behaviour is instead characterised as "complex, relative and context-dependent" (Wallen and Daut 2018, p.57). While behavioural science recognises that purposeful reasoning drives some human behaviours, others stem from "automatic mental processes or affect, often outside of awareness" (Battista et al. 2018, p.2).

As Battista et al. (2018, p.2) explain:

> A more realistic model of compliance (the "behavior change model") based on this understanding of human behavior would posit that a range of factors – including economic self-interest as well as social norms, perceptions, beliefs, and information – influences decisions about whether to engage in illegal behavior, and that the most important drivers of illegal behavior are context dependent. Hence, efforts to increase compliance should address whichever factors most strongly drive illegal behavior in a particular context.

7.4.4 Drivers of illegal fishing

With the growing understanding of illegal fishing as a collection of distinct behaviours[63] undertaken by a range of actors (Battista et al. 2018, p.9), new frameworks have emerged to capture a diversity of possible drivers. Battista et al. (2018, p.5), for example, identify three driver categories alongside specific illegal fishing drivers of fishers (Table 7).

Table 7. Categorised behavioural drivers

Driver category	Illegal fishing driver
Self-interest	Increase profits or social status or improve reputation
	Safety and protection
	Resistance to change out of desire to preserve identity or tradition
	Meeting immediate survival needs in the face of poverty
Perceptions and beliefs	Fishing illegally because of belief others are doing so
	Perceived lack of legitimacy of regulations
	Lack of trust between enforcers and fishers
Information	Lack of knowledge about regulations
	Lack of information about consequences of illegal fishing

Source: Battista et al. 2018

Other authors have been interested in exploring how these drivers intersect and have a variable weighting in their level of influence. This includes, for example, efforts to identify the ultimate causes of illegal fishing (e.g. overcapacity, ineffective management, and subsidies) compared to factors that might "contribute in a more proximate sense" (Vince et al. 2021, p.519). These more-proximate factors might include poverty, market incentives, and a lack of legitimacy for laws and regulations (Nahuelhual et al. 2023).

Each of these factors, and their level of influence on decision-making to engage in illegal behaviour, however, are likely to be context specific (Collins et al. 2021). In the context of Vietnamese illegal fishing in Australian waters, for instance, Vince et al. (2021) identify drivers such as the depletion of domestic fisheries, the displacement of traditional fishing grounds due to territorial disputes, and perceptions of increased revenue. Similarly, a survey of 82 Vietnamese fishers apprehended in Australian waters between 2015 and 2017 found their primary behavioural drivers to be "displacement from the South China Sea and degraded local resources" (Wilcox and Bergseth 2021).

[63] For example, fishing in restricted areas, fishing for protected species, or fishing with illegal gear (Battista et al. 2018, p.9).

Context-specific factors are particularly important in the context of illegal Indonesian fishing in the AFZ, as previous studies have articulated. Each origin village (of fishers and crews) experiences specific contextual factors linking their participation in legal and illegal fishing in the AFZ. This itself is related to specific groups' (such as the Bugis, Butonese and Bajo fishers) maritime history and engagement in distant shore fishing – including to Australia – over many decades and centuries, a high dependence on maritime-based livelihoods, reliance on patron–client relations to access markets, a specific ability to target these high-value marine products, specialised fishing skills and the technology to do so (see also Results part 2). This is means that any solutions to the wicked problem of illegal small-scale fishing in Australian waters have to be cognisant of the contextual factors for different fishery participant groups.

Identifying these drivers is difficult, as they are unlikely to be homogenous, even at the level of the country-of-origin level of fishers (Busilacchi et al. 2022, p.62). In a study on the underlying motives of TBF among communities in Papua New Guinea, for example, Busilacchi et al. (2022, p.62) found "socio-economic, cultural, and ecological differences at the village scale" and possible drivers that included:

- a lack of government enforcement capacity
- authorities' tolerance of illegal trade
- a lack of information
- obligatory dependencies created by middlemen through the provision of services, and family or kinship ties
- a continual need for cash in the villages (due to a rapid transition to a cash economy)
- the inaccessibility of legal value chains
- distance to market.

7.4.5 Designing behaviour-change interventions

Despite increased academic interest in investigating the diversity of drivers underlying illegal fishing, little guidance has been developed on how to design and implement specific behaviour-change interventions targeting fishers' noncompliance. This includes, for example, acknowledging any potential unintended consequences of implementing behaviour-change initiatives such as placing the "burden" of change on individual fishers (Oyanedal et al. 2020, p.1122), forming local-level divisions in the community,[64] as well as challenging the wide-ranging enabling environment influencing illegal fishing, such as the broader livelihoods context.

An important exception and starting point is a paper by Battista et al. (2018, pp.8–11) which outlines a 5-step process for designing interventions targeting specific illegal fishing behaviours:

1. Gain an in-depth understanding of the community and context to identify relevant actors, types of problematic behaviours, and possible drivers (e.g. via informal interviews, a literature review, and other social science methods).
2. Develop hypothetical interventions (e.g. by developing a theory of change that explains how the behavioural drivers identified in Step 1 can be addressed).

[64] An example identified by Battista et al. (2018, p.10) is that "if interventions involve the implementation of a program that rewards community members who report illegal fishing, conflicts may form between adjacent areas of the community that failed to emerge in the pilot stage (e.g., if one part of the community has a disproportionately large number of illegal fishermen)."

3. Experimentally test hypothetical interventions (e.g. using samples of individuals from each target-actor group to test the effectiveness of each intervention).
4. Pilot interventions based on the mechanisms identified (e.g. interventions demonstrating efficacy should be piloted with small groups under real-world conditions in the target community).
5. Scale up tested interventions, and set up systems to monitor, evaluate and adjust.

These steps reflect the broader design features of major behaviour-change frameworks such as social marketing,[65] human-centred design, and the theory of change (for a helpful summary of these frameworks, see Wallen and Daut 2018, p.4). While each framework incorporates different stages and processes, Hagger et al. (2020, p.4) identify 6 common steps in development of behaviour-change interventions:

1. identifying the problem that warrants change
2. identifying the behaviour or behaviour-related outcome of interest
3. identifying the theory and evidence-based mechanisms on how a particular change technique or approach is likely to work in changing behaviour and working them into a logic model
4. embedding the change technique or approach into an intervention and planning and designing a method or trial to test the proposed model
5. planning the means to evaluate efficacy
6. planning for implementation of the intervention.

Although not focused on illegal fishing specifically, a range of behaviour-change strategies and tools have also been devised, each reflecting different assumptions about the cause of the undesired behaviour and a hypothesis as to what might trigger a behaviour change. Wallen and Daut (2018, pp.58–64) for example, identify four methods relevant to reducing consumer demand for illegal wildlife and wildlife products:

- education and awareness (e.g. providing educational materials based on the assumption that individuals lack the necessary information and providing information will change behaviour)
- outreach, relationship building and trust (e.g. initiatives designed to facilitate services or goods that improve wellbeing and/or initiate behaviour that is viewed as more sustainable or beneficial). This method emphasises the importance of the relationship and trust between stakeholders and those seeking to influence their behaviour as a prerequisite for behaviour change.
- social influences (e.g. public commitments on an agreed-upon behaviour). Represented by concepts like social norms, social comparison and social learning, this approach highlights the influence of an individual's social group (e.g. family, friends and community members) on their behaviour.
- behavioural insights and nudges[66] (e.g. change behaviour by replacing or making the default choice more or less easy, attractive, social and/or timely). This approach assumes that the behavioural choices available to an individual within

65 Social marketing has been applied in Indonesia by Fish Forever, which is a global program aimed at improving the social, economic and ecological wellbeing of fishing communities (McDonald et al. 2020). "The intervention combines TURF reserves (community-based territorial use rights for fishing coupled with no-take marine reserves) with locally tailored social-marketing behavior change campaigns" (McDonald et al. 2020, p.1176).

66 For example, "Indonesia's fatwa policy against all hunting of and trade in endangered species incorporates aspects of social norms and taboos to create a new default that nudges individuals towards more socially desirable and religiously approved behaviour" (Wallen and Daut 2018, p.64).

> any setting are limited, and that small changes can be made to the decision context to change behaviour in a predictable way without prohibiting alternatives (e.g. "putting fruit at eye level counts as a nudge, whereas banning junk food does not" [Thaler and Sunstein 2008, p.6]).

It is important to note that some of these strategies are already being used by Australian authorities in their response to illegal Indonesian fishing in the AFZ (e.g. PICs). Battista et al. (2018, p.3) also argue that behavioural approaches are not "a panacea for ending illegal fishing". This is because interventions aimed at addressing these drivers are unlikely "to produce strong enough incentives in the absence of surveillance and enforcement to achieve high compliance" (Battista et al. 2018, p.11). Thus, rather than replacing these methods, behaviour-change tools should instead be used to "supplement enforcement efforts or prompt compliance where enforcement is inadequate to reduce illegal fishing activity" (Battista et al. 2018, p.11).

While behavioural science has the potential to provide a richer picture of the manifold drivers contributing to illegal fishing, this approach is not without limitations. Shortcomings identified in the literature include the limited attention this approach affords to different kinds of noncompliant behaviour, as well as the difficulty of crafting behaviour-change interventions (Oyanedel et al. 2020, pp.1121–22). As previously discussed, an additional challenge encountered by the research teams in conducting this study was the risk of overemphasising the behavioural drivers of individual fishers at the expense of the broader opportunity context in which illegal fishing occurs. Our research approach aimed to address this by focusing on identifying individual motives or drivers with broad recognition of the contextual enablers of Indonesian fishing, by adopting the conceptual framework of Oyanedel et al. (2020) – which distinguishes between two main approaches to the study of noncompliance in SSF: actor-based and opportunity-based.

7.5 Results part 2: Fisher origins, networks and livelihoods[67]

7.5.1 Introduction

TBF in the AFZ – legal and illegal – is the livelihood of many Indonesian fishers. During a scoping visit in April 2023, members of the Indonesian team visited 4 communities (Appendix 7, Table 13) to identify TBF activities and locations for intensive fieldwork during August to early October 2023, conducted in three main fishing villages in the NTT Province: Oesapa (Kupang, West Timor), Tanjung Pasir hamlet and Pepela village and Oelaba (Rote Island) (Appendix 7, Table 14). The Indonesian research team also briefly visited the villages of Tablolong (West Timor) and Oenggae (Rote Island). Except for Oenggae, these villages are or have been fishing/trading hubs and operate as transit sites for boats and crews from other places in Indonesia to embark on fishing trips to the Australian–Indonesian border region, the MOU Box and fishing grounds further east and south in the Timor and Arafura Seas inside the AFZ. This section provides information on the origins, networks, and broad livelihood characteristics of those involved in TBF in the research sites for this study.[68] Figure 6 depicts the villages and networks of fishers that were discussed, including those outside the NTT Province. Figure 7 illustrates the TBF activity by fishers from Rote Island and Kupang, West Timor.

This section also briefly describes the postpandemic gendered household-livelihood activities of each location and community group visited. However, some of the livelihood

[67] This section, including the maps, was prepared by Dedi Supriadi Adhuri, Indonesian research team leader, and colleagues.

[68] Several researchers have previously profiled some of these villages, including Fox and Sen 2002; Stacey 2007; Prescott et al. 2016, 2017; Carnegie 2014.

portfolio information collected was incomplete for some locations and could not be presented as visual livelihood calendars for all actor groups as initially intended. We could not precisely characterise the local community's economic, social, and institutional context in which these livelihoods are situated and which play a role in community livelihood portfolios (see Methodology section for more information on data collection and limitations). Nevertheless, we present portfolios for a broad picture of the gendered livelihood activities of each community and the role of TBF within those place-based livelihoods. We also sought to find out about disruptions in livelihoods from the COVID-19 pandemic or other existing vulnerabilities (e.g. marine-resource scarcity in Indonesia, or patron–client relations) and potential links between any recent livelihood disruptions and illegal fishing during 2020–23. Most of this information is provided in section 7.6 about drivers, particularly those relating to economic and livelihood strategy drivers and COVID-19 pandemic-related drivers.

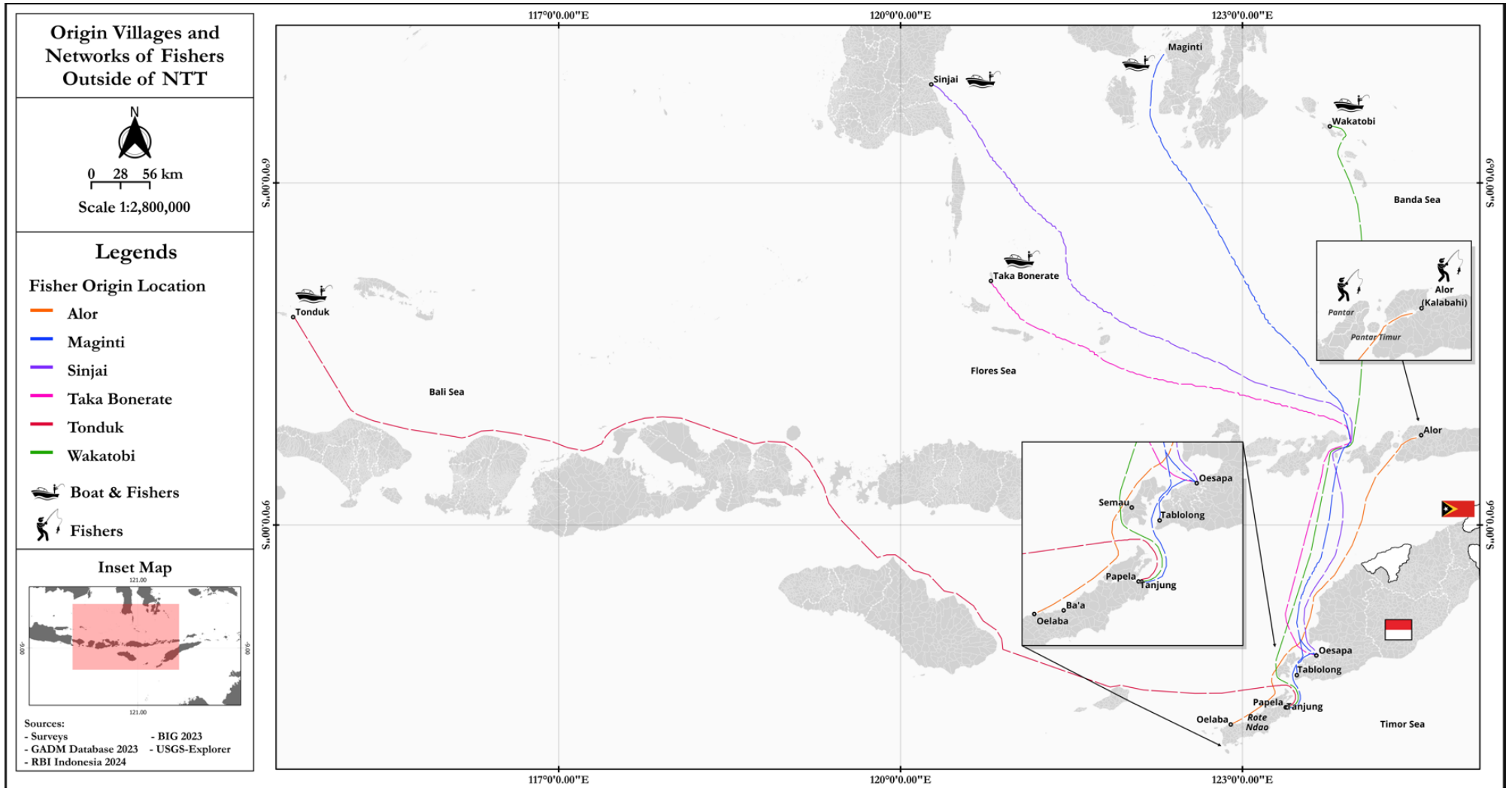


Figure 6. Origin villages and networks among fishers from outside of NTT province, Indonesia

Source: compiled from field research data, August–October 2023

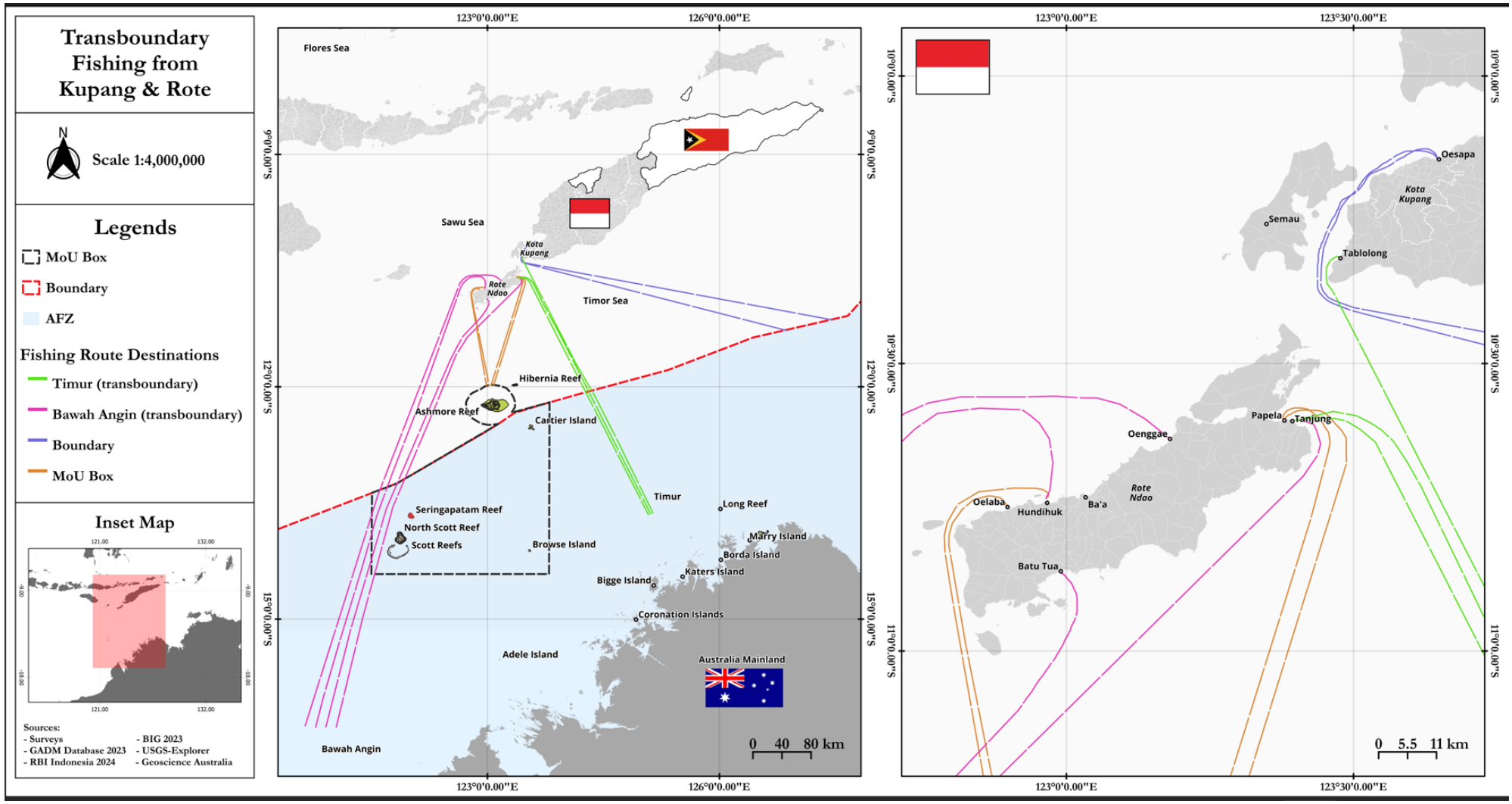


Figure 7. TBF activity by fishers operating from Rote Island and Kupang, West Timor, Indonesia

Source: compiled from field research data, August–October 2023

7.5.2 Oesapa

Oesapa is a village located in Kupang Bay on Timor Island (Figure 8). This village has an estimated population of 30,767 people (9,674 households) (village leader, personal communication, 2023). The village is divided into 54 neighbourhoods (collectively called *Rukun Tetangga, RT*), 11 of which are populated by people whose main occupation is fishing. Three neighbourhoods (no. 31, 32 and 27) are known as *kampung nelayan tripang* (trepang fishers' settlement). The rapid development of the trepang fisher settlements in these neighbourhoods was stimulated by the arrival of trepang fishers from Sinjai, South Sulawesi, in the 1990s (see Figure 6). Adhuri (2013) notes that the movement of Sinjai fishers to Oesapa was because of a rumour (which was proven true) about the abundance of trepang in the border waters of Indonesia and Australia. Since then, the settlement has developed as the centre of trepang fishing in Kupang. Besides local groups (Timorese), trepang fishing has also attracted fishers from many other places, mainly from Eastern Indonesia, to settle in Oesapa. The settlement has become a multi-ethnic community comprising local people plus Timorese immigrants from Sinjai, Jawa, Bajau, Flores, Rote and other parts of Timor.

Oesapa livelihoods

Fishers from Oesapa are engaged in a range of coastal-fishing activities and target various species (Figure 9). They also use various fishing boats and gear such as hand lines, surface gillnets, deep-sea gillnets, floating lift nets and fixed lift nets, spear guns, and diving with compressors. They fish around Kupang Bay and the coastal areas of West Timor, as well as in Savu Sea waters around Sumba, Sabu and Rote Timor using motorised boats. Fish trading at a local fish market is also a livelihood activity for men in Oesapa, with a reported average income of IDR150,000 per day. Other crew livelihood activities include working as a labourer or a motorbike driver. Fishing in the border region is an important part of annual livelihood portfolios, especially from March to May and September to December. It is reportedly the most profitable fisheries-based livelihood activity due to abundant resources in Australian waters and trepang prices. Catching finfish during a trepang voyage can provide extra income for the crew (for example, when sold to the wife of a boat captain). Some are specialised divers using compressors, who target deeper waters than fishers from Pepela, who also target trepang. They also use mobile apps to examine weather conditions (fish finders). In FGDs, fishers noted the shares system for TBF is inequitable, favouring bosses.

Women in Oesapa are engaged in various small-scale trading activities, including trading/processing fish, selling cakes, running kiosks, selling/making takeaway food and gleaning[69] for subsistence/food. People lost boats and fishing equipment after Severe Tropical Cyclone Seroja in 2021 and reported there was limited support for them afterwards, creating livelihood problems.

[69] *Gleaning is a form of fishing activity, often conducted by women and children, in shallow coastal, estuarine waters or habitats exposed during low tide.* '*Gathering*' *or* '*collecting*' *are terms often used to describe this activity.*

Figure 8. Various fishing boats in Oesapa

Source: Jotham SR Ninef

Figure 9. Oesapa village and boats

Source: Jotham SR Ninef

Oesapa: transboundary fishing

Regarding fishing vessels and techniques, the current trepang fishing by Oesapa fishers still follows the same pattern as the Sinjai fishers who began doing it. They use motorised boats (*bodi jolor*) equipped with one or two inboard engines and a compressor (*hookah*) to dive for trepang and spear finfish as their primary and secondary targets, respectively. In 2023, 24 local trepang fishing boats were operating (Figure 10). Based on their size, these comprised 9 boats (7 boats of 1–3 gross tonnes [GT], 2 boats of 3–5 GT), 10 ships of 5–7 GT and 3 boats of more than 7 GT).

Figure 10. Trepang boats in Oesapa

Source: Jotham SR Ninef

Figure 11. Trepang processing in Oesapa village

Source: Dedi Supriadi Adhuri

The main fishing grounds of the Oesapa boats are the border waters of Indonesia and Australia. This includes the overlapping claimed area of the Indonesian EEZ and the Australian seabed (see Figure 7 showing Australian–Indonesian maritime border arrangements). In these waters, Indonesian fishers can catch finfish, but harvesting trepang living on the seabed is prohibited. Some of our research participants have experienced apprehensions for illegal fishing inside the AFZ and MOU Box, and served time in jail (SGI1_Oes_Elderly).

Other than locally owned and operated boats, Oesapa is a transit site for boats from different parts of Eastern Indonesia. In this regard, we found two arrangements of outside boats operating from Oesapa. The first arrangement is the boats that come and operate from Oesapa seasonally. These are primarily boats from South Sulawesi (Sinjai and Taka Bonerate) whose owners have affiliations with bosses or relatives in Oesapa. The boat owners send their boats, some with crews, to be operated with the support of their partners or to source additional crew from Oesapa. In 2023, we found two boats from Sinjai and Taka Bonerate in South Sulawesi to operate out of Oesapa during the calm season (September to December). They operate the same equipment as Oesapa-based boats, using *bodi jolor* vessels and *hookah* as supporting equipment for diving.

The second arrangement is boats with crews that travel to Oesapa for occasional transit to buy fuel, fishing equipment and supplies. During our fieldwork, we also found boats from Maginti Island, West Muna District and South-East Sulawesi Province (Figure 6) anchored in waters off Oesapa waiting to undertake trepang voyages south into the Timor Sea. The boats with the second arrangement, originally from Maginti Island, are different. Although the type and size of the boats are the same as Oesapa-based boats, they are all painted green (see Figure 12). Their fishing ground is in the area popularly called *Timur* inside the AFZ. From apprehension cases, we know this area is extensive: from the Kimberley Region in north-west Australia up to the NT border area and even around the coastal regions east of Darwin. They mainly operate near mangrove areas where fishers can hide their green-painted boats in the mangroves – making them harder to detect and be apprehended. These voyages generally last for up to 14 days, have crews of up to 8 people, and their navigation equipment includes GPS. Trepang is harvested by gleaning, stored in salt, and transported back to port where it is sold fresh or processed (Figure 11).

7.5.3 Tablolong

During fieldwork, we also saw some Maginti boats anchored in waters off Tablolong village, a small port located 33 km to the south-west of Oesapa in West Timor (see Figure 6). In 2023, Maginti boats used the port as a transit site to source fuel, equipment and supplies before sailing to ‘Timur.’ Tablolong was a historically important port for boats to launch from, into the offshore reefs in the Timor Sea (Stacey 2007). This port was once the base and transit area of Madura sailing boats (*lete-lete*) that fished legally in the MOU Box in past decades, but some anecdotal evidence suggests a small number of *lete-lete* boats with engines have recently been operating illegally in the MOU Box area. However, the number of Madurese boats now transiting Tablolong and active in the MOU Box (legal fishing) is reported to have significantly reduced in the last 10 years, and boats have stopped transiting, according to some local villages. However, some Madurese boats also transit through Rote villages/ports. During our first fieldwork trip (5–21 August 2023), we found all *lete-lete* boats from Madura transited in Pepela before they sailed to the MOU Box.

To summarise, Oesapa and Tablolong villages are home and transit sites of fishers and boats that fish for trepang and finfish in the border area and to coastal waters of the northern part of Australia popularly called ‘Timur’. Those from outside come from South and South-East Sulawesi settlements, including Sinjai, Taka Bonerate and Maginti Islands. Because the fishers are using motorised boats, they cannot be categorised as ‘traditional fishers’ based on the Indonesian and Australian 1974 MOU agreement, and their operations in the AFZ are illegal.

Figure 12. Boats used in TBF by fishers from Maginti in Tablolong (LF23/24-030) signal that this boat was apprehended fishing illegally by the Australian authorities in the AFZ

Source: Dedi Supriadi Adhuri

7.5.4 Pepela and Tanjung Pasir

Pepela is a village located east of Rote Island (see Figure 6). Administratively, the village belongs to the Rote Timur (East Rote) subdistrict. This village is home to 1,833 people living in 649 households (2022) (Badan Pusat Statistik Kabupaten Rote Ndao 2023). Pepela consists of two main settlements: Pepela, and Kampung Tanjung or Tanjung Pasir. The Pepela settlement is an old settlement populated by indigenous Rotenese and immigrants of mixed ethnicities, including maritime groups from Sulawesi. It is the Pepela village's centre and the government-managed port location. Kampung Tanjung Pasir, separated by a small creek from Pepela and adjacent to the village's main cemetery, is the settlement that was started in 1991/1992 by Bajo from settlements including Mola and Mantigola in the Wakatobi Islands, South-East Sulawesi province (Stacey 2007). However, some other maritime-oriented ethnic groups, such as Butonese and Bugis, have joined the Bajo in the Tanjung but remain distinctly a Bajo village (Figure 13).

Figure 13. Tanjung Pasir settlement

Source: Dedi Supriadi Adhuri

Pepela has been the most crucial centre and transit port for legal and illegal fishing in Australian waters for most of the twentieth century and the last 24 years. During our fieldwork in 2023, we found all types of boats operating from Pepela fishing in and outside of the MOU Box. These include *perahu lambo, bodi jolor, bodi batang* and *perahu lete-lete* operated by Madurese. Each boat type targets different species and locations, and is operated by various ethnic groups (see Figure 14 and Figure 15).

Figure 14. *Perahu lambo* and various *bodi* types in Kampung Tanjung Pasir

Source: Dedi Supriadi Adhuri

Figure 15. Pepela settlement; view from the port

Source: Dedi Supriadi Adhuri

Pepela and Tanjung Pasir's livelihoods

The main livelihood of the people here is fishing. (FGD1_Pep_Women)

In Pepela, men from approximately 30 households (SGI_Pep_Leaders&Elderly) are engaged in coastal fishing activities (for a range of activities, using a range of gear, all year round), offshore fishing activities west and south of Rote (mostly at end of east monsoon and in west monsoon, for pelagic and demersal fisheries species) and cross-border fishing in Indonesian and Australian waters (mainly during the east monsoon, targeting sharks and trepang). Men switch between activities depending on a range of circumstances. Some fishers prefer not to engage in illegal fishing in AFZ. Sometimes, men also seek labouring work in construction or building work during bad weather (e.g. during the west monsoon season) or due to fuel scarcity. Fuel access was identified as a constant challenge. Women are engaged in a range of small-scale livelihoods, small trading, food preparation and sales, working in or running a store/kiosk, fish trading, gleaning (for food and sales), and some limited seaweed activity – although engagement in seaweed appears to have declined in recent years.

Men in Tanjung Pasir engage in various demersal (*ikan dasar*) and pelagic fishery activities around Rote and in offshore waters. Pelagic fishing for baby tuna (all species), yellowfin tuna, and skipjack is an important livelihood for men and women during most months of the year. Fishers operate in coastal and offshore waters, and target areas with fish aggregating devices (FADs) (*Roppong or Rumpon*) owned by Indonesian-based companies. Some men operate as traders/seafood collectors for bosses, boat mechanics and boat builders/repairers. Women in the Tanjung Pasir hamlet engage in fish trading all year (Figure 16), seaweed farming, food preparation and sale, grocery stalls and kiosks, and gleaning.

Figure 16. Some women in Kampung Tanjung sell skipjack from local fishers' catch.

Source: Dedi Supriadi Adhuri

Pepela and Tanjung Pasir: transboundary fishing

Perahu lambo is the traditional sailing boat used by Pepela and Tanjung Pasir fishers (Figure 17), but the *lambo* in Pepela have recently been equipped with onboard engines. Initially, their main targets were trepang, trochus, and shark meat and fins. Fishers engaged in gleaning and free diving to collect trepang, and used hand lines for shark fishing. In the 1990s, they abandoned their gleaning and diving for sedentary species and shifted to exclusively fishing for sharks using longlines. Legal *perahu lambo* fishing activities are conducted in the MOU Box. For this, except in the last two years, fishers would uninstall the engine and use sails for fishing in the MOU Box. Apprehension cases show they also engaged in illegal fishing outside the MOU Box. In the last three years, some *lambo* with engines were involved in illegal fishing for trepang outside the MOU Box as far as *Bawah Angin* (Rowley Shoals) inside the AFZ. All *perahu lambo* that currently operate from Pepela are owned locally. In 2023, there were 20 *lambo* operating in Pepela. Most, if not all, of these *perahu lambo* are owned by bosses in the Pepela settlement (SGI1_Pep_Leaders_Elderly).

Figure 17. *Perahu lambo* in Papela port

Source: Dedi Supriadi Adhuri

Motorised boats – *bodi batang* and *bodi jolor* – are small boats of various sizes equipped with one to three engines. *Bodi batang* are smaller than *bodi jolor* and do not have a cabin. The boats are used either for coastal or offshore domestic or TBF. Coastal fishing targets coral reef fish or small pelagic fish, while offshore fishing targets demersal and big pelagic fish (e.g. tuna). Offshore fishing for big pelagic fish was mainly carried out near FADs belonging to big fishing companies (SGI1_Pap_Leaders_Elderly). The identification of the number of boats, boat type and size, fishing techniques and target species in the Tanjung Pasir settlement is provided in Table 8. There were approximately 100 motorised boats in Tanjung Pasir in mid-2023.

Table 8. Fishing vessels and type in Tanjung subvillage (Pepela) in 2023

Boat			**Fishing gear**	**Main target**
Type	**Size (GT)**	**Quantity**		
Bodi Batang	1	74	Longline, handline	Big pelagic fish
Bodi Batang	1	9	Gleaning	Trepang
Bodi Jolor	5–6	4	Diving, handline	Trepang, coral reef fish
Bodi Jolor	3–4	14	Diving, handline	Trepang, big pelagic fish
Perahu lambo	15	2	Gleaning	Trepang

Source: Village elder, Tanjung Pasir

Regarding TBF, *bodi* were initially used by the Bajo of Tanjung Pasir for shark fishing in the 1990s when many fishers there switched to shark from trepang and trochus fishing. Since the start of the COVID-19 pandemic, the Bodi shark fishers in Pepela and Tanjung Pasir settlements switched back their fishing target to trepang, fishing outside of the MOU box and sailing as far as Rowley Shoals. In Table 9, all the *bodi batang* and *bodi jolor* in Tanjung Pasir used for trepang fishing are most likely conducting illegal TBF. It is mainly fishers and boats operating through Oelaba that fish legally for trepang in the MOU using *perahu lambo*.

Table 9. Fishing vessels reported to be present in Tanjung Pasir subvillage (Pepela) during August 2023 originating from South-East Sulawesi

Boat			Fishing gear	Main target
Type	Size (GT)	Origin		
Jolor	4	Maginti Island, Muna	Gleaning	Trepang
Jolor	4	Maginti Island, Muna	Gleaning	Trepang
Jolor	4	Pasi Padagang, Muna	Gleaning	Trepang
Jolor	4	Terapung, Muna	Gleaning	Trepang
Jolor	4	Maginti Island, Muna	Gleaning	Trepang
Jolor	4	Tasippi Island, Muna	Gleaning	Trepang
Jolor	4	Tasippi Island, Muna	Gleaning	Trepang
Jolor	4	Tasippi Island, Muna	Gleaning	Trepang
Jolor	4	Katela Island, Muna	Gleaning	Trepang
Jolor	4	Lapulu, Kendari	Gleaning	Trepang

Boat			Fishing gear	Main target
Type	Size (GT)	Origin		
Jolor	4	Tanjung Pinang, Muna	Gleaning	Trepang
Jolor	4	Maginti Island, Muna	Gleaning	Trepang
Jolor	4	Mandike Island, Muna	Gleaning	Trepang
Batang	1	Mola Utara, Wakatobi	Gleaning	Trepang
Batang	1	Mola Utara, Wakatobi	Gleaning	Trepang

Source: Village elder, Tanjung Pasir

In Pepela, the Tanjung settlement is also a transit site for *bodi* coming from other parts of Indonesia. In August 2023, an elder in Tanjung settlement identified 15 boats, most of them coming from several island communities in Muna District, South-East Sulawesi (e.g. Maginti, Tasippi, Mandike and Katela islands) and two originating from Mola Utara village, Wakatobi District (see Figure 14 and Table 9). They were all gleaning for trepang. All boats from Muna districts carried out illegal TBF in the waters of *Timur*. The crews of the *bodi* boats were mostly fishers from their home islands. Some recruited Tanjung Pasir fishers to guide them to the fishing grounds, or to add as crew on board. This includes the fishing grounds in and around Western Australia's Kimberley Region. Boats from Mola Utara fished in the same fishing ground as the fishers in Tanjung. However, there is a strong network between fishers from Mola and other villages in Wakatobi Islands and Tanjung Pasir/Pepela – and more likely, more than 2 boats were coming from outside the area during the 2023 season. Although they are a mix of different groups, most of them are Bajo – who have a history of fishing in what are now Australian waters both within and outside the MOU Box (Stacey 2007). Thus, it is apparent that fishers from Muna and Wakatobi, South-East Sulawesi, currently engage in TBF as part of the Bajo fisher network.

Other outside fleets that Pepela hosts are *perahu lete-lete* (Figure 18), the traditional sailing boats from Madura, and the neighbouring small islands of Raas and Tonduk. During our first fieldwork trip (August 2023), we saw several *lete-lete* anchored in the port of Pepela, and 11 *lete-lete* participated in TBF in 2023. These boats, travelling 2–3 weeks from east Java, transit in Pepela to add supplies and wait for good weather to sail to the MOU Box. These are one group of traditional fishers who largely fish following the agreement between the Australian and Indonesian governments. They fish by gleaning, fishing and free diving in the MOU Box. These boats are equipped with one or two engines, used during their trip from home islands to Pepela and returning. Theoretically, the crew uninstalls the engine when they sailed from Pepela to the MOU Box and returned.

These Madurese fishers are part of the Madurese network of TBF into the AFZ. They have been active in the AFZ region since at least the 1950s, if not before (Stacey 2007) (see also Stenros 2011 for a detailed history of Madurese). People originating from Madura have settled in Pepela during the last century.

Figure 18. Madurese *lete-lete* in Papela Port

Source: Dedi Supriadi Adhuri

7.5.5 Oelua/Oelaba

Oelua is a village located northwest of Rote Island (Figure 6). Administratively, this village is under the Loaholu subdistrict of Rote Ndao district. Oelua is home to 2,103 people who live in 526 households (Badan Pusat Statistik Kabupaten Rote Ndao 2024). The population of Oelua is a mix of different ethnic groups. These cover Rotenese, immigrants from various places (but mainly from Sulawesi, such as Butonese and Bugis), and a small number of Bajau people. They live in five different hamlets (Oelaba, Holotula, Lasilae, Oelua and Oedae) (Carnegie 2008) (Figure 19).

Figure 19. Oelua settlement; view from the sailing tower

Source: Dedi Supriadi Adhuri

In the context of TBF, the most relevant hamlet is Oelaba. The descendants of maritime-oriented ethnic group immigrants such as the Bugis, Butonese and Makassarese populate this hamlet. Interestingly, their maritime livelihood was not so much about fishing but inter-island trade, which Carnegie (2008, 2014) calls 'sailing trading livelihoods'. *Lambo* were their primary vehicle for this livelihood (Figure 20), transporting different kinds of goods (e.g. lontar syrup, betel nut, agricultural and construction products, and household equipment) all over Indonesia, but mainly in the eastern part of the archipelago with strong linkages to communities in Sulawesi.

In the mid-1980s, the Oelaba sailors added fishing in the MOU Box to their annual livelihood activities. This trend was likely stimulated by the dearth of trepang left by the Pepela fishers, who switched to shark finning in the same era. Since then, Oelaba fishers have visited the MOU Box as part of their annual livelihood activities. Since the Indonesian Ministry of Transportation passed a regulation in 2017 that only allows boats to be used for one function (Peraturan Menteri Perhubungan Republik Indonesia Nomor PM 39 Tahun 2017), the people decided to register their boats as fishing boats. With that, their *lambo* became exclusively used for TBF in the MOU Box once a year. They leave the *lambo* idle the rest of the time. According to an FGD of boat owners in Oelua (FGD_Oel_B. Owner&Captain1), there were 24 *lambo* available in Oelaba in 2023, 20 of which went to the MOU Box that year.

Figure 20. *Perahu lambo* and some small *bodi* in Oelua

Source: Dedi Supriadi Adhuri

Oelaba livelihoods

In Oelaba, men and women are engaged in various livelihood activities over the year, with TBF remaining an important activity within the portfolio of community members.[70] In 2023, we were informed that during the east monsoon months (July–October), boats owned by people from Oelua/Oelaba had some crews drawn locally, but most boats were crewed mostly by men from Pura and Pantar Islands in the Alor district. *Perahu lambo* voyages to MOU Box target trepang, trochus shell and reef fish. Most boats are involved in one 1–2 month trip annually. The profit-sharing system in Oelaba rewards boat owners with good returns. The following statements from FGD illustrate the role of TBF for some community and outside crew members:

> Although fishing is also used for daily needs, the income from transboundary fishing is very helpful in financing large projects such as building houses … The biggest results usually come from cross-border fishermen. They are the ones who get the most benefits. (FGD_Oel_Women1)

> The distribution of the money varies; for example, some people get IDR7,000,000, some get IDR5,000,000, and some get IDR1,000,000 … The fishermen's profit depends mainly on their fish catch, and it often fluctuates every time they go fishing. (FGD_Oel_Women 1)

Most men in Oelaba engage in a range of coastal fishing activities in *bodi batang* (handline, gillnet, spear gun) most of the year, especially during March/April – November /December inshore, and around Rote and neighbouring small islands. Some men reported that the peak season for coastal fishing was during October–December. During the January–March wet season, the weather offers less opportunity for coastal fishing activities. Men and women produce seaweed all year round, with the best production levels in the wet season but variable returns. In recent years, fewer people have been involved in seaweed farming than before. This is partly related to the negative impact of

[70] Fox and Sen (2002) reported that for Oelaba, "the single most prominent source of income for all levels of fishermen was said to derive from voyaging to the Ashmore and other reefs in the AFZ". They also provide a detailed coverage of Oelaba community, livelihoods and demography in their report (pp.38–42).

the Montara oil spill in 2009 on West Timor, Rote Ndao and Sabu Raijua seafood farming and livelihoods.[71] There was some indication in FGDs that income and production from seaweed by women had decreased in recent years. Some men and women also engage in salt production during dry-season months. Gleaning is also an important year-round activity for women. Women engage in a range of small-scale trading activities, including selling a variety of preprepared foods; making/selling cakes and sugar (*gula air/lontar*) products (*gula air sopi* production); gleaning for shellfish; and selling other items such as kerosene or betel nut, either in the village or at weekly markets. Women and men rear livestock (goats and chickens) all year round and especially for sale during Islamic festivals. Men work in seasonal or temporary construction, building or carpentry work (earning approximately IDR85,000/day), and a few people have small businesses (e.g. kiosks).

Although we did not visit Pantar Islands, where some crews originate to participate in Oelaba-based TBF as crews, there was some mention in FGDs that Pantarese fishers have seasonal livelihood activities they perform when not participating in TBF.

Oelaba: transboundary fishing

Our calculation of those involved in TBF is shown in Table 10. One hundred and forty-eight fishers worked on the 20 *lambo* that went to the MOU Box. While Oelaba-based boat owners own all the *lambo*, the majority of captains and crews originate from elsewhere: the captains are from Oelua (12 people), Pura (6), Pantar (1) and Rote Timur (1). The crews were mostly from the Alor district: Pura (48 fishers, 32%) and Pantar (50 fishers, 34%). Local Oelua fishers comprised only 26 fishers (18%), and the rest were from villages in Rote (Holulay, Hundihuk[72]) and one person from North Maluku (Ternate).

[71] For information on the Montara Oil spill and class action see https://www.theguardian.com/environment/2022/jan/16/very-hard-life-now-12-years-after-the-montara-oil-spill-indonesians-are-still-fighting-to-be-heard

[72] Nine fishers from the Hundihuk village boat *Kuda Laut* died at sea due to a cyclone in March 2022. A memorial plaque has been dedicated to them in the village: *Nine fishers missing after Indonesian boat capsizes off Australian coast* https://www.theguardian.com/world/2022/mar/21/nine-people-feared-dead-after-indonesian-fishing-boat-capsizes-off-australian-coast

Table 10. Oelaba *perahu lambo* boats actively fishing in the MOU Box in 2023

Number of boats (unit)	Number of crew members (including captains)	Origin of crew members		Origin of captains	
		Location	Number	Location	Number
20	148	Pura Island	48	Pura Island	6
		Oelua village	26	Oelua village	12
		Pantar Island	50	Pantar Island	1
		Holulay village, Rote	2	Holulay village, Rote	0
		Hundihuk village, Rote	1	Hundihuk village, Rote	0
		Ternate, Maluku	1	Ternate, Maluku	0
		Rote Timur	0	Rote Timur	1

Source: Oelua village officer

Most fishers from Oelaba or who crewed on Oelaba boats appear not engaged in illegal fishing outside of the MOU Box. Despite the COVID-19 pandemic and economic pressures, they did not engage in illegal fishing as intensely as other groups. During our research feedback visit in October 2024, we were informed during the community workshop that 3–4 Oelaba *lambo* boats were involved in illegal fishing for trepang outside of the MOU Box in 2022. However, when some boats were apprehended, others also ceased illegal TBF.

7.5.6 Conclusion

Our coverage of fisher origins, networks and TBF activity – drawn from previous studies and fieldwork in 2023 – shows that for these 4 main localities and associated communities, whether engaged in legal or illegal TBF, the activity remains a key component of the livelihood portfolio of many members in these locations. Based on the fieldwork conducted, discussions with communities, review of past studies and our research results, there appears to be no primary or significant change or difference in the socioeconomic status of participating communities since the pandemic (see Appendix 7). However, we did not conduct a detailed socioeconomic impact assessment to ground this assertion. Also, in all locations – and perhaps starker in Pepela and Tanjung Pasir than Oelaba and Oesapa – it is obvious the importance of TBF in the broader livelihoods and limited land-based livelihood opportunities outside of fisheries, and associated maritime-based activities and services, for the many people in these communities. It is also noted from our 2023 field research that the presence of motorised boats and crews from South and South-East Sulawesi and their engagement in TBF fishing (along the border region and illegally inside the AFZ) has continued from previous decades.

While we have not conducted a detailed characterisation of the local community economic, social and institutional context, there is no doubt that many of the more vulnerable community members in these communities would benefit from livelihood-related interventions across a range of areas to improve other financial, social and human capital assets that are used in their livelihood activities to generate more income and

improve their overall wellbeing. Enhancing engagement in domestic fisheries and other maritime and small enterprise activities of households would also create benefits. Any future community development or livelihood-based interventions would require a more comprehensive baseline assessment with target communities or families to identify areas for livelihood strengthening, and to demonstrate change impact on livelihood assets and outcomes over time. This is discussed in more detail in the conclusions and recommendations.

7.6 Results part 3: Behavioural drivers, enablers and fisher perspectives

7.6.1 Actor-based drivers of Illegal fishing

The actor-based overlapping motivations for illegal and legal Indonesian fishing adapted from Petit's 2019 BDM, referred to as Level 1 drivers, are the higher-level or main drivers which we call factors (shown in Figure 21 along with Level 2 drivers). Each factor and the associated 28 dimensions are discussed next. It is important to note that although this study identifies different kinds of drivers, each is interrelated, and they work together to inform human behaviour. Moreover, even in instances where a driver may appear very important, it is not necessarily a sufficient explanation in isolation. For example, during the COVID-19 pandemic, economic hardship among fishing communities increased, but financial difficulties alone are not sufficient to explain the resurgence of illegal fishing, which was more likely prompted by a combination of financial hardship and the (re)discovery of new fishing grounds abundant in trepang.

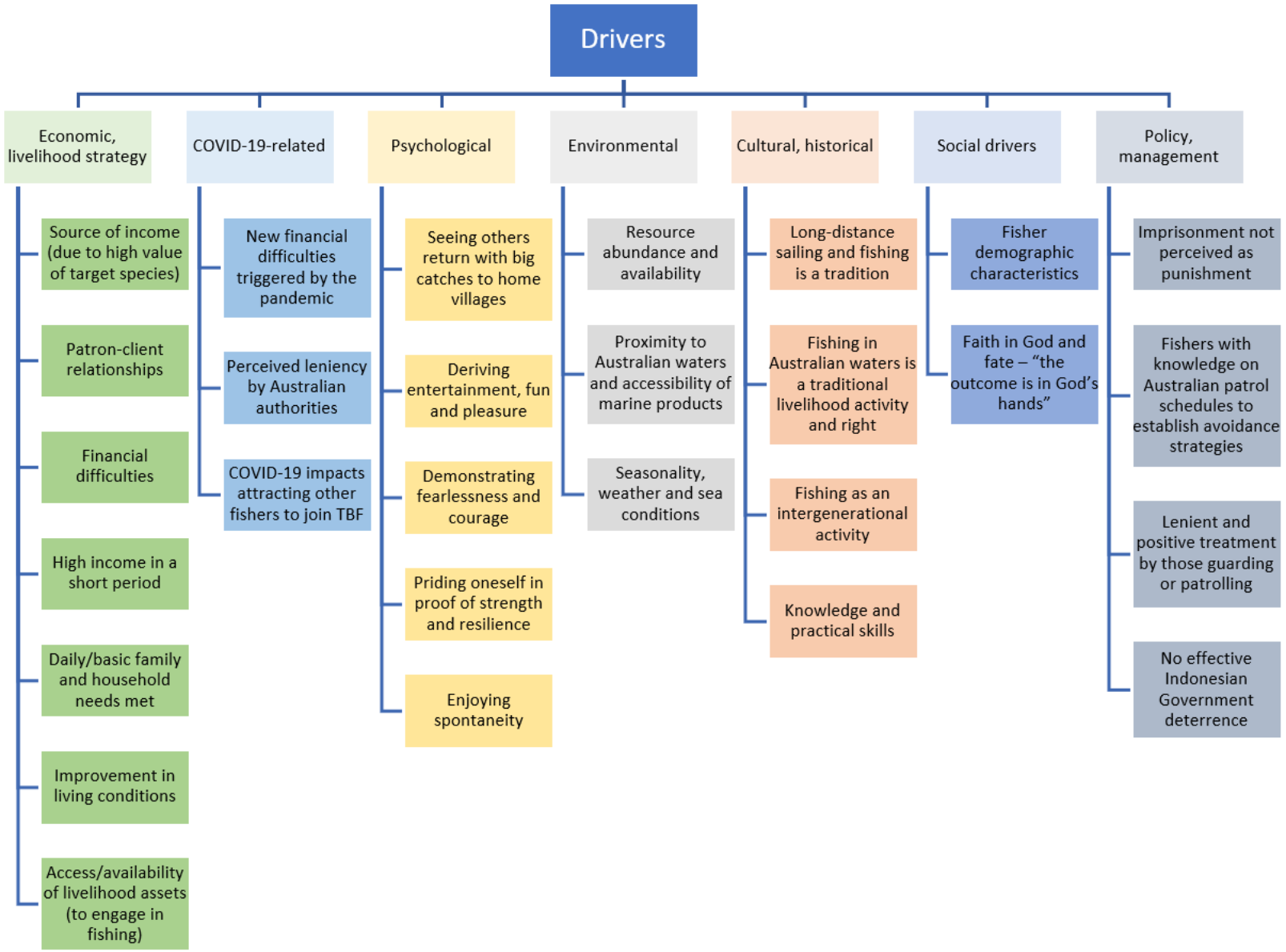


Figure 21. Level 1 and 2 drivers of Indonesian fishing

Economic and livelihood strategy drivers

Economic and livelihood strategy drivers refer to TBF as providing a source of income in the context of lower or insufficient income from other livelihood activities, and/or limited livelihoods opportunities to generate income. Study participants consider illegal fishing particularly attractive for providing a substantial income in a short period (much higher than average monthly incomes from other livelihood activities), as well as an avenue to overcome a range of financial difficulties such as providing income for basic household needs as well as financial stress to repay existing debts. Actors involved in TBF use the income generated to meet daily/basic household needs and expenses, service financial debt, as a source of finance to invest in assets (e.g. housing and fishing gear), and to improve their livelihoods and wellbeing. Economic and livelihood strategy drivers comprise seven dimensions (Figure 22) identified in the fieldwork data, each of which is explained briefly.

Economic & Livelihood Strategy factors

- Source of income (due to high value of target species)
- Patron-client relationships
- Financial difficulties
- High income in a short period
- Daily/basic family and household needs met
- Improvement in living conditions
- Access/availability of livelihood assets (to engage in fishing) e.g. physical assets

Figure 22. Economic and livelihood strategy dimensions

Source of income (due to high value of target species)

TBF is a crucial livelihood activity in each fieldwork location and is considered integral to the communities' economy. Research participants experience fishing for trepang and other high-value target species as providing a higher earning potential than other available livelihood activities, and there is a market demand for key species. This driver has been well documented in previous studies (e.g. Fox and Sen 2002; Prescott et al. 2017). Examples of other sources of income from other livelihood activities, and estimated value mentioned by participants or observed by the research team, are listed in Appendix 8.

Some of the prices fishers identified for certain trepang species are shown below. Example prices provided by one trader in Oelaba originating from Makassar (KII2_Oel_Trader1) for different species of trepang in August 2023 include:

- Trepang *nanas* (*Thelenota ananas*) IDR600,000/kg. In 2015, it was priced at IDR500,000/kg (Prescott et al. 2017, p.5).
- Trepang *polos (bohadschia spp)* IDR330,000/kg. In 2015, it was IDR220,714/kg (Prescott et al. 2017, p.5).
- Trepang *cera* IDR50,000/kg.
- Trepang *batu (Holothuria whitmaei)* IDR500,000/kg. In 2015, this was priced at IDR277,778 (Prescott et al. 2017, p.5).

- Trepang *hitam* (black trepang) IDR250,000/kg.
- Trepang *bintik* (spotty trepang) IDR275,000/kg.
- Trepang *susu* (milk trepang) IDR600,000/kg. In 2015, it was IDR680,000 (Prescott et al. 2017, p.5).
- Trepang *gamad* IDR600,000/kg.

Most residents[73] in the target locations, particularly women, report that they are involved in more than one livelihood activity at any given time, as each provides insufficient return on capital to cover their daily needs (KII1_Tan_Woman2; KII1_Tan_Woman3). Some actors also engage in TBF to supplement their income with skilled employment, such as investing in a boat asset to earn extra income. A woman in Oesapa, for example, said that her son "works as a teacher and [also] owns a boat that catches sea cucumbers across the border" (KII1_Oes_Woman3).

Women research participants expressed that limited employment or other livelihood options in their communities were a motivating factor for male relatives to fish in the AFZ (FGD1_Pap_Women; FGD1_Tan_Women; KII2_Oes_Woman2). Participants also mentioned that the income from TBF is generally higher than other options, and one woman interviewee in Oesapa noted the issue of limited or restricted assets and capital to apply to other livelihoods:

> I suggested my husband to work on land but my husband didn't have a choice because no capital. (KII1_Oes_Woman1)

In Pepela, participants also noted limited income (benefits) derived from domestic fishing, and barriers to sustainable livelihood from domestic fishing such as scarcity and expense of fuel, lack of marketing facilities (i.e. a place to store and sell fish), and low availability of ice (FGD2_Pap_BoatOwner&Captains; SGI1_Pap_Elderly).

While income is a key driver, how much an actor in TBF earns depends on the distribution system used in different fisheries and patron–client relations (described next). There is a distribution system for sharing income from the sale of the catch according to a person's role on the boat (e.g. boat owner, captain and crew) that is calculated upon return from fishing activities (KII1_Tan_Woman1; KII1_Pap_Elderly1; KII2_Oes_BoatOwner&Trader1; KII2_Tan_Crew1; KII1_Pap_Captain2 and KII1_Pap_Crew3; KII1_Tan_Captain1). Field-based descriptions of the revenue distribution process include:

> The catch is divided proportionally among the crew. The boat owner also gets a certain share. In addition, boat owners also receive commissions from the sale of catch, such as sea cucumbers, to large buyers. (KII1_Pap_Elderly1)

> The profit-sharing system between the crew and the captain is one part for the crew and two parts for the captain. (KII2_Oes_BoatOwner&Trader1)

> This division varies, but an example is that the crew might get about 30 per cent of the proceeds, the skipper might get about 20 per cent, and the boat owner might get a larger share, say 50 per cent. (KII1_Pap_Captain2 and KII1_Pap_Crew3)

> The boss gets 20% of the total income. For example, if the income is IDR10,000,000 [AUD910], the boss gets IDR2,000,000 [AUD182]. The distribution of the income after the sale is immediately divided into three

73 Not all fishers, however, have multiple livelihood strategies.

> parts … one part is for the boat captain and two parts are for the crew and the skipper. (KII1_Tan_Captain1)

Distribution of income can also vary depending on the type of boat being used. As two crew members in Pepela explained:

> For sailboats without engines, the payout system is implemented by dividing the catch into three parts. For motorboats, the payout system is implemented by dividing the catch into two parts … there is a difference in the profit-sharing system between sailboat (divided into three parts) and motorboat (divided into two parts). (KII1_Pap_Crew1&2)

TBF can involve up to 6 trips per year, but "the results can vary, for example IDR2–3 million [AUD182–273] per time, depending on the season and sea conditions" (KII1_Oes_Woman1). Aside from income generation, TBF is also considered a career, with the possibility of growth from one role into another generating opportunities to earn more:

> Yes, first I worked as a cook on a ship. I was responsible for cooking and food preparation during the voyage. After about three years of sailing, I started to move up and became a crew member. At this stage, I was no longer responsible for cooking and started doing other crew duties, such as helping to catch fish or setting longlines. This is a common change in a fisherman's career on a boat like this. (KII1_Pap_Captain1)

Patron–client relationships

Patron–client relations have been well documented in past studies (for example, Fox and Sen 2002; Stacey 2007; Prescott et al. 2017). TBF is a collaborative livelihood activity where actors play different roles, hold various responsibilities and take on different risks (e.g. the boss can take the risk of losing the boat and gear if caught, whereas the fisher risks their personal safety, security and operational costs). This can affect the earnings and later debt arrangements which become key drivers of TBF. The specific arrangements vary by fisher groups, communities, type of fishing and financing arrangements.

An important dynamic in these patron–client relationships is the debt of the fisher to the boss or financer. There are two main kinds of debt:

- debts owed by fishers as a group (e.g. needing to repay the operational costs for the fishing trip (FGD1_Oes_Women; FGD1_Tan_Women), which can amount to IDR17 million (AUD1,547) for a 10-day voyage (KII2_Oes_BoatOwner&Trader1)
- debts owed by fishers as individuals (e.g. borrowing money in advance from the boss to cover family needs during the fishing expedition). This debt needs to be repaid through future TBF trips (KII1_Pap_Woman1; KII2_Tan_Crew1; FGD1_Tan_Crew; FGD1_Oes_BoatOwner; KII2_Oes_BoatOwnerTrader1).

Bosses also act as middlemen or intermediaries between fishers and the market (buyers). These relationships are not confined to fishing activities only. For example, bosses also provide household support to fisher families. Fishers are therefore driven to fulfil their obligations to the boss in exchange for the support they provide to their families when they go fishing, and/or when they encounter problems (e.g. apprehension, bad weather). Fishers also feel less worried about meeting their family needs during financial difficulties because of their boss's support (KII1_Pap_Woman1; KII2_Tan_Crew1; FGD1_Tan_Crew; FGD1_Oes_BoatOwner; KII2_Oes_BoatOwnerTrader1). These relationships are well documented in the literature and are an important characteristic and (thus) a driver of illegal fishing.

Financial difficulties

Economic stress at the family or household level contributes to why some fishers engage in TBF, despite the many health and safety risks involved. From the perspective of research participants, the leading causes of financial difficulties cited in the data of this report are the limited incomes from other employment and livelihood activities, as well as debt. We also acknowledge that debt arrangements from fisheries and other livelihood activities result in financial difficulties. These financial difficulties can arise from interceptions and apprehensions for illegal TBF activity, unsuccessful returns on fishing (e.g. low catch, poor weather), and other vulnerabilities such as family illness or natural disasters (Stacey 2007).

High income in a short period

A critical attraction of TBF is the ability to make a comparatively high income in a short period. This period may range from 5 days to two weeks (depending on the location, target species and type of boat used), whereas earning a comparable income from fishing in Indonesian waters could take one month (FGD1_Oes_Crew; FGD1-Pap-Crew).

Daily/basic family and household needs met

Aside from the potential to make an income quickly, TBF generates cash income to fulfil daily family needs such as food, water, electricity and school fees for children.

Improvement in living conditions

Beyond income for daily needs, income generated from TBF is attractive for its potential to improve living conditions at the household level – for example, to build a house or buy/repair fishing equipment:

> After the Seroja cyclone hit the Tanjung, our houses were destroyed. The government provided support but that was not enough. We also wanted to rebuild our houses. Therefore, our husband went there [to the AFZ] to generate income for the building materials. (FGD1_Tan_Women)

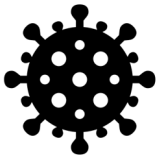
> My husband hadn't gone fishing there [to the AFZ] for a long time until recently. He went there to earn an income to buy new nets as the old one was broken. (KII1_Pap_Woman4)

COVID-19-related drivers

COVID-19-related factors (Figure 23) refer to social, economic and management/movement changes triggered at the beginning of the 2020 pandemic. Research participants correlate the COVID-19 pandemic with new financial difficulties, driving them to pursue fishing in the AFZ.

Note: it is not identified if the situation also resulted in more legal fishing activity inside the MOU Box, but it appears there is little evidence this was the case due to most communities – except for a dozen *perahu lambo* in Pepela – using motorised boats.

It was reported that during the pandemic, fishers experienced a drop in market prices for fish species targeted in Indonesian waters and difficulties accessing local towns and markets on Rote (e.g. travelling to Ba'a) and Kupang. However, the price of trepang remained high, along with market demand. Fishers also believe they would be less likely to get caught by Australian authorities during this time, due to social-distancing restrictions; patrol officers not boarding boats at sea; and leniency in gear, catch and occasional vessel seizure through legislative forfeitures at sea (rather than boat apprehensions and prosecutions).



COVID-19 related factors	New financial difficulties triggered by the pandemic
	Perceived leniency by Australian authorities
	COVID-19 impacts attracting other fishers to join TBF

Figure 23. COVID-19-related drivers and dimensions

New financial difficulties triggered by the pandemic

Research participants shared their experiences of financial difficulties triggered by the pandemic. For example, in the Tanjung, women participants said that the financial hardship caused by the pandemic led some families to borrow money from their boss to cover daily living expenses, further increasing their dependence on the boss (FGD1_Tan_Women).

The pandemic also lowered fish prices (KNTI 2020), and prompted the prioritisation of trepang fishing in Australian waters, as the following quotes illustrate:

> The effect of the COVID-19 pandemic is that the price of fish has dropped drastically, so people prefer to switch to catch sea cucumbers because sea cucumbers still have a high price. (KII1_Tan_BoatOwner1)

> During the pandemic, the family experienced economic hardship because the price of fish dropped. They are forced to go into debt to meet their needs and pay off the debt with the wages from the trepang catch. (KII1_Tan_Woman1)

Other participants attribute economic difficulties at the beginning of the pandemic to a lack of seafood buyers, as well as limitations on freedom of movement within Kupang, West Timor, and Rote (e.g. due to social-distancing restrictions, leading to closed markets and travel constraints) (FGD1_Pap_Women; FGD1_Tan_Women).

Perceived leniency by Australian authorities

A motivation for engagement in TBF cited by some research participants, particularly those in Tanjung (FGD1_Tan_Boat Owners & Captains; FGD1_Tan__Crew) and Pepela is the perceived leniency by Australian authorities during the pandemic:

> Legal issues that are weakly enforced are also a major cause of the current rampant sea cucumber fishing. During the COVID-19 pandemic, some fishermen may not be inspected and may operate unhindered, resulting in increased sea cucumber activity. (KII1_Pap_Leader1)

> Some fishermen may not be inspected and may operate unhindered [i.e. not stopped]. (KII1_Pap_Leader1)

COVID-19 impacts attracting other fishers to join transboundary fishing

As explained earlier in this report, COVID-19 reactivated interest in TBF practices among some actors and connections (e.g. people from Maginti, Selayar) (KII1_Pap_Captain1; KII1_Tan_Crew1) who have a history of involvement in TBF, as well as from new players from Rote villages only (e.g. Batu Tua, Hundihuk and Oenggae):

> They have known the situation there for a long time. They come here with experience from there. So when they found out there were people here, they stopped using people from here and started using people from there. They managed to come ashore in the Kimberly area (KII1_Pap_Leader1).
>
> More and more Maginti people are coming, about 20 ships. (KII1_Tan_Crew1)

While there were likely travel restrictions within Indonesia at this time, the fishers were driven by the decreased likelihood of Australian authorities undertaking patrols and detaining apprehended fishers in Australia.

Psychological drivers

Psychological drivers refer to the underlying thoughts and attitudes prompting fisher engagement in TBF. This includes, for example, individual motivation and pride, and the absence of fear of getting caught and punished by Australian authorities (Figure 24).

Psychological factors

- Seeing others return with big catches to home villages
- Deriving entertainment, fun and pleasure
- Demonstrating fearlessness and courage
- Priding oneself in proof of strength and resilience
- Enjoying spontaneity

Figure 24. Psychological drivers and dimensions

Seeing others return with big catches to home villages

Research participants noted that they became interested in pursuing TBF based on hearing about and seeing for themselves the successful catches of fishers who had returned to their villages from fishing in the AFZ. As a captain in Tanjung explained, “Many people ‘jump in’ because they see others succeeding” (KII1_Tan_Captain1).

Fleets of boats used for TBF are also very visible in the coastal communities of Rote, adding an element of acceptability to illegal fishing as a livelihood activity. This includes, for example, boats spraypainted by Australian authorities during legislative forfeitures to mark them as having been apprehended.

As a crew member in Pepela said:

> One of the factors that encourages fishermen shifting to cross-border fishing is the large number of boats that embark cross-border trips [and return safely with a good catch]. (KII1_Pap_Crew 1)

Deriving entertainment, fun and pleasure

Undertaking TBF is seen by some fishers as something pleasurable, particularly the idea of travelling to Australia waters for the first time (KII2_Tan_Crew1). There is also the camaraderie and experience of working together as peers to overcome a dangerous challenge.

TBF is also possibly driven by the curiosity and challenge of undertaking a new experience. As crew member in Tanjung explains:

> I am interested in participating because it is a new experience that I have never had before. There is curiosity and a desire to experience for myself what it feels like to catch sea cucumbers in eastern [Timur] waters. (KII2_Tan_Crew1)

Demonstrating fearlessness and courage

The absence of a fear of getting caught and the risk of an accident is closely connected to management and policy drivers and social drivers. Research participants acknowledge their awareness of the rules and boundaries related to Indonesian fishing in the AFZ, but there is an absence of fear of the risks of distant-shore fishing or the consequences if caught. As a crew member in Tanjung said, “Even though [I] was aware of the risks, [I] was not afraid and still had the intention to do it” (KII1_Tan_Crew1). A woman respondent in Tanjung further explained positive perceptions of Australian Border Force officials and a belief that fishers will ‘only’ be returned home if caught rather than imprisoned:

> No, they are not afraid because the social spirit of Australians is considered great and has a broad humanity. If they were caught, they might have been arrested, but people still go and are not afraid of being caught … They are arrested but still go home. (KII1_Tan_Woman4)

Priding oneself in proof of strength and resilience

Despite the belief held by some research participants that their faith in God or fate (*nasib*) determines the outcome of TBF, a crew member in the Tanjung shared his pride in travelling to Australian waters and suggested others might be similarly motivated by a desire to prove their strength:

> The reason a person is interested in going to Australian waters may include a drive to prove strength and resilience to others. (KII2_Tan_Crew1)

Enjoying spontaneity

Although TBF provides a regular source of income for fishers, a boat captain in Tanjung said that deciding to travel to the AFZ can also be a spontaneous decision (KII1_Tan_Captain1). A crew member in Oesapa also explained that if fishing in Indonesian waters is unsuccessful, they may change their course and decide to fish in other areas (KII2_Oes_Crew2).

Environmental drivers

As mentioned in the methodology, we use the term ‘environmental’ to refer to conditions in the physical environment rather than the broader context in which people live, as per the BDM (Petit 2019, p.23). Specifically, environmental drivers of illegal fishing concern the

more abundant supply (and size in some areas) of trepang and other products perceived by fishers to be available in Australian waters and the geographic proximity of fishing communities to the AFZ (Figure 25).

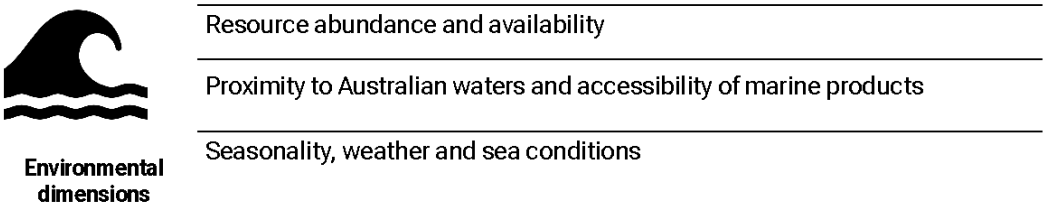


Figure 25. Environmental drivers and dimensions

Resource abundance and availability

Research participants shared their perspectives and experiences regarding the greater supply of trepang and other marine products available in Australian waters than in Indonesian waters. With this comes the prospect of a larger catch than might otherwise be available in other legal fishing grounds. As an elderly man in Pepela explained, “There are not many sea cucumbers left in Indonesian waters” (KII1_Pap_Elderly1).

The visibility mentioned above of seeing others return to the village with a substantial quantity of sea cucumber, along with the necessity of procuring a source of income to meet essential living expenses, reinforces this motivation:

> The motivation to keep going to Australia is because we didn’t get results at home. We are looking for food and remember that the family back home depends on the results of our hunts. (KII1_Tan_Crew2)

Proximity to Australian waters and accessibility of marine products

In addition to the perceived abundance of marine resources in Australian waters, Indonesian fishers have easy access to these fishing grounds in terms of proximity, as well as the necessary equipment and skills:

> Ashmore Reef[74] is the main destination because there are still many marine products to be found there, such as sea cucumbers, which can be reached in a relatively short trip, [and found] at a depth of about 15 metres. (KII1_Pap_Elderly1)

Seasonality, weather and sea conditions

Either ‘good’ or ‘bad’ weather (e.g. rough seas, cyclone season) is considered good for fishing (KII1_Pep_Captain2 & KII1_Pep_Crew3). Good weather enables fishers to reach and return from the fishing ground despite the higher risk of apprehension by Australian authorities. Bad weather poses a challenge for fisher navigation, but carries less chance of being apprehended. This is because of a belief that Australian authorities assume fishers will not dare to voyage during bad weather. For *perahu lambo*, the fishing season to the MOU Box is only between August and October due to the wind conditions, whereas motorised boats can travel January to March and September to November (FGD_Tan_BoatOwners&Captains). In Oesapa, the sea cucumber fishing season occurs March to May and September to December (FGD_Oes_BoatOwners&Captains).

[74] Note: the name Ashmore Reef or *Pulau* is commonly used by fishers to refer to the MOU Box.

Cultural and historical drivers

Cultural and historical drivers refer to the factors that have prompted Indonesian fishing in areas now part of the Australian waters, such as the reefs and islands inside the MOU box, as well as reefs and islands located offshore of the Kimberley mainland – designated as Australian waters, but frequented by Indonesian fishers for many generations (Figure 26).

Long-distance sailing and fishing is a tradition

Fishing in Australian waters is a traditional livelihood activity and right

Fishing is an intergenerational activity

Knowledge and practical skills

Figure 26. Cultural and historical driver dimensions

Long-distance sailing and fishing tradition

Although this dimension did not feature strongly in the fieldwork data due to the limited scope of the study, we know from the literature and our observations that there is a history and tradition (see also Results part 2) of distant-shore sailing, fishing (and trading) and spending time away from home villages for most ethnic/fisher groups engaged in legal and illegal fishing in Australian waters (Fox 1977; Fox and Sen 2002; Stacey 2007; Stacey and Allison 2019).

Fishing in Australian waters is a traditional livelihood activity and right

Research participants acknowledge that Indonesian fishing in Australian waters (e.g. Ashmore and Scott reefs) is not a new practice, and that Indonesian fishers have been "living off the sea for several generations" (KII1_Pap_Captain1). One leader in Pepela, for example, said that fishing in Australian waters can be traced back to "1770, when Makassar fishermen together with people from Rote took sea cucumbers there" (KII1_Pap_Leader1).

While on the one hand there is some recognition of Australian sovereignty of the AFZ, of waters and reefs that were once traditional fishing grounds prior to maritime expansion, others hold strong beliefs that fishers have the right to fish in areas more extensive than what is permitted under the 1974/1989 MOU arrangements and areas restricted for access that were available to them in the past. This right can be interpreted as a form of justification to continue to engage in illegal activity (Stacey 2007).

Fishing is an intergenerational activity

Participants also emphasise the cultural significance of fishing as an intergenerational livelihood activity passed down from grandfathers to other male family members. Women participants similarly highlight fishing as a livelihood activity undertaken in partnership by fathers and their sons:

> The first time he and his father were looking for sea cucumbers, then he followed other people, the first time he and his father went to Scott [Datu] Island. (KII1_Tan_Woman4)

> The tradition of going to Australia has been going on since the time of our great-grandparents and has been passed down to the current

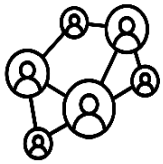
> generation. Before he married my mother, my father often accompanied people who went there. (KII1_Tan_Woman1)
>
> I always go with my dad. Dad still goes to sea, and he is now over 60 years old. (KII2_Tan_Crew1)

Knowledge and practical skills

Many Indonesian fishers engaged in legal and illegal fishing in the AFZ have deep indigenous, local and ecological knowledge (a topic we did not explore) about the marine environment, species availability, weather and ocean conditions. They also have the navigation skills to travel long distances offshore and in open seas to reach productive fishing grounds (KII1_Tan_Captain3). This also extends to the knowledge and skills in using different fishing techniques, gear, and operating boats. This knowledge and skill is connected strongly to the tradition of sailing and fishing as a livelihood strategy.

Social drivers

The phrase social drivers encompasses determinants associated with relationships within families, communities, groups and society as described by Petit (2019, p.12). While the patron–client system can also be considered a social driver, we discuss this in reference to economic and livelihood factors (Figure 27).



Social factors

Fisher demographic characteristics

Faith in God and fate–" the outcome is in God's hands"

Figure 27. Social drivers and dimensions

Fisher demographic characteristics

TBF is particularly attractive to individuals of a specific life stage, such as among young, unmarried fishers with no children, but also to captains or crew with generational experience and knowledge of the region/fishery. Although not mentioned in the fieldwork data, this is relevant to the notion of *merantau* (to leave your home area to make a living) – especially for young men – noted in the literature (Stacey 1999). Uncertainty about a future career and limited employment options for early school leavers situate these fishers at a transition time in life. As the following participants explain:

> At that time, I was still young and had no children, so I was confused and didn't know what field to work in. It's true, I don't have any special expertise in any particular field. I just live at home with my grandfather. During those three months, I really didn't know what was happening, what I was eating, everything was unclear. (KII1_Pap_Captain1)
>
> Many Bajo people only go to school until the second or third grade of junior high school, sometimes they never go to school at all. There are many reasons, being beaten by friends at school makes them feel inferior, so they decide to stop going to school. So many children over the age of 12 have gone to sea, learning how to fish. (KII1_Tan_Woman4)

> I am still single. I can still travel because of my single status. (KII2_Oes_Crew2)

Faith in God and fate: "The outcome is in God's hands"

As mentioned above, faith in God and notions of fate also appear to inform decision-making to engage in TBF, as the following quotes illustrate:

> The fishermen realise that the risk of death or accident is part of their job. They accept this fact as part of the risks that must be faced in the fishing profession. They go about their work with the belief that whatever happens is fate, and they surrender to God's will. For them, life and death are God's affairs, and they continue their work with enthusiasm and gratitude. (FGD1-Pap-Crew)

> We believe that God is in control, the destiny is determined. We are still patiently trying to find food. Even though we survived yesterday, we know there are risks, but we still want to go there again. We cannot avoid fate. (KII1_Pap_Leader1)

Policy and management drivers

Policy and management of illegal fishing drivers (Figure 28) pertain to the perspectives of study participants on possible responses by Australian authorities if they are intercepted or caught at sea, and the possibility of avoiding detection. There is also some mention in the data about perceived deterrents, including the possibility of increased Indonesian government involvement in surveillance operations.

Policy & management related factors

- Imprisonment not perceived as a punishment
- Fishers with knowledge on Australian patrol schedules to establish avoidance strategies
- Lenient and positive treatment by those guarding or patrolling
- No effective Indonesian government deterrence

Figure 28. Policy and management drivers and dimensions

Imprisonment not perceived as a punishment

Even when fishers are apprehended, they do not necessarily see incarceration in Australia as a form of retribution. This is due to the perceived favourable conditions of Australian prisons, which some participants likened to hotels:

> Prisons in Australia at the time did have quite good facilities. Inside the prison block, we had access to snacks and soft drinks at any time. Each bedroom is equipped with two beds, a TV, a refrigerator and a [toilet]. In addition, there is air conditioning and a white cupboard in the room. So, in terms of facilities, you could say it's like a hotel. (FG1_Pap_Crew1)

> Australian prisons [are] considered as good as hotels. (KII1_Pap_Captain2 & KII1_Pap_Crew3)

> Western prisons have better facilities and conditions than most prisons. They may even be comparable to luxury hotels. Compared to other prisons, we called them “luxury hotel” prisons which include better food facilities and more flexible schedules. (KII1_Tan_Captain1)

However, the impacts of imprisonment can be significant for the families of fishers – creating significant psychological stress and financial difficulties especially for women, who increase their labour burden to engage in additional income-generating activities to cope.

Fishers with knowledge on Australian patrol schedules to establish avoidance strategies

Fishers believe they are aware of the surveillance strategies of Australian authorities. For example, if fishers hear a helicopter or plane and they are spotted, they assume a patrol boat will arrive within several hours (FGD1_BoatOwner&Captain; FGD1_Tan_BoatOwner; SGI1_Pap_Elderly; SGI1_Oes_Elderly). They also believe there are unlikely to be patrols on public holidays and during rough seas in the west monsoon period (KII1_Oel_TraderMoneyLenderElderly1). As a Trader in Oelaba said:

> The fisherman is smarter, sir. For example, in December during the Christian Christmas preparations, the guards there do not operate because of church activities to welcome Christmas and New Year. They are very smart … And then there are other examples of independence celebrations or big days and important moments there. I’ve asked [the fishers], and it turns out that this is how they can steal. (KII1_Oel_TraderMoneyLenderElderly1)

Lenient and positive treatment by those guarding or patrolling

During the early COVID-19 period, if fishers were caught or apprehended by Australian authorities, they were mostly turned back, and their catch or gear seized. There was less risk of being jailed in Australia, or having their boat seized and destroyed (as per AFMA data). Some fishers also mentioned being given access to medication and clean drinking water by Australian officials (as has been previously documented in the literature and in media reports of interactions between Australian fishers, sailors and Indonesian fishers) and the absence of violent tactics displayed by Australian authorities.

No effective Indonesian Government deterrence

Some Indonesian government activity has been implemented to deter their citizens from engaging in illegal fishing. Some fishers interviewed mentioned an initiative in 2022 by the Indonesian Government Minister of Marine Affairs and Fisheries to deter illegal fishing by asking fishers to sign a document stating that they will not fish illegally in Australian waters. However, the fishers did not sign. It was also acknowledged the Indonesian government has limited ability to restrict the movement and activities of fishers. Indonesian government activity has included Indonesian Government Directorate General of Surveillance for Marine and Fisheries Resources Surveillance (PSDKP) engagement in Joint Australia–Indonesia PICs raising awareness about risks and consequences of illegal fishing and of not following MOU Box rules.

The issue of the Indonesian government’s role in deterrence was mentioned in an FGD in Pepela:

> I think the Indonesian government needs to increase surveillance in Indonesian waters to reduce this illegal problem. (FGD1_Pap_Crew)

However, Indonesian government has limited ability to restrict the movement and activities of fishers.

7.6.2 Location-based drivers of Illegal fishing

Pepela

In Pepela, the most cited drivers of Indonesian fishing among crew are related to economic and livelihood strategy factors, particularly those associated with financial difficulties, limited job opportunities and minimal government support. The limited government support is possibly due to government perceptions that people in Pepela will use government assistance (including Australian Government support for alternative livelihoods) to aid future engagement in illegal fishing (SGI_Pap_Leaders & Elderly).

In the fieldwork data from Pepela, perspectives on the impacts of the COVID-19 pandemic are mixed. Some interviewees said they avoided engaging in illegal fishing or stopped legally fishing using sail boats in the MOU Box (KII1_Pap_Crew4), whereas other captains, crew and leaders described the COVID-19 period as attracting more people to fish cross-border due to Australian government leniency (KII1_Pap_Captain2; KII1_Pap_Crew3; KII1_Pap_Crew1&2; KII1_Pap_Leader1). Some also talked about the financial impacts of COVID-19 on their ability to save, and the ways in which the pandemic created new financial difficulties.

Tanjung Pasir

Tanjung Pasir was established by migrant fishers from Wakatobi Island communities (Sulawesi) who settled on the beach to engage in TBF and locally based supplementary livelihoods (e.g. small trading and other fishing activities) (Stacey 2007). These migrants have very limited access to land-based resources in Tanjung Pasir because they do not own the land. Research participants similarly noted economic and livelihood strategy–related drivers, including the:

- need to meet basic (household) needs, such as provision of food and other family expenses and assets
- desire to improve their living conditions
- potential to generate income in a short period (due to the higher price of sea cucumbers compared to lower value of finfish).

These economic drivers are closely connected to other environmental and cultural drivers, such as the potential to harvest a substantially larger and more profitable catch. Participants also highlighted fishing as an intergenerational activity passed on from grandparents to current generations, and other psychological drivers mentioned above such as pride and bravery. For people based in Tanjung Pasir, long-distance fishing to Australian waters is their tradition; previous research demonstrates Wakatobi and Tanjung Sama-Bajo fishers have connections to AFZ waters since the early 1900s (Stacey 2007). These fishers thus may have less consideration of risk due to these historical antecedents.

Oesapa

The establishment of the trepang-fishing community in Oesapa was initiated by immigrant fishers from Sinjai, South Sulawesi, who specialise in fishing in the border zone using a compressor (*hookah*) to target trepang. Like Tanjung Pasir, participants noted the economic drivers of TBF as a source of income and limited other employment opportunities. These economic drivers are closely intertwined with other factors such as psychological drivers (e.g. seeing others return with big catches to home villages), environmental (e.g. resource abundance and availability), and a low risk assessment of the perceived likelihood of getting caught.

Drivers of recent illegal activity were reported in all locations as being the same as in the past, but COVID-19 is thought to have triggered a resurgence of illegal fishing, as has been the case in previous decades where specific drivers such as market demand have

driven high numbers of boats into TBF. In the case of Oesapa specifically, the increased illegal fishing activity is associated with the area becoming a transit site for fishers from other parts of Indonesia, particularly fishers from small islands in Muna District, South-East Sulawesi.

Oelaba

In Oelaba, participants informed us of minimal community involvement in illegal fishing (SGI1_Oel_Elderly) due to the inheritance of fishing practices deemed legal in the MOU Box (KII1_Oel_Crew1), and heightened awareness of the risks of engaging in illegal fishing due to previous negative experiences of apprehension and burning of boats (SGI1_Oel_Elderly). A trader in Oelaba told us there are no boat owners in Oelaba, but that people from Sumbawa, Lombok, Sulawesi and Pantar/Alor usually transit around their coastal waters (KII1_Oel_TraderMoneyLenderElderly1). One elder in Oelaba was also critical of fishers in other villages (e.g. Pepela) who are perceived as driven by a desire to 'get rich quick' rather than engage in legal activities to fulfil basic livelihood needs:

> But fishermen there just want to get rich, not to fulfil their needs. This is not a need but just a desire factor.
> (KII1_Oel_TraderMoneyLenderElderly1)

7.6.3 Opportunity context: enablers of illegal Indonesian fishing

As noted above, the research teams observed that when constructing a list of drivers that appear to influence Indonesian fishing behaviour, it is essential to consider the broader contextual factors that also contribute to illegal fishing. The potential drawback of solely naming behavioural drivers is that it assigns the responsibility for illegal fishing to individual fishers or other associated actors – rather than the broader opportunity structure that includes deficiencies in the regulatory environment, social or economic systems that influence the value chain, ethnic marginalisation, specific community-group livelihood vulnerabilities, or legal plurality on rights of access. For example, a leader from Pepela explained the right of Indonesians to fish in the MOU Box and his disagreement with the designated border areas (SGI1_Pap_Elderly). Thus, as our findings and the literature highlight, one of the challenges associated with illegal fishing in Australian waters and addressing drivers is the interconnectedness of actor-based drivers and the wider enabling environment. The local context is composed of multifaceted social- and economic-based influences which exist to support illegal fishing. Some of the enablers of illegal Indonesian fishing identified in the data can also be interpreted as drivers – in particular, the economic aspects, patron–client relations and associated market aspects, accessibility and availability of marine resources, and the skills to participate in maritime and fisheries-based activities. It was beyond the scope of this study to consider all those wider enablers in detail; however, from our research, 3 key enablers were identified by research participants. These include:

- patron–client relations system, and high consumer demand and prices for target fish species (local and export), especially 'prestige' products on international markets
- the existence of the 1974 MOU agreement and the fact that some current illegal fishers have in the past operated 'legally' under the provisions of the agreement (see Stacey 2007; Fox 1977)
- the limited livelihood opportunities available within the broader community livelihood context in which the TBF is situated as an important livelihood activity.

A major enabling factor overall is associated with the economic, trade and market aspects of fishing. These include a domestic and international market demand for high-value species, high prices for trepang in particular, fishers' access to markets through buyers, and a supporting patron–client system for fishers (which can cover a range of aspects

from access to operational capital and funds for families, access to boats and equipment, access to buyers, and longer-term support in times of need).

Buyers from other parts of Indonesia (e.g. Makassar, Surabaya) as well as local middlemen visit Rote, and fishers can directly negotiate prices (KII2_Oel_Trader1): "Buyers usually come from Tanjung Hamlet, and there are also buyers from outside the area who transit here" (KII1_Tan_KioskOwner1). Part of the price negotiation involves the boss in the village calling buyers based in other cities to check the price of species, who then select the highest price. For those involved in patron–client relationships, the boss is well connected to exporters through a regional and national marketing chain (KII2_Oel_Trader1).

The economic incentive to engage in MOU Box trepang fishing – driven by high exploitation rates and good prices for the product – can result in higher incomes compared with other livelihoods, such as domestic fishing in rural NTT or eastern Indonesia (Prescott et al. 2017). It has been noted in past research, however, that potential incomes from other nonmaritime activities such as working in palm oil plantations may provide a near equivalent or acceptable income to fishing in the AFZ – but without the risks and consequences (Prescott et al. 2017). However, it is worth noting that despite prospects of reasonable incomes from illegal fishing or even some good seasons of legal MOU Box fishing, earnings vary across groups and crews – depending on costs of operations (e.g. price of fuel), borrowings, and revenue from catches which can experience market fluctuations. Regarding legal trepang fishing in the MOU Box and sustainable harvests, Prescott et al. (2017, p.204) have also noted that "as long as sea cucumber prices continue to appreciate and opportunity costs in the fishers' communities remain low there is no sign that the economic incentives will change sufficiently to curtail the unsustainable fishing."

Another broad enabling factor is the sheer number of artisanal fishers in Indonesia available to participate in illegal fishing. With so many fishers in Indonesia there is competition over limited resources, including competition among artisanal 'small boat' fishers and industrial fishing groups and sectors (Fox et al. 2009). This is creating limited resource availability and depletion of localised resources (Stacey et al. 2011) in the Arafura and Timor seas region of Indonesia. This acute pressure on resources in parts of eastern Indonesia – especially in Sulawesi – is responsible for the movement of fishers either seasonally or permanently to strategic locations of islands in southern parts of Indonesia (Fox et al. 2009). Fishers with the skills and economic backing engage in distant-shore fishing in AFZ in response (Briggs 2003). Workforce availability and labour supply is made possible by the historical, social and economic networks established between fishers from regions and islands through intermarriage, settlement and kinship (Fox et al. 2009). These enabling factors are also supported through cultural tradition and a substantial set of traditional knowledge and skills associated with fishing, specific to some cultural groups/maritime populations (fisher identity). The existence of the MOU agreement can also be considered an enabling policy driver, as legal fishing can be a gateway to illegal fishing.

Motorised boats and fuel availability appear to be a key enabler, because without fuel or affordable fuel (in context of costs versus returns) would severely impact illegal activity in the AFZ. TBF involves long-distance expeditions, requiring fuel. Although difficult to access, and expensive fuel prices (KII1_Oel_TraderMoneyLenderElderly1), fishers are usually able to access fuel through the bosses and the cost can be covered through the high income of successful trepang fishing. A woman in Pepela told us, however, that "the price of diesel has doubled, which affects operational costs in catching fish" (KII1_Pap_Woman4). Similarly, a woman in Tanjung explained that "they overcome the increase in price of goods when fuel price rises by reducing consumption of food, cigarettes, hot water and snacks. However, sometimes it is difficult to reduce all expenses" (KII1_Tan_Woman2). A captain in Tanjung also explained, "It is difficult to get diesel in Kupang. This is mainly due to limited supply and high prices … I have been

buying diesel there for almost a year. The price is IDR15,000 per litre" (KII1_Tan_Captain1). A crew member in Tanjung also said that "fuel is usually bought in Kupang because the price is cheaper there. Here the price is higher, about IDR15,000 per litre for gasoline" (KII2_Tan_Crew1).

Some of the livelihood constraints and vulnerabilities of the fishers engaged in TBF have been identified previously in the literature (e.g. Briggs 2003; Fox and Sen 2002; Missbach 2016; Jaiteh et al. 2017; Stacey and Allison 2019; Prescott et al. 2017) and can be characterised as institutional, governance or existing social enabling or constraining factors which exert influence one way or another on actors' decision-making and engagement in illegal fishing. Missbach (2016, p.749), for example, identified that 'hyper-precarious livelihoods' of eastern Indonesian SSF and the heavily exploited fisheries in Indonesia (Napitupulu et al. 2022) are an important factor in decision-making to engage in illegal fishing behaviour or people smuggling.

Previous literature has noted issues associated with specific fisher groups such as the Sama-Bajo who are among key groups engaged in legal and illegal fishing. Livelihood issues have been identified related to poverty, limited livelihood-diversification opportunities, ethnic marginalisation and discrimination, lack of political unity (Stacey and Allison 2019), lack of fishing rights, and impacts of marine protected areas on maritime livelihoods (Stacey et al. 2017). These indigenous groups reliant on natural resources are considered socially marginalised and have been noted to be under-represented in government social-protection policies and programs in Indonesia (McWilliam, Wianti and Taufik 2023). Moreover, with little power or unity as a group, mobile groups such as the Sama-Bajo are often marginalised within land-based governance systems and overlooked as key stakeholder groups in marine conservation and management programs (Gaynor 2005; Jones et al. 2011). Fishers from these communities also experience a range of social exclusions (political, health, education, financial, rights and access to natural resources).

7.6.4 Risks from engaging in illegal fishing

We sought to investigate perceptions of risk in relation to drivers of illegal fishing. Engaging in TBF is recognised by research participants as a high-risk activity, carrying accident, health, and safety risks; economic and livelihood risks; and the risk of getting caught by Australian authorities (Figure 29). Risk and decision-making around illegal fishing engagement can also be influenced by the boat owner or boss. For example, the value of a small, motorised boat is less than a sailing boat and thus if apprehended may have a lesser financial impact (e.g. Oelaba). In comparison, communities where people own multiple boats may not be impacted as severely by apprehension than single-boat owners. Individual boat owners/captains may in some circumstance not take on as much risk as boats owned by bosses.

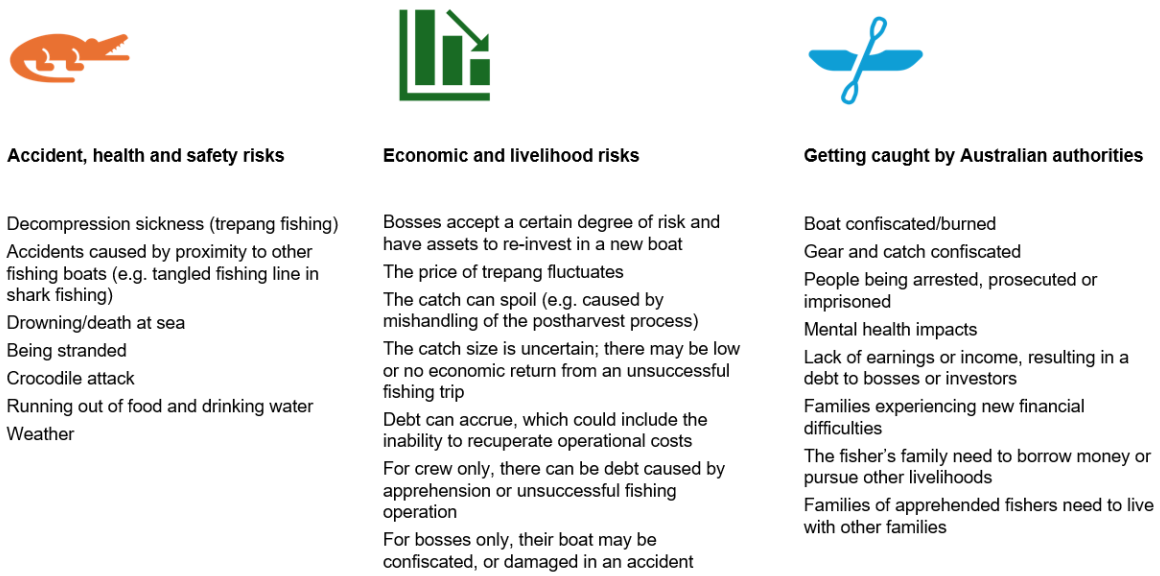


Figure 29. Three main categories of risks identified compiled from field data

Accident, health, and safety risks

TBF is considered a life-threatening and hazardous activity that has resulted in previous deaths (e.g. caused by fishing during a cyclone). One example provided in a KII is the case of a woman who lost her husband and son who died during a cyclone in April 2023, creating financial uncertainty and debt to the boss (KII1_Tan_Woman3). Another example is a woman fish trader in Tanjung who lost her husband: the captain of a boat that sunk. Due to her husband's death, the woman needed to sell jewellery to cover the operational costs of the failed voyage (KII1_Tan_Woman1).

Commonly cited risks in the fieldwork data include:

- **decompression sickness** (from trepang fishing): "The main challenge is the risk of decompression due to deep-sea diving with a compressor. The recovery time after decompression is 3 months" (KII2_Oes_BoatOwner&Trader1) (also mentioned in K112_Oes_BoatOwner1; KII2_Oes_Woman1; KII2_Oes_Woman2)
- **accidents caused by proximity to other fishing boats** (e.g. tangled fishing line during shark fishing) (KII1_Pap_Captain2 and KII1_Pap_Crew3)
- **drowning/death at sea**: "However, after participating in transboundary fishing for sea cucumber several times, my husband decided to stop because the incident of almost drowning" (KII2_Oes_Woman2) (also mentioned in KII1_Pap_Captain1; KII1_Pap_Woman2; KII1_Pap_Woman3; KII1_Tan_Woman3; KII2_Oes_BoatOwner1)
- **being stranded** (KII1_Pap_Captain1; KII1_Tan_BoatOwner1; KII2_Oes_Captain1)
- **crocodile attack** (some are fearful, others are not afraid such as the Maginti fishers): "A friend of mine was bitten by a crocodile while looking for sea cucumbers [in coastal waters off the Kimberly coast of Australia].[75] However, we managed to get home without being caught by Australian patrols or officials … After the accident, the person who was bitten by the crocodile was saved and the

[75] For related news coverage and the Australian Border Force using threat of crocodile attacks as a deterrence, see Mills (2024).

sea cucumbers were still harvested, about 2,000,000 more. Even if you have an accident, you can still get some results" (KII2_Tan_Crew1)

- **running out of food or drinking water** (KII1_Pap_Captain1; KII1_Tan_BoatOwner1)
- **weather** (waves, western monsoon, strong winds, cyclones, rain, storms) (KII1_Pap_Woman2; KII1_Oel_Crew1; KII1_Oel_Woman2; KII1_Oes_Woman1; KII1_Pap_Captain1; KII1_Pap_Captain2 and KII1_Pap_Crew3; KII1_Pap_Crew4; KII1_Pap_Elderly1; KII1_Pap_Woman1; KII1_Pap_Woman3; KII1_Pap_Woman4; KII1_Tan_BoatOwner1; KII1_Tan_Captain3; KII1_Tan_Crew1; KII1_Tan_Woman1; KII1_Tan_Woman3; KII2_Oes_BoatOwner1; KII2_Oes_Woman2).

Some fishers report direct experience of accidents that have led them to stop fishing. Notions of destiny or fate appear to play a role in fishermen deciding whether to take on the risks involved with TBF, such as the belief that "God is in control" (KII1_Pap_Captain1). Risk assessment and decision-making on whether to engage in TBF and where (e.g. close to the border area or deep inside the AFZ) therefore appears to be influenced by their faith.

The risks involved in TBF are generally the same as pre-COVID-19, but the pandemic impacted how people assessed these risks. Some fishers, for example, believed that Australian authorities would be less likely to punish fishers operating illegally near the border area due to transmission risks and social-distancing practices (COVID-19 protocols). Those fishers, however, took on the additional risk of voyaging during rough seas in the west monsoon.

Economic and livelihood risks

Engaging in illegal fishing also carries economic and livelihood risks for all actors involved in illegal TBF, but the degree of vulnerability varies between bosses and crew due to the boss's control of assets and capital. Examples of economic and livelihood risks include:

- **Bosses accept a certain degree of risk and have assets to re-invest in a new boat.** Some bosses in Pepela, Tanjung and Oesapa own more than one boat. As a result, they are less afraid of taking the risk of losing a boat if apprehended, compared to individual-boat owners that have only one boat (KII2_Pap_Boat Owner1). Owners of *bodi* boats are also less afraid of getting caught because of the lesser value of *bodi* boats compared to *lambo*. This can be seen in Oelaba, where most boat owners only own one boat and therefore tend to fish legally in the MOU Box (FGD2_Oel_Boat Owners & Captains). This is in comparison to boat owners in Pepela who own multiple *lambo* and *bodi*, and are therefore more likely to take on the risk of fishing illegally and getting caught. This is reflected in the AFMA data where a higher proportion of apprehended fishers are recorded as departing from the home port of Pepela compared to any other location. For people who only own one boat, they risk losing their entire livelihoods, whereas people with multiple boats are more likely to experience a decrease in total income. During our fieldwork, we also observed negative perceptions held by some community members towards other communities engaged in illegal fishing (SGI1_Oel_Elderly).
- **The price of trepang fluctuates.** Although the price of trepang is higher than finfish (e.g. small pelagic fish or coral fish), it is subject to fluctuations in the global market and manipulations by middlemen (note: this is based on our personal observations of the market, but was not explored in our research).
- **The catch can spoil** (e.g. caused by mishandling of the post-harvest process) (note: this is based on observations, not in our data).

- **The catch size is uncertain; there may be low or no economic return from an unsuccessful fishing trip.** Some participants noted the economic uncertainty of how much a crew might catch, and the possibility that they might not meet their operational expenses, resulting in an unsuccessful voyage (KII1_Tan_Woman1; KII2_Oes_BoatOwner&Trader1). As a crew member in Oesapa stated, "While it is possible to earn a significant amount, it is not guaranteed. The problem is that people tell stories about having many results, but it turns out that this is not the case. I have already lost twice and do not have any money" (KII2_Oes_Crew2).
- **Debt can accrue, which could include the inability to recuperate operational costs.** "Apart from that, there are a lot of expenses, but sometimes the results do not cover the costs. There is a risk of going home negative" (KII1_Tan_Woman1).
- **For crew only, there can be debt caused by apprehension or an unsuccessful fishing operation** (KII1_Pap_Captain1; KII1_Tan_Woman3): "In 2005/2006, my husband was arrested and imprisoned for 5 months. Even so, I still sell fish by taking fish from relatives or neighbours and will be paid after selling. Because my husband was caught, he owed IDR2,000,000 to the boss and a down payment debt of IDR1,000,000, for a total of IDR3,000,000. The debt is repaid in instalments from the proceeds of future fishing trips" (KII1_Pap_Woman1).
- **For bosses only, their boat may be confiscated, or damaged in an accident.** However, this may be perceived differently by bosses who own multiple boats. "If an accident occurs or the vessel gets lost, the risk and responsibility lie with the boat owner. The captain and his crew only pay the [operational] costs. They are not financially responsible" (KII1_Tan_Captain1).

Getting caught by Australian authorities

Research participants describe the "risk of being caught" (KII1_Oes_Woman1) by Australian authorities as a predominantly economic concern, with a range of gendered impacts (discussed next) and consequences for individual fishers their families, crews and assets:

- **Boat confiscated or burned** (KII1_Pap_Captain2 and KII1_Pap_Crew3; KII1_Pap_Leader1; FGD1_Pap_BoatOwner&Captain; KII1_Tan_BoatOwner1; KII1_Tan_Captain1; KII1_Tan_Captain3; KII2_Oes_BoatOwner&Trader; KII2_Oes_Crew1; KII2_Oes_Trader1; KII2_Tan_Crew1)
- **Gear and catch confiscated** (KII2_Tan_Crew1)
- **People being arrested, prosecuted, or imprisoned** (KII1_Tan_Woman2; KII2_Oes_BoatOwner&Trader1; KII2_Oes_BoatOwner1; KII2_Pap_Captain1; KII1_Tan_Woman3): "We knew that this trip was illegal, and if discovered by the Australians, we could be arrested and imprisoned. However, we accept the risk and are happy with the results so far" (KII2_Tan_Crew1).
- **Mental health impacts** (e.g. "worry", "anxiety", "stress", depression) on fishers and their families because of imprisonment, accident or being away from family (or the potential of these) (KII1_Pap_Captain1; KII1_Pap_Woman1; KII1_Tan_Woman3): "My son was caught at 12 years old. Because he was underage, he was released. When he was caught, I cried everyday" (KII1_Oes_Woman2). "The children worried about their father who always [went] back and forth in the transboundary waters. They worried about whether the father would come home" (FGD1_Tan_Women).
- **Lack of earnings or income, resulting in a debt to bosses or investors:** "When my husband was caught, the family felt sad and disappointed. Our financial condition worsened because there was no income. The boat master may give us some money, but we may have to struggle for daily food" (KII1_Pap_Woman3). "Families had to work harder to cover the debt. The wives

had to find income by selling fish, fruits and vegetables. They borrowed money from the boss" (FGD1_Pap_Women). This situation creates a financial and domestic burden on women.

- **Families experiencing new financial difficulties:** "The impact included the loss of family income and mental pressure. The family left behind by the prisoned diver [apprehended sea cucumber diver] would have trouble fulfilling family needs, such as daily needs, children's education, etc." (FGD1_Oes_Women).
- **The fisher's family need to borrow money or pursue other livelihoods:** "When a fisherman is caught, the fisherman's wife has to borrow money from the boat owner to meet the family's needs. The amount of money given ranges from IDR300,000 to IDR700,000" (KII2_Oes_BoatOwner&Trader1). "At that time, the conditions were difficult because he had no money. To overcome this situation, the family tried to sell ice cream and cakes, but finally decided to return to the village because of the difficulties in running a sales business" (KII1_Tan_Woman1).
- **Families of apprehended fishers need to live with other families** (KII1_Tan_Captain1).

The different actors in TBF all experience different impacts and consequences arising from illegal fishing – the crew, families of crew, boat owners and bosses.

7.6.5 Decision-making about the risks of engaging in illegal fishing

A person's role on the boat shapes their ability to decide where and when to fish. Interviewees indicate that boat owners and captains decide on the fishing ground, and the boss can also select crew members. One captain based in Tanjung Pasir said that crew members are "often involved in the decision to cross [the border] and they usually discuss this with the captain before they decide to do so" (KII1_Tan_Captain1). Crew members also choose which captains to work with based on "how comfortable they are working together" (KII2_Oes_BoatOwner&Trader1). Considerations include the "skipper's ability to maintain the boat and engine, knowledge of the fishing grounds, and the skipper's integrity or honesty" (KII2_Oes_BoatOwner&Trader1). Other factors influencing the choice of fishing ground identified in the data include (see Figure 30):

- fuel availability
- weather conditions
- knowledge about productive fishing grounds from past experiences or shared information among actors (e.g. places known to have an abundance of sea cucumbers)
- water depth (especially for trepang fishing using compressors)
- Australian government compliance and enforcement policy actions at the time of fishing.

Regarding the decision-making influence of women, some women participants said that women have no decision-making power on male family members' choice to engage in TBF due to the family's economic needs. Others said they could stop men from engaging in TBF if they felt concerned about the weather or their family members' wellbeing. One woman from Pepela also said that mothers do, at times, stop their children from engaging in cross-border fishing, "especially because of the risks and fears of such activities. Mothers prefer that their children focus on education" (KII1_Pap_Woman3). Illustrative quotes include:

> I cannot influence my husband's decision to cross the border. If there is no money, I tell my husband to sail the border. (KII1_Pap_Woman1)

I prohibit cross-border fishing activities if the wind is too strong. (KII1_Pap_Woman1)

I persuade my son-in-law not to go across borders in case of experiencing the same incident as my late husband. (KII1_Pap_Woman2)

I asked my husband not to go out during bad weather or a storm. I was worried for his safety. (KII1_Pap_Woman3)

If the wife doesn't want her husband to go for transboundary fishing, the husband will still go due to debt with the boss. (FGD1_Tan_Women)

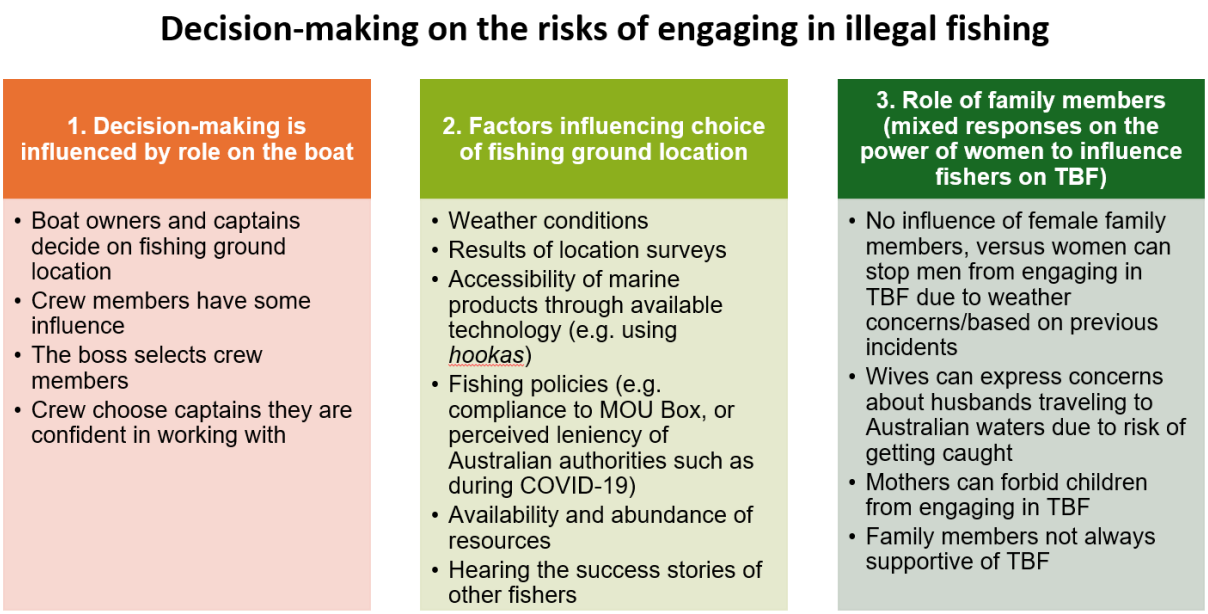


Figure 30. Decision-making on the risks of engaging in illegal fishing

7.6.6 Impacts of apprehensions

There are three main themes in the fieldwork data on the impacts of apprehensions (Figure 31), or what is most often termed by research participants as "getting caught" (*ditangkap*) by Australian authorities – that is, there is no specific terms used by fishers to distinguish between a penalty of legislative forfeiture (seizure of boat, gear and/or catch at sea) or apprehension and prosecution through Australia legal system.

The themes are:

1. type of punishment
2. economic and livelihood impacts
3. gendered impacts on family.

Note: these impacts refer to risks that have materialised and focus only on the consequences of "getting caught", not other broader impacts such as injury or death caused by bad weather.

Impacts of apprehensions

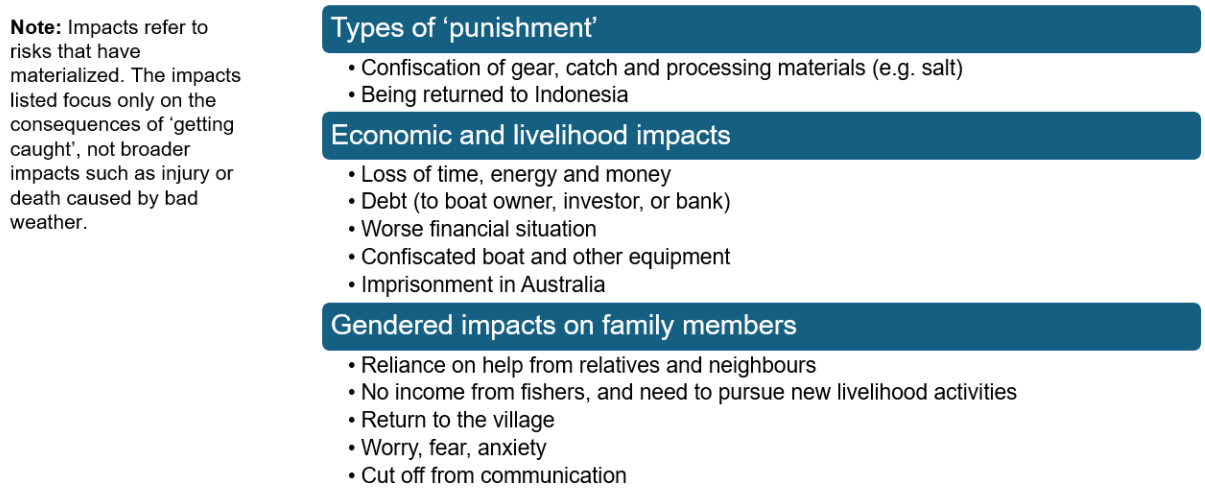


Figure 31. Impacts of apprehensions on actors

Types of punishment

The two main types of punishment experienced by participants in this research are confiscation of gear, catch and processing materials (e.g. salt); or being returned to Indonesia either on their own boat, or in cases where their boat is confiscated, they return on other Indonesian fishing boats (colloquially referred to as *gojek*, a form of motorbike taxi) (FGD1_Tan_BoatOwners).

Four KII participants also shared their experiences of detention in Australia, with the reported duration of legal proceedings lasting up to 6 months (KII1_Pap_Crew3), and 3 weeks imprisonment for one crew (KII1_Pap_Captain1). Three interviewees had been detained in Australia on multiple occasions:

> The punishment he has received is imprisonment and he has stated that in some cases he has been imprisoned for 3 months. Initially, in 2002, Mr [redacted] was also detained for 6 months. (KII1_Pap_Captain2)

> I was detained after being arrested when I first tried my luck there in 2002. I was detained for some time, but then I was allowed to go home. Similarly, when I was arrested during COVID-19, I was allowed to go home without the catch. (KII1_Pap_Crew4)

> Yes, he had the experience of being caught … At that time, the conditions were difficult because he had no money. (KII1_Tan_Woman1)

Other participants shared their experiences in past decades of being apprehended, or having their boats confiscated and burned:

> In November 2005, 3 boats were caught by the Australian police. The captured boats were then burned and the fishermen were taken to Australia. The fishermen were then tried and imprisoned for 1 month (KII2_Oes_BoatOnwer&Trader1).

Detention in Australia and/or having a boat confiscated, forfeited, and/or destroyed have gendered livelihood impacts on the families of fishers. Commonly mentioned impacts on women include:

- the need to find other sources of income through the livelihood activities of women
- stress and pressure
- the need to borrow money from the boss, family or neighbours
- the need to mortgage existing assets (e.g. gold jewellery)
- a change in the gendered role in the household (the woman becomes the main breadwinner) (KII1_Tan_Woman1; KII1_Tan_Woman4).

The most cited impact is the need for families to borrow money to pay off a debt or to meet basic needs if the voyage is unsuccessful (and/or to borrow money to tide themselves over until the fisher returns home and can engage in livelihood income-generating activity again), as the following quotes illustrate:

> My husband was once caught by Australian Border Force government officials, but he was immediately sent home and not detained. The family decided to borrow money from the boss [to meet daily living costs]. (KII2_Oes_Woman1)

> If you get caught, it means you are in debt. The boss may give you time to wait and find a solution, such as going fishing with other boats. However, the debt still exists and must be paid. (KII1_Oes_Woman1)

Two interviewees also mentioned that getting caught worsened the financial situation of their families:

> When my husband was caught, the family feel sad and disappointed. Our financial condition worsened because there was no income. The boat captain may give us some money, but we may have to struggle for daily food. (KII1_Pap_Woman3)

> With his departure [death], the family's source of income was reduced, making it difficult for [name redacted] to meet the household's needs and the children's shopping needs. (KII1_Tan_Woman3)

An important theme in the fieldwork data is thus the gendered consequences of apprehensions on family members, particularly women and their coping strategies/responses. Examples provided by research participants include:

- **Relying on help (e.g. somewhere to live, money) from relatives and neighbours**: "The family have difficulties when the husband cannot work because of being arrested … only relying on help from relatives or looking for ways to meet daily needs" (KII1_Pap_Woman3). "After her husband died in typhoon incident during transboundary fishing, her main source of income came from selling sweet iced drinks at IDR1,000 per pack, with the business capital borrowed from a neighbour and to be repaid after the products were sold. Her financial situation was also heavily dependent on financial support from her child and child-in-law" (KII1_Tan_Woman3).
- **Borrowing money from a moneylender, resulting in further debt due to high interest rates.** One example conveyed at a community feedback meeting in Tanjung Pasir by a woman was how she borrowed IDR3,000,000 from a 'loan shark' to pay for the cost of her repatriated male family to travel from Bali back to Rote. The total amount she had to repay was IDR7.2 million – more than double (CBF1_Tan).

- **Needing to pursue new livelihood activities (e.g. selling or producing fish, food, vegetables, ice blocks).** "Families had to work harder to cover the debt. The wives had to find income by selling fish, fruits and vegetables. They borrowed money from the boss" (FGD1_Pap_Women). "The fishermen's wives and children are aware of the risks. So the wife prepared precautionary measures, such as having a kiosk business, to deal with uncertain situations like this" (KII2_Pap_Captain1). "The families of the imprisoned fishermen live with other families or in their own houses. The wife is engaged in selling or doing other work to support the family. The fishermen's families also faced economic challenges during that time" (KII1_Pap_Captain1).
- **Returning to their home village (e.g. in Sulawesi):** "He had been caught two or five times. At the time, the situation was difficult because he had no money. To cope with this, the family tried selling ice blocks and cakes, but eventually decided to return to the village due to the challenges of running the business" (KII1_Tan_Women1).
- **Experiencing worry, fear, panic and anxiety because of family members getting caught or not being able to contact apprehended family members** (KII1_Oel_Woman6): "When my son was caught, I cried every day and stress" (KII1_Oes_Woman2), and "I had headache [stress/depressed] when my husband was caught" (KII1_Tan_Woman2).
- **Attempting to handle the anxiety and other psychological stressors, women are encouraged to turn towards their faith** (KII1_Oel_Woman3): "I told my husband about my worry of him being apprehended, and my husband told me not to worry, and to pray" (KII1_Oel_Woman3).

7.6.7 Perspectives on government policy (Indonesian and Australian fisheries management and compliance)

Two themes emerged in the fieldwork data relating to perspectives on government policy:

1) perspectives on Australia's apprehension, and repatriation of fishers to Indonesia, and
2) knowledge and attitudes towards the MOU Box.

Research participants shared their approval of Australian policy during COVID-19 pandemic years "because they didn't use strict measures such as sinking fishing boats or put people through the courts as was done in 2006" (KII1_Tan_BoatOwner1). This response reflects Australian approaches during the pandemic, with fewer boat apprehensions at sea and prosecution of crews through the courts. Other research participants said that attitudes towards Australian policy responses are more mixed:

> Fishermen have different opinions. Some are of the opinion that the treatment has been good because there have been very few arrests, while others are of the opinion that this is not the case. (KII1_Tan_Captain1)

Suggestions made by participants on potential avenues to improve Australian and Indonesian TBF policy responses are similarly divergent. A captain in the Tanjung Pasir, for example, called on both governments to "reduce the number of fishermen who cross the border by tightening up the policy, increasing surveillance, or implementing harsher penalties, especially for those who have been caught more than once" (KII1_Tan_Captain). Other participants advocated for the Australian and Indonesian governments to "consider increasing the area limits for fishers" (KII1_Tan_Woman1), and to allow fisherman using motorised boats or sail boats outside of the MOU Box "to anchor or take shelter [in Australian waters] when there is [strong] wind" (KII2_Oes_BoatOwner&Trader1).

Two interviewees questioned whether the MOU Box policy of sail-powered vessels only accessing the area is being implemented, stating that "the [Australian] government does not restrict the MOU Box area. Since 2023, *perahu lambo* are allowed to be equipped with an engine" (KII1_Pap_Crew1&2), and another questioned the boundaries of the MOU Box:

> According to the fishermen, the MOU Box map used by the fishermen and the governments have differences, especially in terms of latitude, which is considered different from the previous map. Fishermen argue that the boundary has been moved far into Indonesian waters. The fishermen feel that this is detrimental to them because the fishing areas for Indonesian fishermen are limited. (KII2_Oes_BoatOwner&Trader1)

While specific questions to actors on their perceptions of PICs were not asked by the research team, there was little mention of fisher experiences about attending such events. There is only a brief mention in the recorded data about fishers attending PICs or information shared with community during visits in past years (SGI_Pap_Leaders&Elderly). At the community feedback meeting in Pepela, one participant noted they did not believe the PICs were a deterrent (CFB1_Pep). The leader of the Indonesian research team also informally received some information and videos from fishers and community leaders in Pepela on 9 September 2023 describing their attendance at 'socialisation' events on illegal fishing facilitated by the Indonesian government and attended by Australian authorities. Several participants noted their concern about the repetitiveness and clarity of information campaigns. One Pepela captain talked about Indonesian government policy with a call for the Indonesian government to "pay more attention to the state of the border between Australia and Indonesia" (KII1_Pap_Captain1), a concern related to a potential closure of the MOU Box by the Australian Government and impacts on the Madurese legal fishers:

> If Indonesian waters are closed or catches are reduced, the economic condition of Madurese fishermen will be seriously affected. Restrictions or closures of Indonesian waters could limit fishermen's access to the fishing grounds they usually visit, potentially affecting the sustainability of their livelihoods. (KII1_Pap_Elderly1)

The perspectives are summarised in Figure 32.

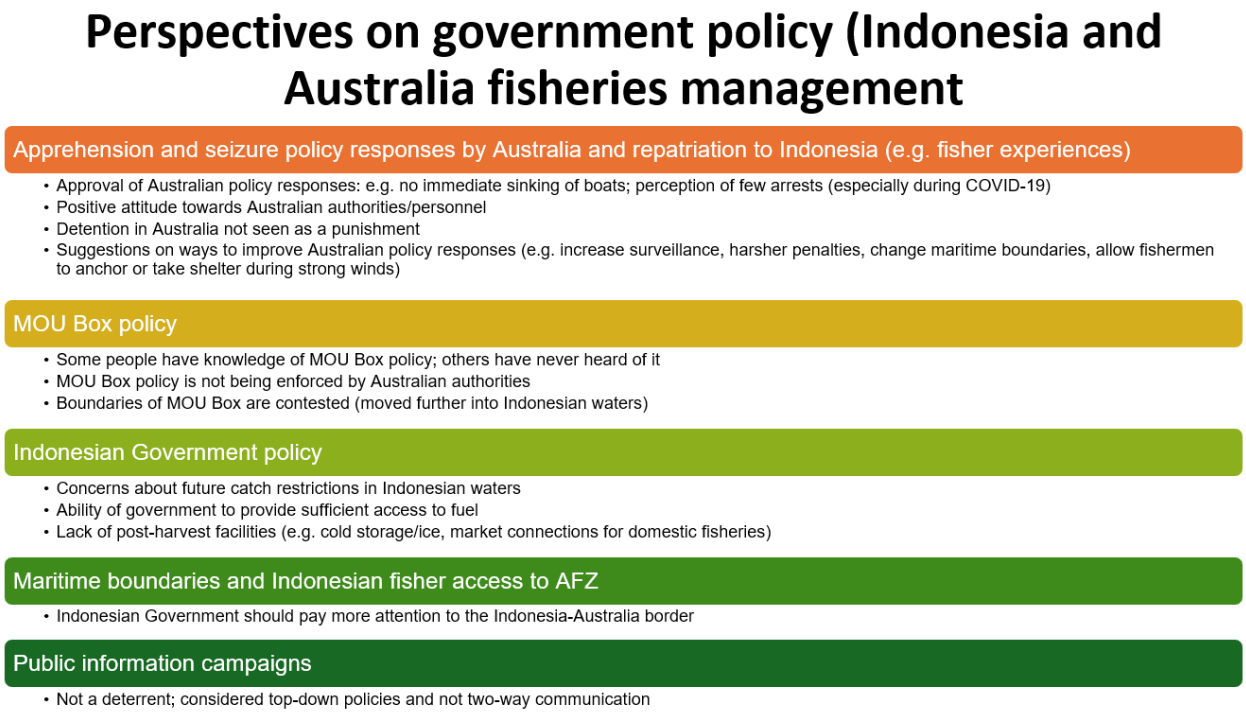


Figure 32. Summary of perspectives on Australian and Indonesian governments' policies

7.6.8 Experiences of livelihood enhancements or interventions

Most KII and FGD women participants report no past previous involvement in development and livelihood opportunities, such as skills training:

> [I've] never participated in any livelihood program or training. (KII1_Oes_Woman2)

> [I've] never been involved in livelihood-development programs or participated in training related to fishermen or fishing. (KII1_Oes_Woman1)

> [I've] not been directly involved in government training activities. (KII1_Tan_Woman2)

> I have never been involved in livelihood-development programs. (KII2_Oes_Woman1)

> I have never been involved in training related to livelihood skills. (KII1_Pap_Woman2)

> I have never been involved. (KII1_Pap_Woman1)

However, two women said they had participated in classes focused on sewing and processing shark into floss:

> There was sewing training from social services that was held previously. Retraining is needed. I have attended training held by the Rote District Marine and Fisheries affair at the village office. Training was on processing shark into fish floss. (KII1_Pap_Woman3)

> … get support from Social Services when I joined sewing training. Yes, there is an increase in skills and abilities in sewing. The program can also provide additional income that helps families. (KII1_Pap_Woman4)

One woman in Pepela said that she had previously participated in training on fish shredding, but did not pursue this because she feared others would do the same, posing competition (KII1_Pap_Woman3). Another woman in Pepela said she had participated in tailoring training, but also did not pursue this as she did not feel she had the skills to make clothing patterns (KII1_Pap_Woman4).

Crew in Oelaba noted the government had previously distributed trawler and small motorised (*katingting*) boats to support livelihood development in the village (FDG2_Oel_Crew). At the community feedback meeting, it was noted the village administration had distributed 20 GPS units supplied from village development funds to support accurate fishing-location access (CFB1_Oel).

7.6.9 Community perspectives on strategies for livelihood enhancements or interventions

During the main period of fieldwork, only limited discussions were held on livelihood improvements (due to reasons noted in the Methodology section) Options suggested by different male actors for further supporting and improving development and livelihoods for men and women include providing:

- livelihood skills training to women, for example, in farming and aquaculture (KII1_Pap_Captain1)
- aquaculture training to men (KII1_Pap_Captain1)
- education support to a graduate level (KII1_Tan_BoatOwner1).

During a FGD with women in Pepela some perspectives on improving family livelihoods were offered:

> “Everyone's situation is different, but to improve the family's welfare is to look for side jobs, such as working at the village office or looking for a permanent job in addition to fishing, also selling fish, or looking for other alternatives to earn income, especially when there is excess fish stock or wasted fish” (FGD1_Pap_Women).

Following the responses, women also had suggestions for addressing post-harvest issues through value addition and product diversification (e.g. with salted or dried fish), or increasing family income by accessing wider markets and new business opportunities. But for this to occur, some assistance or support (in the form of financial capital or through a cooperative) is needed to help in developing the business. Women noted, “However, beforehand it is necessary to settle existing debts” (FGD1_Pap_Women). It was also noted that “there may be a desire to improve the welfare of fishing families, but it may be limited by available capital and debt. Efforts to improve the situation can involve looking for solutions to pay debt or starting additional profitable business opportunities” (FGD1_Pap_Women). Some other small-scale suggestions from a woman in Oelaba included betel nut and palm sugar businesses at the market (KII1_OEL_Woman2).

During the community feedback meetings in October 2024, the research team asked participants for their perspectives on possible livelihood enhancements (with the aim of activities to build and support the existing assets and wellbeing of fishers and their families through, for example, domestic fisheries, management, education, or other enterprise support). Noting the challenges of such a discussion, and without an appropriate methodological supporting process, a few ideas were shared by community members with the research team.

Participants in Oelaba feedback meeting (CFB1_Oel) noted that young people from Oelaba are not interested in TBF, and are migrating to other parts of Indonesia to pursue opportunities in construction or palm oil plantations in Papua and elsewhere. However, young men from the Alor-Pantar region who crew Oelaba boats operating in the MOU Box are still interested in crewing opportunities (CFB1_Oel). In Oelaba, fishers requested FADs and nets to allow them to fish more productively around coastal waters (CFB1_Oel).

In Pepela, there was a general comment that people do not know how to improve livelihoods to engage in fisheries development, and some articulated their fear that any new development or initiatives (e.g. the distribution of boats or subsidies) would be unequally distributed and potentially create social unrest (CFB1_Pep). The idea for fisheries-development assessment was raised and whether there are opportunities to further support sustainable domestic fisheries; however, there are seasonal constraints in domestic-fishery livelihood activities. One participant noted the need to involve the bosses in any such development, and to avoid current unequal structures of profit distribution. Other issues raised included the vested interests of some actors in the village which could negatively impact on any new interventions or programs.

In Tanjung Pasir people talked about the limited job opportunities available for young people outside of fisheries even once they graduate from high school (CBF1_Tan).

In Oesapa, discussion focused on deterrence activities by some village members (CFB1_Oes).

7.7 Discussion

The overarching aim of this project was to identify multiple drivers of illegal Indonesian fishing in the AFZ, and opportunities for gendered livelihood improvements to reduce future illegal activity and improve wellbeing of selected fishing communities in NTT, Indonesia. Five project objectives guided the research approach, design, results and analysis. Our research analysis:

- identified trends in illegal and legal fishing in the AFZ
- implemented a collaborative research design between the Indonesian and Australian teams to build capacity and knowledge, drawing on theoretical approaches to behavioural science
- identified multiple actor-based drivers of illegal fishing, including livelihood enablers and fishers' perceptions on risks, decision-making and impacts of responses to noncompliance
- reviewed past livelihood interventions enacted in NTT fishing communities
- evaluated opportunities for addressing drivers, livelihood improvements and their likelihood of success in reducing illegal fishing
- produced exploratory research knowledge for potential future research for development investment.

Next, we synthesise our key findings.

7.7.1 Illegal fishing trends

Legal and illegal fishing in the AFZ by groups of fishers from island communities and ethnic groups has continued over the last five decades (i.e. since the 1974 MOU agreement was established). The recent period of increased levels of illegal Indonesian fishing incursions in the AFZ since COVID-19 began (and continuing into 2024/25) is a trend Australia has experienced at various times over the last 50 years as a result of significant events and the reactions of fishers to multiple drivers. There is no doubt that in

the last four years fishers have continued to strategically target specific fishing areas with higher trepang stocks in the AFZ [than in Indonesia] and for which high international export demand continues.

Surveillance, compliance and deterrence policy responses have resulted in forfeitures, apprehensions and prosecutions of thousands of fishers, boats, catches and equipment. But, in general, we conclude that this has not been a sufficient response to stem the tide of incursions. Moreover, even in instances when authorities successfully 'catch' fishers undertaking illegal behaviour, it is more likely to negatively impact on their households and women further trapping them in debt relationships that will see the fisher crew 're-offend'. These impacts have not been addressed as part of Australia's compliance program or addressed through other development initiatives in any substantial form.

7.7.2 Drivers of illegal activity since COVID-19

We have identified and increased research knowledge on existing, known actor-based drivers (*underlying motivations driving behaviour*) of illegal fishing with opportunity-based approaches (*enablers that create opportunities for noncompliance*). This new 'picture' shows a large, complex interplay of drivers and enablers, a blurring between the two and noncompliance as the "interaction of a motivated actor with an opportunity" (Oyanedel et al. 2020, p.1121). Our research has expanded the drivers identified in previous BDMs to identify seven Level 1 drivers: economic and livelihood, COVID-19-related, psychological, environmental, social, cultural and historical, and policy and management. We also identified 28 Level 2 dimensions.

Some of these drivers may be more important than others for different fisher groups, within the enabling context of each community and group. Moreover, even in instances where a driver may appear very important, it is not necessarily a sufficient explanation in isolation. For example, during COVID-19, economic hardship among fishing communities increased. However, financial difficulties alone are not sufficient to entirely explain the strong resurgence of illegal fishing, which was likely prompted by a combination of financial hardship, the discovery of new fishing grounds abundant in trepang, and willing patrons to support such ventures into the AFZ. Further, while COVID-19 was a key driver of illegal fishing together with the perception of minimal negative impacts from Australia's deterrence approach, other drivers and enabling conditions continued to support illegal fishing activity. Therefore, we expect that illegal fishing will continue in the future if there is no significant intervention to address some of the actor-based drivers and broader livelihood issues that fishers and their families face. Our research results also support previous research on the instrumental (rational choice) approach, in that illegal fishing does not only occur when the potential benefits outweigh the costs.

7.7.3 Livelihood risks and impacts

In identifying drivers, we also sought to broadly investigate the perceptions of risk and decision-making in illegal fishing and any differences to pre-COVID-19 times. People's perceptions of risk (e.g. reduced likelihood of getting apprehended, given changes in apprehension policy during COVID-19) did appear to contribute to increases in illegal fishing activity during COVID-19. Within this framework of drivers and enabling contexts a set of risks identified by actors also exist, covering three themes: health, accident and safety; economic and livelihood; and apprehension-related risks. There is no doubt that actor-based drivers are informed by these identified risks, and thus decision-making about whether a fisher or boat crew decide to engage in illegal fishing or not. These decision-making results are, in some cases, similar to drivers as influencers. Some people's perspectives on Australian and Indonesian deterrence policy suggested that PICs were not an effective to deter illegal fishing. This finding supports academic research that a compliance approach cannot be the only mechanism to reduce illegal fishing.

We were particularly interested in whether women relatives of fisher crews have any influence over fishers' decision-making to engage in illegal fishing: there were varied

results. In summary, decision-making about illegal fishing is more likely to be influenced by a person's role on the boat (e.g. captain) and factors influencing choice of fishing location (e.g. fuel availability, knowledge of fishing grounds), and in some cases the role of family members. Most research to date has identified broad impacts of apprehensions, natural disasters, death at sea, low catch rates, or unsuccessful voyages. However, our identified main themes were: health, accident and safety; economic and livelihood; and apprehension-related risks. The resulting impacts of the consequences of getting caught identified are: types of punishment, economic and livelihood impacts, and gendered impacts on family/household members.

The apprehension and detention of fishers for illegal fishing can result in flow-on, negative gendered impacts on families; in particular, exerting more pressure on women that results in implementing coping strategies and responses to 'make ends meet' in various ways. These include sourcing extra work or income to meet household needs or debts, experiencing mental health and stress, getting further into debt by borrowing more money to pay for travel costs of repatriated family members inside Indonesia or to make ends meet, and changing gender roles and norms so women become the main household income-earner.

7.7.4 Opportunity-based approaches

It was beyond the scope of this study to consider all broad enablers that create opportunities for noncompliance, but three key enablers we examined are:

- patron–client relations supporting fishing activity – articulated by fishers themselves as a bond which is hard to extract themselves from, and which limits opportunities for fishers and families to pursue other economic choices (McWilliam et al. 2020)
- high international market demand for target species
- the continued existence of the MOU agreement (under which some currently 'illegal' fishers previously operated legally) and limitations of the 50-year agreement
- the continuing role of transboundary fishing in the livelihood portfolios of many groups, and limited livelihood opportunities available within fishers' communities.

There are significant challenges in dismantling patron–client relations, because "as a form of economic interdependency, the patron-client tie comes at the cost of autonomy and the freedom to pursue alternative economic choices and options. It follows that most well-intentioned attempts to reduce the disabling indebtedness of *punggawa* [bosses] patronage will likely be strongly resisted by entrenched local interests" (McWilliam et al. 2020, p.15). As McWilliam et al. (2023, p.271) state, "*Punggawa* represent a reliable, albeit highly contested source of informal local social assistance in circumstances where recently there have been few other options." Although the disadvantages of this problem are difficult to dismantle, these patrons and clients have to be part of the solution, and cannot be ignored in any livelihood initiatives. A future intervention – carefully planned, and locally designed and implemented – with some bosses could be used to test potential approaches.

Added to these enablers are a wider range of livelihood constraints and vulnerabilities of fishers engaged in TBF that have been previously identified in the literature. They can be characterised as institutional, governance or existing social factors that enable or constrain, and which exert influence on people's decision-making about and engagement in illegal fishing. For example, Missbach (2016, p.749) identified that the "hyper-precarious livelihoods" of Eastern Indonesian SSF and the heavily exploited fisheries in Indonesia (Napitupulu et al. 2022) were important factors in decision-making to engage in illegal fishing or people-smuggling. Some of the maritime fishing communities engaged in TBF are socially marginalised, and are under-represented in Indonesian Government social-

protection policies and local programs (Wianti and McWilliam 2023). These groups – such as the Sama-Bajo – are often also marginalised within land-based governance systems and overlooked as key stakeholder groups generally. The range of social exclusions these fishers experience relate to politics, health, education, finance, rights and access to natural resources – and can all contribute to ongoing engagement in illegal fishing and risky behaviour (Asia Foundation 2016).

7.7.5 Role of transboundary fishing in livelihoods and interventions

Our research shows that within the four locations covered in this research, TBF activity (illegal and legal) remains a key livelihood strategy for many people, and that no significant change in the importance and role of this activity has occurred over recent decades, before or since COVID-19. It is not possible to ascertain if the most recent round of illegal apprehensions since COVID-19 has changed fishers' behaviours regarding engaging in legal or illegal TBF activity, but there is some evidence from past research (e.g. Stacey 2017) that some short-term livelihood strategy changes can occur as a result of the impacts of apprehension and result in some people shifting to other activities to generate income. However, the extent of possible short- to medium- (or longer) term livelihood shifts appears limited for fishers due to the extensive number of drivers, and what appear to be limitations in domestic livelihood opportunities for these maritime-dependent communities with strong historical connections to traditional fishing areas in the Timor and Arafura seas. Moreover, some of the fisher groups experience significant livelihood vulnerability due to a much wider range of social, economic and political contexts in which their lives are situated.

This is further supported by the limited availability of livelihood interventions, support, and community-development projects that have been implemented in these communities – despite decades of narrative and agreements to implement assistance. As we explored in the results, decades of good intentions and 'on paper' commitments have been made by various stakeholder agencies for 'alternative livelihoods' for key fishing communities with a historic interest in the MOU Box and surrounding fishing grounds. However, most activity has ended without any significant, collaborative long-term partnerships, support or funding; and most have been:

- poorly designed (without clear impact pathways and goals such initiatives might contribute to)
- with limited understanding of livelihoods and guiding frameworks to support programs
- had a (potentially misplaced focus) on 'alternative livelihoods' compared to a focus on strengthening other components of existing household livelihood portfolios
- underfunded
- included limited evaluation.

This also reveals an imbalance in investment and resources spent on compliance compared with the low level of investment in community-development or livelihood improvement programs. There is also limited coordination with other donor- or bilateral-funded livelihood development agencies and programs in NTT. Such livelihood investment is challenged given the out-of-date MOU agreement that, to some extent, supports opportunities for illegal fishing. For decades, community voices have called for changes to meet current standards and best practices of equity-based sustainable fisheries management and justice, but there is an intractable stasis. The issue of illegal TBF by Indonesian SSF displays characteristics of a wicked problem, yet efforts to logically address it appear to be generally deficient considering the scale and prolonged duration of the issue.

7.7.6 Opportunities for future interventions

There is no doubt that this case of illegal small-scale Indonesian fishing in the AFZ incorporates both actor-based drivers and enablers that are extensive and pose a challenge to address. Our research results highlight the need to move beyond fishers' noncompliance as the main approach to managing illegal fishing, and instead focus on factors which most strongly drive illegal behaviour because of livelihood vulnerabilities within their broader enabling environment. We did not undertake a detailed survey of people's perspectives on the opportunities available to them regarding livelihood-activity improvements (see Methods and limitations). As we noted, only a few people shared any experience of direct livelihood interventions in their community either specifically aimed at addressing drivers of illegal fishing or for general community development. While people raised some suggestions (in the data), these were generally not comprehensive, instead pointing to a desire by all participants for a range of potential maritime and other livelihood-strengthening initiatives that would improve the conditions of families, communities and, in particular, women and youth.

However, as articulated in our literature review, there is little evidence-based guidance in the literature as to how to address noncompliance by drawing on behavioural or other community development or livelihood approaches – making an appealing test case for a future research-for-development intervention to improve livelihoods and reduce illegal activity – and given that illegal fishing occurs in many fisheries globally, and calls for new approaches and tools (Battista et al. 2018).

We also acknowledge the difficult issue of placing the burden of change (Oyanedal et al. 2020) on fishers and the potential this might create in local-level conflict of division within broader enabling context of livelihoods. But we also draw attention to the impacts fishers have experienced because of the significant historical and policy decisions and changes over the years (e.g. changes to fishing areas, restrictions on access, lack of fisher engagement in fisheries management) that are also drivers of illegal fishing.

Our literature review identifies design features that should be considered in a future intervention. Firstly, the program should be a co-designed participatory community and stakeholder program (Battista et al. 2018), and be designed to address a particular livelihood diversification goal. For example: (i) improving the production of an established (legal) activity, (ii) adding a new activity within an established livelihood strategy, or (iii) adding a new activity not currently part of an existing livelihood portfolio (Roscher et al. 2022a). A mixed approach is needed rather than a single focus on 'alternatives', alongside the need to recognise the roles, contribution and relationship of gendered household livelihoods activities and outcomes (Stacey et al. 2019). Another factor, drawing on the results of previous ACIAR studies, is the need for long time frames and funding (5–10 years) to support the social change needed for long-term livelihood improvements (Stacey et al. 2021). Many of the community members surveyed for this study are maritime and fishing peoples, and a singular focus on non-maritime or fisheries orientated 'alternative livelihoods' may not work. Approaches should be designed to support ongoing compliance efforts which, as noted, we concluded are inadequate to create long-term reductions in illegal fishing among some historical groups. We acknowledge that drivers are not homogeneous across fishers and that context specific factors are crucially important for designing any interventions. A key lesson from the literature is the need for local, context-specific interventions (Steenbergen et al. 2017) because different localities and fisher families have specific contextual, historical and economic factors that determine their participation in legal or illegal fishing.

There is also an excellent body of work and approaches on improving a range of livelihood outcomes in rural SSF contexts from the Asia-Pacific region that can be drawn on to address illegal Indonesian fishing in the AFZ. A number of existing programs have significant goals about fisheries management, livelihood improvement, food security and poverty reduction – they could provide relevant lessons for designing interventions in NTT and Sulawesi fishing communities (e.g. ACIAR project 'A nutrition-sensitive approach to

fisheries management and development in Timor-Leste and Nusa Tenggara Timur Province, Indonesia').

If greater attention is given to supporting sustainable community livelihoods and socio-economic arrangements, we believe there will be more opportunities to reduce illegal fishing in the long term for some of the communities who participated in this research or who have a historic interest in the region/MOU agreements – and ultimately to address some of the vulnerabilities present in the 'hyper-precarious' livelihoods of communities in NTT and beyond.

8 Impacts

8.1 Scientific impacts – now and in 5 years

An academic impact of this research is the outcomes of the global literature review exploring theoretical approaches to understanding the causes of Illegal fishing (or the deterrence and prevention of illegal fishing) in SSF and associated contexts of managing marine natural resources. Studies on legal and illegal Indonesian fishing in Australian waters had not yet comprehensively considered drivers and behavioural, contextual factors within existing literature and conceptual frameworks. This research represents a comprehensive review of behavioural drivers' literature and the application of those conceptual approaches to investigating drivers and enabling contexts surrounding small-scale Indonesian TBF in Australian waters.

The research adopted a conceptual framework of noncompliance (Oyanedel et al. 2020) that captured a dynamic interplay of individual behavioural drivers and other contextual enablers (actor-based and opportunity-based) that appear to facilitate the recent spike in illegal Indonesian SSF in the AFZ and that relate to the study of noncompliance in SSF. We identified 7 behavioural driver categories and some contextual enablers that underpin Indonesian small-scale TBF. The research findings in this study have also provided an better understanding of the complex mix of drivers and contexts of Indonesian fisheries in Australian waters influencing fisher decision-making to participate in illegal activity.

These findings can inform future understandings of any resurgences of illicit fishing incursions and support the identification of long-term solutions for viable community development and policy alternatives to enforcing Australia's borders. Specifically, it provides evidence for viable policy and livelihood options to complement current enforcement measures that could lead to a medium-term to long-term reduction in illegal fishing. Our report findings contribute new knowledge to the study of noncompliance in small-scale TBF and SSF livelihoods.

Reviewing studies and identifying key themes, concepts, approaches and theoretical explanations of noncompliance behaviours and drivers, present a new perspective to inform future interventions around livelihood improvements for rural Indonesian fishers. This will thus contribute to a more likely successful outcome from any future interventions.

Perspectives covered in the project regarding livelihood approaches also provide new knowledge for future livelihoods projects, which will thus have a greater chance of success than previous approaches.

The knowledge contribution of this project is to produce evidence for viable community development and policy alternatives to the enforcement of Australia's borders, and further research for development priorities. It is anticipated that this knowledge will be used to support livelihood improvements for fishing communities and reduce the number of illegal fishing incursions. Potential long-term outcomes will be supported by the readiness of the Australian and Indonesian governments.

Pursuing the research recommendations and potential research questions will lead to further scientific impacts.

8.2 Capacity impacts – now and in 5 years

The approach of the SRA, as ACIAR requested, was for Australian researchers to provide training and support to an Indonesian research team to lead and conduct the field data collection in selected villages without Australian researchers directly engaged in data-collection activities. This influenced the research design, methodology, data-collection approach, analysis and results.

The Australian lead agency was tasked to identify and contract a multidisciplinary Indonesian research team to co-design the research approach and methodology, provide support materials and training, and undertake field research in selected sites with support from the Australian research team. The Indonesian team comprised 4 experienced researchers and 3 research support staff.

A key emphasis of the project was co-design of the research instruments and Indonesian researcher leadership of the data collection in selected villages in Indonesia. The Australian team did not participate directly in any field data collection (as per the ACIAR requirement); instead, they supported the design of research instruments, data management, analysis and write-up stages. This approach throughout the project duration resulted in a highly collaborative project, with skills and knowledge exchanged via online team meetings, sharing of documents and drafts during the project, and a series of face-to-face meetings/workshops held in Indonesia. All members of the Indonesian research team have a high level of English language skills. Only one member of the Australian team had conversational Indonesian. During joint team interactions, communication was mostly conducted in English. This includes collaboration on the development of tools to guide the research activities, drawing on the conceptual framework, and identifying the broad topics and questions each activity sought to answer.

A major capacity-building activity in the research-design phase was the development of a field handbook (Appendix 1) compiled to support the first phase of field research in target communities arising from the two field-research planning workshops (April and July 2023).

The outcomes of the project include increased and improved research capacity of all Indonesian (and Australian) research team members, particularly in the areas of social science research theories related to behavioural change literature, qualitative data collection design using mixed methods, data/information management, data analysis of social science qualitative data, and ethical and consent engagement approaches. All team members also have an enhanced understanding of researching illegal activities and approaches to address sensitivities associated with this topic.

At the end of the data-analysis workshop in Bali in January 2024, the research teams participated in a reflection activity on the project's collaborative approach and methodology. A capacity-building impact of the project for the Indonesian research team was learning how to manage a large electronic dataset (e.g. data cleaning, coding, and methods of qualitative data analysis). Indonesian team members also requested more support in the future for qualitative data-analysis methods. The experiences gained among the Australian and Indonesian researchers have also facilitated capacity-building opportunities beyond project the project. Two members of the Indonesian research team (Tegar Nalle and Widya Safitri) have drawn on team expertise to prepare scholarship applications for study abroad.

8.3 Community impacts – now and in 5 years

Given that the study was an information collation and review, the current community impacts arising from the study are most related to the process of engagement of participants from selected communities, the ethical approach, gender participation (because in the past, most research has focused on men respondents only), and validation of results. Key research assumptions included the willingness of communities to collaborate in the study.

As we have noted, during the community feedback visits and results validation activities in October 2024, at all workshops community members were satisfied with our research results and analysis of the complexity of behavioural drivers of illegal fishing. They felt their views had been represented adequately. However, we were limited in our ability to identify actual livelihood-related solutions since the project was not resourced to do this, which is what future investment could tackle. So, we were cautious in not raising community members' expectations regarding the benefits that would be delivered from the research project. We anticipate that our research findings, incorporating the views and situation of communities, will be considered wisely by the Australian and Indonesian governments, who will be equipped with the knowledge to act – because much has been promised in the past for community livelihood improvement but with few solid/concrete longstanding outcomes. A commitment to developing a larger future investment in selected communities willing to engage in such a program will benefit diverse social groups – men, women, youth and other actors involved in fishing-based livelihoods.

The key audiences for the research are the community research participants and the Australian and Indonesian governments, to receive evidence to support future investments. It was imperative to acknowledge that the project is categorised as *exploratory research* for future development investment, and did not raise unnecessary expectations among research participants.

The knowledge generated from the project is anticipated to be used by Australian and Indonesian governments and partners to develop a future staged-investment project to address livelihood sustainability in selected NTT communities engaged in legal and illegal fishing in the AFZ. Such an investment would have considerable long-term social, economic and environmental benefits.

8.3.1 Economic impacts

The economic impacts of a future investment could generate more livelihood benefits by providing regular, legal income sources and result in less debt.

8.3.2 Social impacts

The social impacts from a future investment could generate a range of social benefits.

8.3.3 Environmental impacts

Reducing illegal activity by Indonesian fishers to harvest marine species such as trepang, shark and demersal fish species would ultimately have a long-term positive impact on Australia's marine resources and habitats.

8.4 Communication and dissemination activities

8.4.1 Internal

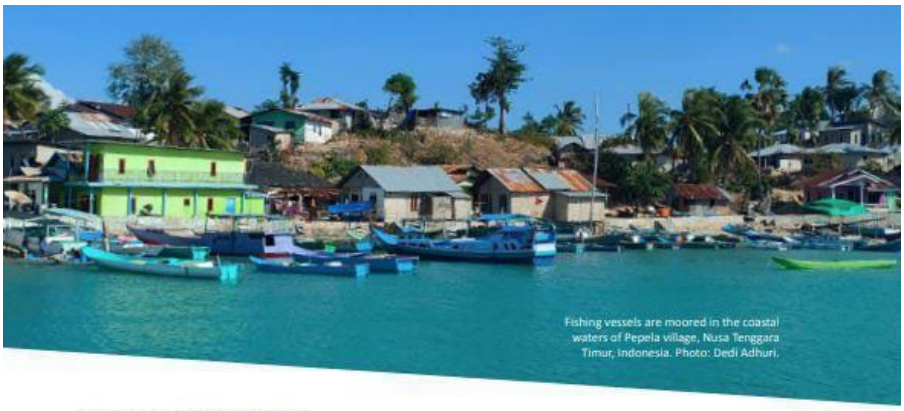
- Australia and Indonesian research project team (monthly or more frequent) online Zoom meetings to discuss planning, field data collection, results, data analysis and report write-up.
- Australian-team prepared trip reports (e.g. April 2023, July 2023, January 2024 and October 2024) for all project travel to Indonesia for ACIAR.
- Regular emails to the ACIAR Project Manager prepared by the Project Leader to keep ACIAR informed of progress (as no Annual Report was required for the SRA).

8.4.2 Stakeholders

- Australian and Indonesian teams met with DFAT and DAFF in Jakarta in July 2023 (face to face) and in November 2023 (online) about project activities.
- The Preliminary Project Results Update Summary was shared with ACIAR and AFMA on 30 April 2024.
- The summary English and Indonesian research results document was prepared and shared with community and government stakeholders in NTT in October 2024.
- The Executive Summary (in English and Bahasa Indonesia) of the Final Report was shared with project stakeholders in mid-2025.
- Dedi Supriadi Adhuri presented updates on the project and activities at a Strategic Action Program for the Arafura and Timor Seas Region (ATS) 2024–2033 Mainstreaming Workshop in Bogor on 29 February 2024.
- Our final presentation (online and in-person) to Indonesian and Australian Government stakeholders occurred in mid-2025.

8.4.3 Research Institute for the Environment and Livelihoods/Charles Darwin University internal communications

- project listing on RIEL/CDU website: https://www.cdu.edu.au/riel/research/research-groups/communities-livelihoods-natural-resources
- 4 pieces prepared for the CDU/RIEL Newsletter on project activities
  - RIEL Newsletter, July 2023
  - RIEL Newsletter, January 2024
  - RIEL Newsletter, February 2025
  - RIEL Newsletter, October 2024
  - RIEL Newsletter, 2025 TBC
- summary of project in the CDU RIEL Annual Report 2023 Research Highlights (Figure 33).



Fishing vessels are moored in the coastal waters of Pepela village, Nusa Tenggara Timur, Indonesia. Photo: Dedi Adhuri.

Research highlights

Understanding drivers of transboundary fishing in Australian waters

The highly collaborative project 'Towards improved livelihoods for Indonesian fishers in Nusa Tenggara Timur Province, Indonesia' emphasises a co-design approach between Australian and Indonesian researchers.

The project, which runs from March 2023 to October 2024, engages a multidisciplinary social science research team to exchange knowledge and build capacity to situate Indonesian illegal and legal fishing activities in Australian waters within a place-based assessment of livelihood trajectories. The work also identifies the changing conditions that have led to an increase in illegal activity in Australian waters as a viable livelihood pathway, and evaluates opportunities for addressing behavioural drivers in the context of future livelihood interventions.

RIEL's Prof Natasha Stacey leads this project alongside Dr Dedi Adhuri of Indonesia's National Research and Innovation Agency (BRIN). The team includes RIEL research fellow Dr Kylie McKenna; RIEL alum Dr Ria Fitriana; Dr Achmad Zamroni and Widya Safitri of BRIN; and Jotham Ninef and Tegar Nalle of Nusa Cendana University. The work is funded by ACIAR's Social Systems Program.

"The project, grounded in social science approaches, will make a significant contribution to the literature by uncovering the complex mix of actor and opportunity-based drivers which influence decision making and risk assessments by fishers," said Prof Stacey.

"Drawing on our extensive experience in sustainable livelihoods, the focus of forthcoming work is to provide recommendations for the Indonesian and Australian governments and other stakeholders on how to better engage coastal communities in livelihood improvements and reduce reliance on illegal fishing," she added.

As of 2023, the project had completed a literature review on deterrence approaches to illegal fishing, co-designed methodology and tools for data collection and engagement, engaged a wide range of research end users, and completed field data collection in five coastal communities in Nusa Tenggara Timur. By late 2024, the team expects to conduct final field visits and report back to communities and stakeholders.

Research helps to assess impacts of mining on wellbeing

An ongoing PhD project is evaluating the role of ecosystem services from mining landscapes for the wellbeing of First Nations communities in northern Australia.

In Australia, mining can disrupt the link between ecosystems and First Nations peoples by degrading the natural environment that is integral to people's cultural, spiritual, and daily lives. This research project is contributing to developing a framework for assessing the impacts of mining on the wellbeing of First Nations peoples, beyond the environmental or social impacts.

Mining operations can lead to deforestation, water contamination, and habitat destruction, which can compromise ecosystems and can further impact the wellbeing of First Nations communities by disrupting people's connections to cultural and spiritual places, traditional learning, songlines, and storytelling. The destruction or alteration of sacred sites and landscapes can erode people's cultural identity and heritage. Additionally, pollution and environmental degradation can pose significant health risks. Economic disruptions caused by losing traditional livelihoods can further weaken community resilience and social cohesion.

Figure 33. Project summary in the CDU RIEL Annual Report 2023

8.4.4 Conference and seminar presentations

- Adhuri, D et al (27 June 2025) 'Livelihood mobility of Indonesian fishers: Understanding the drivers, risk and impacts of illegal transboundary fishing in the Australian Fishing Zone' [conference presentation], MARE Conference, University of Amsterdam.
- Stacey N (29 June 2023) 'Drivers of legal and illegal Indonesian fishing in the Australian Fishing Zone' [conference presentation], MARE Conference, University of Amsterdam.
- McKenna K (8 December 2023) 'Towards improved livelihoods for Indonesian fishers in Nusa Tenggara Timur Province, Indonesia' [unpublished conference presentation], RIEL/CDU Research Highlights Symposium, Darwin.

- McKenna K and Zamroni A (27 February 2024) ‘Drivers of legal and illegal Indonesian fishing in the Australian Fishing Zone’ [unpublished conference presentation], CDU Indonesian Symposium, Darwin.
- Adhuri D and McKenna K (8 April 2024) ‘Drivers of legal and illegal Indonesian fishing in the Australian Fishing Zone’ [unpublished conference presentation], Encountering Maritime Northern Australia Symposium, CDU, Darwin
- Adhuri D and McKenna K (12 August 2024) ‘Behavioural drivers of illegal Indonesian artisanal Transboundary Fishing in the Australian Fishing Zone with implications for deterrence and prevention approaches’ [unpublished workshop presentation], Maritime security and small-scale fisheries in Southeast Asia workshop, The Australian National University.
- Adhuri D and Stacey N (June 2025) ‘Livelihood mobility of Indonesian fishers: Understanding the drivers, risk and impacts of illegal transboundary fishing in the Australian Fishing Zone’ [unpublished conference presentation], MARE Conference, University of Amsterdam.
- RIEL/CDU Seminar series Presentation (TBC 2025).

8.4.5 Social media posts

- N/A

9 Conclusions and recommendations

9.1 Conclusions

This SRA project has explored the multiple behavioural drivers of illegal Indonesian SSF in Australia waters since COVID-19, and opportunities for gendered livelihood improvement to reduce future illegal activity and improve the wellbeing of selected fishing communities in NTT, Indonesia. The project was a collaborative and co-designed study implemented by multidisciplinary teams of Australian and Indonesian researchers: Indonesian researchers were responsible for the in-country research and data collection, supported by the Australian team in data analysis and writing. The process increased the knowledge, skills and capacity of both teams, and created a greater shared understanding of the problem and potential solutions.

Adding to existing illegal-behavioural driver frameworks and models, our findings provided a current situation analysis of seven behavioural actor-based drivers and 28 interlinked dimensions enacted by a range of individuals and groups involved in illegal incursions in Australian waters. The research also situated TBF – both illegal and legal fishing – within a broader social, economic and environmental enabling context of the target fisher communities. We conclude that while the global and local disruptions prompted by the onset of COVID-19 provided an opportunity for an increase in illegal activity by some groups, other multiple and interlinked drivers were important and remain just as relevant in this post-COVID-19 'era'.

Echoing calls in the wider literature to reframe illegal fishing as a wicked problem, our research emphasises the need for research approaches to move beyond fishers' noncompliance – an instrumental approach by rational decision-makers – as a key explanation of the problem to one that focuses more on conceptualising and addressing specific behavioural, actor-based drivers and the broader enabling contextual factors. Clearly a new approach is warranted, while at the same time continuing compliance efforts by Australia and Indonesia to protect sovereignty, increase resource sustainability and deal with biosecurity concerns.

To the best of our knowledge, this is the first time a behavioural approach – drawing on conceptual and theoretical understandings of noncompliance – has been applied to the problem of illegal Indonesian SSF in the AFZ. Notwithstanding the potential of behavioural science approaches to provide a richer picture of the manifold drivers contributing to illegal fishing, these approaches are not without limitations. Shortcomings identified in the literature include the limited attention this approach affords to different kinds of noncompliant behaviour, the difficulty of crafting behaviour-change interventions, the long time needed for social change, and potentially placing the burden of change on individual fishers/actors.

Indonesian activity along the Australia–Indonesia border region and illegal activities inside the AFZ comes in waves in response to various ecological, social and economic drivers. Continued surges in illegal activity in the future (and as has continued since the 'end' of COVID-19) is almost inevitable given the resource gradient (e.g. healthy fish stocks on the Australian side and overfished stocks on the Indonesian side) that exists at the border.

Despite the longstanding issue of illegal fishing there have been surprisingly few attempts at livelihood improvements, and those have been largely ineffective. Most 'livelihood' investments (e.g. by ATSEA Program and other international NGO agencies) in Rote Ndao have been in non-illegal fishing communities, and often driven by conservation interests. If greater attention can instead be given to supporting sustainable community livelihoods and the priority social, cultural and economic drivers, we believe this will provide a longer term reduction in illegal fishing by some of the communities who participated in this research and for communities who have a historic interest in the

region, since the 1974 MOU agreement. Given the significant investment in research-for-development programs in operation in the Asia-Pacific region (including Eastern Indonesia), there are opportunities to build on and create closer links with existing ACIAR programs and approaches in Fisheries and Social Systems projects in operation in Indonesia in particular (and Timor Leste and some Pacific Islands).

Through the SRA research activities and knowledge contribution of this project, we identify several recommendations for addressing some of the behavioural drivers that could provide opportunities for future livelihood improvement interventions for men and women in selected communities. In doing so, however, we note the limitations and complexities of suggesting livelihood enhancements/opportunities, and the limitations in our study to be able to identify specific livelihood activity improvements. There is little direction or evidence in the literature about how to address noncompliance by drawing on behavioural and other community development/livelihood approaches. This could make an appealing test case for a future research-for-development intervention to improve livelihoods and reduce illegal activity that would have relevance for many places or natural-resource-management contexts.

We note that our recommendations would not be able to stop all illegal fishing in the AFZ by small-scale fishers, but there is a need for a livelihood-focused response informed by behavioural science to support wellbeing in these communities. This is especially because of limited informed investment in the past within NTT – one of the poorest provinces in Indonesia with low Human Development Index indicators.

Given the proximity of NTT to Australia and its tradition of fisheries-based livelihoods in what are now Australian waters, there is a moral argument for Australia (and Indonesia) to invest more substantially in this region. The Rote Ndao government (based on informal meetings with government members during fieldwork) view livelihood improvement as an important priority for their future. However, the investment needs to be significant, long term (+10 years), and multi-focused. By multifocused, we mean that they (1) address a range of livelihood-diversification activities, assets and outcomes; (2) are participatory, using locally identified and co-designed livelihoods improvement ideas; and (3) are implemented without requiring subsidies or handouts (something some of our research participants identified as necessary to avoid). However, this will require experienced NGOs, local government, research facilitators and community champions with a firm commitment to the principles of gender equality, disability and social inclusion, to achieve desired outcomes within this complex issue.

It is our sincere hope that after many decades of meetings, workshops and research projects that a future program of activity in selected target communities – particularly in Rote Ndao, but potentially in other NTT/Southeast Sulawesi communities (as part of networked communities and ethnic groups) – could make a difference to the lives of rural and remote maritime communities of Eastern Indonesia who have a longstanding connection to the oceans and resources of the Timor and Arafura seas. However, such hope for long-term generational outcomes is premised on the support and readiness of the Australian and Indonesian governments and community members to support a development program for affected communities.

9.2 Recommendations

9.2.1 Research questions

Given the contextual challenges and multiple drivers of illegal fishing, we recommend that a future research agenda tackles the question of whether addressing a smaller suite of drivers and priority enabling contexts [associated with that driver] can contribute to: reducing ongoing illegal fishing by certain groups, and creating positive measurable livelihood impacts on families and households through improved assets and outcomes (e.g. income stability and generation, diversification, sustainable resource use, and other measures in health and education).

Specific questions should include:

- What specific actor-based drivers can be addressed through approaches of behavioural change and transformative livelihood diversification?
- What are the most important enabling contextual factors supporting actor-based drivers, and what mechanisms are best placed to manage these?
- What types of livelihood enhancement, strengthening or diversification can contribute to or help achieve sustainable livelihoods (and reduce illegal fishing) for a given context?[76] What mechanisms can provide for short-term livelihood needs over the long period needed for change?
- What smaller individual or collective initiatives could bring about larger, cascading system-wide change within maritime networks in NTT and beyond?

9.2.2 Household- and community-identified livelihoods enhancements

A future research agenda to co-design a program to address specific drivers and broader enabling context factors (especially market- and economic-based) related to illegal fishing and livelihood vulnerabilities of selected communities should:

- be informed and grounded in conceptual underpinnings and principles from behavioural science (and change) approaches (e.g. Oyandel et al. 2020; Battista et al. 2018; Hagger et al. 2020; and review in section 7.4.5)
- incorporate aspects of a new agency and behaviour change framework for transforming agri-food systems (after Freed et al. 2025), and theory of change for supporting behaviour change in agricultural research
- integrate sustainable livelihoods diversification approaches (e.g. Roscher et al. 2022a, 2022b; Stacey et al. 2021; Stacey and Govan 2019).

We note that such a research agenda will likely lead to relevant theories and findings relevant to noncompliance in other natural resource management settings (Oyandel et al. 2020). It may also provide further evidence about whether livelihood diversification does in fact lead to reduced pressure on natural resources, and how it addresses livelihood vulnerability and poverty "but under what circumstances, how and for whom" (Roscher et al. 2022b, 922). Further, it could address the "conceptual ambiguity stemming from a lack of attention and awareness to the complexity of livelihood diversification. … Conventional understandings and definitions of livelihood diversification typically fails to capture this complexity due to pre-conceived ideas about material assistance and 'livelihood projects'" as Roscher et al. (2022a, p.2114) and others (e.g. Stacey et al. 2021) have shown exist in

[76] Noting as our results showed that illegal fishing is an important livelihood activity within the portfolio of fishers, but that "individuals and households may also move in and out of different pathways as desires, opportunities, and capacities allow them to do so" (Roscher et al. 2022a, p.2113)

demonstrating 'success' in coastal livelihood programs in Indonesia and, more broadly, the Asia-Pacific region.

This agenda should:

- Work with fishery value-chain actors and actor groups (individuals, households, groups or organisations).
- Identify the priority individual- and system-level (e.g. governance, economic, resource, social/relationship) behavioural drivers to be addressed and consider the factors enabling or impeding them.
- Identify the desired outcomes through a logic model/impact pathway to identify and address the behavioural changes, goals and type of livelihood interventions (e.g. the opportunities available, such as asset-based or institutional or other vulnerability-reducing actions).
- Test and trial desired interventions, changes or mechanisms with individuals and small groups, then evaluate and modify.
- Be supported by a range of learning-focused (versus one-off) training and workshops, and livelihood-support activities (e.g. financial programs; value-chain improvement, programs, education opportunities) to enable change.
- Scale up and establish monitoring and evaluation systems to provide evidence.

The agenda, designed then delivered using participatory co-designed processes, could be supported by a range of learning-focused (versus one-off) trainings and workshops, and livelihood-support (e.g. financial and economic empowerment programs) activities to enable change. Such support should aim to include or consider:

- coastal field schools (or adapted farmer field schools used in many Asia-Pacific countries and Indonesia), and learning-space approaches to support collective action (e.g. Freed et al. 2025)
- experimental actions to simulate actor engagement and discussion (e.g. using game theory or hypothetical options) that can help test assumptions and uptake of interventions (after Battista et al. 2018)
- gendered value-chain analyses of key domestic fisheries (coastal, offshore including in the border regions) that are currently part of the community livelihood portfolios, to identify constraints and livelihood-enhancement opportunities within these fisheries (e.g. FADs)
- integration of experiences from other Indonesian value-chain improvement programs currently in operation (e.g. improving domestic quota rights and fisheries management for tuna)
- review of current financial options to trial options that are not debt-creating arrangements for people and households. The entire issue of access to finance, digital learning, income management, and broader gender-based finance programs and arrangements (e.g. Permodalian Nasional Madani or AmarthaFin for women) in target communities requires deep review, assessment and reflection with the community to identify suitable options for existing social contexts
- tests of potential approaches using a carefully planned, designed and implemented intervention with patrons
- programs of vocational education and training for youth outside of fishing, including work placements, to support them into other career options
- trials of a contractual-type approach with certain individuals/households/actor groups, drawing on elements of Battista et al. (2018) rather than a broad-brush 'community approach' in initial phases

- activities free from subsidies and hand-outs of fishing gear, etc., unless closely aligned with other activities providing livelihood enhancements to avoid inequity and conflict (as recommended by research participants)
- a robust baseline and monitoring framework linked to theories of change, to measure change over a long timeframe (5–10 years)
- capacity-building through a research partner (e.g. university, extension officers, NGOs, community champions) – micro-credentials could also be an option – to support an integrated program, including learning resources to guide livelihood planning for selected communities that draw on existing resources adapted for Indonesia (e.g. Stacey and Govan 2019; Govan et al. 2017).

We suggest a focus on the following drivers:

- Economic and livelihood strategy drivers: community and household livelihoods improvements and wellbeing through participatory approaches, vulnerability assessments, livelihood-feasibility scenarios, market-chain awareness and value-chain analyses related to domestic fishers, addressing seasonality issues and financial programs.
- Psychological and social drivers: youth-focused activities such as apprenticeships, or other training such as field schools.
- Cultural and historical drivers: through negotiation and changes to current MOU agreement regulations, provide incentives for legal fishing to avoid people making high-risk decisions with potential negative impacts; and address issues associated with use of nonmotorised *perahu lambo* (e.g. safety, limitations on use).
- Policy and management drivers: continued ABF enforcement and improved Indonesian regulation (enforcement approach will continue to deter some people).

In designing a program, we recommend interventions in the following communities due to their longstanding interest in the region and challenging livelihood vulnerabilities (some of which are particularly acute for these maritime populations in Eastern Indonesia):

- Pepela, Rote Island: origin village; MOU Box fishing and illegal fishing; border region and domestic fisheries, maritime traders
- Tanjung Pasir, Rote Island: origin village; MOU Box fishing and illegal fishing; border region and domestic fisheries, some maritime traders. Strong connections with households and fishers from Mola and Mantigola Wakatobi, Southeast Sulawesi part of broader network of Tanjung-Pepela fishers' movement of seasonal crews and boats to NTT each year
- Oesepa, Kupang, West Timor: not origin village, but key Kupang fishing sector; border region; illegal and domestic fisheries
- Maginti, Tiworo Straits, Southeast Sulawesi: part of eastern Indonesian Bugis, Butonese, Bajo network; largely engaged in illegal fishing previously and currently, and have knowledge of the region; many accessing Kimberly mainland and offshore islands
- Oelaba, Rote Island: recent entrants; largely comply with MOU Box; use crew from Pantar Islands; sailing fishing livelihoods focus, some domestic coastal fishing; some evidence of also crewing other illegal fishing boats
- Madura, east Java: origin fishers; MOU Box fishing although some illegal activity; but using engines in *perahu lete-lete* boats; largely comply and small in number, but historic interest in MOU Box fishing.

9.2.3 1974/1989 MOU agreements

Fishing rights are generally considered foundational elements for successful fisheries management, which are mostly non-existent under the 1974/1989 MOU agreements. Providing access rights for those with a historic right within or around the area permitted as per the MOU might reduce some illegal fishing by regular fishers and provide some sustainable-livelihood benefits. A range of engagement and management actions could support compliance among some fisher groups. Such recommendations have been suggested for 30 years but not tried, so we do not yet know if they would have a positive impact.

Key features could include:

- seasonal closures of the MOU Box during which fishers may fish without certain usual restrictions
- requirements for licensing and registration
- compulsory safety at sea measures (in general, for all fishers) such as kits, life jackets, solar, radios[77]
- permission for using motors on sailing boats inside certain allowed areas
- participatory and collaborative fisheries management (including integrated science and traditional knowledge) with fishers
- quotas for specific species allowed to catch (probably excluding shark)
- incentives for compliant behaviour and fisheries management.

9.2.4 Regulation, compliance and management of illegal fishing data

There are opportunities to improve – by both Australia and Indonesian agencies working together – consistent and standardised reporting and data-keeping, especially because illegal fishing (based on the evidence from the last 50 years) is likely to continue. These opportunities include:

- providing additional investment toward improving the existing data management and recording program system for monitoring and compliance in the MOU and AFZ. These records of legal and illegal fishing activity involve the Australian and Indonesian departments working closely together in the long term and will allow for a more comprehensive baseline of information from which to show change (e.g. in illegal fishing as a result of interventions) over time.
- including Traditional Owners of sea-country (where illegal fishing is occurring) from Western Australia, the Northern Territory and potentially the Torres Strait Islands – where possible – in Indonesian PICs or community visits. This might provide an opportunity for coastal and maritime peoples from two regions to come together and, in particular, for Indigenous Australians to share information directly about their ownership of areas of the marine estate, and aspirations for fishing enterprises in their country.
- linking participation of key actors in PICs more closely with data collection and monitoring of illegal activity to show impact of compliance programs in reducing illegal activity in communities as part of a broader livelihood investment program.

It is beyond the scope of our report to provide analysis on what might be considered (or proven) elements of organised crime associated with illegal fishing or indeed criminal activity within the fisheries value chains, as recently suggested by AFMA in a recent ABC

[77] The Torres Strait Islands has a program of support and activity which may be appropriate to adapt/learn from for Eastern Indonesian fisheries: https://www.msq.qld.gov.au/about-us/news-and-stories/headlines-torres-strait-marine-safety

interview.[78] However, it is necessary to acknowledge that the longstanding historical, cultural and social economic practices involving patron–client relationships often associated with illegal fishing may sit outside of what many would suggest are 'organised crime networks'. It is likely that some organised crime within the diversity of 'illegal fishing' (as noted in our literature review) may be occurring among some groups.

[78] https://www.abc.net.au/news/2025-01-15/authorities-investigate-surge-in-foreign-boats-australian-waters/104783448

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10.2 List of publications produced by project

- Paper in preparation: Authors (in review) 'The behavioural drivers of illegal Indonesian small-scale transboundary fishing in the Australian Fishing Zone: Towards improved livelihoods for Indonesian fishers in Nusa Tenggara Timur Province, Indonesia', *Maritime Studies*.

11 Appendixes

11.1 Appendix 1: Phase 1 Fieldwork Handbook (August 2023) for the project

Note: the following pages show content, not layout, of the handbook.

Towards improved livelihoods for Indonesian fishers in East Nusa Tenggara Province, Indonesia

Phase 1 Fieldwork Handbook

August 2023

Table of contents

- Introduction

This Handbook has been compiled to support the first phase of field research in target communities. A scoping visit was conducted in April 2023, and two field research planning workshops have been held (April and July 2023). It is anticipated that three main phases of field research will be conducted:

- Phase 1: first round of FGDs and some KIIs/SGIs in selected communities;
- Phase 2: completion of all KIIs/SGIs;
- Phase 3: further community level consultations to share preliminary results and future actions.

The aim of this Handbook is to compile all the research instruments for the research team to use (and translate). It is likely that these tools may be updated as the fieldwork commences and some pilot FGDs and KIIs are held with selected participants. Some adjustments may also be made for Phase 2 of field research and data collection.

1. Project research approach and design

This project explores livelihood expressions of groups of Indonesian fishers operating out of Nusa Tenggara Timur (NTT) Province in Indonesia. The overarching aim of this project is to identify multiple drivers of illegal (and legal) Indonesian fishing in the AFZ, and potential opportunities for addressing gendered livelihood improvements of selected fishing communities in NTT, Indonesia. The project engages an Australian and Indonesian multidisciplinary social science research team to build capacity and knowledge to:

a) situate illegal and legal fishing activities within a place-based assessment of livelihood trajectories;
b) identify the changing conditions that have led to the recent increase in illegal activity in Australian waters as a viable livelihood pathway in response to numerous drivers; and
c) present an analysis of the research and evaluate opportunities for addressing behavioural drivers in the context of future livelihood interventions.

A summary of the key project research questions, methods, sources of information, and research instruments are listed in **Table 1**.

Table 1 Summary of project research design & methods

Questions	Methods	Source of information/ participants	Research instruments
1. Who are the illegal & legal fishers: summary of the last 50 years since the signing of MoU Box.	Desktop study: 1970s-2019 2020-2023: illegal activity Interviews if needed.	AFMA Data Court Data Published and unpublished research/reports/grey literature	Key informant interview guide for AFMA staff
2. What forms of illegal fishing activity is occurring? **3. Where is it taking place (origin villages, boats, place, species, ethnicity, past involvement), to ascertain different forms of illegal activity?**	Desktop study AFMA data and interviews Court data FGDs	Academic & grey literature Media articles on incidents	Literature search plan Endnote libraries of Australian & Indonesian media articles AFMA data on total foreign fishing interceptions in the last 10 years
4. What are the recent drivers of illegal activity? **a) What is the current post-pandemic livelihood context of fishers and households in origin and fishing base villages? Have livelihood strategies changed or responded to new contexts?**	Behaviour change literature FGDs	Fisher crew Boat owners & captains Women	FGD guides for Fisher Crew, Women, Boat Owners & Captains

b) Is there a link between recent livelihood disruptions and illegal activity? **c) Is there a link between species availability, market prices and value chain arrangements (e.g., patron-client relations and debt servicing), and illegal activity?** **d) Is there a link between other social and cultural practices and illegal activity? (e.g., youth seeking experiences)**	Small group interviews Key informant interviews	Seafood traders & collectors Village Elders & Leaders	Small group interview guide for Seafood traders & collectors, Village Elders & Leaders Mapping of general livelihoods Mapping of fisheries-based livelihoods Historical timeline of changes, trends, and disruptions in transboundary fishing activity since 2000. Diagram of diverse drivers of transboundary fishing List of 'opportunities' influencing trends in transboundary fishing
5. How is the 'illegality' of some fishing journeys understood and enforced among communities and authorities in Indonesia and Australia?	FGDs Small group interviews	Fisher crew Women Boat owners & captains	FGD guides for Fisher Crew, Women, Boat Owners & Captains Small group interview guide for seafood traders &

	Key informant interviews	Seafood traders & collectors	collectors, Village Elders & Leaders
	Data analysis referring to the Behaviour change literature	Village Elders & Leaders	Diagram of diverse drivers of transboundary fishing List of 'opportunities' influencing trends in transboundary fishing
6. What are the risks associated with transboundary fishing and how do these risks impact choice in livelihood strategy? **a) Does risk seeking behaviour play a role in illegal activity?** **b) How are decisions made regarding risk taking/engaging in illegal activity at an individual and household level (men and women) within the context of current livelihoods and other opportunities?**	FGDs Small group interviews Key informant interviews Data analysis referring the behaviour change literature	Fisher crew Women Boat owners & captains Seafood traders & collectors Village Elders & Leaders	FGD guides for Fisher Crew, Women, Boat Owners & Captains Small group interview guide for seafood traders & collectors, Village Elders & Leaders Diagram of diverse drivers of transboundary fishing List of 'opportunities' influencing trends in transboundary fishing
7. What are the impacts (costs) of 'illegal' activity on fishers, boat owners, traders, and household members of fishers/boat owners?	FGDs	Fisher crew Women	List of impacts (costs) of 'illegal' activity for all groups

	Small group interviews Key informant interviews	Boat owners & captains Seafood traders & collectors Village Elders & Leaders	List of gendered impacts of fishing apprehensions on families/households (see draft list developed in Jakarta, Appendix 8)
8. What are the gendered benefits and impacts from illegal activity from fishers and households' perspectives, patrons, and boat owners? (e.g., monetary, and non-monetary returns including income, experience, debt-credit relationships for household needs)	FGDs Small group interviews Key informant interviews	Fisher crew Women Boat owners & captains Seafood traders & collectors Village Elders & Leaders	FGD guides for Fisher Crew, Women, Boat Owners & Captains Small group interview guide for seafood traders & collectors, Village Elders & Leaders List of gendered impacts of fishing apprehensions on families/households (see draft list developed in Jakarta, Appendix 8)
9. What options exist for gendered livelihood improvements in selected villages (in the context of past initiatives) not only in terms of direct income but other outcomes (e.g., for women to mitigate future livelihood disruptions or shocks/vulnerabilities)	FGDs Small group interviews Key informant interviews	Fisher crew Women Boat owners & captains	FGD guides for fisher crew, women, boat owners & captains Small group interview guide for seafood traders &

10. What is the policy context for transboundary fishing and supporting livelihood improvements?	Seafood traders & collectors	collectors, Village Elders & Leaders
	Village Elders & Leaders	List of gendered impacts of fishing apprehensions on families/households

- *Theoretical approaches and definitions*

Two main theoretical approaches exist to study non-compliant behaviour and crimes (for an in-depth discussion of both approaches, see: Oyanedel et al., 2020). Firstly, **actor-based approaches** focus on individuals to explain the *underlying motivations* for non-compliance. These approaches draw primarily on economic, behavioural, and psychological theories to engage with the economic and non-economic factors influencing non-compliance, such as perceived legitimacy of regulations and normative factors.

In the design of research instruments and preliminary theoretical framework, the research team has referred to these factors as **'drivers'** as they refer to the *underlying motivations driving behaviour.* Examples identified in the Jakarta workshop include historical livelihood connections to the sea; family and peer pressure to generate income; risk-taking behaviour; faith, and belief.

Opportunity-based approaches, in contrast, focus on the role of the immediate environment in the performance of non-compliant behaviours. Informed by criminological literature, these approaches see non-compliance mainly as a product of opportunity rather than underlying motivation.

In the design of research instruments and preliminary theoretical framework, we have been using the term **'opportunities'** to refer to *situations that create opportunities for non-compliance.* Examples identified in the Jakarta workshop include Australian law enforcement changes during COVID and abundance of target species.

2. Overview of August fieldwork activities

The project applies a co-designed mixed methods methodology, with transdisciplinary social research methods through a phased approach (see page 3), with a focus on behavioural factors as drivers of illegal activity and livelihood decision-making. It will include both qualitative and quantitative methods in 3 targeted communities of Nusa Tenggara Timur:

1. Oelaba, Rote Island
2. Papela/Tanjung Pasir, Rote Island
3. Oesapa, West Timor

- *The Indonesian research team*

Team member	Role	Responsibilities
Dr. Dedi S. Adhuri	Indonesian Team Leader/ co-Lead Researcher, BRIN	Leading the team in the field (both for data collection and stakeholder engagement) and coordinate with Natasha & Kylie
Dr. Ria Fitriana	Gender, Fisheries, and value chain expert Consultant	Lead all activities related to gender (women) and value chain data collections. (supported by an assistant)
Dr. Achmad Zamroni	Research Associate, BRIN	Data collection activities (FGD, KII). Work with Kupang-based research assistant on field data management (voice recordings and photography)
Mr. Jotham Ninef	Lead Researcher – Universitas Nusa Cendana (UNDANA), Fisheries and Community Engagement	Data collection activities (FGD, KII); Work with Kupang-based research assistant on field data management (voice recordings and photography)
Mrs. Lasmi	Research Associate - UNDANA	Support Ria with the gender and value chain data collection. Work with Roni and Jotham on data management. Support logistics for fieldwork and data collection.
Mr. Tegar V. Nalle	Research Associate - UNDANA	Support data collection. Works with Roni and Jotham on data management. Support logistics for fieldwork and data collection.
Mrs. Widya Safitri	Research Assistant, BRIN	Support project administration and data management (based in Jakarta).

- *The Australian Team (not directly participating in target communities field data collection)*

Team member	Role	Responsibilities
Prof. Natasha Stacey	Project Leader, CDU	Review research instruments; provide guidance on data analysis and approaches, online debriefs with fieldwork team
Dr. Kylie McKenna	Research Associate, CDU	Research assistance, assistance with research instrument development, handbook preparation, support the team with research data management and compilation of data for analysis

- *Participants and sample*

We anticipate the following number of participants according to location, participant type, and method. Some participants groups may be more appropriate to involve via a small group interview, rather than a facilitated focus group (e.g., groups 4 & 5). Numbers of participants in FGDs, small group interviews and KIIs may change.

Depending on the outcome of the first phase of field work some additional field visits may be undertaken to other communities who are known to have participated in and play a key role in transboundary activity.

The participants selected to participate in KIIs will be determined following the FGDs to ensure a spread of fishers, boat owners, captions and women are represented (according to criteria such as, role in fishing and experiences in transboundary fishing and Australian policy).

Location	FGDs (Comprising 5-10 people in each group)	Small group interview (Comprising more than 1 person, but less than 5)	Key informant interviews
Oelaba	Group 1: Fisher Crew	Group 4: Seafood Traders & Collectors	Aim to trial each KII interview guide in each community (see Section 5 for KII guides)
	Group 2: Boat Owners & Captains	Group 5: Village elders & Leaders	
	Group 3: Women		
Pepela Settlement	Group 1: Fisher Crew	Group 4: Seafood Traders & Collectors	Aim to trial each KII interview guide in each community (see Section 5 for KII guides)
	Group 2: Fisher Boat Owners & Captains	Group 5: Village elders & Leaders	
	Group 3: Women		
Tanjung Pasir Settlement	Group 1: Fisher Crew	Group 4: Seafood Traders & Collectors (1) (If considered appropriate for this location) Group 5: Village elders & Leaders	Aim to trial each KII interview guide in each community (see Section 5 for KII guides)
	Group 2: Fisher Boat Owners & Captains		
	Group 3: Women		
Oesapa	Group 1: Fisher Crew	Group 4: Seafood Traders & Collectors	Aim to trial each KII interview guide in each community (see Section 5 for KII guides)
	Group 2: Boat Owners & Captains	Group 5: Village elders & Leaders	
	Group 3: Women		

3. FGD guides

- *FGD Group 1: Fisher Crew*

Participant Criteria
1. Fishing Crew (representing a cross section of the following criteria) a. Below 25 years b. Married c. Single d. Mixed ethnic group e. Mixed settlement criteria f. Various boat types 2. Fisher/Mechanics (*Motorist*) 3. Apprehended at sea (legislative forfeitures) 4. Convicted fishers 5. Compliant fishers

Lead Facilitator:

Note-taker:

Number of Participants:

Date/Duration:

Location:

Materials required: Consent form, project information sheet, graph of apprehensions data; diagram of drivers; markers; pens; butchers' paper; audio recorder; notebooks.

Objectives:
1. Understand the broad livelihood activities of fisher crew engaged in transboundary fishing.
2. Develop a historical timeline of changes and trends in transboundary fishing activity since 2000.
3. Understand the recent and diverse drivers of transboundary fishing since the COVID-19 pandemic from 2020-2023 (the present).
4. Identify initial perspectives on opportunities for improving the outcomes of existing livelihoods and activities.

Expected Outputs/Recording of Information: Mapping of general livelihoods; mapping of fisheries-based livelihoods; historical timeline of changes, trends, and disruptions in transboundary fishing activity since 2000; qualitative data on diverse drivers of transboundary fishing; qualitative data on 'opportunities' influencing trends in

transboundary fishing; signed consent forms; participant register; audio recording; written notes; photographs of butchers paper; print outs of A3 maps of AFZ and allowed fishing (from AFMA/KKP Public Information Campaign website).

FGD Activities and steps

Activity 1. Introduction

Steps:
1. Introduce yourself.
2. Explain the aims and purpose of the project (see Section 1 above).
3. Distribute the project information sheet and consent forms (Attachments 1 & 2) and ask people to complete prior to commencing the activities.
4. Collect signed consent forms and store for safe keeping (use PDF scanner app on phones).
5. Record participant names, gender, age on the participant register (Attachment 3).
6. If appropriate, ask participants to introduce themselves briefly and then commence the activities.

Activity 2: Understand the broad livelihood activities of fisher crew engaged in transboundary fishing.

Facilitators note: This includes fishing in the MOU Box, AFZ, and other Indonesian waters near the Australian- Indonesian fishing border.

Steps:
1. Ask the group: within your community, what are the different livelihoods that people engage in from year to year?
2. Use Table 1 as a guide to map general information for all household livelihood activities by gender and Table 2 to map gendered fisheries-based livelihoods.
3. Ask the group: what activities do you receive most of your income from? Note: there is no need to record the amount of income received. This question is aimed at understanding dependance and contribution of different livelihood activities.

Table 1. Mapping of general livelihood activities (includes income and non-income generating – refer to floating coconut diagram or additional list of broad activities)

List of household livelihoods activities (both formal and informal, e.g. care, community	Gender	Month					Note
	Male or female or other	1	2	3	…	12	

work, paid/salaried work, baking, collecting firewood, domestic work, childcare, transport, collecting water)							
a. Tuna fishing around NTT waters						**	- Frequency: Daily, weekly, seasonal (e.g. dry or wet season) - ** intensity of the activity
b. Trepang fishing in MOU box							

Table 2. Mapping gendered fisheries-based livelihood activity (commercial and subsistence)

Name of fishing activity	Gender	Boat type	Fishing Gear	Main target species	Fishing location/ Ground	Season (Month)

Activity 3. Develop a timeline of transboundary fishing activity since 2000 which includes any changes or disruptions that resulted in a change of activity.

Steps:

1. Work with participants to develop a historical timeline (e.g., using butchers' paper) of transboundary fishing by year, including key events or activities (e.g., CRISES EKONI, Pandemic, fuel prices.
    a. Prompting questions: What were the key transboundary fishing activities by community group since 2000? What changes have occurred from traditional or past activity? What were the disruptions (e.g. economic, governance, fisheries related, weather related, policy related at community, province or national/international)? What drove these changes? (if any?)

2. Share the graph of apprehensions data (Attachment 8) showing the trends and spikes in transboundary fishing activity and apprehensions.
3. Ask: how do you explain these trends?

Activity 4. Understand the recent and diverse drivers of transboundary fishing since the COVID-19 pandemic from 2020-2023

Facilitators note: try to capture broad and diverse set of drivers and motivations within the context of the COVID pandemic and the livelihood context. Avoid leading questions or sharing our planning diagram on drivers developed in Jakarta.

Steps:

1. Refer to graph on apprehension data (Attachment 8)
2. Ask: What are the factors (drivers/opportunities) influencing the trends of transboundary fishing? In particular, the large numbers of recorded apprehensions in AFZ since 2020? Note: avoid sharing the drivers diagram drafted in Jakarta with participants
3. Use prompting questions to talk to people about their different motivations, or drivers, but try to avoid pre-identifying a list of drivers for them.

Activity 5: Livelihood support and opportunities

Steps:

1. Ask participants to *hypothetically assume* there is no policy shift from the Australian and Indonesian Governments concerning transboundary fishing. Ask: how can community livelihoods be better supported better supported to provide a reliable and sufficient source of income to meet your family's and aspirations of your children?
2. Aks: Let's suppose the MOU arrangements stay the same, and illegal fishing continues to be subject to apprehension and prosecution under Australian legal regime how can your community and your fishing households be better supported to provide a reliable and sufficient source of income to meet your family's and aspirations of your children?
    a. Prompting question: How can you build on your existing resources (livelihood assets) and skills that people have access to make your lives run well?
3. What are some of the key livelihood issues/challenges you see amongst the fishing families and community as a whole?

- *FGD Group 2: Boat Owners & Captains*

Participant criteria
1. Boat captains who fish 2. Boat owners who fish

Lead Facilitator:

Note-taker:

Number of Participants:

Date/Duration:

Location:

Materials required: Consent form, project information sheet, graph of apprehensions data; diagram of drivers; markers; pens; butchers' paper; audio recorder; notebooks.

Objectives:

1. Understand the broad livelihood activities of boat owners and captains engaged in transboundary fishing.
2. Understand the role of boat owners and captains in supporting the community economy.
3. Develop a historical timeline of changes and trends in transboundary fishing activity since 2000.
4. Understand the recent and diverse drivers of transboundary fishing since the COVID-19 pandemic from 2020-2023.
5. Identify perspectives on opportunities for improving the outcomes of existing livelihoods and activities.

Expected Outputs/Recording of Information: Mapping of general livelihoods; mapping of fisheries-based livelihoods; historical timeline of changes, trends, and disruptions in transboundary fishing activity since 2000; qualitative data on diverse drivers of transboundary fishing; qualitative data on 'opportunities' influencing trends in transboundary fishing; signed consent forms; participant register; audio recording; written notes; photographs of butchers' paper.

FGD Activities and key steps

Activity 1. Introduction

Steps:

1. Introduce yourself.
2. Explain the aims and purpose of the project (see Section 1 above).
3. Distribute the project information sheet and consent forms (Attachments 1 & 2) and ask people to complete prior to commencing the activities.
7. Collect signed consent forms and store for safe keeping (use PDF scanner app on phones).
4. Record participant names, gender, age on the participant register
5. If appropriate, ask participants to introduce themselves briefly and then commence the activities.

Activity 2: Understand the broad livelihood activities of boat captains and crew engaged in transboundary fishing.

Facilitators note: This includes fishing in the MOU Box, AFZ, and other Indonesian waters.

Steps:

Table 1. Mapping of general livelihood activities (includes income and non-income generating – refer to floating coconut diagram or additional list of broad activities)

List of household livelihoods activities (both formal and informal, e.g. care, community work, paid/salaried work, baking, collecting firewood, domestic work, childcare, transport,	Gender	Month					Note
	Male or female or other	1	2	3	…	12	

collecting water)							
a. Tuna fishing around NTT waters						**	- Frequency: Daily, weekly, seasonal (e.g. dry or wet season) - ** intensity of the activity
b. Trepang fishing in MOU box							

Table 2. Mapping fisheries-based livelihoods

No	Boat type	F. Gear	Main target species (for commercial)	F. Ground	F. Season (Month)

Activity 3. Develop a timeline of transboundary fishing activity since 2000 which includes any changes or disruptions that resulted in a change of activity.

Steps:

1. Work with participants to develop a historical timeline (e.g., using butchers' paper) of transboundary fishing by year, including key events or activities (e.g., CRISES EKONI, Pandemic, fuel prices.
    a. Prompting questions: What were the key transboundary fishing activities by community group since 2000? What changes have occurred from traditional or past activity? What were the disruptions (e.g., economic, governance, fisheries related, weather related, policy related at community, province or national/international)? What drove these changes? (if any?)
2. Share the graph of apprehensions data (Attachment 8) showing the trends and spikes in transboundary fishing activity and apprehensions.
3. Ask: how do you explain these trends?

Activity 4. Understand the recent and diverse drivers of transboundary fishing since the COVID-19 pandemic from 2020-2023

Facilitators note: try to capture broad and diverse set of drivers and motivations within the context of the COVID pandemic and the livelihood context. Avoid leading questions or sharing our planning diagram on drivers developed in Jakarta.

Steps:

4. Refer to graph on apprehension data (Attachment 8)
5. Ask: What are the factors (drivers/opportunities) influencing the trends of transboundary fishing? In particular, the large numbers of recorded apprehensions in AFZ since 2020? Note: avoid sharing the drivers diagram drafted in Jakarta with participants
6. Use prompting questions to talk to people about their different motivations, or drivers, but try to avoid pre-identifying a list of drivers for them.

Activity 5: Livelihood support and opportunities

Steps:

1. Ask participants to hypothetically assume there is no policy shift from the Australian and Indonesian Governments concerning transboundary fishing (i.e., the MOU arrangements stay the same, and illegal fishing is subject to apprehension and prosecution)
2. Ask: how can your community and your fishing households be better supported to provide a reliable and sufficient source of income to meet your family's and aspirations of your children?
    a. Prompt: What can be done to make your lives run well?
    b. Prompt: How can you build on your existing resources and skills that people have access to?
3. What are some of the key livelihood issues/challenges you see amongst the fishing families and community as a whole?

- *FGD Group 3: Women*

Participant criteria
1. Wife of apprehended fisher 2. Wife of compliant fishers 3. Wife of boat captain 4. Wife of boat owner 5. Representative of women groups 6. Mother of young crew members 7. Widow of fisher lost at sea 8. Wife of jailed fishers

Lead Facilitator:

Note-taker:

Number of Participants:

Date/Duration:

Location:

Materials required: Consent form, project information sheet, graph of apprehensions data; diagram of drivers; markers; pens; butchers' paper; audio recorder; notebooks.

Objectives:

1. Understand the broad livelihood activities of women whose husbands, sons, fathers, or other household male family members are engaged in transboundary fishing)
2. Develop a historical timeline of changes, trends in transboundary fishing activity since 2000.
3. Understand the recent and diverse drivers of transboundary fishing since the COVID-19 pandemic from 2020-2023
4. Identify the gendered impacts of fishing apprehensions on families/households and their coping strategies.
5. Identify women's perspectives on opportunities for improving the outcomes of existing livelihoods and activities.

Expected Outputs/Recording of Information: Mapping of general livelihoods; mapping of fisheries-based livelihoods; historical timeline of changes, trends, and disruptions in transboundary fishing activity since 2000; qualitative data on diverse drivers of transboundary fishing; qualitative data on gendered impacts of fishing apprehensions; qualitative data on women's perspectives of strategies to improve existing livelihoods ; signed consent forms; participant register; audio recording; written notes; photographs of butchers paper.

FGD 3 activities and key steps

Activity/topic 1. Introduction

Steps:

1. Introduce yourself.
2. Explain the aims and purpose of the project (see Section 1 above).
3. Distribute the project information sheet and consent forms (Attachments 1 & 2) and ask people to complete prior to commencing the activities.
4. Collect signed consent forms and store for safe keeping (use PDF scanner app on phones).
5. Record participant names, gender, age on the participant register
6. If appropriate, ask participants to introduce themselves briefly and then commence the activities.

Activity/topic 2: Understand the broad livelihood activities of women whose husbands or sons are engaged in transboundary fishing.

Facilitators note: This includes fishing in the MOU Box, AFZ, and other Indonesian waters.

Steps:

1. Ask the group: Within your community, what are the different livelihoods that people engage in from year to year?
2. Use Table 1 to map general information of livelihoods and Table 2 To map fisheries-based livelihoods.
3. Ask the group: What activities do you receive most of your income from?

Table 1. Mapping of general livelihood activities (includes income and non-income generating – refer to floating coconut diagram or additional list of broad activities)

List of household livelihoods activities (both formal and informal, e.g. care, community work, paid/salaried work, baking, collecting firewood, domestic	Gender	Month					Note
	Male or female or other	1	2	3	…	12	

work, childcare, transport, collecting water)							
a. Tuna fishing around NTT waters						**	- Frequency: Daily, weekly, seasonal (e.g. dry or wet season) - ** intensity of the activity
b. Trepang fishing in MOU box							

Table 2. Mapping fisheries-based livelihoods

No	Boat type	F. Gear	Main target species (for commercial)	F. Ground	F. Season (Month)

Activity/topic 3: Develop a historical timeline of changes, trends, and disruptions in transboundary fishing activity since 2000.

Steps:

1. Work with participants to develop a historical timeline (e.g., using butchers' paper) of transboundary fishing by year, including key events or activities (e.g., CRISES EKONI, Pandemic, fuel prices.
    a. Prompting questions: What were the key transboundary fishing activities by community group since 2000? What changes have occurred from traditional or past activity? What were the disruptions (e.g., economic, governance, fisheries related, weather related, policy related at community, province or national/international)? What drove these changes? (if any?)
2. Share the graph of apprehensions data (Attachment 8) showing the trends and spikes in transboundary fishing activity and apprehensions.
3. Ask: how do you explain these trends?

Activity 4. Understand the recent and diverse drivers of transboundary fishing since the COVID-19 pandemic from 2020-2023

Facilitators note: try to capture broad and diverse set of drivers and motivations within the Facilitators note: try to capture broad and diverse set of drivers and motivations within the context of the COVID pandemic and the livelihood context. Avoid leading questions or sharing our planning diagram on drivers developed in Jakarta.

Steps:

7. Refer to graph on apprehension data (Attachment 8)
8. Ask: What are the factors (drivers/opportunities) influencing the trends of transboundary fishing? In particular, the large numbers of recorded apprehensions in AFZ since 2020? Note: avoid sharing the drivers diagram drafted in Jakarta with participants
9. Use prompting questions to talk to people about their different motivations, or drivers, but try to avoid pre-identifying a list of drivers for them.

Activity 5: impacts of fishing apprehensions on families/households and their coping strategies.

1. What are the impacts of fishing apprehensions on your family and household?
2. What strategies do you use to cope?
3. Do women have a say in in their husband's choice of livelihood activity e.g., fishing in Australian waters?

Activity 6. Female perspectives on opportunities for improving existing women's livelihoods and their perspectives on transboundary fishing activities of male members of the household.

1. Ask participants to *hypothetically assume* there is no policy shift from the Australian and Indonesian Governments concerning transboundary fishing (i.e., the MOU arrangements stay the same, and illegal fishing is subject to apprehension and prosecution)
2. Ask: how can your community and your fishing households be better supported to provide a reliable and sufficient source of income to meet your family's and aspirations of your children?
3. Prompting question: What can be done to make your lives run well?
4. Prompt question: How can you build on your existing resources and skills that people have access to?
5. What are some of the key livelihood issues/challenges you see amongst the fishing families and community as a whole?

- 4. Small Group Interview Guides

- *Group 4: Seafood Traders & Collectors, Kiosk Owners, and Money Lenders*

Participant criteria
Seafood Traders Collectors (Patrons/Bosses) Money Lenders Kiosk Owners

Lead Facilitator:

Note-taker:

Number of Participants:

Date/Duration:

Location:

Materials required: Consent forms, project information sheet, audio recorder; notebooks, pens.

Objectives:

1. To identify perspectives on transboundary fishing activity, market and value chain of target species and community livelihood impacts and opportunities.

Expected Outputs/Recording of Information: Mapping of general livelihoods; mapping of fisheries-based livelihoods; historical timeline of changes, trends, and disruptions in transboundary fishing activity since 2000; qualitative data on diverse drivers of transboundary fishing; qualitative data on 'opportunities' influencing trends in transboundary fishing; signed consent forms; participant register; audio recording; written notes; photographs of butchers paper; print outs of A3 maps of AFZ and allowed fishing (from AFMA/KKP Public Information Campaign website)

Small Group Interview Group 4 activities and key steps

Activity/Discussion focus

1. Introduction

Steps:
1. Introduce yourself.
2. Explain the aims and purpose of the project (see Section 1 above).
3. Distribute the project information sheet and consent forms (Attachments 1 & 2) and ask people to complete prior to commencing the activities.
4. Collect signed consent forms and store for safe keeping (use PDF scanner app on phones).
5. Record participant names, gender, age on the participant register (Attachment 3).
6. If appropriate, ask participants to introduce themselves briefly and then commence the activities.

Activity/topic 2: Role of actors in supporting community and household economy

1. What is (your) role in supporting the individual, household, or community economy? (e.g., providing money, equipment, purchasing catch)
2. What fisher groups do you support?
3. What are some of the key livelihood issues/challenges you see amongst the fishing families and community as a whole?

Activity/topic 3: Markets and value chains of key species targeted in transboundary fishing

1. What is the current market demand/trends for key species (e.g., shark, trepang, finfish.
2. What are the current trends in commodities and supply and demand?
3. What is the value/supply chain for key target species?
4. What are some of the challenges you experience in working with fishers in meeting your value chain needs (e.g., quality, quantity, reliability)

Activity/topic 4: Impacts of transboundary fishing on your business and community economy

1. What factors (driver/opportunity) influence the trend of fishing activity in AFZ? (check by the identified diagram of drivers and opportunities).
2. What are the impacts (costs) of illegal activity on fishers, boat owners, traders, and household members of fishers/boat owners?
3. What are the impacts of transboundary fishing (apprehensions and prosecutions) on you? And, how do you react to, or overcome these impacts?

Activity/topic 5: Viable Sustainable Fisheries

1. Do you see any viable options for sustainable fisheries from a value chain or marketing perspective?

- *Group 5: Village Elders & Leaders*

Participant criteria
1. Kepala Desa 2. Kepala Dusun 3. Iman 4. Pastor 5. Village Elder 6. Informal Leader 7. Leader of Village Organisation

Lead Facilitator:

Note-taker:

Number of Participants:

Date/Duration:

Location:

Materials required: Consent forms, project information sheet, audio recorder; notebooks, pens.

Objectives:

1. To understand village leaders' perspectives on transboundary fishing activity, and community livelihood impacts and opportunities.

Expected Outputs/Recording of Information: Mapping of general livelihoods; mapping of fisheries-based livelihoods; historical timeline of changes, trends, and disruptions in transboundary fishing activity since 2000; qualitative data on diverse drivers of transboundary fishing; qualitative data on 'opportunities' influencing trends in transboundary fishing; signed consent forms; participant register; audio recording; written notes; photographs of butchers paper; print outs of A3 maps of AFZ and allowed fishing (from AFMA/KKP Public Information Campaign website)

Small Group Interview Group 5 activities and key steps

Activity/topic 1. Introduction

Steps:

1. Introduce yourself.
2. Explain the aims and purpose of the project (see Section 1 above).
3. Distribute the project information sheet and consent forms (Attachments 1 & 2) and ask people to complete prior to commencing the activities.
4. Collect signed consent forms and store for safe keeping (use PDF scanner app on phones).
5. Record participant names, gender, age on the participant register (Attachment 3).
6. If appropriate, ask participants to introduce themselves briefly and then commence the activities.

Activity/topic 2: Gendered Livelihoods post COVID 19 Pandemic in your community

1. What are the main livelihoods in your community?
2. Do you have any observations about the contributions of transboundary fishing to community and household livelihoods since the Pandemic?
3. Were livelihoods disrupted during the pandemic?
4. How did households respond to these disruptions?

Activity/topic 3: Impacts of Transboundary fishing on community

1. What are the local social and economic impacts of transboundary fishing activity and fishing boats, gear and catch apprehensions on the community?
2. Do you have other views or opinions about transboundary fishing activity and the Australian and Indonesian government responses?
3. In your view do you think the Public Information Campaigns have an impact to deter fishers from transboundary fishing?

Activity/topic 4: Gendered Community Livelihoods

1. What are government and non-government programmes related to livelihood?
2. What is your opinion about those programmes?
3. What is your perspective on opportunities for livelihood improvements in the context of existing government or NGO programmes?
4. Are there specific programs for women?
5. What livelihoods could be improved for men and women
6. What is your suggestion to improve the effectiveness of livelihood programs?
7. What are some of the key livelihood issues/challenges you see amongst the fishing families and community as a whole?

- 5. Key Informant Interview Guides

Facilitators note: We assume these are likely to be revised following the first focus groups, based on what worked well and what didn't in terms of data collection and the potential for this data to answer the overarching research questions (See above, Section 2. Project research approach).

- *Fisher Crew – Interview Guide*

Introductory Questions to complete Informant Profile

Name of Informant	
Information Flyer distributed, explained and Consent Form completed and signed	Yes/no
Location (dusun, desa, Kecematan)	
Age	
Gender	M/F
Status	Married/Single/Widow
Occupational Status/Role	
Education	
Ethnic	

Introduction: Current Livelihoods

- What is your current livelihood activity (e.g., one or more main activities this year) for income?
- What other current household livelihood activities support your family?
- Do you have sufficient access to resources to support your livelihood activities (e.g. capital for livelihood activities?)
    - If not, what is your strategy to cover your expenses?
- What happens in emergency situations, and who do you ask for help to support your family for income, food, and other expenses such as education?

Transboundary fishing

- We would like to talk to you about your experiences in transboundary fishing activities, in particular as fisher crew, and where you currently fish and what species of fish you target.
- How did you become involved in fishing?
- What type of boat, fishing gear have you used?
- As a crew member, how were you recruited in your current fishing activity?
- How are your fishing activities funded?
    - How are the financial costs shared among the crew/captain/boat owner?

    - How are the benefits from sale of catch (after other fishing related costs are taken care of) distributed amongst the crew, captain, or boat owner?
- Who makes decisions about undertaking transboundary fishing? Do other members of your family or household or boat captions/owners have a say in this decision making?
- How important is fishing in AFZ for you and your family?
    - Does it provide enough income to support your family needs?

Illegal Apprehensions during COVID and motivations/drivers

- Show the graph of apprehensions.
- Ask: In your view, what were the reasons for the large numbers of Indonesian boats apprehended fishing illegally in Australian waters during COVID?
    - Ask: do you think this trend will continue in coming years?
    - For example: Was there a link between recent COVID related livelihood disruptions and illegal activity?
    - For example; Are there any connections between illegal fishing and market prices for key species (e.g. trepang), their availability in Australian waters and patron-client relations and debt servicing)?
- What is your primary motivation for engaging in transboundary fishing? (e.g., income/lack of livelihood alternatives; historic connection to the seas; overexploitation of Indonesian fishing resources).
- Are there differences between groups or crew members in their motivations? (e.g., young men, people with families, people with debts owing to seafood traders, people who have suffered a livelihood disruption, family illness, etc.).
- Are people likely to be motivated by different factors depending on their role in fishing? (e.g., captain vs. crew).

Impacts

- Have you ever been apprehended at sea and had your catch, gear and or boat confiscated?
- Have you been apprehended and taken to Darwin or elsewhere and prosecuted through the Australian courts for charges of illegal fishing?
- Have you ever spent time in an Australian jail for illegal fishing convictions?
- If yes, what are the social and economic impacts to you, your family, and fisher crew?
- How do you balance the risks and the benefits of engaging in illegal fishing outside the allowed areas?

Perspectives on Government Policy (Indonesia and Australia) and Fisheries Management

- Do you have any perspectives on the current policy of MOU box, transboundary fishing laws and enforcement?
- Do you have any suggestions on future policy and implementation to support legal sustainable fisheries for communities?

Experiences with livelihood development programs

- Have you ever been involved in or benefited from livelihood development programmes in your community?
- What is your opinion about those programmes? Did any aspects of your livelihood improve?
- Do you have any suggestions to improve the effectiveness of livelihood programmes?

Future Livelihood Improvement Opportunities

- What kind of opportunities could be provided to support livelihoods for you or your family members or the community?
- Are there any specific livelihood opportunities in your opinion which could be explored further?

- *Boat Owners & Captains – Interview Guide*

Introductory Questions to complete Informant Profile

Name of Informant	
Information Flyer distributed, explained and Consent Form completed and signed	Yes/no
Location (dusun, desa, Kecematan)	
Age	
Gender	M/F
Status	Married/Single/Widow
Occupational Status/Role	
Education	
Ethnic	

Introduction: Current Livelihoods

- What is your current livelihood activity (e.g., one or more main activities this year) for income?
- What other current household livelihood activities support your family?

Transboundary fishing

- We would like to talk to you about your experiences in transboundary fishing activities, in particular, as a boat captain and or boat owner, and where you, or your crew, currently fish and what species of fish you target.
- How did you become involved in fishing?
- What type of boat, fishing gear have you used?
- As a boat owner or captain, how do you recruit your crew?
- How are your fishing activities funded?
    - How do you share the financial costs among the crew?
    - How are the benefits from sale of catch after other costs are taken care of distributed amongst the crew, captain, or boat owner?
- Who makes decisions about undertaking transboundary fishing? Do fisher crew also have a say in this decision making?
- How important is fishing in AFZ for you and your family?
    - Does it provide enough income to support your family needs?

Illegal Apprehensions during COVID and motivations/drivers

- Show participant the graph of apprehensions.
- Ask: In your view, what were the reasons for the large numbers of Indonesian boats apprehended fishing illegally in Australian waters during COVID?
    - Ask: do you think this trend will continue in coming years?

    - For example: Was there a link between recent COVID related livelihood disruptions and illegal activity?
    - For example; Are there any connections between illegal fishing and market prices for key species (eg trepang), their availability in Australian waters and patron-client relations and debt servicing)?
- What is your primary motivation for engaging in transboundary fishing? (e.g., income/lack of livelihood alternatives; historic connection to the seas; overexploitation of Indonesian fishing resources).
- Are there differences between groups or crew members in their motivations? (e.g., young men, people with families, people with debts owing to seafood traders, people who have suffered a livelihood disruption, family illness, etc.).
- Are people likely to be motivated by different factors depending on their role in fishing? (e.g., captain vs. crew).

Impacts

- Have you ever been apprehended at sea and had your catch, gear and or boat confiscated?
- Have you been apprehended and taken to Darwin or elsewhere and prosecuted through the Australian courts for charges of illegal fishing?
- Have you ever spent time in an Australian jail for illegal fishing convictions?
- If yes, what are the social and economic impacts to you, your family, and fisher crew?
- How do you balance the risks and the benefits of engaging in illegal fishing outside the allowed areas?

Perspectives on Government Policy (Indonesia and Australia) and Fisheries Management

- Do you have any perspectives on the current policy of MOU box, transboundary fishing laws and enforcement?
- Do you have any suggestions on future policy and implementation to support legal sustainable fisheries for communities?

Experiences with livelihood development programs

- Have you ever been involved in or benefited from livelihood development programmes in your community?
- What is your opinion about those programmes? Did any aspects of your livelihood improve?
- Do you have any suggestions to improve the effectiveness of livelihood programmes?

Future Livelihood Improvement Opportunities

- What kind of opportunities could be provided to support livelihoods for you or your family members or community?
- Are there any specific livelihood opportunities in your opinion which could be explored further?

- *Women – Interview Guide*

Introductory Questions to complete Informant Profile

Name of Informant	
Information Flyer distributed, explained and Consent Form completed and signed	Yes/no
Location (dusun, desa, Kecematan)	
Age	
Gender	F
Status	Married/Single/Widow
Occupational Status/Role	
Education	
Ethnic	

Introduction: Current Livelihoods

- What is your current livelihood activity (e.g., one or more main activities this year) for income? Are you engaged in fishing-based livelihoods (such as gleaning, fishing, selling or trading fish?)
- What other current household livelihood activities support your family?
- Do you have sufficient access to resources to support your livelihood activities (e.g. capital for livelihood activities?)
    - If not, what is your strategy to cover your expenses?
- What happens in emergency situations, and who do you ask for help to support your family for income, food, and other expenses such as education?

Transboundary fishing

- We would like to talk to you about transboundary fishing activities, in particular, your experiences and views as a woman whose husband, son, father, or other household male family member, are engaged in transboundary fishing.
- How did your family member become involved in fishing?
- What type of boat, fishing gear have they used?
- Do you know how your family member was recruited for their fishing role?
- How are your family member's fishing activities funded?
    - How are the financial costs shared among the crew?
    - How are the benefits from sale of catch after other costs are taken care of and distributed amongst the crew, captain, or boat owner?
- Who makes decisions about undertaking transboundary fishing? Do women (as wives, mothers, sisters) also have a say in this decision making?
- How important is fishing in AFZ for you and your family?
    - Does it provide enough income to support your family needs?

Illegal Apprehensions during COVID and motivations/drivers

- Show participant the graph of apprehensions.
- Ask: in your view, what were the reasons for the large numbers of Indonesian boats apprehended for fishing illegally in Australian waters during COVID?
    - Do you think this trend will continue in coming years?
    - For example, was there a link between recent COVID related livelihood disruptions and illegal activity?
    - Was there a link between species availability, market prices and value chain arrangements (e.g., patron-client relations and debt servicing), and illegal activity?
- What is the primary motivation of your family member in engaging in transboundary fishing? (e.g., income/lack of livelihood alternatives; historic connection to the seas; overexploitation of Indonesian fishing resources; etc)
- Are there differences between groups in their motivations? (e.g., young men, people with families, people with heavy debts owing to seafood traders, people who have suffered a livelihood disruption, family illness, etc)
- Are people likely to be motivated by different factors depending on their role in fishing? (e.g., captain vs. crew).

Impacts

- Has your family member ever been apprehended at sea and had their catch, gear and or boat confiscated?
- Has your family member ever been apprehended and taken to Darwin or elsewhere and prosecuted through the Australian courts for charges of illegal fishing?
- Has your family member ever spent time in an Australian jail for illegal fishing convictions?
- If yes, what are the social and economic impacts to you, your family, and fisher crew? E.g. debt to bosses or other people.
- How do your family members balance the risks and the benefits of engaging in illegal fishing outside the allowed areas?

Perspectives on Government Policy (Indonesia and Australia) and Fisheries Management

- Do you have any perspectives on the current policy of MOU box, transboundary fishing laws and enforcement?
- Do you have any suggestions on future policy and implementation to support legal sustainable fisheries for communities?

Experiences with livelihood development programs

- Have you ever been involved in livelihood development programmes in your community?
- What is your opinion about those programmes? Did your livelihood improve?
- What is your suggestion to improve the effectiveness of livelihood programmes?

Future Livelihood Improvement Opportunities

- What kind of opportunities could be provided to support livelihoods for you or your family members or community?
- Are there any specific livelihood opportunities in your opinion which could be explored further?

- *Seafood Traders & Collectors – Interview Guide*

Introductory Questions to complete Informant Profile

Name of Informant	
Information Flyer distributed, explained and Consent Form completed and signed	Yes/no
Location: dusun, desa, kecamatan	
Age	
Gender	F/M
Status	Married/Single/Widow
Occupational Status/Role	
Education	
Ethnic	

Introduction: Role in community and household economy

- What is (your) role in supporting the individual, household, or community economy? (e.g., providing money, equipment, food for fishing trips, purchasing catch)
- What fisher groups do you support?
- What are some of the key livelihood issues/challenges you see amongst the fishing families and community as a whole?

Markets and value chains of key species targeted in transboundary fishing

- What is the current market demand/trends for key species (e.g., shark, trepang, finfish)
- What is the value/supply chain for key target species?
- What are some of the challenges you experience in working with fishers in meeting your value chain needs (e.g. quality, quantity, reliability)

Transboundary fishing

- We would like to talk to you about your experiences in transboundary fishing activities, in particular, as a seafood trader and collector, and where the fisher groups you support currently fish and the species that they target.
- How did you become involved in seafood trading/collecting?
- What type of boat, fishing gear do your fisher groups use?
- As a seafood trader/collector, how do you identify/select the fisher groups you choose to trade with?
- Who makes decisions about undertaking transboundary fishing? Do traders and collectors also have a say in this decision making?
- How important is fishing in AFZ for you and your family/business? Do you have other sources of income/businesses?

Illegal Apprehensions during COVID and motivations/drivers

- Show participant the graph of apprehensions.
- Ask: in your view, what were the reasons for the large numbers of Indonesian boats apprehended for fishing illegally in Australian waters during COVID?
    - Do you think this trend will continue in coming years?
    - For example, was there a link between recent COVID related livelihood disruptions and illegal activity?
    - Was there a link between species availability, market prices and value chain arrangements (e.g., patron-client relations and debt servicing), and illegal activity?
- What is the primary motivation for engaging in engaging in transboundary fishing? (e.g., income/lack of livelihood alternatives; historic connection to the seas; overexploitation of Indonesian fishing resources; etc)
- Are there differences between groups in their motivations? (e.g., young men, people with families, people with heavy debts owing to seafood traders, people who have suffered a livelihood disruption, family illness, etc)
- Are people likely to be motivated by different factors depending on their role in fishing? (e.g., captain vs. crew).

Impacts

- Have any of the fisher groups that you have worked with ever been apprehended at sea and had their catch, gear and or boat confiscated?
- Have any of the fisher groups that you have worked with ever been taken to Darwin or elsewhere and prosecuted through the Australian courts for charges of illegal fishing?
- If yes, what are the social and economic impacts to you others involved?
- If there is an outstanding debt due to apprehensions how is this debt cleared?
- As a trader/collector, are there any specific risks for you supporting fishers who engage in transboundary fishing?

Perspectives on Government Policy (Indonesia and Australia) and Fisheries Management

- Do you have any perspectives on the current policy of MOU box, transboundary fishing laws and enforcement?
- Do you have any suggestions on future policy and implementation to support legal sustainable fisheries for communities?

Viable Sustainable Fisheries

- Do you have any perspectives on fisheries market and supply chains in Indonesia and the future trends in trepang or other species demand?
- Do you see any viable options for sustainable fisheries from a value chain or marketing perspective?

- *Village Elders & Leaders – Interview Guide*

Introductory Questions to complete Informant Profile

Name of Informant	
Information Flyer distributed, explained and Consent Form completed and signed	Yes/no
Location: dusun, desa, Kecamatan	
Age	
Gender	F/M
Status	Married/Single/Widow
Occupational Status/Role	
Education	
Ethnic	

Introduction: Role in community and household economy

- In your role as a village leader are you involved in any community development or livelihood or food security support programs or activities supporting village households (e.g., poor households) or community development?
- What are some of the key livelihood issues/challenges you see amongst the fishing families and the community as a whole?

Transboundary fishing

- We would like to talk to you as a village elder/leader about the experiences of people in your community who are engaging in transboundary fishing activities.
- How important is fishing in AFZ for individuals and groups in your community?

Illegal Apprehensions during COVID and motivations/drivers

- Show participant the graph of apprehensions.
- Ask: in your view, what were the reasons for the large numbers of Indonesian boats apprehended for fishing illegally in Australian waters during COVID?
    - Do you think this trend will continue in coming years?
    - For example, was there a link between recent COVID related livelihood disruptions and illegal activity?
    - Was there a link between species availability, market prices and value chain arrangements (e.g., patron-client relations and debt servicing), and illegal activity?
- What is the primary motivation for groups engaging in transboundary fishing? (e.g., income/lack of livelihood alternatives; historic connection to the seas; overexploitation of Indonesian fishing resources; etc)

- Are there differences between groups in their motivations? (e.g., young men, people with families, people with heavy debts owing to seafood traders, people who have suffered a livelihood disruption, family illness, etc)
- Are people likely to be motivated by different factors depending on their role in fishing? (e.g., captain vs. crew).
- Are there impacts on your community relating to fishers from other places spending time in your community prior to transboundary fishing activities? Are there pressures on community and village resources?

Impacts

- For individuals or groups from your community either
    - apprehended at sea and had their catch, gear and or boat confiscated? or
    - apprehended and taken to Darwin or elsewhere and prosecuted through the Australian courts for charges of illegal fishing?
- what are the social and economic impacts to families, fisher crew, and the broader community?

Perspectives on Government Policy (Indonesia and Australia) and Fisheries Management

- Do you have any perspectives on the current policy of MOU box, transboundary fishing laws and enforcement?
- Do you have any suggestions on future policy and implementation to support legal sustainable fisheries for communities?

Experiences with livelihood development programs

- Have your community members ever been involved in livelihood development?
- What is your opinion about those programmes? Did their livelihoods improve?
- What is your suggestion to improve the effectiveness of livelihood programmes?

Future Livelihood Improvement Opportunities

- What kind of opportunities could be provided to support livelihoods for people in your community?
- Are there any specific livelihood opportunities in your opinion which could be explored further?

- 6. Key Government stakeholders and potential questions

The following table lists the key government, non-government, and private sector actors in Indonesia with an interest in transboundary fishing. These stakeholders will be approached for a meeting or interview.

	Type of actor	**Agencies**	**Interests/connection to transboundary fishing**	**Potential questions**
1	Government actors/key agencies and institutions that are involved in legal/illegal fishing	1. District Rote (DKP, BAPPEDA, Dinas Pemberdayaan Desa dan Masyarakat (DPDM), village gov., Polair, Pos AL Papela, LANAL Rote, BPBD, Asisten II)	1. DKP: in charge for welfare of fishers. 2. BAPPEDA: developing program all sectors in district level. 3. DPDM: in charge for village community empowerment. 4. Village gov.: village community leadership and services. 5. Polair, Pos AL Papala, LANAL Rote: security/surveillance in the waters and border areas. 6. BPBD: Safety and rescue 7. Asisten II: Policy and program development for fishing communities.	Main question: 1. What they understand about transboundary fishing activities? 2. What the program or strategies to deal with transboundary fishing? Specific questions: 1. DKP: Are there any specific programs for fishers in Papela and Oelaba? 2. BAPPEDA: What program plan is in place for fishers in Papela and Oelaba? 3. DPDM: What program plan is in place for fisher's empowerment in Papela and Oelaba? 4. Village gov.: What is the history and current status and issues of transboundary fishing? What is the concern? Any government programs to address transboundary fishing issues (past, present, future)? 5. Polair, Pos AL Papala, LANAL Rote: Refer to main questions and ask them if they have further information to say!

				6. BPBD: Refer to main questions and ask them if they have further information to say! 7. Asisten II: Refer to main questions and ask them if they have further information to say!
		2. City of Kupang (DKP, BAPPEDA, Dinas Pemberdayaan Desa dan Masyarakat)	▪ DKP: in charge for welfare of fishers. ▪ BAPPEDA: developing program all sectors in district level. ▪ DPDM: in charge for village community empowerment.	▪
		3. NTT Province (PSDKP, DKP Prop., Karantina ikan, BAPPEDA, Dinas Pemberdayaan Desa dan Masyarakat)	▪ PSDKP: Fishing surveillance ▪ DKP: in charge for welfare of fishers. ▪ BAPPEDA: developing program all sectors in district level. ▪ DPDM: in charge for village community empowerment.	▪
		4. National: KKP (: Sekjen, PDS, PSDKP). Kemenkomarves, Kemlu	▪ KKP: provide the programmes related to surveillance, alternative livelihood, ▪ Kemenkomarves: ▪ Bappenas: provide the national program in fisheries sector, community economy empowerment, and foreign	▪

		BAPPENAS Kemendes	cooperation as well as programs. ▪ Kemendes: provide the program for village development.	
		5. ACIAR Indonesia	▪ Project related to fisheries in Indonesia particularly in Rote	▪
		6. Australian Embassy	▪ Policy on transboundary fisheries/fishing ▪ Bilateral initiative with Indonesian Government.	▪
	Non-Government actors/key agencies and institutions that are involved in legal/illegal fishing	1. Local NGOs, ATSEA 2, COREMAP-CTI,	▪ Environmental issues and livelihoods	▪
	Private sectors	2. Exporters (Surabaya and Makassar)	▪ Supply chain information of fishery products	▪

- Attachment 1: Information sheet

***Towards improved livelihoods for Indonesian fishers in Nusa Tenggara Timur Province, Indonesia* Study – Information Sheet for Participants**

Who is doing the research?

This project is a collaboration between social science and fisheries researchers from Indonesia and Australia to explore the livelihoods of selected Indonesian fishing communities in Nusa Tenggara Timur (NTT) Province. The Indonesia team includes Dedi S. Adhuri (Indonesian team leader, National Research and Innovation Agency), Jotham Ninef (Community Engagement and Fisheries, Universitas Nusa Cendana), Ria Fitriana (Gender and Fisheries Expert), and Research Associates, Achmad Zamroni, and Widya Safitri. The Australian team from Charles Darwin University includes Natasha Stacey, (Australian team leader) and Kylie McKenna, Livelihoods. The project is funded by the Australian Centre for International Agricultural Research (ACIAR).

What is the research about?

This project will identify social, cultural, and economic drivers of Indonesian fishing in the Australian Fishing Zone (AFZ), maritime border regions and potential opportunities for gendered livelihood improvements of selected fishing communities in NTT. The research team will be facilitating focus group discussions, small group and key informant interviews with people in three communities: Papela, Tanjung Pasir and Oelaba villages in Kabupaten Rote Ndao, and Oesapa village in Kabupaten Kupang, West Timor. The people the team wish to talk to include individuals engaged in fishing activities including crew members, captains and boat owners, and female members of their households; local traders, village, and local government leaders.

We would like to talk to selected research participants about experiences and perceptions concerning the drivers of Indonesian transboundary fishing in Australian waters and impacts of apprehensions at individual, family, and the community level. We also would like to ask participants their views on opportunities for future livelihood improvements. We will also be speaking to members of the Indonesian and Australian government agencies about their programs and perspectives on transboundary fishing and the MOU box.

The anticipated benefits of the study include:

- Increased understanding of the multiple contexts, drivers and impacts of Indonesian transboundary fishing in the AFZ in selected communities,

- Engagement of fishing stakeholders in discussions about transboundary fishing issues and their and community livelihoods needs,
- Preliminary identification of evidence-based options for future livelihood improvements in communities in NTT.

What will you have to do?

If you agree to participate you will be asked to do one or more of the following:

- Participate in a focus group discussion (up to 2hrs) with other men or women and make or have your views noted by members of the research team.
- Participate in a semi-structured key informant interview (for a duration of up to 1 hour). You can choose to do this on your own or with other peers. The interview will be recorded (see consent form)
- Participation in the study is voluntary and you can decline the invitation to contribute to the study with no repercussions.

Will the research harm me in any way?

There are no risks to you if you agree to participate in the research and the information collected will **be confidential and anonymous**. There are no risks if you decide to withdraw from the research at any time.

What happens to my information?

The information you provide will be recorded and notes made to be used by the researchers to prepare a report which will include a summary of all the information all participants have told the researchers and the researchers recommendations for addressing illegal fishing and improving livelihoods of target communities in this study. The research results will be published in a report to the project funding agency, some information will also be used in an academic journal paper and conference or seminar presentations. The research team will also prepare a summary of the project results for all participants.

Where can I go if I have concerns?

This project is being managed by Natasha Stacey Charles Darwin University in Darwin in collaboration with Dedi S. Adhuri at BRIN in Jakarta and Jotham Ninef at Universitas Nusa Cendana in Kupang.

If you would like more information before you decide to participate, please contact Dedi S. Adhuri researcher via WhatsApp (+62 813 8394 0111) and email (dediadhuri@hotmail.com). You may also use these contact details at any time during the project or if you need information or wish to withdraw. This project has been approved by the Charles Darwin University Human Research Ethics Committee ID number H23055. If you have any questions or concerns that you do not want to direct to the researcher, you are invited to the contact

the Charles Darwin University Research Integrity and Ethics team on +61 8 8946 6063, on the toll free number, 1800 466 215, or by email, ethics@cdu.edu.au.

Thank you for considering taking part in this research.

- Attachment 2: Consent form

RESEARCH CENTER FOR SOCIETY AND CULTURE
BRIN NATIONAL RESEARCH AND INNOVATION AGENCY

Record of Consent to be part of the Towards improved livelihoods for Indonesian fishers in Nusa Tenggara Timur Province, Indonesia Study

Type of Participation and Consent *(tick which is applicable)*

- ❑ Focus Group participation
- ❑ Key Informant Interview
- ❑ Meeting

I have spoken to a member of the project team from BRIN, CDU, or Nusa Cendana University about the project. I understand this project aims to identify multiple drivers of Indonesian fishing in the Australian Fishing Zone, and potential opportunities for addressing gendered livelihood improvements of selected fishing communities in Nusa Tenggara Timur, Indonesia. I have read the Information Sheet for Participants, which explains why this project is being done and my part in it. I understand it.

☐ I consent to participating in project activities for the study.

☐ I consent to the researchers using information I provide for the purposes of the study.

☐ I know that I am free to withdraw from the project activities at any time. If I do withdraw there will be no adverse consequences for me.

☐ I know that the researchers will keep the information I provide confidential and stored in a secure location.

☐ I know that I will not get paid for participating in the research project.

Consent of Recording of Notes and Photographs

Tick which is applicable

☐ I consent to my words being recorded during a focus group discussion, interview or meeting.

☐ I consent to my words being quoted in any reporting (such as written report or booklets about the study findings to funders, in a research paper, seminar and

conference presentations) and would/would not like my name to be used. If quoted, I understand that I will be given the opportunity to check the quote.

☐ I consent to my organisation being listed as being part of the study.

☐ I understand that photographs may be taken during focus groups or interviews, and I give permission for the images to be used by Charles Darwin University in reporting about the study. Permission includes their use in printed or online material including social media and project communications.

☐ I want to receive a summary of the findings at the end of the project at the contact address or email below:

Contact address, email or WhatsApp number:

.....

I have read this Informed Consent Form and I agree with all the points listed above.

Signed: _____

Full name printed: _____

Date: _____

Location: _____

If you have any questions or concerns that you do not want to direct to the researcher, you are invited to the contact the Ethics team of the Charles Darwin University Human Research Ethics Committee on (08) 89466063, on the toll free number, 1800 466 215 or by email, ethics@cdu.edu.au. The Ethics team can pass on any concerns to appropriate officers within the University.

To be completed by Project Team Member Only

Project Team Member Name:_____

FGD Group/Interview/Meeting additional details:_____

Time Duration:_____

Gender of Participant: _____

- Attachment 3: Interview participant register (sample developed for Women's FGD)

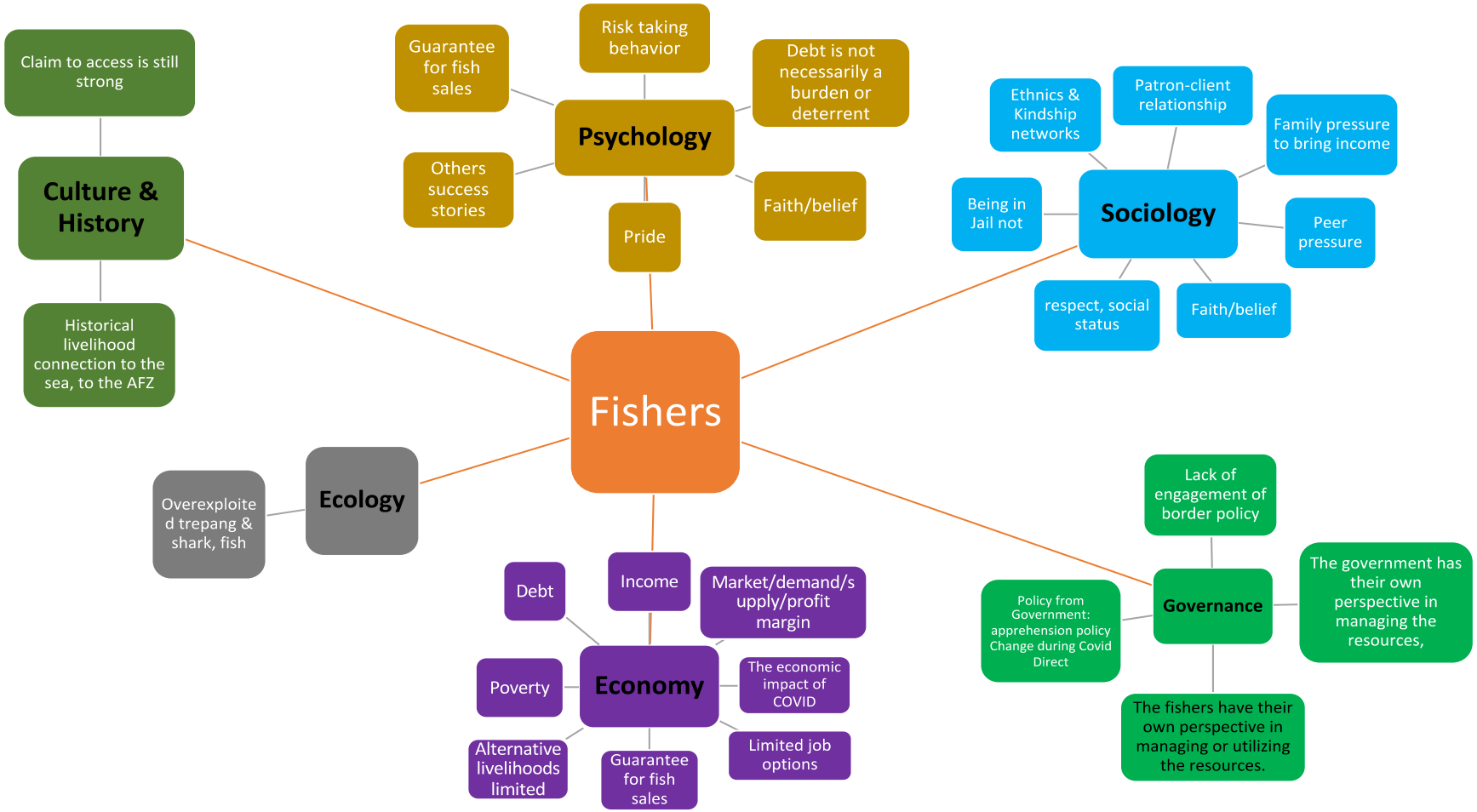
FGD Kelompok:…..
Tempat:
Tanggal: Jam Mulai:……. Jam Selesai:……

No	**Nama**	**Umur**	**Jenis Kelamin (L/P)**	**Suku asal**	**Pekerjaan (Apakah ada usaha? Sebutkan)**	**Status (Menikah/suami telah tiada)**	**Nama Suami Jika ada**	**Suku asal suami**	**Pekerjaan Suami Jika nelayan, nelayan apa, posisi dalam kapal**	**Jumlah anak yang menjadi tanggungan**	**Alamat Dusun dan Desa**
No	Name	Age	Gender	Ethnic	Income related activity	Status (married/Widow)	Husband name	Husband ethnic	Husband job	Number of Member of family under guardian	Address (sub village)

- Attachment 4: Drivers of transboundary fishing diagram

This is a draft diagram developed by the research team in Jakarta. It is to be used by the research team on fieldwork as background information and is not to be shared with participants.

Actor-based: underlying motivation for illegal behavior



- Attachment 5: Opportunities list

This is a draft list of 'opportunities' developed by the research team in Jakarta. It is to be used by the research team on fieldwork as background information and is not to be shared with participants.

1. Australian law enforcement changes during COVID
2. Belief fishers will not fish due to COVID
2. Market price/demand
3. No Indonesian government deterrent
4. Abundance of available species
3. Patron client relationships: belief boss will support them and family
5. Revision of MoU Box: no community consultation/involvement in boundaries; different perception of boundaries
6. Family proximity to MoU Box
7. Availability of fuel and boat

- Attachment 6: Scoping trip findings on transboundary fisheries of selected communities

This table is a draft developed by the research team in Jakarta and can be confirmed and updated during fieldwork.

No	Site/Village	Fishing Boat/Gear	Main Target Species	Fishing Ground	Pre Covid-19 (before 2020)	Covid-19 (2020 – 2022)	Post Covid (2023)	Status (by government standard)	
								Legal	Illegal
1	Oelaba	Lambo/Gleaning and Free Dive	Trepang, Fin fish	MoU Box	√	√	√	√	-
2	Papela	Sailing Lambo/Gleaning and Free Dive	Trepang, Shark, Fin Fish	MoU Box	√	√	√	√	-
		Motorized Lambo/Gleaning and Free Dive	Trepang, Shark, Fin Fish	MoU Box	-	√	√	Technically illegal, but practically allowed when poor weather conditions or for transit purposes	-
				Outside of MoU Box	-	√√√	√√	-	√
		Bodi (inboard engine)	Trepang,	Outside of MoU Box	√	√√√	√√	-	√

No	Site/Village	Fishing Boat/Gear	Main Target Species	Fishing Ground	Pre Covid-19 (before 2020)	Covid-19 (2020 – 2022)	Post Covid (2023)	Status (by government standard)	
								Legal	Illegal
			Shark	Outside of MoU Box	√	√	√	√	√
			Tuna	Border area	√	√	√	√	√
3	Hundihuk	Sailing Lambo/Gleaning and Free Dive	Trepang, Fin Fish	MoU Box	√	√	√	√	-
		Motorized Lambo/Gleaning and Free Dive	Trepang	MoU Box	-	√	√	Technically illegal, but practically allowed during poor weather conditions for transit purposes	-
				Outside of MoU Box	-	√√√	√√	-	√
		Body (inboard engine)	Trepang	Outside of MoU Box	-	√√	√√	-	√
4	Oesapa	Body (inboard engine)	Trepang	Outside of MoU Box	√	√√√	√√	-	√

Remark:

√ : Low intensity
√√ : Medium intensity
√√√ : High intensity

- Attachment 7: Value chain actors and roles (to be updated during fieldwork)

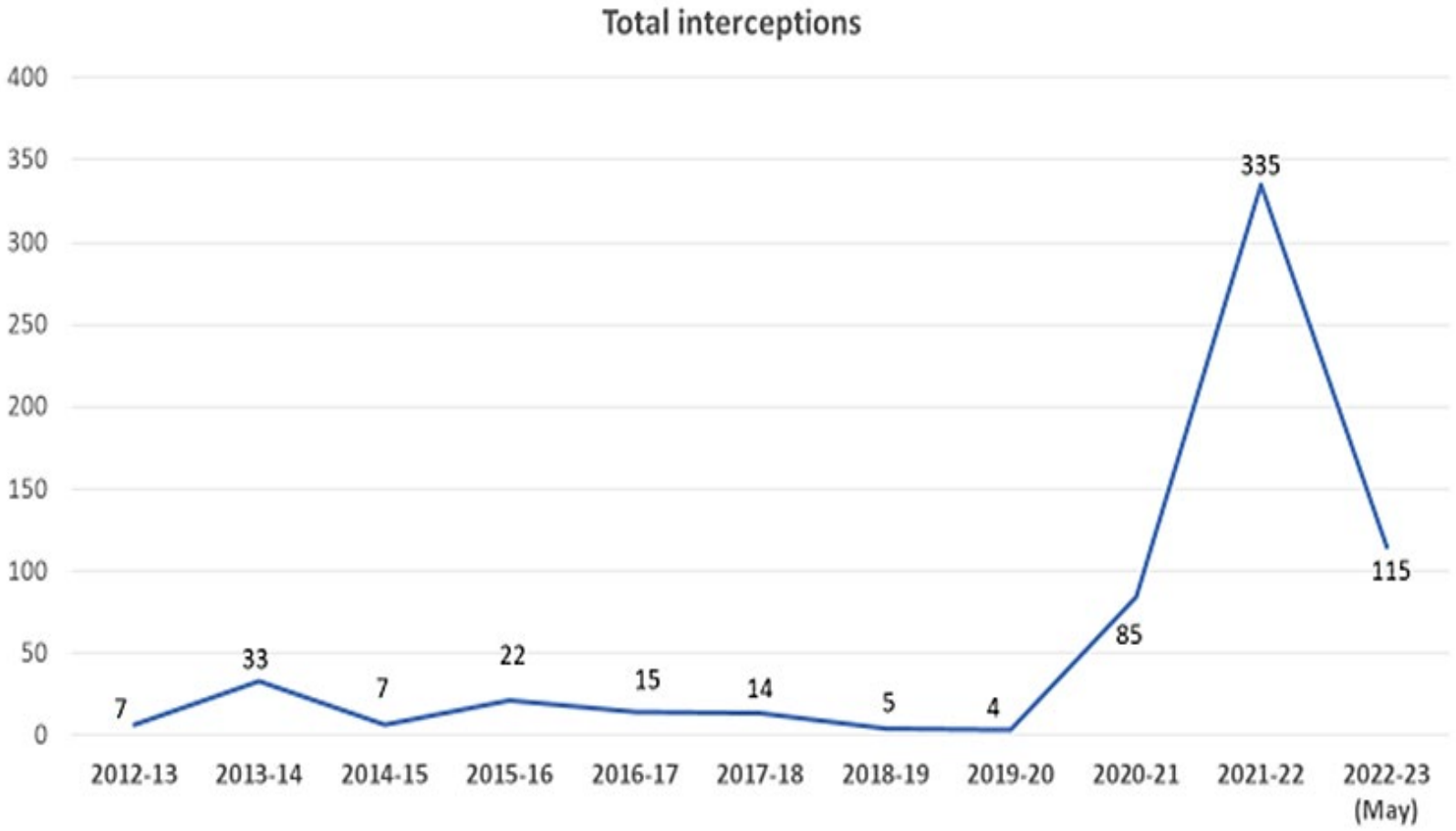
This is a draft table developed by the research team in Jakarta and can be updated and revised during fieldwork.

No	Actors (by roles in fisheries)	Roles	Remarks
1	Captain	Lead the boat preparation and fishing operation	
2	Crew	Boat preparation and fishing operation	
3	Boat Owner – type 1	Owns the boat	
	Boat Owner – type 2	Owns the boat, provide logistics, operational cost, and family needs of crews and captain	
4	Buyer	Buying the catch and selling to other traders (larger)	
5	Investor (money lender)	Provide operational cost, logistics	
6	Buyer +	Buyer and investor	

Factors contributing to value chain relationship:

1. Family member
2. Long-term social relationships (e.g. working relationship)
3. Ethnicity – certain groups work with certain actors
4. Debt (low catch/previous failure, ongoing debt issues from other livelihood shocks or disruptions)
5. Patron-client relationship (power, resource)

- Attachment 8: Graph of apprehensions data


Total interceptions
400
350
300
250
200
150
100
50
0
7
33
7
22
15
14
5
4
85
335
115
2012-13
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21
2021-22
2022-23 (May)

Source: AFMA

- Attachment 9: List of gender issues relevant to the project

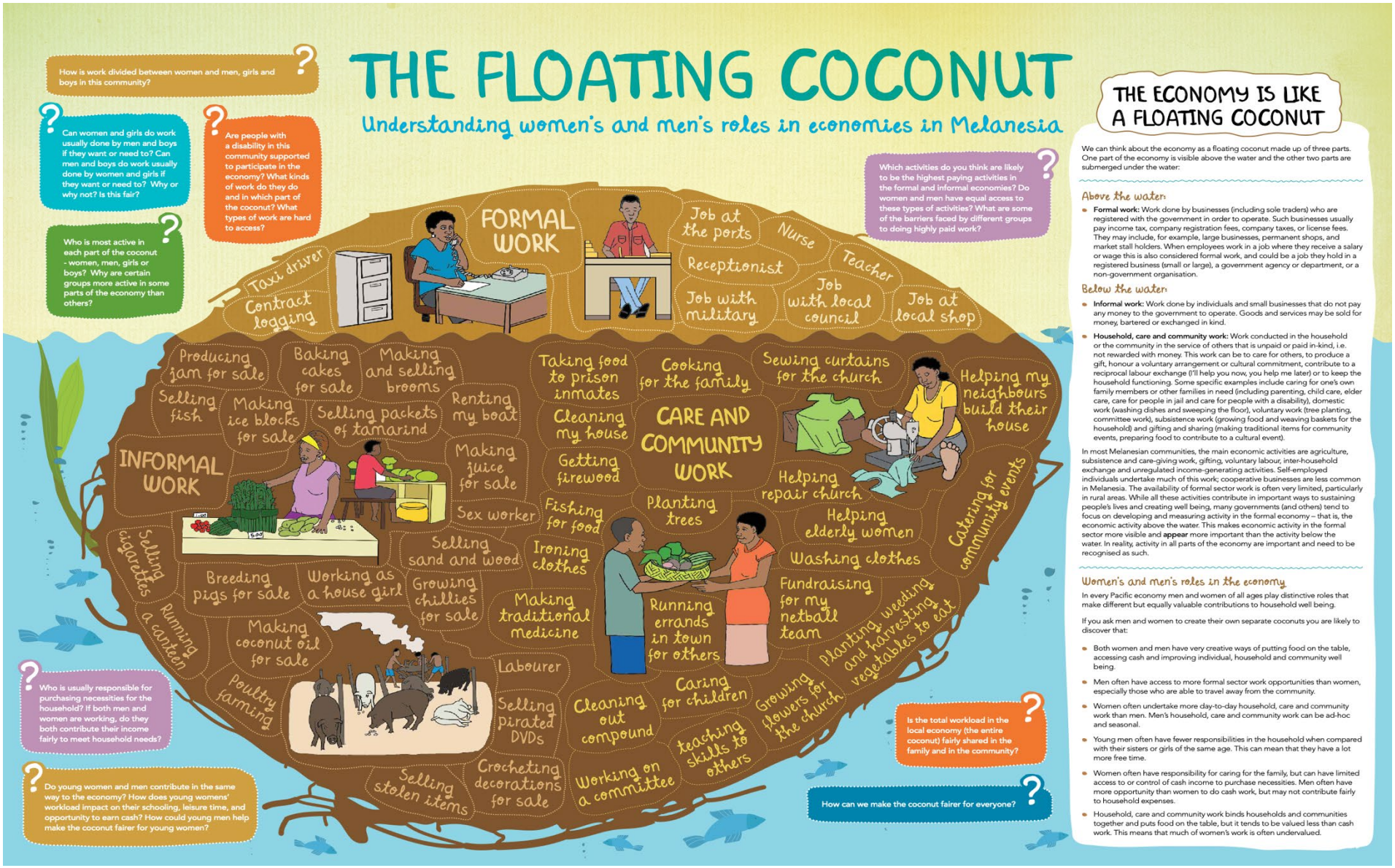
This is a draft list of gender issues relevant to the project developed by the research team in Jakarta and can be updated and revised during fieldwork.

Review gender issues:

- Fishing family
  - General livelihoods: activities during fishing and in absence of fishermen, non-fishing season.
  - Fishing activity
    - Roles (preparation, fishing, post fishing) segregated by gender by groups as boss/Juragan/crews.
  - Livelihood Opportunities
  - Livelihood strategies in normal situation
    - Access to capital for livelihood activities: debt (cash and non-cash),
    - expenditure,
  - Livelihood strategies (during shocks or emergency time: what happens in emergency situation who they will ask for help?
    - Low price of fish
    - High price of logistics
    - Member of family sickness
    - New School year
    - Social feast (life cycle ceremony)
  - Roles, including financial aspect segregated by gender
  - Power relation

        - Who decide on fishing ground, fishing boats, boss? Do women have a say to choose these aspects?
        - Who decide on the use of money?
        - Women's view on transboundary fishing: benefit, negative impact, & risk
    - Relationship among actors
        - wife of fisher is supported by boat owner
    - Their views on their children future?
- Intergenerational issues
    - Choice of future (work/education) between parents and children

- Attachment 10: The floating coconut



THE ECONOMY IS LIKE A FLOATING COCONUT

We can think about the economy as a floating coconut made up of three parts. One part of the economy is visible above the water and the other two parts are submerged under the water:

Above the water:

- **Formal work:** Work done by businesses (including sole traders) who are registered with the government in order to operate. Such businesses usually pay income tax, company registration fees, company taxes, or license fees. They may include, for example, large businesses, permanent shops, and market stall holders. When employees work in a job where they receive a salary or wage this is also considered formal work, and could be a job they hold in a registered business (small or large), a government agency or department, or a non-government organisation.

Below the water:

- **Informal work:** Work done by individuals and small businesses that do not pay any money to the government to operate. Goods and services may be sold for money, bartered or exchanged in kind.
- **Household, care and community work:** Work conducted in the household or the community in the service of others that is unpaid or paid in-kind, i.e. not rewarded with money. This work can be to care for others, to produce a gift, honour a voluntary arrangement or cultural commitment, contribute to a reciprocal labour exchange ('I'll help you now, you help me later) or to keep the household functioning. Some specific examples include caring for one's own family members or other families in need (including parenting, child care, elder care, care for people in jail and care for people with a disability), domestic work (washing dishes and sweeping the floor), voluntary work (tree planting, committee work), subsistence work (growing food and weaving baskets for the household) and gifting and sharing (making traditional items for community events, preparing food to contribute to a cultural event).

In most Melanesian communities, the main economic activities are agriculture, subsistence and care-giving work, gifting, voluntary labour, inter-household exchange and unregulated income-generating activities. Self-employed individuals undertake much of this work; cooperative businesses are less common in Melanesia. The availability of formal sector work is often very limited, particularly in rural areas. While all these activities contribute in important ways to sustaining people's lives and creating well being, many governments (and others) tend to focus on developing and measuring activity in the formal economy – that is, the economic activity above the water. This makes economic activity in the formal sector more visible and **appear** more important than the activity below the water. In reality, activity in all parts of the economy are important and need to be recognised as such.

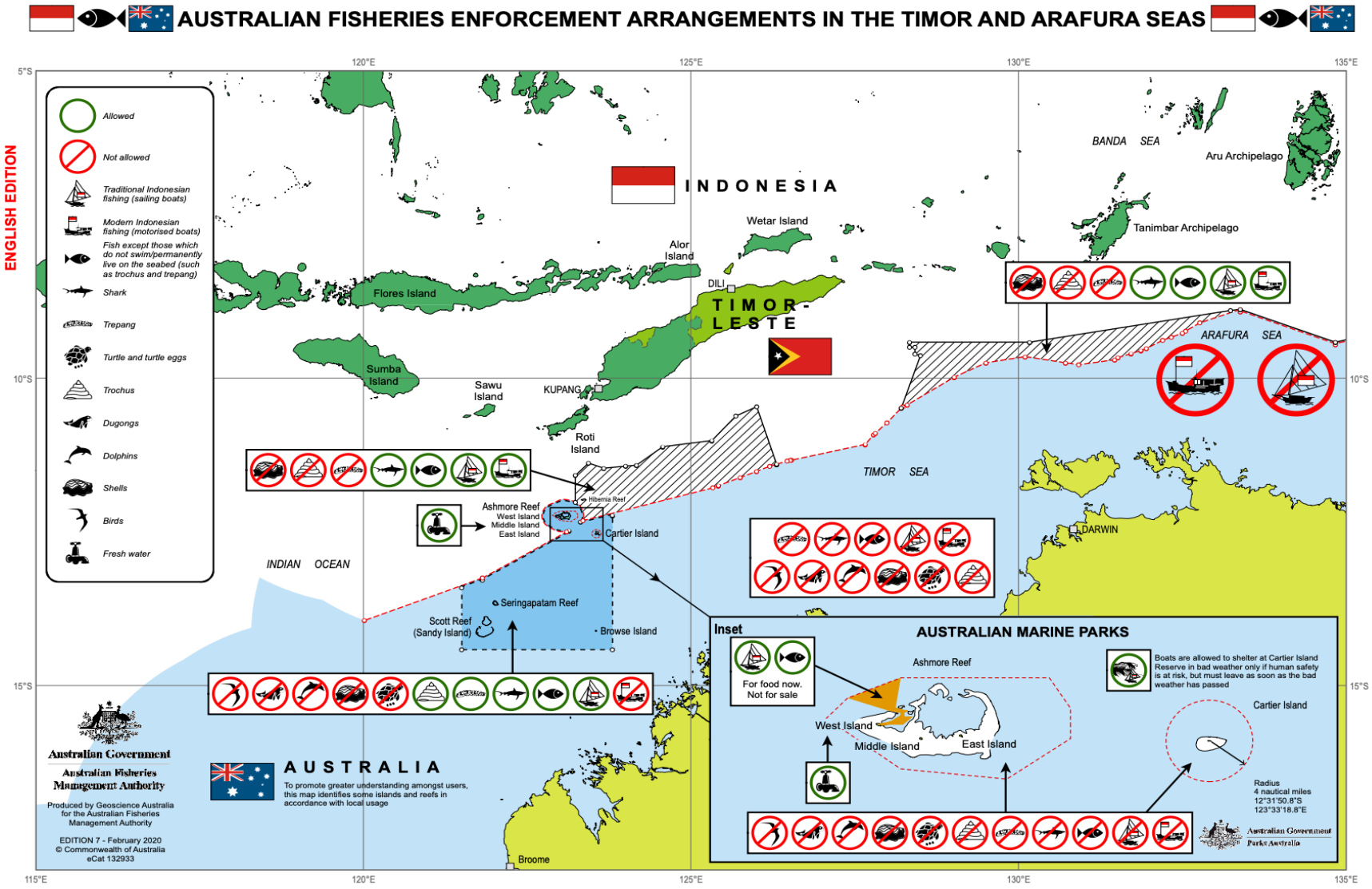
Women's and men's roles in the economy

In every Pacific economy men and women of all ages play distinctive roles that make different but equally valuable contributions to household well being.

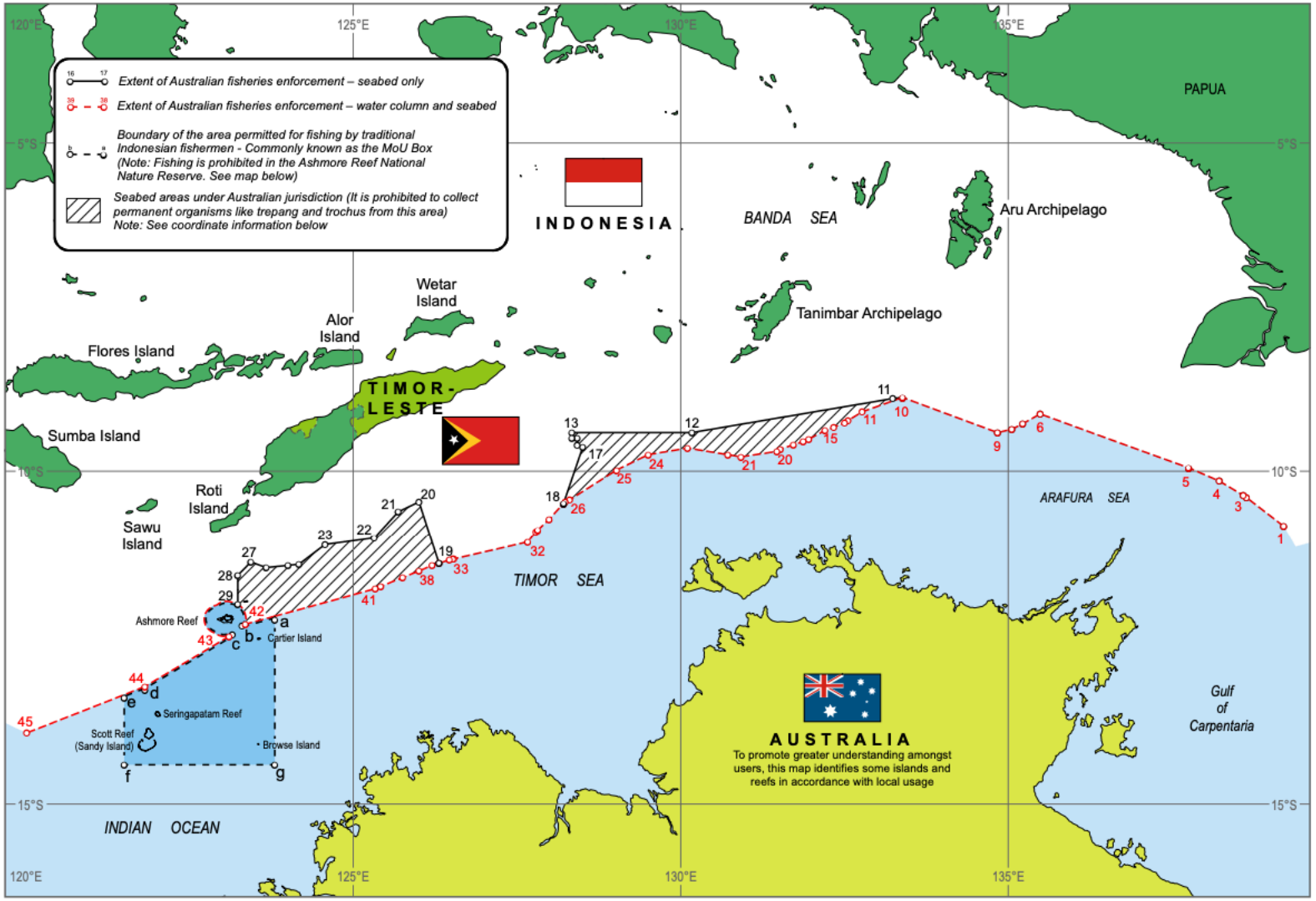
If you ask men and women to create their own separate coconuts you are likely to discover that:

- Both women and men have very creative ways of putting food on the table, accessing cash and improving individual, household and community well being.
- Men often have access to more formal sector work opportunities than women, especially those who are able to travel away from the community.
- Women often undertake more day-to-day household, care and community work than men. Men's household, care and community work can be ad-hoc and seasonal.
- Young men often have fewer responsibilities in the household when compared with their sisters or girls of the same age. This can mean that they have a lot more free time.
- Women often have responsibility for caring for the family, but can have limited access to or control of cash income to purchase necessities. Men often have more opportunity than women to do cash work, but may not contribute fairly to household expenses.
- Household, care and community work binds households and communities together and puts food on the table, but it tends to be valued less than cash work. This means that much of women's work is often undervalued.

- Attachment 11: Maps of AFZ and allowed fishing from AFMA Website


AUSTRALIAN FISHERIES ENFORCEMENT ARRANGEMENTS IN THE TIMOR AND ARAFURA SEAS
ENGLISH EDITION
Allowed
Not allowed
Traditional Indonesian fishing (sailing boats)
Modern Indonesian fishing (motorised boats)
Fish except those which do not swim/permanently live on the seabed (such as trochus and trepang)
Shark
Trepang
Turtle and turtle eggs
Trochus
Dugongs
Dolphins
Shells
Birds
Fresh water
INDONESIA
TIMOR-LESTE
AUSTRALIA
BANDA SEA
ARAFURA SEA
TIMOR SEA
INDIAN OCEAN
Aru Archipelago
Tanimbar Archipelago
Wetar Island
Alor Island
Flores Island
Sumba Island
Sawu Island
Roti Island
DILI
KUPANG
DARWIN
Broome
Ashmore Reef
West Island
Middle Island
East Island
Hibernia Reef
Cartier Island
Seringapatam Reef
Scott Reef (Sandy Island)
Browse Island
Inset
AUSTRALIAN MARINE PARKS
For food now. Not for sale
Boats are allowed to shelter at Cartier Island Reserve in bad weather only if human safety is at risk, but must leave as soon as the bad weather has passed
Radius 4 nautical miles 12°31'50.8"S 123°33'18.8"E
Australian Government
Australian Fisheries Management Authority
Produced by Geoscience Australia for the Australian Fisheries Management Authority
EDITION 7 - February 2020
© Commonwealth of Australia
eCat 132933
To promote greater understanding amongst users, this map identifies some islands and reefs in accordance with local usage
Australian Government
Parks Australia
5°S
10°S
15°S
115°E
120°E
125°E
130°E
135°E

AUSTRALIAN FISHERIES ENFORCEMENT ARRANGEMENTS IN THE TIMOR AND ARAFURA SEAS



Australia has strong fisheries laws and if you are caught illegally fishing in Australian waters you may lose your boat, your catch and your fishing gear. You may be fined or sent to jail.

11.2 Appendix 2: Drivers list

These are the drivers and dimensions according to the actor categories, study locations, and the number of times each was mentioned. Level 1 drivers are highlighted in the cells that span the table.

Table 11. Drivers and dimensions from actor categories, study locations, and mentions

Level 2 dimension	KII identifier	FGD identifier	SGI identifier
Economic and livelihood strategy			
Source of income (due to high value of target species)	KII1_Pep_Elderly1 KII1_Pep_Woman1 KII1_Pep_Woman2 KII1_Pep_Woman3 KII1_Pep_Woman4 KII1_Oel_Crew1 KII1_Oel_Woman2 KII1_Oes_Woman1 KII1_Oes_Woman2 KII2_Oes_Buyer1 KII2_Oes_BoatOwner&Trader1 KII1_Tan_BoatOwner1 KII1_Tan_Woman2 KII2_Tan_Crew1	FGD1_Oes_Crew FGD1_Oes_Women FGD1_Oel_Crew FGD1_Oel_Boat Owners&Captains FGD2_Oel_Boat Owners&Captains FGD2_Pep_BoatOwner&Captains	SGI1_Oel-elderly SGI1_Pep_Elderly
Patron–client relationships	KII1_Oes_Woman1 KII1_Pep_Woman1 KII1_Pep_Captain1 KII1_Pep_KioskOnwer1 KII1_Pep_Woman4 KII1_Tan_BoatOwner1 KII1_Tan_Captain1 KII1_Tan_Woman1	All FGDs on questions that cover fishing operational costs and debt	All SGIs on questions that cover fishing operational costs and debt

Level 2 dimension	KII identifier	FGD identifier	SGI identifier
	KII1_Tan_Woman4 KII2_Tan_Crew1 KII1_Pep_Elderly1 KII1_Tan_BoatOwner1 KII2_Tan_Crew1 KII1_Oel_TraderMoneyLenderElderly1		
Financial difficulties	KII1_Pep_Captain2 KII1_Pep_Crew3 KII1_Pep_Leader1 KII1_Pep_Woman3 KII1_Pep_Woman4 KII1_Pep_Captain2 KII1_Pep_Crew3 KII1_Pep_Captain1	FGD1_Oes_Boat Owners FGD1_Oes_Women	
High income in a short period	KII1_Oel_TraderMoneyLenderElder1 KIII1_Tan_Woman1 KII2_Tan_Crew1 KII2_Oes_Crew2	FGD1_Oel_Boat Owners&Captains	SGI1_Oel-elderly
Daily/basic family and household needs met	KII1_Pep_Captain1 KII1_Tan_BoatOwner1 KIII1_Tan_Woman2 KIII1_Tan_Woman3 KII2_Oes_Woman1		SGI2_Oel_Captain&Crew
Improvement in living conditions	KII1_Oel_Crew1 KII1_Tan_Woman2 KII1_Tan_Woman3		
Access/availability of livelihood assets (to engage in fishing) e.g. physical and human assets	KII1_Pap_Elderly1 KII1_Pap_Captain1 KII2_Oes_BoatOwner&Trader1	FGD1_Tan_Crew	

Level 2 dimension	KII identifier	FGD identifier	SGI identifier
	KII1_Oel_TraderMoneyLenderElderly1 KII2_Oes_BoatOwner1		
COVID-19-related			
New financial difficulties triggered by the pandemic	KII1_Pep_Woman4 KII1_Pep_Woman1 KII1_Tan_Woman2 KII1_Tan_BoatOwner1 KII1_Tan_Woman1 KII1_Pep_Elderly1 KII1_Oel_Crew1 KII1_Pep_Crew4 KII1_Pep_Captain1	FGD1_Oes_Boat Owner FGD1_Pep_Women FGD1_PepBoatOwner&Captain FGD1_Pep-Crew	SGI_Pep_Leaders_Elderly
Perceived leniency by Australian authorities	KII1_Pep_Captain2 KII1_Pep_Crew3 KII1_Pep_Crew1&2 KII1_Pep_Leader1 KII1_Pep_Captain2 KII1_Pep_Crew3	FGD1_Oes_Women FGD1_Oes_Boat Owner	
COVID-19 impacts attracting other fishers to join transboundary fishing	KII1_Pep_Captain1 KII1_Pep_Leader1 KII1_Tan_Crew1	FGD1_Pep-Boat Owner&Captain (Seroja typhoon) FGD1_Pap_Women FGD1_Oes_Women	
Psychological			
Seeing others return with big catches to home villages	KII1_Tan_Captain1 KII1_Pep_Crew 1		
Deriving entertainment, fun and pleasure	KII2_Tan_Crew1		
Demonstrating fearlessness and courage	KII1_Tan_Crew1 KII1_Tan_Woman4		

Level 2 dimension	KII identifier	FGD identifier	SGI identifier
Priding oneself in proof of strength and resilience	KII2_Tan_Crew1		
Enjoying spontaneity	KII2_Tan_Crew1 KII2_Oes_Crew2		
Environmental			
Resource abundance and availability	KII1_Pep_Elderly1 KII1_Pep_Crew1&2 KII1_Pep_Elderly1 KII2_Oes_Crew2 KII1_Tan_Crew2		
Proximity to Australian waters and accessibility of marine products	KII1_Pep_Elderly1 KII1_Oes_Woman1		
Seasonality, weather and sea conditions	KII1_Pep_Captain2 KII1_Pep_Crew3	FGD_Tan_BoatOwners&Captains FGD_Oes_BoatOwners&Captains	
Cultural and historical			
Long-distance sailing and fishing are a tradition	KII1_Pep_Captain1 KII1_Pep_Elderly1 KII1_Pep_Leader1	FGD1_OEL_Crew	
Fishing in Australian waters is a traditional livelihood activity and right	KII1_Pep_Captain1 KII1_Pep_Leader1		
Fishing is an intergenerational activity	KII2_Tan_Crew1 KII1_Tan_Woman1 KII1_Tan_Woman2	FGD1_OEL_Crew	
Knowledge and practical skills	KII1_Tan_Captain3		
Social			
Fisher demographic characteristics	KII1_Tan_Woman4 KII2_Oes_Crew2		

Level 2 dimension	KII identifier	FGD identifier	SGI identifier
	KII1_Pep_Captain1 KII1_Tan_Woman4 KII2_Oes_Crew2		
Faith in God and fate: “the outcome is in God’s hands”	KII1_Pep_Woman2 KII1_Pep_Leader1	FGD1_Pep-Crew	
Policy and management			
Imprisonment not perceived as a punishment	KII1_Pep_Captain2 KII1_Pep_Crew3 KII1_Pep_Captain2 KII1_Pep_Crew3 KII1_Tan_Captain1	FG1_Pep_Crew1	
Fishers have knowledge on Australian patrol schedules and can establish avoidance strategies	KII1_Oel_TraderMoneyLenderElderly1	FGD1_BoatOwner&Captain FGD1_Tan_BoatOwner	SGI1_Oes_Elderly SGI1_Pep_Elderly
Lenient and positive treatment by those guarding or patrolling			SGI2_Oel_Captain&Crew
No effective Indonesian Government deterrence		FGD1_Pep_Crew	

11.3 Appendix 3: Fact sheet (English) *Research Project Update October 2024*

Note: the following pages show content, not layout, of the fact sheet.

❑ Towards improved livelihoods for Indonesian fishers in Nusa Tenggara Timur Province, Indonesia Project

❑ *Research Project Update*

October 2024

This fact sheet has been prepared to support discussions on the preliminary results of this project with the community and government research participants, and seek further views on solutions for reducing illegal transboundary fishing in Australian waters and potential livelihood improvements in communities.

❑ What is the research about?

The project explores the experiences and perceptions concerning the multiple drivers of recent transboundary Indonesian fishing in Australian waters and the impacts of apprehensions at individual, family and community levels. We are also exploring research participants views on solutions to illegal fishing activity and opportunities to support other gendered livelihood improvements in selected communities.

This project is a collaboration between researchers from Indonesian and Australian Universities and Research Agencies (see research team below) and is funded by the Australian Centre for International Agricultural Research (ACIAR). The project started in March 2022 and will end in December 2024.

The outcomes of this project are to:

- Increase current understanding of the multiple drivers and contexts of illegal and legal Indonesian fishing in Australian waters particularly since the COVID 19 Pandemic in 2020
- Deliver new knowledge to understand Indonesian fishing in Australian waters through a gendered behavioural change lens,
- Provide preliminary identification of recommendations for addressing illegal fishing and livelihood improvements in vulnerable communities in NTT.

Activities conducted with fishing communities and other stakeholders in NTT

In August and October 2023, the research team visited five targeted communities: Papela, Tanjung Pasir, Oelaba and Oenggai villages in Kabupaten Rote Ndao, and Oesapa village in Kabupaten Kupang, West Timor. These locations were chosen because each represents different types of engagement in transboundary fishing. During two visits the team facilitated focus group discussions, small group interviews, and key informant interviews with a range of individuals. Research participants included crew members, captains and boat owners, and female members of their households, local traders, village, and local government leaders. In total, 227 people participated comprising 168 men and 58 women (the gender of one participant was not recorded). This included the following numbers of male and female participants in each of the locations: Papela (55 people – 43 M, 12 F);

Tanjung (47 people: 30 M, 17 F), Oelaba (63: 45 M; 18 F); Oenggai (16: 15 M, 1 F) and Oesapa (46: 35 M, 10 F).

- **What we found**

- While the data collection was limited to the five locations, fishers who engage in illegal activity in the AFZ originate from many different islands and ethnic groups from Indonesia. Some groups have been active in the region for longer than others. Different groups access various products such as sea cucumber, reef fish, and sharks and use different technology and boats.

Behavioural Drivers of Illegal Indonesian Transboundary Fishing
Based on the information we collected from research participants in the target villages we identified seven reasons or drivers as to why fishers engage in illegal fishing activity in Australian waters and in particular since the COVID 19 Pandemic (see Figure 1).

We found that these drivers are interrelated and many fishers engage in transboundary fishing for multiple reasons. For each of these 7 drivers there are additional dimensions of sub reasons which are described in more detail below. We did not weigh the importance of drivers for each village or participant group as we concluded that the importance of one driver is likely to change over time and most fishing activity cannot be attributed only to one driver in isolation from other drivers and broader societal enabling factors (see below).

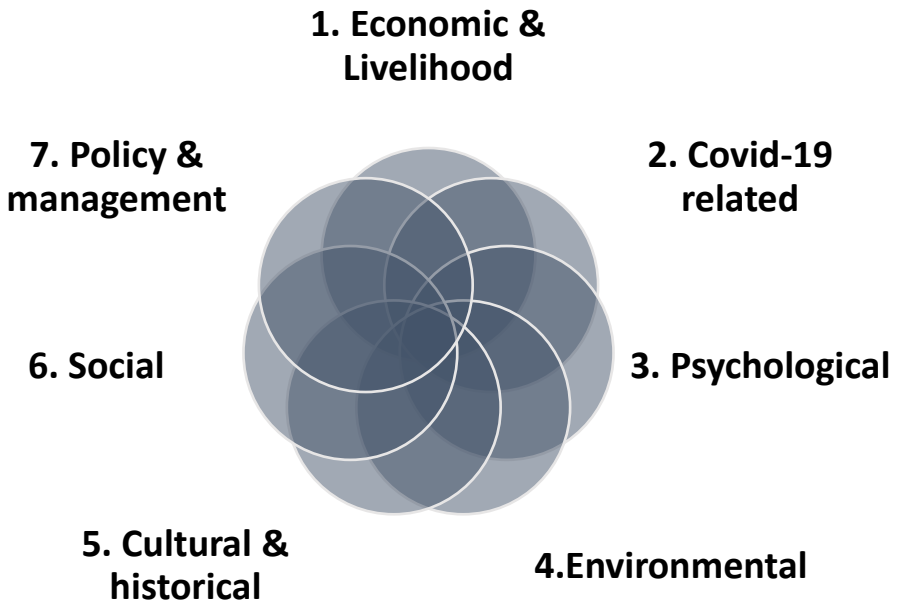


Figure 1: Seven interconnected behavioural drivers of illegal Indonesian transboundary fishing in Australian waters

1. *Economic and livelihood strategy drivers* refer to transboundary fishing as *providing a source of income* in the context of lower or insufficient income from other livelihood activities and/or limited livelihood opportunities to generate income. Study

participants consider illegal fishing attractive for providing a substantial income (much higher than average monthly incomes from other livelihood activities) in a short period. The income generated from transboundary fishing is used to meet daily/basic household needs and expenses, to service financial debt, as a source of finance to invest in assets (e.g. housing and fishing gear), and to improve household livelihoods and well-being.

2. *COVID-19-related drivers* refer to social, economic, and mobility changes triggered at the beginning of the 2020 pandemic. Research participants correlate the COVID-19 pandemic with new financial difficulties, driving them to pursue fishing in the AFZ. It was reported that during the pandemic, fishers experienced a drop in market prices for fish species targeted in Indonesian waters and difficulties accessing local towns and markets on Rote island and Kupang. However, the price of trepang remained high, with very strong market demand. Fishers also believed they would be less likely to be apprehended and prosecuted by Australian authorities during this time due to social distancing restrictions.
3. *Psychological drivers* refer to the underlying thoughts and attitudes prompting fisher engagement in transboundary fishing. This includes, for example, individual motivation from seeing others return with big catches, pleasure and camaraderie experience of working together with peers, bravery, and the absence of fear of getting caught and punished by Australian authorities and showing strength and resilience.
4. *Environmental drivers* refer to the more abundant supply of trepang and other products perceived by fishers to be available in Australian waters and the geographic proximity of fishing communities to the AFZ.
5. *Cultural and historical drivers* refer to the factors that have prompted Indonesian fishing in areas now part of the Australian waters, such as history of long-distance sailing and fishing tradition to the reefs and islands inside the MOU box as well as reefs and islands located offshore of the Kimberley mainland, designated as 'Australian waters', frequented by Indonesian fishers for many generations.
6. The phrase *'social drivers'* encompasses determinants associated with relationships within families, communities, groups, and society and religious beliefs.
7. *Policy and management* drivers pertain to the perspectives of participants on possible responses by Australian authorities if intercepted or caught at sea and the possibility of avoiding detection.

Opportunity Context: Other enablers of illegal Indonesian fishing

One of the challenges associated with understanding and addressing illegal fishing drivers is the interconnectedness of individual fisher or 'actor based' drivers and the wider social and economic influences present in the day to day lives and wellbeing of communities and society at large. These include deficiencies in the regulatory environment, social or economic systems influencing the value chain, ethnic marginalisation or specific community group livelihood vulnerabilities. Some of the 'enablers' of illegal Indonesian fishing identified in the data can also be interpreted as 'drivers' and are thus listed under both sections.

A major enabling factor in non-compliant fishing is the economic trade and market aspects of fishing. These include a domestic and international market demand for high-value species,

high prices, fishers' access to markets through buyers and a supporting patron-client system for fishers which can cover a range of aspects from access to operational capital and funds for families, access to boats and equipment, access to buyers, and longer-term support in times of need.

Motorised boats and fuel availability also appear to be key enablers, as without fuel or affordable fuel (in the context of costs vs returns) would severely impact activity. These enabling factors are also supported by cultural tradition and a substantial set of Traditional Knowledge and skills associated with fishing specific to some fisher groups. Further, there is a large pool of crews available. Seasonality, weather and sea conditions also are an environmental enabler. The existence of the 1974 Memorandum of Understanding (MOU) agreement also can be considered an enabling policy driver, as legal fishing can be the gateway to illegal fishing. Difficulties of the Indonesian government to effectively prevent fishers from engaging in transboundary fishing also contributes. Finally, the research results also emphasised the limited livelihood opportunities and barriers for some communities.

Risks from engaging in illegal fishing

We also asked people about their perceptions of risk in relation to drivers of illegal fishing. Engagement in transboundary fishing is recognized by research participants as a high-risk activity, carrying 'accident, health, and safety risks,' 'economic and livelihood risks,' and the risk of 'getting caught by Australian authorities. Risk and decision making around illegal fishing engagement can also be influenced by the boat owner or boss.

Impacts of apprehensions

We also asked people about the impacts of apprehensions, or what is most often termed by research participants as "getting caught" ('ditangkap') by Australian authorities [i.e., there is no specific terms used by fishers to distinguish between a penalty of legislative forfeiture (seizure of boat, gear and or catch at sea) or apprehension and prosecution through the Australia legal system]. The types of impacts people identified included the type of 'punishment'; economic and livelihood impacts and gendered impacts on family. Detention in Australia and/or having a boat confiscated, forfeited, and or destroyed are considered to have gendered livelihood impacts on the families of fishers.

Perspectives on government policy

Participants were also asked about their perspectives on government policy to manage transboundary fishing regarding illegal fishing and the MOU box fishery. Research participants shared their approval of Australian policy during COVID 19 Pandemic years. This response is a reflection of Australian approaches during the pandemic, with fewer boat apprehensions at sea and crews taken to Darwin for prosecution through the courts. Other research participants said that attitudes towards Australian policy responses are more mixed.

Livelihood Enhancements

We were also interested to know what livelihood support projects had been implemented in the last decade in the target villages and if research participants had benefited from any livelihood capacity development activities by government, NGOs or development programs. Most participants (men and women) reported no or little past previous involvement in development and livelihood opportunities.

Summary

The Australian and Indonesian governments have historically relied on monitoring, control and surveillance as enforcement strategies to reduce illegal fishing, coupled with legislative forfeiture (seizure of catch, equipment or vessels at sea) or more severe penalties such as apprehension of boats and detention and prosecution in Australia. However, these responses have been shown to have limited long-term success in reducing illegal small-scale Indonesian fishing, as indicated by the resurgence of incursions in Australian waters since the start of the COVID-19 pandemic in 2020 until the current time. Our research results on drivers, risk and impacts support the need for dialogue on the effectiveness of current deterrence approaches, as well as additional strategies, such as improving access to domestic fisheries, or other livelihoods through a range of approaches.

Next steps

During our visit to Kupang and Rote in October 2024, we invite further discussion from community and government representatives. We would like your opinion on

- solutions to reduce illegal fishing and the impacts of apprehension
- reducing the risks that illegal transboundary fishing poses to fishers (such as health and safety hazards, accidents)
- possible future livelihood enhancements with the aim of activities to build and support the existing assets and wellbeing of fishers and their families through for example domestic fisheries, management, education, or other enterprise support.

Following completion of these community visits, we will finalise out report for ACIAR in late 2024 and the results shared with numerous stakeholders including Australia and Indonesian government through various communication channels.

Project Team

Indonesia: Dr. Dedi S. Adhuri, (Co Project Leader), Dr. Achmad Zamroni, Mrs. Widya Safitri, BRIN**;** Jotham Ninef, Mr. Tegar V. Nalle, Mrs. Lasmi Perikanan, UNDANA**;** Dr Ria Fitriana, Consultant

Australia: Prof Natasha Stacey (Team Leader) & Dr Kylie McKenna, Charles Darwin University

❑ *For more information contact Dr* Dedi Adhuri via WhatsApp (+62 813 8394 0111) and email (dediadhuri@hotmail.com)

❑

❑ **Ethical Consent and Permits**

Ethical clearance for the research was obtained through the Charles Darwin University Human Research Ethics Committee (Approval number: H23055) and Ethics Committee on Social Studies and Humanities National Research and Innovation Agency (Approval number: 505 /KE.01/SK/07/2023).

Due to ethical sensitivities participants were asked not to disclose any specific information regarding illegal activity in Australian waters where this is not publicly available information. All information shared by participants was recorded anonymously.

Thank you for taking part in this research.

11.4 Appendix 4: Fact sheet (Bahasa) *Perkembangan Proyek Penelitian Oktober 2024*

Note: the following pages show content, not layout, of the fact sheet.

❑ Menuju peningkatan mata pencaharian nelayan Indonesia di Provinsi Nusa Timur, Proyek Indonesia

❑ *Perkembangan Proyek Penelitian*

Oktober 2024

Lembar fakta ini telah disiapkan untuk mendukung diskusi tentang hasil awal riset dengan peserta penelitian dari masyarakat dan pemerintah, dan mencari pendapat lebih lanjut tentang solusi untuk mengurangi penangkapan ikan lintas batas secara ilegal di perairan Australia dan potensi peningkatan mata pencaharian di masyarakat.

❑ Fokus penelitian

Penelitian ini mengeksplorasi pengalaman dan persepsi mengenai berbagai pendorong penangkapan ikan lintas batas Indonesia ke perairan Australia yang terjadi baru-baru ini dan dampaknya di tingkat individu, keluarga dan Masyarakat. Penelitia ini juga mengeksplorasi pandangan peserta penelitian tentang solusi untuk aktivitas penangkapan ikan ilegal dan peluang untuk mendukung peningkatan mata pencaharian lainnya di komunitas tertentu.

Riset ini merupakan kolaborasi antara para peneliti dari Universitas dan Lembaga Penelitian Indonesia dan Australia (lihat tim peneliti di bawah) dan didanai oleh Pusat Penelitian Pertanian Internasional Australia (ACIAR). Proyek ini dimulai pada Maret 2022 dan akan berakhir pada Desember 2024.

Luaran dari riset ini adalah:

- Peningkatkan pemahaman tentang berbagai pendorong dan konteks penangkapan ikan ilegal dan legal nelayan Indonesia di perairan Australia terutama sejak Pandemi COVID 19 pada tahun 2020
- Memberikan pengetahuan baru untuk memahami penangkapan ikan Indonesia di perairan Australia melalui lensa perubahan perilaku berdasarkan gender,
- Memberikan identifikasi awal rekomendasi untuk mengatasi masalah penangkapan ikan ilegal dan peningkatan mata pencaharian di masyarakat rentan di NTT.

Kegiatan yang dilakukan bersama komunitas nelayan dan pemangku kepentingan lainnya di NTT

Pada bulan Agustus dan Oktober 2023, tim peneliti mengunjungi lima komunitas sasaran: Desa Papela, Tanjung Pasir, Oelaba dan Oenggai di Kabupaten Rote Ndao, dan desa Oesapa di Kabupaten Kupang, Timor Barat. Lokasi-lokasi ini dipilih karena masing-masing mewakili jenis keterlibatan yang berbeda dalam penangkapan ikan lintas batas. Selama dua kunjungan, tim memfasilitasi diskusi kelompok terfokus, wawancara kelompok kecil, dan wawancara informan kunci dengan berbagai individu. Peserta penelitian termasuk anggota awak kapal, kapten dan pemilik kapal, dan anggota rumah tangga perempuan, pedagang lokal, aparat desa, dan pemimpin pemerintah daerah. Secara total, 225 orang telah

berpartisipasi dadlam riset ini yang terdiri dari 164 pria dan 61 wanita. Ini termasuk jumlah peserta pria dan wanita berikut di masing-masing lokasi:

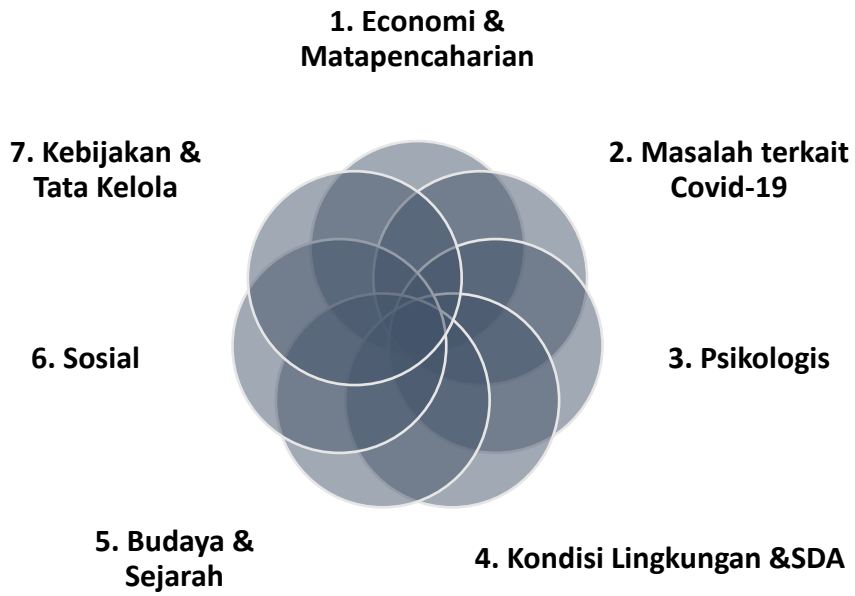
Papela (53 orang – 39 pria, 14 wanita); Tanjung (47 orang: 30 pria, 17 wanita), Oelaba (63: 44 pria; 19 wanita); Oenggai (16: 15 pria, 1 wanita) dan Oesapa (46: 36 pria, 10 wanita)

- **Temuan penelitian**

- Meskipun pengumpulan data terbatas pada lima lokasi, riset ini telah mengidentifikasi nelayan yang terlibat dalam aktivitas ilegal di daerah penangkapan ikan Australia (*AFZ*) berasal dari berbagai pulau dan kelompok etnis dari Indonesia (tidak hanya dari Rote dan Kupang). Beberapa kelompok telah aktif di wilayah tersebut lebih lama daripada yang lain. Kelompok yang berbeda mengakses berbagai produk seperti teripang, ikan karang, dan hiu serta menggunakan teknologi dan perahu yang berbeda.

Faktor Pendorong Perilaku Penangkapan Ikan Ilegal Lintas Batas Indonesia
Berdasarkan informasi yang kami kumpulkan dari peserta penelitian, kami mengidentifikasi tujuh alasan atau pendorong mengapa nelayan terlibat dalam aktivitas penangkapan ikan ilegal di perairan Australia dan khususnya sejak Pandemi COVID 19 (lihat Gambar 1).

Kami menemukan bahwa faktor pendorong ini saling terkait dan banyak nelayan terlibat dalam penangkapan ikan lintas batas karena berbagai alasan. Untuk masing-masing dari 7 driver ini ada dimensi tambahan dari sub alasan yang dijelaskan secara lebih rinci di bawah ini. Kami tidak mempertimbangkan pentingnya pendorong untuk setiap desa atau kelompok peserta karena kami menyimpulkan bahwa pentingnya satu faktor tersebut cenderung berubah dari waktu ke waktu dan sebagian besar aktivitas penangkapan ikan tidak dapat dikaitkan hanya dengan satu faktor pendorong yang terpisah dari faktor lain dan faktor pendukung sosial yang lebih luas (lihat di bawah).



Perawakan 2: Tujuh faktor pendorong perilaku yang saling berhubungan dari penangkapan ikan ilegal lintas batas Indonesia di perairan Australia

8. ***Faktor strategi ekonomi dan mata pencaharian*** mengacu pada penangkapan ikan lintas batas sebagai *sumber pendapatan* dalam situasi di mana pendapatan dari mata pencaharian lain rendah atau tidak mencukupi serta terbatasnya peluang mata pencaharian yang menghasilkan pendapatan mencukupi. Peserta penelitian menganggap penangkapan ikan ilegal menarik karena memberikan pendapatan yang besar dalam waktu singkat (jauh lebih tinggi dari pendapatan bulanan rata-rata dari kegiatan mata pencaharian lainnya). Pendapatan yang dihasilkan dari penangkapan ikan lintas batas digunakan untuk memenuhi kebutuhan dasar rumah tangga sehari-hari, untuk membayar utang, sebagai sumber untuk berinvestasi dalam aset (misalnya perumahan dan alat tangkap), dan untuk meningkatkan mata pencaharian dan kesejahteraan rumah tangga.
9. ***Pendorong Masalah terkait COVID-19*** mengacu pada perubahan sosial, ekonomi, dan mobilitas yang dipicu pada awal pandemi 2020. Peserta penelitian menghubungkan pandemi COVID-19 dengan kesulitan keuangan baru yang oleh karenanya mendorong mereka untuk mengejar penangkapan ikan di *AFZ*. Dikatakan bahwa selama pandemi, harga ikan hasil tangkapan di perairan Indoensia turun secara drastis dan nelayan kesulitan mengakses kota-kota dan pasar lokal di pulau Rote dan Kupang. Namun, harga trepang tetap tinggi, dengan permintaan pasar yang sangat kuat. Nelayan juga percaya bahwa mereka akan lebih kecil kemungkinannya untuk ditangkap dan dituntut oleh pihak berwenang Australia selama waktu ini karena pembatasan jarak sosial.
10. ***Pendorong psikologis*** mengacu pada pemikiran dan sikap yang mendasari yang mendorong keterlibatan nelayan dalam penangkapan ikan lintas batas. Ini termasuk, misalnya, motivasi individu dari melihat orang lain kembali dengan tangkapan besar,

kesenangan dan pengalaman persahabatan bekerja sama dengan teman sebaya, keberanian, dan tidak ada rasa takut ditangkap dan dihukum oleh pihak berwenang Australia dan menunjukkan kekuatan dan ketahanan.

11. ***Pendorong lingkungan*** mengacu pada pasokan trepang dan produk lain yang lebih melimpah yang dirasakan oleh nelayan tersedia di perairan Australia dan kedekatan geografis komunitas nelayan dengan *AFZ*.
12. ***Pendorong budaya dan sejarah*** mengacu pada faktor-faktor yang mendorong penangkapan ikan Indonesia di daerah yang sekarang menjadi bagian dari perairan Australia, seperti sejarah pelayaran jarak jauh dan tradisi penangkapan ikan ke terumbu karang dan pulau-pulau di dalam kotak MOU serta terumbu karang dan pulau-pulau yang terletak di lepas pantai daratan Kimberley, yang ditetapkan sebagai 'perairan Australia', yang sering dikunjungi oleh nelayan Indonesia selama beberapa generasi.
13. Istilah ***'pendorong sosial'*** mencakup faktor penentu yang terkait dengan hubungan dalam keluarga, komunitas, kelompok, dan masyarakat dan keyakinan agama.
14. ***Pendorong kebijakan dan manajemen*** berkaitan dengan perspektif peserta tentang kemungkinan tanggapan oleh otoritas Australia jika mereka kedapatan atau atau tertangkap di laut dan kemungkinan menghindari penangkapan.

Konteks Peluang: Pendukung lain dari penangkapan ikan ilegal Indonesia

Salah satu tantangan untuk memahami dan menangani faktor pendorong penangkapan ikan ilegal adalah keterkaitan nelayan secara individu atau pendorong 'berbasis aktor' dan pengaruh sosial dan ekonomi yang lebih luas yang dialami dalam kehidupan sehari-hari dan kesejahteraan masyarakat pada umumnya. Ini termasuk kekurangan dalam lingkungan peraturan, sistem sosial atau ekonomi yang memengaruhi rantai nilai, marginalisasi etnis atau kerentanan mata pencaharian kelompok masyarakat tertentu. Beberapa ‘kondisi pendukung' penangkapan ikan ilegal Indonesia yang diidentifikasi dalam data juga dapat ditafsirkan sebagai 'pendorong' dan dengan demikian tercantum di kedua bagian tersebut.

Faktor pendukung utama dalam penangkapan ikan ilegal adalah aspek-aspek terkait perdagangan dan pasar. Ini termasuk permintaan pasar domestik dan internasional untuk spesies bernilai tinggi, harga tinggi, akses nelayan ke pasar melalui pembeli dan sistem patron-klien pendukung untuk nelayan yang dapat mencakup berbagai aspek mulai dari akses ke modal operasional dan dana untuk keluarga, akses ke kapal dan peralatan, akses ke pembeli, dan dukungan jangka panjang pada saat dibutuhkan.

Perahu bermotor dan ketersediaan bahan bakar juga tampaknya menjadi pendorong utama, karena tanpa bahan bakar atau bahan bakar yang terjangkau (dalam konteks biaya vs pengembalian) akan sangat berdampak pada aktivitas. Faktor-faktor pendukung ini juga didukung oleh tradisi budaya dan seperangkat pengetahuan tradisional dan keterampilan yang substansial yang terkait dengan penangkapan ikan khusus untuk beberapa kelompok nelayan. Selanjutnya, juga karena ada banyak kru yang tersedia. Musiman, cuaca, dan kondisi laut juga merupakan pendorong lingkungan. Keberadaan perjanjian Memorandum of Understanding (MOU) tahun 1974 juga dapat dianggap sebagai pendorong kebijakan yang memungkinkan, karena penangkapan ikan legal dapat menjadi pintu gerbang menuju

penangkapan ikan ilegal. Kesulitan pemerintah Indonesia untuk secara efektif mencegah nelayan terlibat dalam penangkapan ikan lintas batas juga berkontribusi. Terakhir, hasil penelitian juga menemukan terbatasnya peluang mata pencaharian dan hambatan bagi beberapa masyarakat untuk mengembangkan mata pencaharian lain.

Risiko dari keterlibatan dalam penangkapan ikan ilegal

Kami juga bertanya kepada orang-orang tentang persepsi mereka tentang risiko dalam kaitannya dengan pendorong penangkapan ikan ilegal. Keterlibatan dalam penangkapan ikan lintas batas diakui oleh peserta penelitian sebagai kegiatan berisiko tinggi, membawa 'risiko kecelakaan, kesehatan, dan keselamatan', 'risiko ekonomi dan mata pencaharian,' dan risiko 'ditangkap oleh otoritas Australia. Risiko dan pengambilan keputusan seputar keterlibatan penangkapan ikan ilegal juga dapat dipengaruhi oleh pemilik atau bos kapal.

Dampak dari penangkapan

Kami juga bertanya kepada orang-orang tentang dampak penangkapan, atau apa yang paling sering disebut oleh peserta penelitian sebagai "tertangkap" ('ditangkap') oleh pihak berwenang Australia [yaitu, tidak ada istilah khusus yang digunakan oleh nelayan untuk membedakan antara hukuman penyitaan legislatif (penyitaan kapal, peralatan dan atau tangkapan di laut) atau penangkapan dan penuntutan melalui sistem hukum Australia]. Jenis dampak yang diidentifikasi orang termasuk jenis 'hukuman'; dampak ekonomi dan mata pencaharian serta dampak gender pada keluarga. Penahanan di Australia dan/atau kapal disita, disita, dan atau dihancurkan dianggap memiliki dampak mata pencaharian gender pada keluarga nelayan.

Perspektif tentang kebijakan pemerintah

Peserta juga ditanya perspektif mereka tentang kebijakan pemerintah untuk mengelola penangkapan ikan lintas batas terkait penangkapan ikan ilegal dan perikanan di MOU box. Peserta penelitian bersetuju dengan kebijakan Australia selama tahun-tahun Pandemi COVID 19. Tanggapan ini merupakan cerminan dari pendekatan Australia selama pandemi, dengan lebih sedikit penangkapan kapal di laut dan kru dibawa ke Darwin untuk dituntut melalui pengadilan. Peserta penelitian lain mengatakan bahwa sikap nelayan terhadap kebijakan Australia lebih beragam.

Peningkatan Mata Pencaharian

Kami juga tertarik untuk mengetahui proyek dukungan mata pencaharian apa yang telah dilaksanakan dalam dekade terakhir di desa-desa sasaran dan apakah peserta penelitian mendapat manfaat dari kegiatan pengembangan kapasitas mata pencaharian oleh pemerintah, LSM atau program pembangunan. Sebagian besar peserta (pria dan wanita) melaporkan tidak ada atau sedikit keterlibatan mereka dalam progam pembangunan dan peluang pemingkatan mata pencaharian.

Ringkasan

Pemerintah Australia dan Indonesia secara historis mengandalkan pemantauan, pengendalian, dan pengawasan sebagai strategi penegakan hukum untuk mengurangi penangkapan ikan ilegal, ditambah dengan penyitaan legislatif (penyitaan tangkapan, peralatan atau kapal di laut) atau hukuman yang lebih berat seperti penangkapan kapal dan penahanan serta penuntutan di Australia. Namun, stategi ini telah terbukti kurang berhasil -- jangka panjang-- dalam mengurangi penangkapan ikan ilegal skala kecil di Indonesia, seperti yang ditunjukkan oleh kebangkitan serbuan di perairan Australia sejak dimulainya pandemi COVID-19 pada tahun 2020 hingga saat ini. Hasil penelitian kami tentang pendorong, risiko, dan dampak mendukung perlunya dialog tentang efektivitas pendekatan penangkapan saat ini, serta strategi tambahan, seperti meningkatkan akses ke perikanan domestik, atau mata pencaharian lainnya melalui berbagai pendekatan.

Langkah berikutnya

Selama kunjungan kami ke Kupang dan Rote pada Oktober 2024, kami mengundang diskusi lebih lanjut dari perwakilan masyarakat dan pemerintah. Kami ingin pendapat Anda tentang

- Solusi untuk mengurangi penangkapan ikan ilegal dan dampak penangkapan
- mengurangi risiko penangkapan ikan lintas batas ilegal bagi nelayan (seperti bahaya kesehatan dan keselamatan, kecelakaan)
- Kemungkinan peningkatan mata pencaharian di masa depan dengan tujuan kegiatan untuk membangun dan mendukung aset dan kesejahteraan nelayan dan keluarga mereka yang ada melalui misalnya perikanan domestik, manajemen, pendidikan, atau dukungan perusahaan lainnya.

Setelah menyelesaikan kunjungan komunitas ini, kami akan menyelesaikan laporan untuk ACIAR pada akhir tahun 2024 dan hasilnya dibagikan kepada berbagai pemangku kepentingan termasuk Australia dan pemerintah Indonesia melalui berbagai saluran komunikasi.

Tim Proyek

Indonesia: Dr. Dedi S. Adhuri, (Co Project Leader), Dr. Achmad Zamroni, Widya Safitri, BRIN; Jotham Ninef, Bapak Tegar V. Nalle, Nyonya Lasmi Perikanan, UNDANA; Dr Ria Fitriana, Konsultan

Australia: Prof Natasha Stacey (Ketua Tim) & Dr Kylie McKenna, Universitas Charles Darwin

❑ *Untuk informasi lebih lanjut, hubungi Dr* Dedi Adhuri melalui WhatsApp (+62 813 8394 0111) dan email (dediadhuri@hotmail.com)

❑

❑ **Persetujuan dan Izin Etis**

Izin etik penelitian diperoleh melalui Komite Etik Penelitian Manusia Universitas Charles Darwin (Nomor Persetujuan: H23055) dan Komite Etik Ilmu Sosial dan Humaniora Badan Riset dan Inovasi Nasional (Nomor Persetujuan: 505/KE.01/SK/07/2023).

Karena sensitivitas etika, peserta diminta untuk tidak mengungkapkan informasi spesifik apa pun mengenai aktivitas ilegal di perairan Australia di mana ini bukan informasi yang tersedia untuk umum. Semua informasi yang dibagikan oleh peserta dicatat secara anonim.

Terima kasih telah mengambil bagian dalam penelitian ini.

11.5 Appendix 5: Participants at community and stakeholder feedback meetings

Table 12. Participants at community and stakeholder feedback meetings (October 2024)

Village	No. of participants	Gender		Occupation type							
		Men	Women	a	b	c	d	e	f	g	h
Oelua/ Oelaba	20	15	5	17	3	0	0	0	0	0	0
Papela	23	14	9	7	8	2	2	1	1	2	0
Tanjung	27	15	12	15	11	1	0	0	0	0	0
Kupang	18	12	6	9	0	0	0	0	0	8	1
Total	88	56	32	48	22	3	2	1	1	10	1

Note: Occupation categories as recorded by participants on attendee registers: (a) fisher; (b) housewife; (c) fish trader; (d) fishery entrepreneur; (e) elderly; (f) fisheries extension officer, e.g. NTT Provincial Government Marine and Fisheries Affairs staff; (h) NTT Provincial Government Marine and Fisheries Resources Surveillance staff.

11.6 Appendix 6: Text of the 1974 MOU agreement and 1989 amendment

MEMORANDUM OF UNDERSTANDING BETWEEN THE GOVERNMENT OF AUSTRALIA AND THE GOVERNMENT OF THE REPUBLIC OF INDONESIA REGARDING THE OPERATIONS OF INDONESIAN TRADITIONAL FISHERMEN IN AREAS OF THE AUSTRALIAN EXCLUSIVE FISHING ZONE AND CONTINENTAL SHELF

Following discussions held in Jakarta on 6 and 7 November, 1974, the representatives of the Government of Australia and of the Government of the Republic of Indonesia have agreed to record the following understandings.

1. These understandings shall apply to operations by Indonesian traditional fishermen in the exclusive fishing zone and over the continental shelf adjacent to the Australian mainland and offshore islands.

By “traditional fishermen” is meant the fishermen who have traditionally taken fish and sedentary organisms in Australian waters by methods which have been the tradition over decades of time.

By “exclusive fishing zone” is meant the zone of waters extending twelve miles seaward off the baseline from which the territorial sea of Australia is measured.

2. The Government of the Republic of Indonesia understands that in relation to fishing in the exclusive Australian fishing zone and the exploration for and exploitation of the living natural resources of the Australian continental shelf, in each case adjacent to:

Ashmore Reef (Pulau Pasir) (Latitude 12° 15’ South, Longitude 123° 03’ East), Cartier Islet (Latitude 12° 32’ South, Longitude 123° 33’ East), Scott Reef (Latitude 14° 03’ South, Longitude 121° 47’ East), Seringapatam Reef (Pulau Datu) (Latitude 11° 37’ South, Longitude 122° 03’ East), Browse Islet (Latitude 14° 06’ South, Longitude 123° 32’ East).

The Government of Australia will, subject to paragraph 8 of these understandings, refrain from applying its laws regarding fisheries to Indonesian traditional fishermen who conduct their operations in accordance with these understandings.

3. The Government of the Republic of Indonesia understands that, in the part of the areas described in paragraph 2 of these understandings where the Government of Australia is authorised by international law to regulate fishing or exploitation for or exploitation of the living natural resources of the Australian continental shelf by foreign nationals, the Government of Australia will permit operations by Indonesian nationals subject to the following conditions:

a) Indonesian operations in the areas mentioned in paragraph 2 of the understandings shall be confined to traditional fishermen.

b) Landings by Indonesian traditional fishermen shall be confined to East Islet (Latitude 12° 15’ South, Longitude 123° 07’ East), and Middle Islet (Latitude 12° 15’ South, Longitude 123° 03’ East) of Ashmore Reef for the purposes of obtaining supplies of fresh water.

c) Traditional Indonesian fishing vessels may take shelter within the island groups described in paragraph 2 of these understandings but the persons on board shall not go ashore except as allowed in (b) above.

4. The Government of the Republic of Indonesia understands that the Indonesian will not be permitted to take turtles in the Australian exclusive fishing zone. Trochus, beche de mer, abalone, green snail, sponges and all molluscs will not be taken from the seabed

from high water marks to the edge of the continental shelf, except the seabed adjacent to Ashmore and Cartier Islands, Browse Islet and the Scott and Seringapatam Reef.

5. The Government of the Republic of Indonesia understands that the persons on board Indonesian fishing vessels engaging in fishing in the exclusive Australian fishing zone or exploring for or exploiting the living natural resources of the Australian continental shelf, in either case in areas other than those specified in paragraph 2 of these understandings, shall be subject to the provisions of Australian law.

6. The Government of Australia understands that the Government of the Republic of Indonesia will use its best endeavours to notify all Indonesian fishermen likely to operate in areas adjacent to Australia of the contents of these understandings.

7. Both Governments will facilitate the exchange of information concerning the activities of the traditional Indonesian fishing boats operating in the area west of the Timor Sea.

8. The Government of the Republic of Indonesia understands that the Government of Australia will, until the twenty-eighth day of February 1975, refrain from applying its laws relating to fisheries to Indonesian traditional fishermen in areas of the Australian exclusive fishing zone and continental shelf other than those specified in paragraph 2 of these understandings.

Jakarta, November 7, 1974

First Assistant Secretary
Fisheries Division
Australian Department of
Agriculture
(A.G. Bollen)

Director of Consular Affairs
Department of Foreign Affairs
of Indonesia
(Agus Yaman)

AGREED MINUTES OF MEETING BETWEEN OFFICIALS OF AUSTRALIA AND INDONESIA ON FISHERIES

1. In accordance with the agreement reached by Mr. Ali Alatas, the Foreign Minister of Indonesia and Senator Gareth Evans, the Foreign Minister of Australia in Canberra on 2 March, 1989, Officials from Indonesia and Australia met in Jakarta on 28 and 29 April 1989 to discuss activities of Indonesian fishing vessels under the Memorandum of Understanding between the Government of the Republic of Indonesia and the Government of Australia regarding the operation of Indonesian traditional fishermen in an Area of the Australian Fishing Zone and Continental Shelf, concluded in Jakarta on 7 November 1974. They also discussed activities of Indonesian fishing vessels in the Australian Fishing Zone off the coast of North West Australia and in the Arafura Sea, and fishing in the waters between Christmas Island and Java.

Memorandum of Understanding of 1974

2. Officials reviewed the operation of the MOU. Both sides stressed their desire to address the issues in a spirit of cooperation and good neighbourliness. They noted that there had been a number of developments since 1974 which had affected the MOU. In 1974 Australia and Indonesia exercised jurisdiction over fisheries on 12 nautical miles from their respective territorial sea baselines. In 1979 and 1980, Australia and Indonesia respectively extended their fisheries jurisdiction to 200 nautical miles from their respective territorial sea baselines, and in 1981 a provisional fishing line was agreed. Since the areas referred to in the MOU are south of this line, new arrangements are necessary for the access by Indonesian traditional fishermen to these areas under the MOU.

3. The Australian side informed the Indonesian side that there were also changes in the status of Ashmore Reef and Cartier Islet as a separate territory of the Commonwealth of Australia and the establishment of the Ashmore Reef National Nature Reserve. The Australian side further informed that there had been a considerable increase in the number of Indonesian fishermen visiting the Australian Fishing Zone and a depletion of fishery stocks around the Ashmore Reef, that wells on Middle Islet and East Islet where Indonesian traditional fishermen were permitted under the MOU to land for taking fresh water had been contaminated; that Australia had also incurred international obligations to protect wildlife, including that in the territory of Ashmore and Cartier Islands. The Indonesian side took note of this information.

4. Since the conclusion of the MOU, both Indonesia and Australia had become parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

5. The Indonesian and Australian Officials discussed the implications of the developments mentioned in the preceding paragraphs. They affirmed the continued operation of the MOU for Indonesian traditional fishermen operating by traditional methods and using traditional fishing vessels. An Australian proposal that Indonesian traditional fishermen could conduct fishing not only in the areas adjacent to Ashmore Reef, Cartier Islet, Scott Reef, Seringapatam Reef and Browse Islet as designated in the MOU, but in a wider ‘box’ area in the Australian Fishing Zone and Continental Shelf was welcomed by the Indonesian side. A sketch map and coordinates of this ‘box’ area appears in Annex 1 of this Agreed Minutes.

6. In view of the developments that had occurred since 1974 as highlighted above, Officials considered that to improve the implementation of the MOU, practical guidelines for implementing the MOU as appears in the Annex of these Agreed Minutes were considered necessary.

7. The Indonesian side informed the Australian side on measures that had been and were being taken by the Indonesian authorities to prevent breaches of the MOU. The Indonesian side indicated its willingness to assist in preventing breaches of the MOU and

to take necessary steps to inform Indonesian fishermen of the practical guidelines annexed to this Agreed Minutes.

8. The Indonesian and Australian Officials agreed to make arrangements for cooperation in developing alternative income projects in Eastern Indonesia for traditional fishermen traditionally engaged in fishing under the MOU. The Indonesian side indicated they might include mariculture and nucleus fishing enterprise scheme (Perikanan Inti Rakyat or PIR). Both sides mutually decided to discuss the possibility of channelling Australian aid funds to such projects with appropriate authorities in their respective countries.

North West Coast of Australia

9. The Indonesian and Australian Officials discussed matters related to the activities of Indonesian fishing vessels in the Australian Fishing Zone off the coast of North West Australia. They noted that those activities were outside the scope of the MOU and that Australia would take appropriate enforcement action. The Australian side indicated the legal and economic implications of such activities.

10. The Indonesian and Australian Officials felt the need for a long-term solution to the problem. To this end, they agreed to make arrangements for cooperation in projects to provide income alternatives in Eastern Indonesia for Indonesian fishermen engaged in fishing off the coast of North West Australia. The Indonesian side indicated that they might include mariculture and nucleus fishing enterprise scheme (Perikanan Inti Rakyat or PIR). Both sides decided mutually to discuss the possibility of channelling Australian aid funds to such projects with appropriate authorities in their respective countries.

Arafura Sea

11. Indonesian and Australian Officials discussed the activities of Indonesian non-traditional fishing vessels in the Arafura Sea on the Australian side of the provisional fishing line of 1981. Officials agreed that both Governments should take effective measures, including enforcement measures, to prevent Indonesian non-traditional fishing vessels from fishing on the Australian side of the provisional fishing line without the authorisation of the Australian authorities.

12. Officials agreed to make arrangements for cooperation in exchange of information on shared stocks in the Arafura Sea for the purpose of effective management and conservation of the stocks.

Fishing in waters between Christmas Island and Java and other waters

13. The Officials of Indonesia and Australia noted that fisheries delimitation in waters between Christmas Island and Java and in the west of the provisional fishing line remained to be negotiated and agreed. Pending such an agreement, the Officials noted that both Governments would endeavour to avoid incidents in the area of overlapping jurisdictional claims.

Wildlife Cooperation

14. The Indonesian and Australian Officials considered the mutual advantages of the exchange of information on wildlife species populations believed to be common to both countries. It was agreed that each country’s nature conservation authorities would exchange information on such wildlife populations and management programs and cooperation in the management of wildlife protected areas. In the first instance Indonesian authorities would be consulted on the management plan for the Ashmore Reef National Nature Reserve.

Consultations

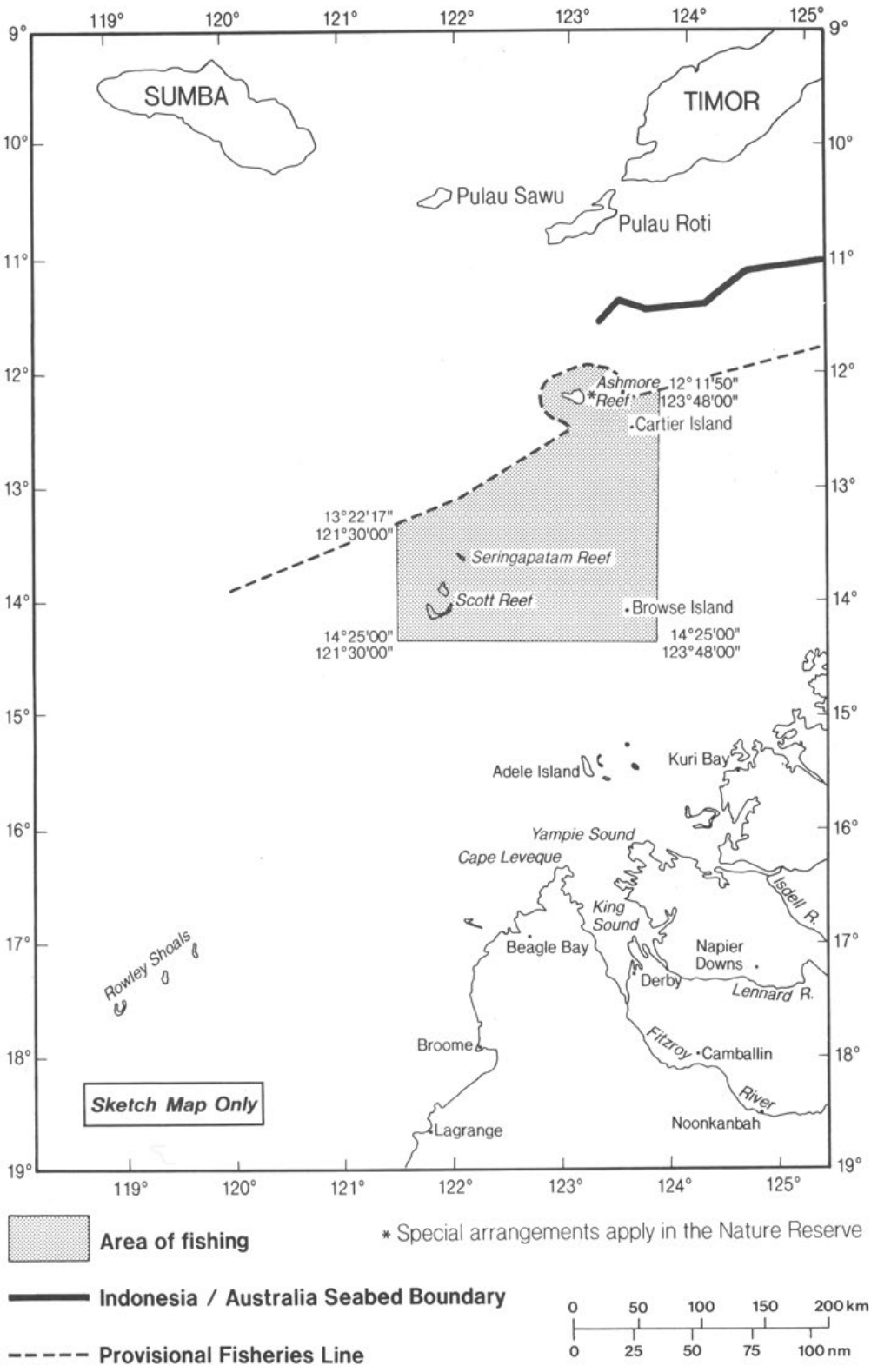
15. The Indonesian and Australian Officials agreed to hold consultations as and when necessary to ensure the effective implementation of the MOU and agreed minutes.

Jakarta, 29 April 1989

Alan Brown
Head of the Australian Delegation

Nugroho Wisnumurti
Head of the Indonesia Delegation

ANNEX 1



Source: ANPWS 1989:62.

CO-ORDINATES OF MOU AREA ('THE BOX')

The area bounded by the line:

a) commencing at the point of Latitude 12° 11' 50" South, Longitude 123° 48' 00" East;

b) running thence south-westerly along the geodesic to the point of Latitude 12° 19' South, Longitude 123°21' East;

c) thence generally north-easterly, northerly, north-westerly, westerly, south-westerly, southerly and south-easterly along the line every point on which is twelve nautical miles seaward of the baseline from which the breadth of the territorial sea is measures, around Ashore Islands, to the point of Latitude 12° 30' South, Longitude 123° 06' East (along Provisional Fisheries Line);

d) thence south-westerly along the geodesic to the point of Latitude 13° 15' South, Longitude 121° 49' East;

e) thence south-westerly along the geodesic to the point of Latitude 13° 22' 17" South, Longitude 121° 30'00" East;

f) thence south along the meridian of Longitude 121° 30' East to its intersection by the parallel of Latitude 14° 25' South;

g) thence east along that parallel to its intersection by the meridian of Longitude 123° 40' East; and

h) thence north along that meridian to the point of commencement.

ANNEX II

PRACTICAL GUIDELINES FOR IMPLEMENTING THE 1974 MOU

1. Access to the MOU area would continue to be limited to Indonesian traditional fishermen using traditional methods and traditional vessels consistent with the tradition over decades of time, which does not include fishing methods or vessels utilising motors or engines.

2. The Indonesian traditional fishermen would continue to conduct traditional activities under the MOU in the area of the Australian Fishing Zone and the continental shelf adjacent to Ashmore Reef, Cartier Islet, Scott Reef, Seringapatam Reef and Browse Islet. In addition, Indonesian traditional fishermen would be able to conduct traditional fishing activities in an expanded area as described in the sketch map and coordinates attached to Annex 1 of the Agreed Minutes.

3. To cope with the depletion of certain stocks of fish and sedentary species in the Ashmore Reef area, the Australian Government had prohibited all fishing activities in the Ashmore Reef National Nature Reserve, but was expected soon to adopt a management plan for the Reserve which might allow some subsistence fishing by the Indonesian traditional fishermen. The Australian side indicated that Indonesia would be consulted on the draft plan. Because of the low level of stock, the taking of sedentary species particularly *Trochus nilotocus* in the Reserve would be prohibited at this stage to allow stocks to recover. The possibility of renewed Indonesian traditional fishing of the species would be considered in future reviews of the management plan.

4. As both Australia and Indonesia are parties to CITES, Officials agreed that any taking of protected wildlife including turtles and clams would continue to be prohibited in accordance with CITES.

5. Indonesian traditional fishermen would be permitted to land on West Islet for the purpose of obtaining supplies of fresh water. The Indonesian side indicated its willingness to discourage Indonesian traditional fishermen from landings on East and Middle Islets because of the lack of fresh water on the two islets.

Jakarta, 29 April 1989.

11.7 Appendix 7: TBF by selected communities recorded during 2023

Table 13. TBF activity by selected communities compiled during April 2023 scoping trip

Village	Fishing boat/gear	Main target species	Fishing ground	Pre-COVID-19 (before 2020)	COVID-19 (2020–22)	Post-COVID-19 (April 2023)	Status (according to legal/sovereign government policy)	
							Legal	Illegal
Oelaba, Rote Ndao	*Lambo*/gleaning and free dive	Trepang, finfish	MOU Box	√	√	√	√	-
Pepela/Tanjung Pasir, Rote Ndao	Sailing *lambo*/gleaning and free dive	Trepang, shark, finfish	MOU Box	√	√	√	√	-
	Motorised *lambo*/gleaning and free dive	Trepang, shark, finfish	MOU Box	-	√	√	Technically illegal, but practically allowed when in poor weather conditions or for transit purposes	-
			Outside of MOU Box	-	√√√	√√	-	√
	Bodi boat (inboard engine)	Trepang	Outside of MOU Box	√	√√√	√√	-	√
	Bodi boat (inboard engine)	Shark	Outside of MOU Box	√	√	√	√	√
	Bodi boat (inboard engine)	Tuna	Border area	√	√	√	√	√
Hundihuk, Rote Ndao	Sailing *lambo*/gleaning and free dive	Trepang, finfish	MOU Box	√	√	√	√	-
	Motorised *lambo*/gleaning and free dive	Trepang	MOU Box	-	√	√	Technically illegal, but practically allowed during poor weather conditions for transit purposes	-

Village	Fishing boat/gear	Main target species	Fishing ground	Pre-COVID-19 (before 2020)	COVID-19 (2020–22)	Post-COVID-19 (April 2023)	Status (according to legal/sovereign government policy)	
							Legal	Illegal
	Motorised *lambo*/gleaning and free dive		Outside of MOU Box	-	√√√	√√	-	√
	Bodi (inboard engine)	Trepang	Outside of MOU Box	-	√√	√√	-	√
Oesapa, Kupang, West Timor	*Bodi* (inboard engine)	Trepang	Outside of MOU Box	√	√√√	√√	-	√

Note: √ = Low intensity; √√ = Medium intensity; √√√ = High intensity

Source: Compiled during a scoping trip (April 2023) to identify selected communities

Table 14. TBF activity by communities compiled from October 2023 field research data

Village	Fishing boat/gear	Main target species	Fishing ground	Pre-COVID-19 (before 2020)	COVID-19 (2020–22)	Post-COVID-19 (April 2023)	Post COVID-19 (October 2023)	Status (according to legal/sovereign government policy)	
								Legal	Illegal
Oelaba, Rote Ndao	*Lambo*/gleaning and free dive	Trepang, finfish	MOU Box	√	√	√	√	√	-
Pepela Rote Ndao	Sailing *lambo*/gleaning and free dive	Trepang, shark, finfish	MOU Box	√	√	√	√	√	-
	Motorised *lambo*/gleaning and free dive	Trepang, shark, finfish	MOU Box	-	√	√	√	Technically illegal, but practically allowed when in poor weather conditions or for transit purposes	-

Village	Fishing boat/gear	Main target species	Fishing ground	Pre-COVID-19 (before 2020)	COVID-19 (2020–22)	Post-COVID-19 (April 2023)	Post COVID-19 (October 2023)	Status (according to legal/sovereign government policy)	
								Legal	Illegal
			Outside of MOU Box	-	√√√	√√	√	-	√
	Bodi boat (inboard engine)	Trepang	Outside of MOU Box	√	√√√	√√	√	-	√
	Bodi boat (inboard engine)	Shark	Outside of MOU Box	√	√	√	-	√	√
	Bodi boat (inboard engine)	Tuna	Border area	√	√	√	√	√	√
Tanjung Pasir, Rote Ndao	Sailing *lambo*/gleaning and free dive	Trepang, finfish	MOU Box	√	√	√	√	√	-
	Motorised *lambo*/gleaning and free dive	Trepang	MOU Box	-	√	√	-	Technically illegal, but practically allowed during poor weather conditions for transit purposes	-
	Motorised *lambo*/gleaning and free dive	Trepang	Outside of MOU Box	-	√√√	√√	√	-	√
	Bodi (inboard engine)	Trepang	Outside of MOU Box	-	√√	√√	√	-	√
Oesapa, Kupang, West Timor	*Bodi* (inboard engine)	Trepang	Outside of MOU Box	√	√√√	√√	√	-	√

Note: √ = Low intensity; √√ = Medium intensity; √√√ = High intensity
Source: Compiled from field research (October 2023)

11.8 Appendix 8: Gendered livelihood income activities

Table 15. Gendered livelihood income activities identified from fieldwork data

Activity	Estimated income	Locations where activity was mentioned and example quotes
Making and selling cakes	IDR2,000,000 per year (KII2_Oes_Woman3)	▪ Pepela (FGD1-Pap-Women; KII1_Pap_Woman2) ▪ Tanjung (KII1_Tan_Woman2; KII1_Tan_Woman4) ▪ Oelaba (KII1_Oel_Woman6; KII1_Oel_Woman4) ▪ Oesapa(KII2_Oes_Woman3) "The best result ever achieved was IDR2,000,000 per year, which happened twice, exactly during Eid. The worst income was IDR 300,000 per month, which happened once" (KII2_Oes_Woman3).
Trading fish	Not in data	▪ Pepela (FGD1-Pap-Women; SGI1_Pap_Seafoodtrader; KII1_Pap_Woman1) ▪ Tanjung (SGI1_Tan_Trader,Moneylender; FGD1_Tan_Women)
Tuna and skipjack fishing	Not in data	▪ Tanjung(KII1_Tan_Captain3; KII1_Tan_Woman2; KII1_Tan_BoatOwner1) "Fishermen choose tuna/skipjack fishing because the results are good. The results are almost the same as catching sea cucumbers in Australian waters. The risks associated with tuna/skipjack fishing are considered lower than those associated with transboundary sea cucumber/shark fishing, including losses/debts, arrests and accidents. Tuna fishing allows fishermen to spend more time at home with their families. The main obstacle is the difficulty in getting fuel, and when it is available, it is expensive, or you have to buy it in Kupang. This has a direct impact on the operating cost of tuna/skipjack fishing" (KII1_Tan_Captain3).
Processing seaweed	IDR11,000/kg (KII1_Oel_Woman2)	▪ Oelaba (KII1_Oel_Woman2; KII1_Oel_Crew1; KII1_Oel_TraderMoneyLender1)
Drying and making fish jerky using salt	Not in data	▪ Pepela (KII1_Pap_Captain2; KII1_Pap_Crew3) ▪ Oelaba (KII1_Oel_Woman2)
Selling ice cubes	IDR2,000–5,000 (KII1_Tan_Woman2)	▪ Tanjung (KII1_Tan_Woman2) "During the west monsoon, selling ice can provide quite a large profit, especially if you can sell 30 ice cubes or more in a day. During the East monsoon, ice sales are usually not very good. It ranges from 2,000 to 3,000, sometimes it can reach 5,000. This is due to the fact that not many people fish during this season, so ice cubes are unsold" (KII1_Tan_Woman2).

Activity	Estimated income	Locations where activity was mentioned and example quotes
Selling betel (*areca*) nut	IDR100,000/kg (Oel_Woman2)	▪ Oelaba (KII1_Oel_Woman2) "My husband is also involved in the betel nut business. When he's not fishing, my husband also sells betel nut in the market (Oel_Woman2).
Selling water sugar/ sweet ice	IDR1,000 per pack (KII1_Tan_Woman3)	▪ Oelaba (KII1_Oel_Woman2 ▪ Tanjung (KII1_Tan_Woman3) "[the woman's] main source of income is selling sweet ice at a price of IDR 1000 per pack, and the business capital comes from a loan from a neighbour, which has to be repaid after the sale" (KII1_Tan_Woman3).
Fishing with lift nets	IDR50.000–100.000 per trip (KII1_Oes_Woman1)	▪ Oesapa (KII1_Oes_Woman1) "My husband works in the lift net fishing for 3 months. He received IDR3.000.000-4.000.000 from the share. During his spare time he does hook and line fishing twice per week and the earning is about IDR50.000-100.000/trip" (KII1_Oes_Woman1).
Construction work as a labourer	Not in data	▪ Oelaba (KII1_Oel_Crew1) ▪ Tanjung (KII2_Tan_Crew1) "I usually work on construction projects, like building projects. As a construction worker, I can be a bricklayer or a carpenter, depending on the needs of the project" (KII2_Tan_Crew1).
Washing clothes	IDR30,000 per month (KII1_Tan_Woman2)	▪ Tanjung (KII1_Tan_Woman2) "Washing is done about three times a month depending on needs or if someone asks to wash clothes" (KII1_Tan_Woman2).
Selling dried needle squid	Not in data	▪ Oelaba (KII1_Oel_TraderMoneyLenderElderly1)
Selling salome	Not in data	▪ Tanjung (KII1_Tan_Woman3)
Acting as shop assistant	IDR850,000 per month (KII2_Oes_Woman2)	▪ Oesapa (KII2_Oes_Woman2) "I work as a shop assistant. My monthly salary as a shop assistant is 850 thousand rupiah" (KII2_Oes_Woman2).
Selling gold jewellery		▪ Tanjung (KII1_Tan_Woman1) "If there is no money at home, I usually tell them to be patient or look for other ways, such as pawning gold items. At that time, I pawned a gold bracelet and got IDR1,000,000" (KII1_Tan_Woman1).
Gleaning (juvenile fish, trepang, shells)		▪ Tanjung (FGD1_Tan_Women)

Activity	Estimated income	Locations where activity was mentioned and example quotes
Cleaning sandfish (*Teripang pasir)*		▪ Tanjung (Research Team observations)
Opening a small kiosk that sells daily needs such as rice, sugar, fried oil, soaps, snacks		▪ Pepela (FGD1-Pap-Women) During a FGD in Pepela, a woman said that she borrowed money at IDR3,000,000 from a cooperative to fund her small kiosk. The repayment amount was IDR86,000/week for 47 weeks. When she was unable repay the instalments, she took money from her husband's income from transboundary fishing (FGD1-Pap-Women).

11.9 Appendix 9: Glossary

Bahasa Indonesia term	English term
Bawah Angin	Rowley Shoals
bodi batang	small, motorised boats of various sizes equipped with one to three engines; smaller than *bodi jolor* and do not have a cabin
bodi jolor	small, motorised boats of various sizes equipped with one to three engines; larger than *bodi batang* and have a cabin
ditangkap	getting caught
Gojek	a form of motorbike taxi
hookah	compressor used in trepang fishing
ikan dasar	demersal fishery activities
lete-lete	traditional sailing boat used by Madurese fishers
merantau	to leave your home area to make a living
nasib	faith in God or fate
perahu lambo	traditional sailing boat (used legally in the MOU Box)
Pulau Pasir	Sand Island
punggawa	bosses
roppong/rumpon	fish aggregating device, FAD
Rukun Tetangga	neighbourhoods
	illegal fishing: fishing-related behaviour or activity deemed illegal and against the rules, laws and regulations governing maritime activity in Australian waters
	noncompliant: referring to illegal activity
	legal fishing: fishing activity consistent with the MOU 1989 arrangements (such as the use of sail-powered vessels and fishing only in permitted areas as per the agreement)
	transboundary fishing/transboundary activity: referring to the actions or activities of fishers who travel across the maritime border between Australia and Indonesia to engage in fishing, whether it be deemed legal or illegal
	environmental: conditions in the physical environment, rather than the broader context in which people live, as per the Behavioural Drivers Model (Petit 2019, p.23).