



COST RECOVERY GUIDELINES FOR MONITORING SERVICES

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About MRAG Asia Pacific

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Executive Summary

BACKGROUND AND CONTEXT

This report, prepared for the Worldwide Fund for Nature (WWF) and the Pacific Islands Forum Fisheries Agency (FFA), examines options, and proposes guidelines, for the recovery of costs for electronic monitoring (EM) services in FFA island member country tuna longline fisheries. It has been prepared as a result of increasing interest in how EM, which has largely been financially supported by non-government organisations or development assistance partners to date, may be sustained in the long term.

The extent to which costs may be recovered for any Government service is dependent on policy decisions of the Government or responsible agency. Relevant considerations may include:

- the extent to which costs are attributable to the user of the service;
- the extent to which Governments or agencies are willing to provide support to stimulate economic activity in the sector concerned; or
- the extent to which support is required to facilitate transition to a new administrative process.

COSTS INVOLVED IN EM

In the context of cost recovery, all costs involved in the delivery of a service should be considered. These include both the *direct* costs – i.e. those immediately linked to the delivery of the service (e.g. in the context of EM services, the costs associated with analytical staff to review EM image data) – as well as the *indirect* costs – i.e. those not immediately involved in the delivery of the service but are otherwise necessary for its delivery.

While the costs associated with the establishment and operation of EM systems will vary between national fisheries administrations, costs can be broadly categorised as one of four types:

1. **Type 1: On vessel costs.** These costs are associated with the installation and operation of EM hardware and supporting systems on board fishing vessels;
2. **Type 2: Program administration and operational costs.** These costs are associated with the administration and operation of the EM program, usually undertaken by national (or regional) fisheries administrations. These costs typically form the ‘core’ of the annual EM program budget, and would be a main focus for cost recovery;
3. **Type 3: Policy and regulatory development costs.** These costs associated with the establishment of relevant regulatory and policy arrangements to support effective EM systems; and
4. **Type 4: Analytical costs:** These costs are associated with the analysis of EM generated information to produce outputs in support of the administration and management of longline fisheries by national fisheries administrations (e.g. production of reports analysing annual trends in EM information).

A description of the different elements of each cost type is presented.

Costs are typically categorised as either ‘fixed’ or ‘variable’. Fixed costs are those that are required to be made irrespective of how much the service or facility is used in practice; they are the costs involved in having the system in place (e.g. salaries for program coordination and administrative staff, office

overheads, insurance and IT systems). Variable costs are directly related to how much the service is used. They are costs incurred only when the service is actually delivered. In the context of EM, the key variable cost will be fees paid to contractors or casual staff for each sea-day reviewed.

Separating costs into either 'fixed' or 'variable' is important because it allows for the equitable recovery of costs across the fleet, as well as the structuring of incentives for voluntary compliance.

PROPOSED COST
RECOVERY
FRAMEWORK

A framework to guide the implementation of cost recovery for EM services in FFA island members is proposed. The framework comprises a series of principles to guide the overarching implementation of cost recovery arrangements, as well as a series of operational level policies to implement cost recovery in practice. The framework has been developed taking into account existing cost recovery policies within the FFA membership, as well as practical experience implementing cost recovery in the Pacific islands region.

To the extent possible, the guiding principles are structured such that they can be easily applied in practice. In rough order of priority, they include:

1. **Full cost recovery as a default.** The default position adopted by Pacific Island countries should be to apply full cost recovery for EM services unless there is an active policy decision not to. Full cost recovery should involve recovering both the direct and attributable indirect costs of providing the service;
2. **Equity in recovery.** For those costs considered recoverable, cost recovery arrangements should be structured in a way that spreads costs equitably amongst users of the service. As a general rule, vessels who use more of the EM service should pay more of the costs;
3. **Minimising financial exposure and risk.** Cost recovery arrangements should be structured to minimise financial exposure for fisheries agencies (and national governments) and risk that services will be delivered for which payment is unable to be made;
4. **Incentives to encourage voluntary compliance.** Incentives should be built into cost recovery arrangements to encourage voluntary compliance with relevant requirements. As a general rule, incentives should be proportionate to the reduction in costs associated with compliant behaviour;
5. **Efficiency in service delivery.** Where the service is to be delivered by Government as a monopoly provider (if, for example, they have a legislative obligation to deliver the service), there is an obligation to ensure the service is delivered efficiently to keep costs as low as possible;
6. **Transparency and accountability.** As a monopoly provider of services, Government agencies have a responsibility to be transparent about the nature and level of costs being recovered and accountable for their use; and
7. **Simplicity.** Cost recovery arrangements should be kept as simple as possible.

Within the broad framework of principles above, more specific policies are required at the operational level to guide the practical recovery of costs.

Recovery policies and approaches may differ depending on the different types of costs. Broadly, we propose that:

- **Type 1 costs should be borne directly by the operator of the fishing vessel.** Typically, this would be implemented through condition of license (i.e. to be eligible to fish in national waters, all vessels must be fitted with a type-approved EM system capable of XXX). This approach is consistent with the regional approach to VMS under which vessels each take responsibility for the installation and continuous operation of type-approved MTUs/ALCs. National governments should set minimum standards for EM units and imagery; where practical, these should be harmonised within the FFA membership.
- **Type 2 costs should be fully cost recovered from industry,** unless there is an active policy decision to subsidise the operation of some or all vessels. Both the direct and indirect costs should be recovered. In practice, type 2 costs should be categorised as either fixed or variable costs. **Fixed costs** should be recovered equally across the fleet in recognition that the operation of an EM system is a requirement of licensing. In practice, the full budgeted fixed costs for the upcoming year should be divided amongst the expected number of longline vessels to achieve a ‘fixed fee’ payable for the upcoming year. Full payment of fixed fees should be a condition of license allocation/renewal such that the full fixed costs of operating the system are recovered upfront as part of the annual licensing process (consistent with the principle of minimising financial exposure).

All **variable costs** should ideally be rolled into a single fee per EM sea-day record reviewed and analysed. A proportion of the expected variable costs (e.g. XXX sea-days) should also be recovered upfront as part of the licensing process. Sea-days would be decremented as they are used from the amount initially paid. Fishing companies should be issued invoices for an additional number of sea-days before they exhaust the number of sea-days they have paid for; the fishing vessel should always be in credit. Non-payment of variable costs should result in compliance action (e.g. license suspension/cancellation, administrative penalty).

- **Type 3 costs should be borne by national governments.** These costs - policy development and legislative drafting - are typically considered ‘core’ functions of Government and should be funded internally.
- **Cost recovery arrangements for Type 4 costs are a matter of national discretion.** In practice, these costs are attributable to industry given analysis of EM generated information would not be required in the absence of fishing activity. In the context of EM in the Pacific Islands region, the extent to which costs are recovered may be dependent on the extent to which analysis is focused on the management of the commercial tuna sector and conducted in house (and therefore recovered), or whether EM information is provided to regional agencies (e.g. SPC) to analyse (in which case, analysis may be funded externally).

IMPLEMENTING
COST RECOVERY IN
PRACTICE

The implementation of cost recovery in practice requires a series of coordinated activities to be undertaken by relevant agencies in each FFA member. These include:

- The development of **clear national policies** to guide the implementation of cost recovery for EM;
- The establishment of a **clear legal framework** to authorise and support the implementation of EM;
- The development of a practical **operating model** which sets out the main costs involved in providing the service, allows for the attribution of costs to relevant stakeholders and ultimately calculates the fees to be recovered;
- The development of arrangements for **stakeholder engagement**;
- The development of **systems and processes to monitor the implementation** of cost recovery arrangements; and
- The development of processes for **periodic review** of costs and overall cost recovery policy arrangements.

While national cost recovery policy is a matter for each FFA member country, to assist in the development of national policies, a general business case and a template policy covering EM services is included. The draft policy is consistent with the approach outlined in this paper and may be customised as each FFA member sees fit (e.g., different levels of cost recovery may be applied to domestic and foreign vessels; cost recovery may be phased in over different periods; etc). The policy covers the core elements of a practical policy – purpose, scope, definitions, policy, implementation, review – but may be expanded or refined as necessary.

We have also provided a basic template EM cost recovery operating model which sets out, conceptually, the type of model required to support EM in practice. Although the model is consistent with the policies outlined in this report, the model will need to be customised to the unique circumstances/cost structures of each FFA member to be used in practice. Moreover, because EM is likely to be implemented as part of a broader suite of MCS tools within an integrated MCS regime in FFA member countries, we have also provided an ‘integrated’ MCS cost recovery model template which outlines how, conceptually, cost recovery may be applied across multiple MCS types.

1 Introduction

Human at-sea observer coverage for longline tuna fisheries operating within the areas under national jurisdiction of FFA island member countries, and the adjacent high seas, has rarely achieved an annual coverage of 5% required under the Western and Central Pacific Fisheries Commission's (WCPFC) Conservation and Management Measure (CMM) 2007-01 (the "longline problem")¹. While some FFA member countries achieve relatively high at-sea human observer coverage rates – for example, Fiji achieved an annual coverage of 28% for the period 2015-2017 - low observer coverage is generally a feature of longline fleets operating across the region.

Low observer coverage is due to a combination of factors. They include an absence of flag State regulations that oblige vessels to accept observers, logistical challenges associated with the deployment of human observers on vessels that undertake trips of extended duration on the high seas, safety concerns and the small size of some of those vessels where an observer placement means it is necessary to displace a crew member with consequent implications for vessel operations.

To complement the coverage and quality of information available through human observers on longline vessels, significant global progress has been made during the last five years with the utilisation of automated camera systems installed on fishing vessels. These electronic monitoring (EM) systems are providing additional independent monitoring of at-sea fishing operations for an increasing number of national or regional fisheries administrations.

Since 2014, such systems have been trialled across a number of FFA members including Australia, the Federated States of Micronesia, Fiji, Marshall Islands, New Zealand, Palau, Solomon Islands and Cook Islands.

The drivers for these initiatives include strengthening the availability of independent information on fishing activities – for example, improving the information base on catch and effort for target species, by-catch and discards and encounters with species of special interest – as well as encouraging compliance with national or regional regulations. The analytical software of several EM systems is well advanced towards being able to facilitate the collection of limited biological information, such as fish length. Significant advances in relation to image recognition and artificial intelligence are predicted to further strengthen such systems as a valuable additional fishery monitoring and data collection tool in the short to medium term.

External development assistance partners such as the World Bank and the Food and Agricultural Organisation, as well as non-government organisations (NGOs), have provided substantial financial and technical support for EM trials in FFA members to date. In addition, several longline companies, such as Luen Thai in Micronesia and Bumble Bee in Fiji, have been trialling EM systems independently.

While assistance provided by NGOs and development assistance partners is appreciated by the FFA island members, there is a clear recognition that the long term operation of effective EM systems requires a durable, self-sustaining financing model. To this end, the Worldwide Fund for Nature (WWF) and the FFA agreed to facilitate a review of cost recovery options for EM operating in the

¹ An agreed metric for "coverage" for at-sea observer programmes remains unresolved in the Western and Central Pacific Fisheries Commission (WCPFC). The obligation for 5% coverage in the longline fishery under the WCPFC Regional Observer Programme is not defined in its Conservation Measure (CMM) 2007-01. The metric in terms of coverage of catch, hooks deployed or retrieved, vessels or trips is unspecified. In addition, there is no advice regarding the spatial or temporal scale required to achieve representativeness of observer coverage for WCPO longline fisheries (see, for example WCPFC-TCC9-2013/09). For this report, sea-days has been applied as the metric to measure performance for EM. Equally, fishing days or hooks monitored may also be considered as an appropriate metric although these metrics may not accommodate ancillary activity of the fishing vessel of compliance interest, such as transshipment.

zones of FFA island members and on the adjacent high seas. The objective of the review was to examine options and develop cost recovery guidelines for EM that could be applied across Pacific island-region tuna fisheries. The Terms of Reference are at Appendix A.

In undertaking the review, the team examined existing cost recovery policies in place for similar services amongst the FFA membership, as well as undertaking site visits to Fiji and the Solomon Islands to meet with staff involved in existing EM trials.

Broadly this report is structured in four main parts. Following this introduction, section 2 briefly introduces the concept of cost recovery in the fisheries sector while section 3 sets out the main types of costs involved in EM and discusses the concepts of both direct and indirect costs, as well as fixed and variable costs. Section 4 lays out a proposed framework for recovering costs associated with EM, including a set of principles to guide recovery and a conceptual model for recovery in practice. Section 5 then discusses some of the requirements for implementing cost recovery in practice (a national policy, legislative requirements, an operating model, etc). Finally, section 6 briefly discusses some of the considerations involved in integrating cost recovery arrangements across multiple MCS tools (e.g. EM, observers, port monitoring, VMS).

2 Cost recovery in the fisheries sector

Cost recovery is the recovery of expenditure associated with the provision of services to users. It is implemented by both Government (including multilateral agencies) and non-Government sectors.

Entities implementing cost recovery may seek full cost recovery – under which the users, or beneficiaries, pay for the full cost of providing the service - or partial cost recovery – under which only a portion of the full costs of the service are paid for by users, with Government or some other entity absorbing the remaining costs. Cost recovery may be sought for both mandatory services (established through regulation, or a condition of license) or elective services.

The extent to which costs are recovered is dependent on policy decisions of the Government or responsible agency. Considerations may include, for example:

- the extent to which costs are attributable to the user of the service;
- the extent to which Governments or agencies are willing to provide support to stimulate economic activity in that sector; or
- the extent to which support is required to facilitate a transition to a new administrative process.

In principle, cost recovery is expected to reflect the real costs associated with the efficient provision of a service. Cost recovery in the fisheries sector is generally not a means to cross-subsidize inefficient activities or to generate a return on the use of fisheries resources. Other targeted mechanisms, such as royalties, resource rents or levies, are available for these purposes (Wyatt and Wallis, 2011).

Two main types of cost recovery charges exist:

- fees - fees are typically charged when a good or service is provided directly to a specific user; and
- levies – a levy is typically charged when a good or service is provided to a broad group of users (e.g. an industry sector) rather than to a specific individual or organisation. Although a levy is a tax, it differs from general taxation in that the enjoyment of services funded through the levy revenue are limited only to that sector paying the levy.

FFA members already apply a number of fees and levies to fund services they provide. At the regional level, either full or partial cost recovery arrangements are already in place for some services

through the FFA Vessel Register, the PNA Vessel Day Scheme Register and the PNA Observer Program, amongst others.

3 Costs involved in electronic monitoring

In the context of cost recovery, all costs involved in the delivery of a service should be considered. These include both the **direct** costs – i.e. those immediately linked to the delivery of the service (e.g. in the context of EM services, the costs associated with analytical staff to review EM image data) – as well as the **indirect** costs – i.e. those not immediately involved in the delivery of the service but are otherwise necessary for its delivery. In the context of EM services, a good example of a necessary indirect cost might be office overheads (rent, electricity, insurance). These are not directly related to the delivery of EM services, but the reality is that staff involved in the EM program need an office with power to coordinate the program and review of EM image data. Failure to incorporate the indirect costs involved in service delivery would mean that, in effect, national fisheries agencies would be subsidising fishing fleets for these costs.

In practice, while 100% of the direct costs associated with service delivery should be factored into cost recovery calculations (because the costs are usually solely associated with the delivery of the service), only the *marginal* costs associated with indirect costs should be considered. For example, if the annual rental costs for a national fisheries agency office were \$100,000 annually, but only 5% of the office space was used for the delivery of EM services, rental costs factored into EM cost recovery calculations should be \$5,000 (i.e. the proportion of overall office rental costs attributable to EM).

The section below sets out the main direct and indirect costs associated with the delivery of EM services.

The actual costs associated with the establishment and operation of EM systems will vary between national fisheries administrations. Depending on the configuration of the EM systems adopted, the approach to delivery of ‘backend’ services such as review of EM image data and the extent to which EM-associated resources and equipment are shared with other MCS programme components², costs can be broadly categorised as one of four types:

1. Type 1: On vessel costs
2. Type 2: Program administration and operational costs
3. Type 3: Policy and regulatory development costs; and
4. Type 4: Analytical costs.

These costs are outlined in more detail below. Identifying and categorising the different types of costs involved in EM is important because different approaches to cost recovery may be taken to different categories of costs (i.e. national governments may choose to fully recover some costs, but not others).

3.1 Type 1: On vessel costs

Type 1 costs are those associated with the installation and operation of EM hardware and supporting systems on board fishing vessels. These costs include:

- Purchase of type-approved ship-board equipment (cameras, sensors and associated wheelhouse storage and system monitoring equipment), including associated depreciation;
- EM system installation by an accredited installer (including secure data storage facility);

² For example, the same computers may be used for EM data analysis, the processing of at-sea human-generated observer data and e-reporting, among other functions.

- Ongoing maintenance of EM equipment;
- EM-attributable communication costs; and
- Crew time to monitor system status and take remedial action in the event of a disruption to service (minor proportion of a single crew member’s responsibilities).

Additional ‘on shore’ costs may also accrue to fishing companies through the installation of computing and EM software monitoring equipment and data storage as well as shore-based staff at company headquarters to monitor EM systems and coordinate EM operations. These costs are assumed to be funded directly by fishing companies and fall outside the scope of this policy.

3.2 Type 2: Program administrative and operational costs

These are costs that are associated with the administration and operation of the EM program, usually undertaken by national (or regional) fisheries administrations. These costs would be typically expected to form the ‘core’ of the annual EM program budget, and would be a main focus for cost recovery. Costs include:

- Program management/coordination personnel (inclusive of salary and on-costs – e.g. pension fund contributions, employer tax contributions, health insurance). Proportion of Full Time Equivalent (FTE) staff as appropriate:
 - Fisheries CEO
 - MCS Programme Manager
 - EM Services Coordinator/Technician
 - Financial Administrator
 - On-staff data analysts/digital observers (initial digital data review and quality assurance procedures such as double analysis and reconciliation with other monitoring data such as observer data)
 - Expert advisory and support services (e.g. administration and HR services; legal advice; auditing)
- Contracted data analysts/digital observers (as needed in relation to volume of data to be reviewed)
- Quality control (QC)/data review – in the same way as data collected by observers is subject to quality control through debriefing by trained debriefers, data collected by EM analysts will need to be subject to some form of quality control. This could take the form of a brief review of all data sets by experienced, qualified EM analysts (e.g. senior observers with relevant training), or a full independent review of a specified number of trips (e.g. 10%) to pick up any systematic errors/issues in data collection (analogous to an internal audit of systems in which a portion of outputs are sampled for analysis). The QC process adopted may depend on the objectives to be achieved – for example, if EM is used by the fisheries agency to monitor compliance with regulations, senior observers may wish to do a high level review of all trip data to identify/discuss any compliance incidents (similar to observer debriefers reviewing GEN-3 forms for all observer trips).
- Office accommodation and overheads:
 - Rental (stand-alone or proportionally shared within the existing office), or
 - Construction/purchase cost for a dedicated Centre (if required)
 - Utilities (water, electricity, rubbish disposal, etc.)
 - Communications/internet
 - Security arrangements
- IT systems:
 - Computing hardware (networked, including peripherals, servers, centralized data management storage capability and reserve mobile hard disks)
 - Analytical and storage software

- Software licenses
- IT database development and management support (from EM system accreditation and registration through to archiving and storage of EM data)
- Annual systems maintenance and support
- Insurance
 - Professional indemnity
 - Buildings and contents
 - Travel (to cover systems accreditation audits)
- Training and capacity building
 - Program management staff
 - Data analysts
- Staff travel
- Logistics costs - e.g. freight, postage and couriers, agent's fees
- Miscellaneous costs – e.g. banking fees.

These costs assume that data will be entered directly by analysts (observers) in a format capable of being uploaded to relevant databases (following some form of quality control). If this is not the case, additional data entry costs may be required.

3.3 Type 3: Policy and regulatory development costs

These are costs associated with the establishment of relevant regulatory and policy arrangements to support effective EM systems. Key costs may include staff time involved in policy development to support EM systems, internal Government policy approvals processes and legislative drafting and review.

3.4 Type 4: Research and analytical costs

These are costs associated with the analysis of EM generated information to produce outputs in support of the administration and management of longline fisheries by national fisheries administrations (e.g. production of reports analysing annual trends in EM information). These are additional to costs associated with initial review and quality control of EM image data.

The responsibilities for the costs associated with EM systems, and how they are apportioned, are important policy considerations in the development of EM implementation strategies.

3.5 Other costs

In addition to the 'core' costs outlined above, a number of other costs potentially relevant to, or involved in, the operation of an EM system may exist. These include:

- Compliance – there are essentially two main types of potential compliance functions associated with EM: firstly, costs associated with fisheries agencies monitoring vessel compliance with relevant EM requirements (e.g. undertaking annual inspections of the functionality of on board EM equipment) and secondly, costs associated with investigations that have been triggered through review of EM information (e.g. a routine review of EM image data highlights an incident requiring investigation/prosecution); and
- Costs associated with the process of type-approval by EM system providers (e.g. hardware/software type approval).

3.6 Fixed and variable costs

Costs involved in EM systems can typically be categorised as either ‘fixed’ or ‘variable’ costs. Fixed costs are those that are required to be made irrespective of how much the service or facility is used in practice – in essence, they are the costs involved in having the system in place. In the context of EM, fixed costs are likely to include salaries for program coordination and administrative staff, office overheads, insurance and IT systems. These costs are required to be made irrespective of whether 1,000 sea days’ worth of EM image data are reviewed, or 10,000. Some fixed costs will vary over time according to the size and nature of the program. For example, an EM system servicing a small number of vessels may need fewer coordinators than a system servicing a large number of vessels.

By contrast, variable costs are directly related to how much the service is used, or how much of the service is delivered – in essence, they are costs incurred only when the service is actually delivered. In the context of EM, perhaps the key variable cost will be fees paid to contractors or occasional staff for each sea day reviewed.

Separating costs into either ‘fixed’ or ‘variable’ is important because it allows for the equitable recovery of costs across the fleet. For example, there is a strong argument that all vessels licensed within a zone have the same obligation to ensure that an EM system is in place, and therefore the fixed costs of establishing the system should be applied equally across the fleet. By contrast, vessels requiring a higher number of sea days reviewed (for example, because they fish more days) result in higher variable fees being incurred – in this case, there is a strong argument that variable fees should be recovered based on actual levels of usage.

The recovery of variable fees based on actual levels of usage also allows fisheries agencies to build in financial incentives to encourage voluntary compliance amongst the fleet. For example, vessels with a history of non-compliance may have 100% of their sea days reviewed, and therefore pay high variable fees. Vessels with a very good compliance history may have only 5% of their sea days reviewed, meaning they will be charged lower variable fees. Over time vessels may move into lower risk categories – and therefore be charged fewer variable fees – based on a demonstrated history of compliance.

4 Proposed cost recovery framework

4.1 Guiding principles

In broad terms, the application of cost recovery policy should be guided by principles which establish the basic conditions under which costs will be recovered and services delivered. A number of FFA members (most notably Australia and New Zealand) have established their own cost recovery policies at the national level which establish a framework of guiding principles (Australian Government, 2014; New Zealand Government, 2017). Given their developed country status, mature, well-funded governance structures and well-developed private sector markets, these policies have an understandably heavy focus on issues such as efficiency in service delivery (because Government delivered services must be seen to be competitive with equivalent private sector services) and transparency in the determination of costs.

Developing FFA member countries are arguably in a different position to their developed world colleagues, with more limited Government funding, greater financial fragility and a less well-developed private service sector. Accordingly, although many of the basic principles guiding cost recovery are likely to be consistent across the full FFA membership (e.g. the need to be efficient in service delivery), the relative emphasis of some of the motivations may be different in developing countries (e.g. the need to minimise exposure to financial risk).

To that end, we have set out below a proposed framework of principles to guide the application of EM cost recovery in Pacific Island FFA member countries. These have taken into account the principles included in existing models in the region (e.g. Australia/NZ), but have been customised to meet the needs and circumstances of Pacific Island countries. To the extent possible, principles have been structured such that they can be easily applied in practice. Principles are roughly structured in order of priority.

1. **Full cost recovery as a default** – The default position adopted by Pacific Island countries should be to apply full cost recovery for EM services unless there is an active policy decision not to. Full cost recovery should involve recovering both the direct and attributable indirect costs of providing the service. The reality is that expenditure of Government funds on services such as EM would not be required were it not for the fact that fishing vessels are operating in its waters earning a private benefit. Accordingly, costs associated with EM are directly attributable to the fishing industry and should therefore be eligible for recovery. Anything less than full cost recovery would effectively amount to a subsidy of the fishing fleet and act as a drain on limited fisheries agency budgets. Notwithstanding that, fisheries agencies may choose to apply something less than full cost recovery to some sectors of the fleet – for example, to the domestic sector as a means of encouraging domestic development. In these cases, the extent of subsidy applied should be calibrated carefully against other benefits derived from that sector (in the case of domestic fleets, local employment, taxes etc);
2. **Equity in recovery** – for those costs considered recoverable, cost recovery arrangements should be structured in a way that spreads costs equitably amongst users of the service. As a general rule, vessels that use more of the service (in this case EM) should pay more of the costs. Careful consideration should be given to the extent to which each user benefits from each service/cost item – for example, some services may be equally enjoyed by all vessels; other services may be enjoyed only by individual vessels. For example, all vessels arguably benefit from the fact that an office exists to house EM staff – these costs may be shared equally amongst the fleet. However, where an individual vessel's EM image data is reviewed, only that vessel is using the service – these types of costs may be recovered directly from the user of the service. In general terms, fixed costs tend to be 'used' relatively equally across the fleet, while variable costs (which depend on how much the service is used) tend to be used by individual vessels;
3. **Minimising financial exposure and risk** – As developing countries, Pacific Island governments have limited sources of income and low financial resilience and flexibility (i.e. they are unable to 'carry' debts for extended periods of time). To that end, cost recovery arrangements should be structured to minimise financial exposure for fisheries agencies (and national governments) and risk that services will be delivered for which payment is unable to be made. In practice, this means that funds for services should be paid in advance, with non-payment of cost recovery fees tied to strategic 'big sticks' (i.e. relevant cost recovery payments are required to be paid before licenses are issued);
4. **Incentives to encourage voluntary compliance** – where possible, incentives should be built into cost recovery arrangements to encourage voluntary compliance with relevant requirements. Providing incentives should not compromise the general principle of full cost recovery, but rather should reward operators whose good behaviour results in fewer costs to Government. As a general rule, incentives should be proportionate to the reduction in costs associated with compliant behaviour. In the context of EM this may mean, for example, that vessels with a history of non-compliance have 100% of their sea days reviewed – and therefore pay higher costs – while vessels with a strong history of voluntary compliance have only 5% of their sea days reviewed - and therefore pay lower costs. Vessels should have the capacity to move from higher risk to lower risk categories with a

demonstrated history of compliance, thereby creating a financial incentive for voluntary compliance;

5. **Efficiency in service delivery** – where the service is to be delivered by Government as a monopoly provider (if, for example, they have a legislative obligation to deliver the service), there is an obligation to ensure the service is delivered efficiently to keep costs as low as possible. Efficiency may be benchmarked against equivalent private sector costs for delivery of the same service, although there may not be an appropriate comparator for such benchmarking in all FFA island member countries. In such situations the basis for the cost charged should be transparent and periodically reported. The principle of efficiency should also benefit the fisheries agency – e.g. rather than having staff send 10 small invoices for a fee, it is better to send one or two, assuming there is a capacity to pay.
6. **Transparency and accountability** – as a monopoly provider of services, Government agencies have a responsibility to be transparent about the nature and level of costs being recovered and accountable for their use. The mechanisms through which they achieve transparency and accountability are a matter for national governments;
7. **Simplicity** – to the extent possible, cost recovery arrangements should be kept simple - the more complex a thing is, the more likely it is to break. Simplicity assists with efficiency and transparency at the Government end, and assists with understanding (if not acceptance) at the fishing company end.

4.2 Attribution and recovery

Within the broad framework of principles above, more specific policies are required at the operational level to guide the practical recovery of costs. Recovery policies and approaches may differ depending on the different types of costs. The section below sets out for each of the four main cost types identified in section 3, a proposed cost recovery policy and approach to cost recovery.

4.2.1 Type 1 – ‘On vessel’ costs

Type 1 costs (camera installation, ongoing maintenance and communications costs) **should be borne directly by the operator of the fishing vessel**. Typically, this would be implemented through condition of license (i.e. to be eligible to fish in national waters, all vessels must be fitted with a type-approved EM system capable of XXX) with ‘on vessel’ costs not factored into internal cost recovery calculations of the fisheries agency. This approach is consistent with the regional approach to VMS under which vessels each take responsibility for the installation and continuous operation of type-approved MTUs/ALCs.

National governments should set minimum standards for EM units and imagery (perhaps in the form of a type approval, similar to VMS). Where practical, these should be harmonised within the FFA membership.

Given many longline vessels fish across different zones in the FFA region, the direct purchase of a single type-approved EM system by the fishing vessel - which is capable of being used across multiple zones within a harmonised framework of operating standards within the FFA membership – will minimise costs to vessels and maximise operational flexibility.

The alternative would be for individual national fisheries agencies to purchase EM units and require their installation on vessels they license³. Not only would this potentially lead to unnecessary

³ For a fleet of 30 vessels this would require a capital outlay of US\$300-450K depending on the requirements for each system in relation to the number of camera units and any associated sensor requirements for each vessel.

duplication in the number of systems being purchased (for vessels licensed in multiple countries), but there are numerous challenges that arise in situations where the national fisheries administrations gift, lease or seek to cost-recover EM equipment and supporting systems from vessel operators. For example, while national fisheries administrations could amortise the capital cost of EM systems and seek to recover that cost over a period of several years, this assumes i) that the vessel will remain in the fishery for the time required to recover costs, and ii) that no component of the vessel's EM system will require replacement during that period. The administration of this arrangement would become quite burdensome if the national fisheries administration was also responsible for equipment maintenance. To that end, the direct purchase model fails each of the efficiency, simplicity and minimising financial exposure principles laid out above.

4.2.2 Type 2 – Program administrative and operational costs

Type 2 costs should be fully cost recovered from industry, unless there is an active policy decision to subsidise the operation of some or all vessels. Both the direct (e.g. fees for image data review) and indirect (e.g. office overheads, managerial staff time) costs should be recovered.

In practice, type 2 costs should be categorised as either fixed or variable costs.

Fixed costs should be recovered equally across the fleet in recognition that the operation of an EM system is a requirement of licensing. In practice, the full budgeted fixed costs for the upcoming year should be divided amongst the expected number of longline vessels to achieve a 'fixed fee' payable for the upcoming year. Full payment of fixed fees should be a condition of license allocation/renewal such that the full fixed costs of operating the system are recovered upfront as part of the annual licensing process (consistent with the principle of minimising financial exposure). The full fixed fee should be retained by the fisheries agency irrespective of the number of sea-days fished by the vessel.

Collecting the full fixed costs of operating the EM system upfront as a condition of license limits the risk of financial exposure to the fisheries agency and guarantees that funds will be available (assuming they are quarantined and managed well) to operate the system for the full year.

Perhaps the only complication in this approach is where vessels are licensed across multiple zones, and therefore may be liable for multiple sets of fixed fees. In this case, FFA members may wish to agree some accommodation for multi-zone vessels which limits the extent to which they are 'double charged'.

All **variable costs** should ideally be rolled into a single fee per EM sea-day record reviewed and analysed (or other convenient standard unit – e.g. set, hook). This is done by summing all of the Type 2 variable costs and dividing by the expected number of sea-days to be reviewed.

A proportion of the expected variable costs (e.g. XXX sea-days) should also be recovered upfront as part of the licensing process. Sea-days would be decremented as they are used from the amount initially paid (e.g. if an operator pays for 100 sea-days upfront, 1 day is decremented from this amount for each sea-day of EM image data reviewed). Fishing companies should be issued invoices for an additional number of sea-days before they exhaust the number of sea-days they have paid for (e.g. if they have paid for 100 sea-days, they should be sent invoices for an additional amount of sea-days before they exhaust their initial 100 sea-days; say 75%). The principle being that the fishing vessel should ALWAYS be in credit. Non-payment of variable costs should result in compliance action (e.g. license suspension/cancellation, administrative penalty).

While it is not necessary to collect all of the projected variable costs for the year upfront (given there is less risk of financial exposure than with fixed fees), it is important to collect a 'reasonable' amount (say around ½ of the expected number). This provides operating revenue for the fisheries agency to cover the variable costs of the EM system, and also serves to minimise the number of invoices to

vessels to achieve administrative efficiencies (as a general rule, less invoices will be more efficient than more invoices).

Where any variable fees remain unused within a fishing year they should be 'rolled over' to the following year (i.e. if a vessel pays for 100 sea-days, but only 80 sea-days are used, fees equivalent to the remaining 20 sea-days should be rolled over into the following year). If the vessel chooses not to renew their license for the following year, unused variable fees should be repaid. Tracking of sea-days paid for and sea-days used can be done through a relatively straightforward database.

Within this general approach, FFA island members may choose to apply different cost recovery arrangements to domestic and foreign vessels for type 2 fees as a means of encouraging domestic development (e.g. 100% cost recovery for foreign vessels; 70% cost recovery for domestic vessels). As discussed above, any reduction in fees for domestic operators should be broadly proportionate to the perceived benefits they provide to the national economy (e.g. through local jobs, taxes, etc). Where a subsidy is provided to domestic operators, the impact on the overall operating budget for the EM system should be calculated and a clear plan to raise the additional fees developed. Otherwise the overall functionality of the system across all vessels may be compromised.

Following the collection of variable fees, clear financial incentives to encourage voluntary compliance should be built in to EM operational models – the most obvious approach would be to review a lower proportion of sea-days for those vessels which demonstrate very strong compliance with relevant license conditions including a record of no unexplained disruptions to EM records. Such vessels may only be subject to random review with consequential reduction in variable fees paid.

4.2.3 Type 3 – Policy and regulatory development costs

Type 3 costs should be borne by national governments. These costs - policy development and legislative drafting - are typically considered 'core' functions of Government and should be funded internally. Where some staff are involved in both policy development and the operational delivery of EM services, only the marginal costs associated with service delivery should be recovered.

4.2.4 Type 4 – Research and analytical costs

Cost recovery arrangements for Type 4 costs are a matter of national discretion. In practice, these costs are attributable to industry given analysis of EM generated information would not be required in the absence of fishing activity. Accordingly, it is legitimate to recover these costs. In Australia, for example, AFMA has direct responsibility under the *Fisheries Administration Act 1991* to establish research priorities relating to fisheries managed by the Authority and arrange for research to be undertaken. Research and analysis undertaken includes surveys, fishery assessments, fishery modelling, new technologies and data analysis. These products are primarily used for the management of the commercial fishing industry and are therefore recovered through levies (AFMA, 2017). However, research and analysis for non-commercial fisheries (e.g. customary and recreational fisheries) is government funded.

In the context of EM in the Pacific Islands region, the extent to which costs are recovered may be dependent on the extent to which analysis is focused on the management of the commercial tuna sector and conducted in house (and therefore recovered), or whether EM information is provided to regional agencies (e.g. SPC) to analyse (in which case, analysis may be funded externally).

4.2.5 Other costs

Of the other costs identified in section 3.5:

- compliance costs associated with EM requirements (e.g. a requirement for an annual inspection undertaken by fisheries agency staff) should be considered a type 2 fixed cost and

recovered as part of the annual fixed fee. If there are travel costs associated with compliance inspections – e.g. if agency staff are required to travel to a distant port to undertake the inspection – these should be recovered at cost (or cost plus a small administrative fee to cover travel arranging) from the fishing company;

- compliance costs associated with investigations resulting from EM image data should be funded according to the national government/fisheries agency policies in relation to funding routine compliance activity (e.g. through license fees, consolidated revenue). While there is some argument that costs of investigation should be covered directly by the operator involved (i.e. if there was no incident, there would be no investigation, hence no cost), the policy basis is less clear where the operator is subsequently cleared of any wrongdoing (they may reasonably ask why they are being charged when they did nothing wrong). Advice on funding general compliance related activities is beyond the scope of this report and requires separate analysis. While many developed world countries (e.g. Australia) do not recover the costs of compliance and enforcement activity, their circumstances are arguably different to those of FFA island member countries. In Australia's case, there are relatively strong internal revenue streams from which to fund compliance and there is no licensing of foreign fishing vessels. In the Pacific islands region, internal revenue streams are weaker and licensed foreign vessels do not contribute to consolidated revenues other than through licensing fees. Given there would be less need for fisheries compliance activity on foreign fishing vessels if the fleet did not exist⁴, there is an argument for some level of cost recovery as part of the licensing process. Given compliance activities can rarely be attributed to individual 'users', recovery for compliance costs are better structured as a levy across all relevant license holders (national Governments may choose to apply different arrangements to domestic and foreign vessels, or different sectors – purse seine and longline – depending on expected activity).
- costs associated with the process of type-approval by EM system providers (e.g. hardware/software type approval) should be funded directly by the operators themselves. Operators may be charged an application fee by fisheries agencies (or a coordinating regional agency) to cover the costs of the evaluation process.

5 Implementing cost recovery in practice

5.1 A national policy

A key initial step in the introduction of new cost recovery arrangements is to set out an agreed policy framework to guide implementation. Having a clear policy is powerful because it provides guidance around the government's approach and expectations both to officials charged with implementing cost recovery arrangements and industry members who will be charged for services. It also provides clear guidance to legislative drafters should changes in legislation be required to implement the government's preferred arrangements.

Any cost recovery policy for EM should be consistent with any broader national government/agency cost recovery policies, and be developed according to accepted internal government/agency processes. Ideally, the policy should be written in plain, straightforward language to remove opportunities for ambiguity. Where appropriate, EM cost recovery policy may be integrated into existing policies covering monitoring (or alternatively, the EM policy can be extended to cover other

⁴ Even if no vessels were licensed, there would still be a need for compliance monitoring/enforcement (e.g. at sea patrols) to protect claims of sovereignty and detect and prosecute illegal fishers.

forms of monitoring to form an integrated policy for the recovery of costs across all monitoring services).

Although national cost recovery policy is a matter for each FFA member country, in order to assist in the development of national policies we have provided here a template policy covering EM services. The draft policy is consistent with the approach outlined in this paper and may be customised as each FFA member sees fit (e.g. different levels of cost recovery may be applied to domestic and foreign vessels; cost recovery may be phased in over different periods; etc). The policy covers the core elements of a practical policy – purpose, scope, definitions, policy, implementation, review – but may be expanded or refined as necessary.

Importantly, the policy has been drafted with the assumption in mind that the national agency will deliver the EM services. It is possible that, over time, alternative options for service delivery will emerge. For example, where vessels are licensed by multiple FFA member countries it may be possible for some services (e.g. analysis of EM image data) to be undertaken by a regional agency or by FFA members with the capability to offer a regional or sub-regional EM image data analytical service. If this is the case, the scope and function of such services could be specified in a formal arrangement between the FFA members concerned.

5.2 Legislative and regulatory considerations

When implementing e-monitoring it is important to ensure that the necessary laws are in place so that e-monitoring, including provisions for cost recovery, is legally supported and that the information and data generated can be used as required. Key considerations include:

- determining the most appropriate laws to enable and mandate the use of e-monitoring;
- reviewing and amending evidentiary laws to ensure that e-monitoring records can be used as evidence and that handling of e-monitoring records meets chain of custody requirements; and
- ensuring an appropriate legal framework exists to support cost recovery and obtaining relevant approvals.

5.2.1 Legal, regulatory and policy options to implement e-monitoring

During e-monitoring trials, FFA members generally entered into a voluntary agreement with industry to install equipment on selected boats. In these cases, conditions of use for e-monitoring were included in a Memorandum of Understanding between the national fisheries administration and the fishing company concerned. However, transitioning from trials to implementation of e-monitoring across national fleets will require the establishment of an appropriate legal framework to mandate the use of e-monitoring, as well as any relevant supporting obligations. This can be as simple as including e-monitoring requirements as a mandatory condition of relevant fishing licences, provided this is within the scope of powers for granting licences under the relevant fisheries Act/legislation. In some cases, an amendment to the fisheries management legislation may be required. National fisheries administrations should seek advice from the appropriate government legal authority on the necessary legal requirements.

While licence conditions are a simple instrument through which to implement e-monitoring, they may not be the optimal approach as the penalty provisions may not be as extensive as higher instruments (e.g. Acts, Regulations) and licences are typically applied on an annual basis. A more appropriate approach for those considering long term implementation of an e-monitoring program, may to consider a regulation or direction granted directly under the relevant national fisheries Act. Fisheries management Acts generally include provisions to issue regulations. E-monitoring can be accommodated either as a standalone regulation or included through an amendment to an existing

regulation. FFA has provided support to some members on the use of a regulation to support e-monitoring and standard text is available.

5.2.2 Chain of custody and evidentiary requirements

If e-monitoring data are to be used in detecting and prosecuting instances of non-compliance, it is important that EM data is admissible as evidence in any compliance-related investigations and potential subsequent legal proceedings.

Ensuring integrity in the chain of custody of data that is transmitted from the vessel and recorded to onboard storage media is necessary so that e-monitoring records can be submitted as evidence to support enforcement of fisheries offences. For e-monitoring, the chain of custody refers to a process that ensures an unaltered version of the data is maintained by approved persons and that the data is kept secure and can be accounted for at all times.

Data transmitted from the vessels to the national fisheries agency and FFA and WCPFC systems can follow similar procedures to the existing vessel monitoring system (VMS) data. E-monitoring systems can be type approved to meet the requirements of the FFA and WCPFC VMS which ensures that the data can be integrated into existing monitoring structures and can also reduce the need for duplicate systems on some vessels.

E-monitoring imagery and data recorded to digital storage media on the vessel needs to be managed through an agreed set of procedures that are documented by the national fisheries agency. These procedures need to ensure that a responsible person is authorised to remove the storage media from the vessel and make an approved 'forensic copy' for storage by the responsible fisheries agency and/or government record keeping department. The copy needs to be maintained in an unaltered state for presentation as evidence as required. Typically, the forensic copies of each drive are kept for a defined period of time until the e-monitoring records have been analysed and it has been determined that there are no issues requiring compliance action. In the AFMA e-monitoring program forensic copies are typically kept for a period of six months after which they are deleted, unless required for compliance purposes. In other cases, data has been kept for longer periods (e.g. some FFA members have retained data for 12 months), however, longer storage times require very large data storage capacity which may neither be practical or cost effective for some members.

When deleting forensic copies of e-monitoring storage media, national agencies will need to consider national laws on record keeping and archiving. It is common for countries to require records to be maintained for at least five years and fisheries authorities may need to seek an exemption from these requirements for any copies of e-monitoring records. This can be justified on the grounds that e-monitoring is improving the overall compliance framework, and it is not necessary, practical or affordable to store copies of e-monitoring imagery over the longer term.

When developing chain of custody procedures and reviewing record keeping laws, national authorities should also review their associated laws for submitting digital media to ensure that e-monitoring records are admissible evidence to support enforcement action.

5.2.3 Legal framework for cost recovery

The introduction of any new Government fee for service requires an appropriate framework of legal powers and policy approvals. National agencies seeking to introduce cost recovery for EM services should seek advice from the relevant government legal authority as to whether sufficient powers currently exist, or alternatively what amendments to legislation or policy instruments are required. In some cases, FFA members will already implement cost recovery for similar monitoring services (e.g. observers) and these powers may be relatively easily expanded to incorporate EM. In most cases, a responsible Government entity, with the appropriate statutory authority to approve Government-executed revenue generating initiatives, will be required to authorise the introduction of a new cost recovery mechanism. In some situations, it may be appropriate to prepare a business

case for presentation to the appropriate authority to seek approval for the implementation of cost-recovery arrangements for EM. To assist with securing the necessary support to develop and apply a cost recovery policy for EM, a generic business case is presented at Annex B.

5.3 Developing an operating model

The application of cost recovery policies in practice require the development of an operating model which sets out the main costs involved in providing the service, allows for the attribution of costs to relevant stakeholders and ultimately calculates the fees to be recovered. The operating model should reflect government policy and ideally be structured as simply and intuitively as practical. Typically cost recovery models would be structured around annual budgets, but could be structured over longer or shorter periods if necessary.

Populating the model with cost projections will require a good knowledge of relevant costs, or alternatively the use of reasonable assumptions. Consistent with the principle of minimising financial risk, budget projections should err on the side of being conservative (for example, under-estimating the number of expected licenses in the following year rather than over-estimating). Where possible the operating model should allow alternative cost/recovery scenarios to be tested to examine sensitivity to different approaches. Detailed information on actual costings against each line item should be kept such that the projections (and assumptions) in the operating model can be improved over time.

Similar to the template policy above, we have provided here an example of an operating model for EM cost recovery that may be used and amended as necessary by FFA members. Although many of the generic costs involved in EM are included, it is highly likely that each FFA member will have some of its own unique costs, so we fully expect it will need to be customised by each member. To that end, the template should serve as a conceptual example of the type of operating model required, rather than the finished article.

The example model is structured according to the fixed/variable categorisation described above. The key outputs are a fixed fee payable per year (i.e. the total fixed fees divided by the total number of expected licenses) and a fee per sea-day of EM image data reviewed (i.e. the projected variable costs divided by the projected number of sea-days to be reviewed). The model allows for different proportions of sea-days to be reviewed based on the risk profile of the vessel (higher risk vessels will have a higher proportion of sea days reviewed, and will therefore bear higher costs).

5.4 Stakeholder engagement

A key principle in most cost recovery policies is the principle of stakeholder engagement – the thinking being that those stakeholders from whom costs are being recovered should have the opportunity to discuss with the recovering agency the types of costs being applied and the extent to which service delivery is efficient. In Australia, for example, stakeholder engagement on annual cost recovery budgets is typically undertaken through the Management Advisory Committee (MAC) process which supports each fishery. In the Pacific, the nature and extent of stakeholder engagement is a matter for each FFA member. At a minimum, as a matter of procedural fairness, the general nature and basis for any cost recovery charges applied to licensed vessels should be set out in writing prior to payment.

5.5 Monitoring

A core component of any cost recovery 'operating system' is a system to record expenditure against budgets and monitor the usage of services by each vessel (e.g. the number of sea-days reviewed for each vessel). This is particularly the case where variable costs are differentially applied across the fleet (i.e. some vessels have a higher number of days reviewed and therefore pay more than others)

and costs need to be tracked against payments for each vessel. In practice, monitoring is often done through some form of tailored database. A well-designed database can save substantial staff time, help achieve administrative efficiencies and also assist with a number of other core functions (e.g. track time and calculate payments for contracted reviewers).

5.6 Review

The environment in which Pacific EM systems are likely to operate is ever changing – agency costs change over time, the number of vessels being licensed changes, fishing effort changes and operational costs are likely to go up and down. To that end, all cost recovery systems require formal processes of review to allow for the adjustment of budgets based on projected demand. At a minimum, budgets should be reviewed and adjusted annually, usually aligned to the annual licensing process. The process of reviewing the budget should be informed by actual costs of service delivery in recent years, together with projected needs in the forthcoming year (or years, if major capital purchases are expected and costs are likely to be amortised over a number of cost recovery cycles).

Reviews should also include periodic examination of operational systems to assess whether services could be better delivered and operational efficiencies achieved.

6 Integrating other forms of monitoring

Although this report has focused on EM, in practice EM will be applied by most FFA members as part of a broader suite of MCS tools within an integrated MCS regime. To that end, FFA members may prefer to adopt cost recovery policies and arrangements that cover the full suite of MCS tools (e.g. observers, EM, port monitoring, VMS, etc).

Many of the principles and policies recommend here for EM can relatively easily be refined or expanded to accommodate other forms of MCS. In general terms, all fixed costs attributable across all relevant MCS services for each license type (LL, PS, P&L) could be applied as a general 'compliance levy', payable at the time of license renewal. The levy could cover fixed costs, as well as any other costs difficult to attribute to individual vessels. For example, national governments may wish to recover some of the costs associated with at sea patrols. Because individual vessels do not receive a private benefit from being boarded, or from the general deterrent effect of at sea patrolling, any recovery of patrol funds should be applied equally across all license holders as part of a levy. By contrast, the variable costs associated with individual MCS services (e.g. EM, observers) should be costed separately and applied to individual vessels proportionate to their use of the service.

A basic conceptual model setting out how fixed and variable costs might be costed and recovered across multiple forms of MCS has been provided. Refining the tool to reflect actual national costs and cost items associated with each MCS activity would provide some capacity to compare the cost effectiveness of using alternate MCS tools to meet national MCS objectives (e.g. what is the most cost effective mix of human and electronic monitoring to achieve monitoring objectives in the longline fleet?).

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Annex A – Terms of reference

Scope of Works for Solomon Islands and Fiji Case Studies, Cost Recovery Guidelines for Monitoring Services

BACKGROUND

Independent monitoring of tuna fishing activities in the Western Central Pacific Ocean is important for collecting reliable data to support scientific assessment, regulatory decisions and enforcement activities. In purse seine tuna fisheries there is effective monitoring with observers on every boat. However, in longline tuna fisheries high levels of observer monitoring is often unsafe and too costly, and less than 5% of fishing effort is covered with an observer. E-monitoring systems have been trialled extensively as a cost-effective and efficient option for providing monitoring services, and a number of Pacific countries are now working to implement e-monitoring systems in their commercial tuna fishing fleets, including Solomon Islands.

Trials of e-monitoring systems were conducted in the tuna longline sector in Solomon Islands in 2014. Video e-monitoring systems were installed on two freezer longline vessels and two trips per boat were analysed to test how well the systems recorded data fields under the Western and Central Pacific Fisheries Commission (WCPFC) Regional Observer Programme (ROP). The trials demonstrated that e-monitoring systems are effective at collecting required data on catch and effort, and can enhance compliance through achieving higher vessel coverage. Since these trials, cameras were installed on a further eight tuna longline vessels in 2017, with the next phase of expansion planned to commence in 2018, and world bank funding is planned to fund the installation of 50 more systems over three years.

For e-monitoring to become more widely accepted, it must be able to demonstrate its cost effectiveness as a monitoring solution. Financial sustainability, without reliance on donor funding, should be the cornerstone to widespread adoption in the long term. While countries in the Pacific are at various stages of implementing e-monitoring systems and investigating cost recovery options and arrangements, there are no formal policy guidelines or recommendations governing best practice principles for cost recovery of e-monitoring. The Solomon Islands has discussed the potential to move to a fully cost recovered model of monitoring services, and Fiji is moving in this direction. Initial work on the feasibility of cost recovery has been completed⁵, however, further work is needed to determine if a fully cost recovered model could work, for e-monitoring and observers, and how it would be implemented over time.

PROJECT DESCRIPTION AND OBJECTIVES

The goal of the project is to examine options and develop cost-recovery guidelines for e-monitoring that could be applied across the Pacific tuna fisheries. The objectives are three-fold:

- 1. Develop a cost-recovery guidelines and model:** Undertake a desktop review of existing approaches and propose cost-recovery guidelines and a model(s) for implementing and administering an operational e-monitoring programme for tuna longline fleets, looking at Solomon Islands, and Fiji as case studies. This will examine costs involved in installing

⁵ 2016. Analysis of the costs and benefits of electronic fisheries information systems applied in FFA countries and identification of the legislative, regulatory and policy supporting requirements. Poseidon Aquatic Resource Management.

equipment, the hardware and software required to review footage and data collected, training observers to review data, review time and other associated costs.

2. **Build an implementation roadmap:** To develop a 'roadmap' or implementation plan, detailing how regulatory authorities can move from donor-funded services to a fully cost-recovered model(s). This will take into account the legal, regulatory and policy frameworks that will need to be in place to support implementation.
3. **Examine wider Pacific context:** To determine the applicability of the cost-recovery model(s) and roadmap to Solomon Islands and Fiji, and other Pacific Island contexts, particularly countries and states in the Western Central Pacific Ocean. The consultant can also decide whether to look at specific application to other countries (E.g. FSM and Marshall Islands, who are trialling e-monitoring).

ROLES AND RESPONSIBILITIES

A consultant is required to lead the project and undertake the analysis, using Solomon Islands and Fiji as case studies. The Forum Fisheries Agency (FFA) will be a key resource in the project and a co-author on the report. WWF staff will also provide technical expertise and support where required.

Consultant duties:

- Liaise with key stakeholders including national fisheries authorities (MFMR, and Fiji Fisheries) FFA, WWF, PNA Office, longline industry and service providers.
- Gather data on costs associated across all monitoring services in Solomon Islands and Fiji for the longline tuna fleet, including e-monitoring.
- Develop cost recovery guidelines and a model(s) that reflects the needs identified by Solomon Islands and Fiji for sustaining e-monitoring of their longline tuna fleets.
- Analyse the current legal, regulatory and policy context in Solomon Islands and Fiji, relevant to monitoring services.
- Make recommendations on steps to implement a cost-recovery model(s) and fee for service charges, including suggested changes to legal, regulatory and policy context.
- When developing cost recovery guidelines, consider the applicability of the model in the wider Pacific context including FSM, Palau, Vanuatu and Marshall Islands who trialling e-monitoring in their longline fisheries.
- If appropriate, consider examples where cost recovery models are already in place in other countries. (E.g. Australia).
- Develop a report with advice on the effectiveness of the model for publication.

FFA duties:

- Help build connections for consultant with key stakeholders.
- Provide technical fisheries and monitoring expertise to consultant.
- Provide legal input to consultant.
- Propose example countries for cost recovery models already in place, and for comparison of the applicability of the proposed model.
- Provide technical input and support drafting as a co-author of the report for publication.

WWF duties:

- Help build connections for consultant with key stakeholders.
- Refine scope of project with consultant.
- Provide technical expertise and coordinate travel for consultant.
- Provide input to the report for publication.

Annex B – A draft electronic monitoring business case

Why?

Electronic monitoring is being introduced to longline fleets in FFA member countries to address, *inter alia*:

- low levels of independent monitoring in the longline fishery⁶
- unreliable reporting of catch and effort data in log sheets
- compliance breaches of nationally and regionally agreed Conservation and Management Measures, and
- substantial uncertainty around levels of IUU activity, particularly mis-reporting and illegal transshipment⁷.

Unreliable reporting of catch and effort data in log sheets undermines:

- resource assessments for both target and non-target resources
- assessments of the economics of fishing and associated considerations relating to arrangements for fisheries access, and
- decision-making associated with resource conservation and sustainable management.

Electronic monitoring offers another tool to contribute to efforts to address these threats by:

- extending monitoring to all licensed fishing and support vessels
- supplementing other at-sea or in-port monitoring efforts
- contributing to an improvement in data quality through reconciliation across different data sources; EM, observers, transshipment, traceability schemes, VMS and port monitoring initiatives, and
- strengthening compliance monitoring.

It will also benefit industry through assisting with:

- monitoring crew and at-sea observer welfare
- a positive contribution to certification programmes, such as supported by the Marine Stewardship Council (MSC)
- potential positive benefits for insurance premiums
- improving transparency, and
- providing an independent record of compliant behaviour by good operators.

What?

Electronic monitoring in the fishing industry is the instalment and operation of ruggedized tamper-evident video cameras (CCTV) at strategic locations on board fishing and transshipment vessels and/or at unloading locations. It includes the subsequent analysis of the information recorded.

How?

EM systems provide 24/7 monitoring capability of fishing and unloading operations (gear deployment, retrieval and subsequent catch processing [including discarding] and unloading or transfer).

EM is not being implemented to replace other monitoring systems, such as at-sea observers. It is being implemented to complement and add value to existing programmes and systems.

⁶ <5% observer coverage.

⁷ Together with other compliance breaches on board licensed fishing vessels, and recognising significant uncertainties associated with quantifying the impact of IUU fishing, the estimated quantified impact of IUU fishing is US\$390 million per year [FFA/PNA/SPC 2nd e-monitoring workshop (2017)].

Camera systems can be integrated to Vessel Monitoring Systems (VMS) to provide real-time information relating to the status of the system and location. Integrated sensors can be programmed to trigger systems for the commencement and completion of recording.

Approved EM systems will be certified and accredited for installation by a competent authority such as a national or regional fisheries administration.

Installation will be overseen by accredited EM systems installers and maintenance personnel.

National or regional fisheries administrations will maintain a register of i) type-approved EM systems, and ii) accredited EM systems installation and maintenance individuals or companies.

Vessels will register with either national or regional fisheries administrations once compliance with EM requirements is achieved and appropriately certified. A fee may be associated with this registration.

EM requirements and associated procedures will be based on approved Government policy and legislated in appropriate national fisheries regulations. At the regional level it will be incorporated into MSC-related policies and procedures such as the Harmonised Minimum Terms and Conditions for Access by Fishing Vessels and the Regional Register of Foreign Fishing Vessels, as amended from time to time.

Video data is retrieved for analysis by national or regional fisheries administrations. Fisheries administrations maintain EM review centers with competent staff, usually with at-sea observing experience, and associated computer processing, communications and significant storage and archiving capability.

The EM coverage of fleets fishing under port-to-port, or other arrangements, in FFA member countries is a decision for each national fisheries administration.

Data analysis is risk based. Review rates may be adjusted on the basis of compliance risk assessment or in response to special needs.

Analysis provides both quantitative and qualitative information on fishing vessel operations, including vessel behavior, gear deployment characteristics, catch composition including target and by-catch species, and treatment of the catch. There is increasing capability to collect some biological data, such as fish length. Sexing and other biological information, such as gonad condition, is still collected by at-sea observers or through port sampling programmes⁸.

EM data can be integrated with data compiled from other monitoring activities such as those associated with at-sea observers, transshipment, traceability schemes, VMS and port monitoring initiatives. Reconciliation of the different data types provides valuable opportunities to monitor and strengthen data quality.

National or regional fisheries administrations may apply cost recovery policies to support the cost of administering and managing EM systems.

Who?

EM is the responsibility of national fisheries administrations. It is a potentially very valuable component of the suite of MCS tools that are managed and administered by national and regional fisheries authorities.

National fisheries authorities coordinate and collaborate with other national bodies in the execution of these responsibilities. They include Attorneys General and the ministries of finance or treasury, labor and industry, transport, environment and government offices responsible for economic development.

⁸ To date, the only FFA member that has reduced at-sea observer coverage is Australia, where, in addition to EM, they support a comprehensive port sampling program that ensures the required biological data is still collected.

Technical and implementation advice and regional coordination, including data consolidation and archiving, is facilitated by the regional agencies, FFA, SPC and the PNA.

Currently, some non-Government organisations, such as WWF and TNC, and traditional development assistance partners, such as the World Bank, are providing start-up support to national-level pilot EM initiatives.

Industry is cooperating with EM trials in Palau, FSM, RMI, Fiji and Solomon Islands. Several companies, Bumble Bee in Fiji and Luen Thai in Micronesia, are trialing EM independently with the support of local fisheries administrations.

Annex C - EM Cost Recovery Policy template

Purpose

This policy sets out the (XXX Government's/Agency's) approach to the recovery of costs from licensed industrial longline vessels for the provision of relevant electronic monitoring services.

Scope

This policy covers both the direct and indirect costs associated with the delivery of electronic monitoring services to industrial longline vessels licensed to fish in XXX's EEZ (and the high seas).

Definitions

Unless otherwise indicated, the definitions used in this policy have the same meaning as those in the Pacific Islands Forum Fisheries Agency *Harmonised Minimum Terms and Conditions for Access by Fishing Vessels* (HMTCs), as amended from time to time.

Additional definitions (not otherwise in the HMTCs) are at Annex A.

Policy

The Government of XXX recognises that:

- the industrial longline fishery is a commercial operation which generates a private benefit from the harvest of fisheries resources; and
- the provision of electronic monitoring services, and the associated expenditure of costs, would not otherwise be required in the absence of the industrial longline fishery.

With that in mind, it is the policy of (country/agency) to apply full cost recovery for the provision of electronic monitoring services, unless otherwise indicated. Full cost recovery involves the recovery of both the full direct and indirect costs associated with providing the service.

In recognition of the socio-economic benefits to the national economy provided by domestic fishing vessels, (insert subsidy/discount details – e.g. a discount of XXX% will be applied to cost recovery fees for these vessels – if applicable).

Principles

Application of this policy will be guided by the following principles:

- Equity in recovery – cost recovery arrangements will be structured to recover costs equitably across all users of the service;
- Minimising financial exposure and risk – cost recovery arrangements will be structured to minimise financial exposure and risk to (country/agency);
- Incentives for voluntary compliance - cost recovery arrangements will be structured to provide incentives for voluntary compliance with relevant regulations amongst the longline fleet;
- Efficiency in service delivery – the delivery of services for which funds have been recovered will aim to be as efficient as practical;
- Transparency and accountability – the recovery of costs for electronic monitoring services will be transparent to all users and agencies responsible for service delivery will be accountable for their use; and

- Simplicity - cost recovery arrangements will be structured to be as simple as practical, while satisfying other principles.

Implementation

Costs associated with EM services will be categorised into one of four types:

1. Type 1: On vessel costs – these are costs associated with the installation and operation of EM hardware and supporting systems on board fishing vessels;
2. Type 2: Program administration and operational costs - these are costs that are associated with the administration and operation of the EM program, usually undertaken by national (or regional) fisheries administrations. These costs would be typically expected to form the 'core' of the annual EM program budget;
3. Type 3: Policy and regulatory development costs - these are costs associated with the establishment of relevant regulatory and policy arrangements to support effective EM systems; and
4. Type 4: Research and analytical costs – these are costs associated with the analysis of EM generated information to produce outputs in support of the administration and management of longline fisheries by national fisheries administrations (e.g. production of reports analysing annual trends in EM information).

Type 1 costs

Type 1 costs will be paid directly by fishing companies. This will be implemented through a condition of license requiring the installation, continual operation and maintenance of an electronic monitoring system meeting type-approved specifications. Minimum standards for electronic monitoring hardware and imagery will be established by (govt/agency). Where practical, these will be harmonised within the FFA membership.

Type 2 costs

Foreign fishing vessels will be subject to full (100%) cost recovery for type 2 costs attributable to their vessels.

Domestic fishing vessels will be subject to partial (70%) cost recovery for type 2 costs attributable to their vessels.

Type 2 costs will be categorised as either fixed or variable costs.

Fixed costs will be applied equally across the fleet in recognition that the operation of an EM system is a requirement of licensing. In practice, the full budgeted fixed costs for the upcoming year will be divided amongst the expected number of LL vessels to achieve a 'fixed fee' payable for the upcoming year. Full payment of fixed fees will be a condition of license allocation/renewal. The full fixed fee will be retained by the fisheries agency irrespective of the number of sea days fished by the vessel.

Where a vessel is licensed in multiple FFA member zones, (agency) may reduce the fixed fee payable by an amount determined by the (agency).

All variable costs will be rolled into a single fee per EM sea-day record reviewed and analysed. This is done by summing all of the Type 2 variable costs and dividing by the expected number of sea days to be reviewed.

A proportion of the expected variable costs (e.g. 100 sea days) will be recovered upfront as part of the licensing process. Sea days will be decremented from the amount initially paid for as they are used (e.g. if an operator pays for 100 sea days upfront, 1 day is decremented from this amount for each sea day of EM footage reviewed). Fishing companies will be issued invoices for an additional number of sea days before they exhaust the number of sea days they have paid for (e.g. if they have

paid for 100 sea days, they will be sent invoices for an additional amount of sea days before they exhaust their initial 100 sea days). Fishing companies must always be in credit. Non-payment of variable costs will result in compliance action (e.g. license suspension/cancellation, administrative penalty).

Where any variable fees remain unused within a fishing year they will be 'rolled over' to the following year (i.e. if a vessel pays for 100 sea days, but only 80 sea days are used, fees equivalent to the remaining 20 sea days will be rolled over into the following year). If the vessel chooses not to renew their license for the following year, unused variable fees will be repaid.

The proportion of each vessel's EM footage reviewed will vary according to the (agency's) assessment of its compliance risk. Vessel categorised as higher risk will have a higher proportion of sea days reviewed than lower risk vessels. The proportion of sea days reviewed is at the discretion of the (agency) and may be amended from time to time.

Type 3 costs

Type 3 costs will be funded internally by (Govt).

Type 4 costs

An amount to cover the expected costs of producing analytical products to support the responsible management of the fishery will be recovered as part of the fixed fee paid by all license holders.

Stakeholder engagement

(outline process of stakeholder engagement – e.g. for foreign fishing vessels, arrangements for cost recovery will be discussed with license holders and flag states annually, during annual access negotiations. For domestic vessels, arrangements for cost recovery will be discussed with license holders through XXX)

Monitoring

The (agency) will maintain systems and process to monitor actual usage of services against fees recovered for each cost item. Records of actual costings for current and previous years will be used to inform cost projections for future years.

Review

The calculation of fees to be recovered from longline vessels for monitoring services will be reviewed annually, prior to license approvals.

This policy will be reviewed within five years of initial approval.

Approval

This policy has been approved by (person/title or body), in accordance with (relevant legislation/instrument governing policy approvals)

Annex A: Definitions

Coverage: is the proportion of hooks set monitored by EM submitted to the [national fisheries administration] at the completion of a fishing trip.

Domestic fishing vessels: (insert definition of domestic vessels – if the country chooses to apply a discount on cost recovery fees to domestic vessels, this definition should describe the fleet to which the discount applies as clearly as possible).

E-Monitoring (EM): is a data collection and verification system that independently monitors some fishing activities. It relies on automated operations and sealed and tamper-evident equipment. It includes Vessel Monitoring Systems (VMS) to securely transmit GPS position and time data at prescribed intervals to fisheries administrations and digitized image data.

E-Reporting (ER): is the process of submitting fisheries data from the source (vessel, observer, unloading etc.) to the fisheries administration. It can occur in real time, through satellite transmission or mobile networks, or as stored data transmitted to the fisheries administration periodically including following the completion of a trip.

Responsible use: for the purpose of this Policy only, means use of allocated financial and personnel resources and assets that is efficient, effective, economical and ethical as measured by the timeliness and quality of the delivery of services including in relation to performance auditing and reporting.