Enabling people to create change: Capacity building for Ecosystem Approach to Fisheries (EAF) implementation in Southern Africa

ARTICLE *in* MARINE POLICY · JANUARY 2012

Impact Factor: 2.62 · DOI: 10.1016/j.marpol.2011.06.007 · Source: RePEc

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Marine Policy 36 (2012) 286–296

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Enabling people to create change: Capacity building for Ecosystem Approach to Fisheries (EAF) implementation in Southern Africa

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ARTICLE INFO

Article history:
Received 2 November 2010
Received in revised form
5 April 2011
Accepted 24 June 2011
Available online 20 July 2011

Keywords:
Training
Fisheries
Sustainability
Education
Marine law

ABSTRACT

Recent studies report that 80% of marine resources are fully or over exploited. In an attempt to address this, countries are moving towards implementing an Ecosystems Approach (EAF) to Fisheries management. A strong component of an EAF is the involvement of fishing sector stakeholders in the making of decisions that affect them but, despite this, no formal or informal information exchange or training on this and other EAF concepts existed in South Africa prior to the development of the Responsible Fisheries Programme (RFP). The RFP training course design integrates theoretical presentations and practical exercises, deliberately involving various stakeholders with differing perspectives and roles. The RFP has trained a total of 600 individuals thus far (May 2007–January 2010) from various fisheries sectors in southern Africa. Sampling evaluation forms processed across all fisheries sectors trained, indicated that participants found the practical exercises very useful and valued the group work, which allowed for interactions between the different stakeholder groups. Numerous positive benefits derived from the training are described by means of case studies. Lessons drawn from the roll out of the training include: the forging of a common understanding through stakeholder participation; the benefits of a participatory approach and the appropriate use of local and international case studies to illustrate concepts. Results of the training carried out to date indicate that the RFP training can improve compliance of fisheries regulations, adherence to voluntary measures and uplift the skills of fishers. Such benefits will increase the likelihood of long-term sustainability of southern African fisheries.

1. Introduction

It is without a doubt that the world's oceans are in trouble. Recent surveys report that 80% of global marine resources are fully exploited or worse, over exploited [1]. Worldwide efforts to tackle this challenge have looked to many different management strategies and options for solutions, and although few appear to be successful [2], marine resources continue to dwindle [4,5,1]. A different view of how our oceans are managed has emerged however, and over the past decade more and more people are buying into the more holistic view of fisheries management, i.e. an Ecosystems Approach to Fisheries (EAF) management. The rationale behind an EAF is that, in order to manage fisheries responsibly, it is important to understand the dynamics of both individual populations and the ecosystem as a whole. The concept is simple – healthy ecosystems sustain healthy fisheries – yet the implementation is more complex [3].

In South Africa, the concept is well entrenched. Historically, fishery management decisions have been top-down: the fisheries resources have been treated as State property and the objectives of fisheries management have mainly been confined to conservation of fishery resources, relying on biological sciences alone. Since 1998, however, the country has committed to implementing an Ecosystem Approach to Fisheries management through the World Summit on Sustainable Development Implementation Plan (2002) and has revised its legislation to include EAF applicable regulations.

A strong component of the Ecosystems Approach to Fisheries is the involvement of fishing sector stakeholders in the making of decisions that affect them (the co-management approach) and thereby including 'user knowledge' in decision making [6]. Matthew [7] maintains that, as long as there is poor understanding of fisheries management amongst the fishers, there is likely to be an unwillingness to comply with fisheries regulations. He attributes this in part to a lack of effort both in taking local knowledge into account in decision-making processes and in explaining the rationale behind management decisions. This is the case in South Africa as it is apparent that, although the appropriate policies and

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doi:10.1016/j.marpol.2011.06.007

regulations to cover aspects of an ecosystem approach are in place, this has in many cases not proved sufficient to facilitate implementation on the ground. As an example, mitigation measures such as the use of tori lines to reduce seabird bycatch have been introduced into permit conditions of longline fisheries, but after a decade there is still poor implementation at sea [8]. By including user knowledge in decision making processes, not only does the user (the fisher) feel empowered to implement change and own the decisions, but it is likely that the decisions or solutions being implemented will be practical, more robust and therefore more likely to solve the problem at hand. Furthermore, through having a thorough understanding of fisheries regulations and the skills to implement them, fisheries managers can ensure adequate and appropriate implementation of measures. This will also decrease the risk of fishing companies being penalised for non-compliance by skippers at sea.

Similarly, fishery compliance officers (FCO's), who enforce management actions, cannot do so effectively if they are not equipped with a thorough understanding of fisheries regulations; their own powers and duties and how to use them appropriately. Knowledge of the rationale behind regulations helps FCO's understand the severity of crimes and therefore helps them make educated decisions when implementing fines.

Empowering those who are at the coal face of fisheries management with the knowledge and understanding of fisheries management decisions, will further equip them to be part of those decisions, and can only strengthen the implementation of fisheries management in South Africa. In 2007, there was no formal or informal training on EAF concepts. Fishermen only received legal documents accompanying their permit. They did not receive any information on an EAF and or the regulations and permit conditions. Compliance officers, monitors and fisheries observers were receiving limited training on some permit conditions from observer agencies or other non-government organisations such as BirdLife (e.g. seabird bycatch), but this did not include an understanding of the rationale behind management decisions or an EAF.

The WWF Responsible Fisheries Programme recognised that this lack of training required addressing if South Africa was to successfully implement an EAF and achieve a compliant, sustainable fishing industry. In 2007, a needs assessment was conducted to assess the current perceptions and levels of understanding of the principles of an EAF and associated regulations within the fishing industry. The results indicated a lack of understanding and implementation (Honig and Petersen, unpublished). It was with this background that WWF initiated and developed the Responsible Fisheries training course with the goal of equipping fishers, compliance staff, fisheries observers and managers with the skills and knowledge to implement an Ecosystem Approach to Fisheries Management. The training was initially developed and piloted with the South African hake trawl fishery, as South Africa's largest fishing sector, but later adapted for the large and small pelagic fisheries. More recently, the training has been made generic for application across all fisheries sectors.

This paper explores the challenges, barriers, successes and lessons learnt over the past two years.

2. Methods

2.1. Brief background of fisheries sectors trained

2.1.1. The South African hake trawl fishery

The hake trawl fishery is the largest fishery in South Africa and can be divided into the offshore hake fishery and the inshore hake fishery [9,14]. A global quota management system was applied to the sector in 1978 (Olympic system), and in 1982 individual quotas were introduced. Demersal trawlers targets *Merluccius paradoxus* in the deeper water (250–500 m depths) while the inshore trawlers target *Merluccius capensis* in the shallower waters (shallower than 200–250 m depths) [10]. Hake are mainly a bottom shoaling fish in Southern African waters and migrate closer to surface at night, and was therefore in the past mainly targeted at night. Recently, however, fishing effort however occurs throughout day and night. Today, both the inshore and offshore trawl fisheries for hake are MSC certified [11].

2.1.2. The South African large pelagic fishery

The South African large pelagic fishery consists of the tuna pole fishery and the tuna/swordfish longline fishery. The tuna pole fishery began in the 1970s and consists of approximately 2500 people (191 rights holders). The target species is mainly albacore (longfin) tuna *Thunnus alalunga* and yellowfin tuna *Thunnus albacares*, with a bycatch of yellowtail *Seriola lalandii* [12]. The fishery is seasonal and operates between September and May along the west coast of South Africa when albacore is most abundant. It is the largest large pelagic fishery in South Africa, with 163 vessels registered between 2002 and 2005 and an annual catch averaging approximately 6000 tons (including bycatch of yellowfin and bigeye tuna *T. obesus*).

The fishery is managed through a Total Allowable Effort (TAE), with a maximum of 200 rights being allocated. Medium-term rights were allocated in this fishery in 2003 and long-term (8 year) rights were subsequently allocated in 2006. Currently, 191 rights have been allocated, although not all have been activated (Craig Smith, *pers comm.*).

The tuna longline fishery has been operating since the 1960s, and targets swordfish (*Xiphias gladius*) and predominantly bigeye tuna, yellowfin tuna, and southern bluefin tuna (*Thunnus maccoyii*).

2.1.3. The South African small pelagics fishery

The South African small pelagic (purse seine) fishery began in the 1940s and has grown to become South Africa's largest fishery in terms of volume landed, and the second most valuable fishery in the country [13,14]. Its target is sardine *Sardinops sagax* and anchovy *Engraulis encrasicolus*, with a bycatch of red eye *Etrumeus whiteheadii* and horse mackerel *Trachurus capensis*, which is caught with a purse seine net off small (26 m) wooden boats or larger steel vessels [14]. Sardine and anchovy are often caught together; juvenile sardine are caught as bycatch in anchovy-directed fishing efforts and anchovy can be caught as bycatch when targeting sardine.

2.2. Development of the training

Theoretically, experiential learning is participatory and the focus is on building knowledge through the workshop. The concept that participants are more likely to believe knowledge they have discovered for themselves than in the knowledge presented by others was a primary concept embraced in the development of this training course [15]. The fundamental assumption carried throughout the training was that the participants were as knowledgeable as the facilitators, albeit drawing from their different experiences, and that all would learn from each other. The training methods enabled such sharing of knowledge to take place. As well as enabling interactions between presenters and participants, the training course brought together law enforcement and fishing industry players. Having law enforcement and fishing industry players together in a neutral space enabled each individual to gain some understanding of the challenges faced by each other.

As the training deliberately involved various stakeholders, it was inevitable that the participants would have differing levels of experience, and knowledge of the industry. The strategies to overcome this were based on the core assumption of the training methodology that "all were experts" but in different areas. Firstly, facilitators frequently got the group who were familiar with a concept to explain the concept to the group less familiar with the concept. In this way one keeps their attention and empowers them to teach and share what they know well. Secondly, numerous group work exercises were used. In these groups participants would teach each other and interact at the appropriate level.

Training activities included group work where each group would contain both fishing industry stakeholders and law enforcement officials. Role playing activities enabled compliance officers to step into the shoes of skippers and start thinking from their perspective and vice versa. Skippers, their officers and their crew have an extremely good working knowledge of the conditions and environment above the surface of the sea. They also have a broad ranging wealth of observations on sea currents, weather conditions, types of animals and birds that are seen at sea and the fish that they haul out of the ocean. But for most fishers, the environment under the surface of the sea is a mystery. The use of videos to convey the details of the lives of the life under the sea aimed to create a sense of awe and respect for sea life. Formal presentation followed by debate about the theoretical basis behind food webs created new awareness about the interconnectedness of all living things and their connection with the non-living environment.

Fisheries management measures, such as TAC's (Total Allowable Catch), quotas, closed areas, etc, that have been implemented through regulations were analysed through a game playing activity where participants tried various methods of managing fishing through effort based measures or quotas. Using interactive methodologies, complex theoretical concepts were conveyed to participants in a way that empowered them. The aim of the workshop was not to convince participants of the "correctness" of management directives but to enable them to understand how such regulations and directives are derived. The training course design integrated theoretical presentations and practical exercises.

2.2.1. Support materials

The scientific knowledge of the fisheries sector is mostly contained in reports and published scientific papers often specific to a particular species or fishery. Much of this information is presented in a format familiar to scientists and fisheries managers, using for example mathematical formulas and graphic representation, with language use often incomprehensible to law enforcement officers or resource users on the ground. Part of the training intervention was to produce a training manual where information was adapted into accessible language for the fishing industry while still maintaining its scientific integrity. It was important that the means of explaining concepts took into account a limited mathematical and scientific knowledge. The training manual is unique to every fishery and incorporates the specific regulations that apply to that sector, although the concepts are of a generic nature.

2.2.2. The use of experts and facilitator training

The use of an experienced participatory facilitator/adult education specialist who understood the scientific mindset and was able to mentor the presenters into presenting their scientific evidence in a way that acknowledged its limitations and recognised the value of the fisher's contributions was intrinsic to the course design. Most of the presenters and facilitators had scientific training and an in depth knowledge of their subject. Part of the strength of the training was that knowledgeable and passionate presenters were able to provide a wealth of additional information to the discussions. A significant contribution to the success of the training was that the scientifically trained presenters learnt to acknowledge that the views of the fishers are as equally valid as those derived from formal scientific research.

2.2.3. Evaluation methodology

Chess [16] highlights a user based evaluation approach where participants identify their own goals and then evaluate the success of the workshop based on whether their own goals have been achieved. Adapting this approach to the fisheries training meant that each participant was asked to identify his or her expectation for the workshop and then to reflect on their achievements relative to that expectation at the end of the course.

It is also important to obtain a quantitative measure of the impact of the programme. This data was obtained from the formal course evaluation forms and a number of targeted interviews with participants about 6 months after they have completed the course.

Note that the RFP training was originally piloted with the trawl fishery, and the training has been subsequently adapted for other fisheries. As a result, most individuals trained have been from the South African trawl fishery. The training was also regionally adapted, and was rolled out for the Namibian Hake Trawl fishery in 2008.

3. Results

The course is made up of four modules presented over two days. The first module is an introduction to an Ecosystem Approach to Fisheries management and how this is implemented through international and national regulations or permit conditions. Module two focuses on the ecological details of an ecosystem approach, e.g. bycatch, food webs and marine habitats or ecosystems. Module three deals with fisheries management and module four focuses on incentives for responsible fishing as well as voluntary and enforceable compliance.

3.1. Composition of course participants

The RFP has trained a total of 600 individuals thus far (May 2007–January 2010). Of these, 495 individuals have completed the entire course, i.e. Day 1 and Day 2, whilst 105 (17%) individuals only completed Day 1. Of those attending the course, 82% were men. This reflects the male domination of the fishing industry. Women are more prevalent in the government sector, i.e. compliance officials or Fishery Control Officers (FCO). Participants comprised 50% industry members (including skippers, officers, fishing crew and industry managers), 1% government fisheries managers, 24% compliance officers and 25% other (including monitors, NGO's and researchers). Participants were from all major commercial sectors comprising of 39% hake trawl (inshore trawl, 6%, and offshore trawl, 33%), 9% small pelagics, 15% pelagic longline, 20% tuna pole and 16% from the Namibian hake trawl fishery (Table 1).

3.1.1. Qualitative assessment of success of training

Table 2 provides a sample of comments by learners at the end of various courses, and indicates what parts of the course were important to them.

3.2. Quantitative feedback

A sample of 323 evaluation forms were processed across training interventions comprising of 22% from the Pelagic Longline sector, 15% from the Tuna pole sector, 8% from the small

Table 1
A sample of comments provided by learners at the end of various courses.

For the first time, we have skippers and compliance officials together in the same room, sharing information honestly.
Compliance and industry must hold hands to better protect our fish stocks.
Very informative discussion with both parties (compliance and industry), coming together. We can learn a lot from each other.
I am speechless, don't know what to say. Thank you WWF and Sea Harvest for giving us the opportunity. Time for us to go out there, change the world and look after our species for the next generation.
The power will be that we can educate others.
It is an honor to sit here and learn. I have been working for MCM for 2 years now, and when I got there they gave me a copy of the act and told me to go out and enforce.
We need to look further into the future to sustain our fisheries for the future.

pelagic sector, 30% from the hake trawl sector and 25% from the Namibian hake trawl sector.

The results of the evaluation analysis revealed that participants drew important lessons from all four modules in the course (Fig. 1), although the module that learners felt was the most important and made the most impact is Module 2, Ecological Health.

Approximately half (47%) of learners report that the most important concept they learned through the training falls under Module 2 (Ecological Health). Within this module, the most important aspects (20% of participants) were bycatch-related issues, which included why some animals are more vulnerable than others, seabird and shark bycatch, as well as some species identification. 36% of learners preferred Module 4 (Monitoring and Compliance), whilst 12% noted Module 3 (Introduction to Fisheries Management) as the most useful module.

All participants indicated that they found the practical exercises useful and valued the group work which allowed interactions between the different stakeholder groups. The aspects of the training requiring improvement include further stakeholder representation especially the inclusion of fisheries managers in the course. Learners also suggested the training be longer to include more topics, more videos and more discussion time. Some participants felt that the training would be enriched if it included a practical, or at-sea component. Although this is difficult to arrange perhaps this suggestion could be used in the future refresher courses.

3.3. Has the training impacted on fishing management practices?

For some participants, an understanding of the theoretical concepts gave them insight into the challenges faced by scientists and in some cases, also renewed vigour to challenge them through co-management structures created for engagement between MCM and the industry. For others, the course provided them with information about the functioning of the ecosystem in a manner that motivated them to commit to existing mitigation measures such as tori-lines, rather than dismiss them as "more strangling red tape".

In a more in depth assessment, 31 skippers were interviewed to gauge what impact the training is having. They mostly all agreed that their personal views of the compliance sector in general have changed for the better since the training (Table 2), although the discrepancies in view is largely sector related. The tuna pole sector has made great strides in improving relationships with MCM officials but as is seen by the interviews, much work is still to be done. In general, they all understand why rules and regulations are necessary to preserve fisheries for future generations, and believe that fishermen should self-regulate their behaviour.

All were asked their opinion on what encompassed a "Responsible Skipper" and their replies include someone that knows the laws governing the sea, who understands that quality, not quantity, of fish is needed, who understands the "bigger picture and knows where you [as the fisherman] fit in, who shares information with the crew and is not "just concentrating on fishing for today, but also for tomorrow". These views were echoed amongst the other skippers interviewed and there was a general consensus that a Champion is one who "keeps a clean ship", has a long term view and takes the responsibility upon himself to educate others.

Practical management changes will need to be monitored over time in order to understand the full impact of the training but already there are positive shifts in behaviour.

4. Discussion

Although a more rigorous evaluation of the training is required it is clear that numerous positive benefits have been derived. Through the interviews we have been able to demonstrate that theoretical concepts have been internalised and fishers were able to express them in their own words and not simply regurgitate training terminology in order to impress the evaluators. Although change in behaviour over the long-term is likely to be a step wise process the first indications of this are apparent.

4.1. Lessons learnt

Some lessons that can be drawn from the results of the programme are highlighted here.

4.1.1. Forging a common understanding

Stakeholder participation is critical to the successful implementation of an EAF [17]. A strength of this training programme lies in bringing people together from different backgrounds to share their experiences and perspectives, which has allowed for the development of a common understanding and respect for their respective roles.

At the beginning of the workshop, participants in many cases had a negative impression of each other's role. As is evident from the participants' comments, once they have completed the course this perception had changed. Learners had gained an understanding that each group brings a different piece of information to the table and each have an important role to play.

4.1.2. The benefits of a participatory approach

In many cases workshop participants have differing levels of fisheries experience, and knowledge. This presents a challenge to cater for all levels simultaneously without boring one sub-group or talking over the heads of another. The participatory training methodology was selected to overcome this challenge. The investment in a scientifically trained participative learning expert and the mentoring role that such an expert played in demonstrating facilitation methodology and in evaluating the WWF facilitators contributed to the training success.

A further lesson learned was in finding the ideal number of participants. The course was successful when there were sufficient participants to allow for active discussion and sharing of ideas. However, an excessive number (i.e. over 25 learners) frequently resulted in confident personalities dominating

Table 2
A summary of the responses of a sample of 33 skippers to the question "Have you made any changes on your boat and/or to the way you fish since you attended the course? " All "No" responses are in bold and all "Yes" responses are non-bold. For the full table, please see Appendix 2.

	Response						
	Gear use	**Relationships with MCM and FCOs**	**Attitude (view of the sea, and fisher's role)**	**Logbooks**	**Pollution**	**Compliance**	**Seabirds**
Skipper (small pelagics)	Y—now we use Tori Lines inshore and offshore	Y—get along much better now that there is an understanding between all the parties involved	Y—we do the work now and try save the ecosystem	Y—we write everything down now and have had observers onboard and inspections and there have been no problems at all.	Y—we put all of their garbage and oil in bins and bring it back to land to dump	**N—we are and have been compliant**	Y—now flies tori lines and has taught the crew about their importance
Shore skipper (small pelagics)	Y—we use gear which tries to keep sharks away	Y—there is a better understanding of what we do and why we do it	Y—we speak to fishermen in and around the harbour	Y—they are all up to standard	Y—it is all kept on board	Y—course clued them up on the ecosystem	**N/A as purse seine net**
Skipper (tuna sector)	**N—it is the same**	**N—they do more checks and are a hassle**	Y—he has always had respect for the sea but it is good to know more details about it and stick within permits conditions	**N**	**N—always brought stuff back**	**N—about the same**	Y—we now use red poles on the front of the boat to deter the birds. *We also now release all of the sharks, remove all of the hooks as much as possible and cut the line where it is not possible to release.
Mate (tuna sector)	**N—cannot really change tuna pole**	**No comment—skipper deals with them**	Y—he is harder on crew and makes sure they release all sharks and birds	**No comment—skipper does log book for MCM**	**N—bring everything back to shore, skipper installed milk bottles at everyone's stations for them to put cigarette butts into them**	**N**	Y—we have changed methods of hook removal. Makes sure all of the animals such as sharks and birds are treated well and released according to the methods shown at training.
Skipper (hake trawl)	Y—Did not know much of fish gear in all sectors. Now know why it is important to make use of the right equipment for a specific species	Y—Did not know how to contact in various departments of MCM. Now have met the correct person like the Monitors, etc.	Y—Did not understanding the view of the sea and livelihood—now I have a better understanding why we as nation must look after our Marine resources	Y—Did not know about the importance of recording catches. The reasons for the annual research to announce Biomass and Quotas	**N**	Y—Did not know the importance of Compliance—I learn a lot of the reasons for the permit conditions	Y—Did not know of the lively hood of Seabirds. The importance of all Seabirds on our Islands and how many of them are there along our coastline.
Skipper (hake trawl)		**N—no change. Still think MCM is useless.**			Y—Nothing goes overboard. There are enough landfills on land. Cos tomorrow we have to work there again, and then the stuff you put in the sea, you catch in your nets again (cables, wires, nets).		Y—I watch the birds now. You get the hardegat ones who catch on the line (the small ones). Can release the gannets from the nets. We try to limit the splices.

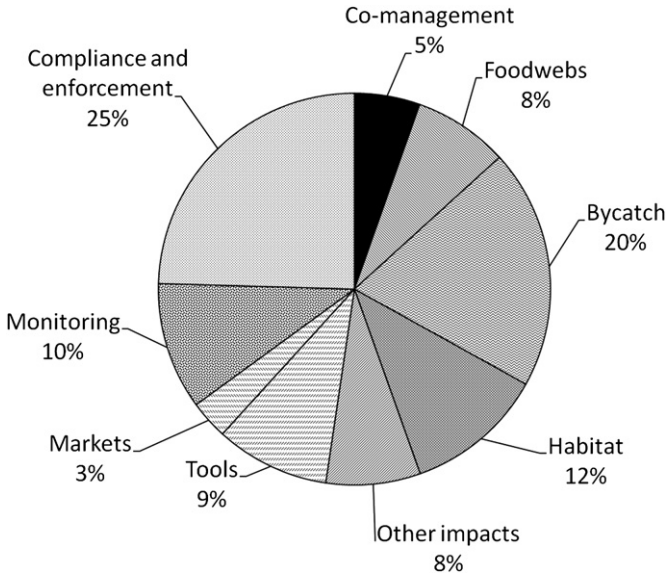

Fig. 1. The most important lessons learned from the training according to the evaluation forms processed, given per module.

discussions. This can be overcome by allowing each learner the opportunity to report back, but a large group takes a long time to report back and learners lose their concentration. The ideal group size was found to be approximately 20 with an equal mix of participants from the different sectors.

4.1.3. Appropriate use of case studies

Local and international case studies were selectively used to illustrate concepts as appropriate. For example, using a local overfishing example may lead the industry members to become defensive and fail to engage with the underlying theoretical base. An international example, i.e. the cod fishery in the North Atlantic, provided a good case study. This enabled the learners to learn a concept without feeling defensive of the outcome. In other cases, it was beneficial to use local examples where participants could relate, for example when presenting the wonders of our local indigenous birdlife and their habits.

4.1.4. Challenge of assessing training outcome

The philosophy of the training course and that of the facilitation was to stimulate participants to think for themselves, to share ideas and to take responsibility, rather than concentrating on whether answers were right or wrong in feedback sessions. The weakness with this philosophy is that it is difficult to assess whether learners are actually learning the material being taught, but the strength lies in empowering individuals to think beyond their day-to-day and inspire them to take responsibility for their actions as their livelihood depends on it. This has resulted in limited formal evaluation of the learning that has taken place and should be given further consideration in the future.

4.1.5. Attracting participants

For a course that was largely attended through coercion, the course demonstrates good success. Our experience showed that, once a course was run successfully for a sector, then the word spread and others wanted to attend the course. The value of the course is considerably reduced if participants failed to attend both days, and where the two days training ran back to back, participants voluntarily committed to attending both days.

The value that participants gave to the course can be demonstrated by an example from the sardine training carried out in July 2009 in Mossel Bay. Two skippers attended day 1 and then went out to sea, after fishing all night they returned to day 2 of the training.

Individual fishers and fishing companies have recognised a number of benefits of attending RFP training courses. For large companies, increasing consumer awareness has led to a demand for sustainably and responsibly harvested fish. Partnerships with environmental organisations such as WWF that result in better capacitated skippers can potentially yield market benefits.

The allocation of long-term rights has the benefit of taking a longer term view and fishing sustainably and thereby protecting their own livelihood. The current state of the fish stocks and the implications for the industry are a reality that is cause for concern for fishers. Furthermore, fishing companies risk fines, penalties and even loss of fishing rights if they fail to comply with the regulations. It is a therefore a prudent risk aversion strategy to ensure skippers are properly trained. Attending such training could also in future be recognised by MCM through Performance review criteria and in this way reward those taking steps to ensure a responsible and sustainable fishing industry.

However smaller companies, or individual fishers who stand to lose two days of income by attending the course when fishing is good, are more aware of the short term loss than the longer term gain and as a result are less likely to attend training. For these groups government funding may be required to assist this sector.

In the future, to attract more participants, such training inventions could become a legal requirement to attend training annually. This is the case for other maritime courses such as the 'safety at sea' training course, and one option could be to offer the RFP training back to back with these sorts of courses.

4.2. Next steps

There are a number of gaps that require addressing. Although the course materials were initially only produced in English, the next step is to translate them into the local languages of the fishers—for the Western Cape, this is Afrikaans and isiXhosa.

The current course has been focused on large scale commercial offshore sectors and could be adapted to include small scale and inshore sectors, and the coastal fisheries. Other sectors such as fisheries observers should also be encouraged to attend the course. Skippers in particular noted that a shortened course would be very beneficial for fishing crews. As the course has been adapted to different fisheries, it has become clear that the course could be streamlined to be more generic in its nature with small sector/fishery specific inserts.

Learners frequently request the following to be expanded upon in the course: a practical on fish identification, a model bird to practise hook removal on, a practical field trip to better understand fishing and fishing gear operations at sea, detailed training on the use of Vessel Monitoring Systems (VMS) and more general environmental education. Although a lot of time is put aside for discussion, learners felt that even more time would be beneficial.

4.3. Long-term sustainability

Since the RFP training course has been developed by WWF, an NGO reliant on donor funding, the long-term sustainability of the training needs to be considered as it is unlikely to be sustained under the current model. The role of an NGO is ideally to identify a need, catalyse action – in this case by developing training resources to meet the need – and then to institutionalise the training within a training authority.

The long-term role for WWF could be as follows:

1. Maintain the applicability of the course by annually updating the course material to ensure it remains in line with the latest international and national developments in the fisheries sector.
2. Maintain the standard of the course by training trainers and evaluating course effectiveness.

Unit standards have been developed and the training course has been South African Qualifications Authority (SAQA) accredited at National Qualifications Framework (NQF) level two and three. This will allow fishing companies to recover the costs of the training through skills levies, etc. Given that there is now an increasing demand from fishing companies to deliver the Responsible Fisheries Training, there is a commercial opportunity for interested training service providers.

5. Conclusions

Results of the training carried out to date indicate that the RFP training can improve compliance of fisheries regulations, adherence to voluntary measures and uplift the skills of fishers. Such benefits will increase the likelihood of long-term sustainability while the recognition of such benefits could enable the South African fishing industry to earn eco-labels (such as Marine Stewardship Council (MSC)) and thereby increase their share of global markets. A successful fishing sector should result in improved livelihoods for fishers, thereby contributing to poverty alleviation and sustainable livelihoods.

A valuable conclusion from this training programme can be illustrated by the words of a skipper who attended the course "Something I took away yesterday…was that we are the ones that can make the biggest change. We are the ones who know what's practical". Through the training, they have accepted the responsibility and want to spread the knowledge to others, including their crew, and ensure that everyone works together for a sustainable fishery. As one skipper says, "We should be agents of change. And as change agents we need to impart knowledge to those that we work with."

This sentiment is echoed by compliance officers, many for whom it was "the first time to have skippers and compliance officials together in the same room, sharing information honestly". They now acknowledge that "compliance and industry must hold hands to better protect our fish stocks and our jobs".

Acknowledgements

The authors would like to thank WWF-South Africa, Irvine and Johnson, Sea Harvest and Oceana for financial support, as well as The Green Connection, Birdlife and Marine and Coastal Management for their technical expertise. We would especially like to thank workshop participants of whom there are too many to name (almost 500) and various key stakeholders including Barrie Rose, Ferdinand Versfeld, Maria Honig, Keith Smith, Russell Hall, John Duncan and Mike Copeland.

Appendix 1

At the end of this module 1, the learner has:

- Learnt that fisheries resources are heavily harvested globally.
- Understood the need for an Ecosystem Approach to Fisheries management.
- Learnt that South Africa has international obligations to work with other nations to protect our fish stocks for future generations.
- Learnt that sustainable development is part of our law—from the constitution, through policies and laws down to regulations.
- Understood that all stakeholders can be involved in a system of co-management of their fishery and that each individual can play a role.

At the end of this module 2, the learner has:

- Understood that all living organisms affect each other and are in a sensitive balance; undermining that balance will destroy fisheries.
- Understood that not all animals are equal. Some are more vulnerable than others.
- Understood that habitats are vital to maintain ecosystems and some important commercial fish.
- Learnt that measures exist to reduce harm to the ecosystem and increase the likelihood of a fishery surviving into the future.
- Understood the relevant permit conditions.
- Gained the practical skill of implementing regulations, e.g. deploying a tori line as a measure to reduce seabird bycatch.

At the end of module 3, the learner has:

- Learnt about a range of management options to ensure sustainable fisheries.
- Understood how these management options are used in the fisheries management through unpacking the permit conditions or relevant regulations.
- Understood how dumping, pollution and ghost fishing impact on the marine ecosystem and fishing activities.

At the end of module 4, the learner has:

- Learnt that fish buyers and consumers are demanding a means of guaranteeing that the fish they buy have been responsibly harvested, for example, eco-labels.
- Understood how monitoring and data collection provides key information to ensure wise decision making.
- Learnt how to fill out logbook and additional catch forms correctly.
- Understood the need and practical implementation of compliance measures such as fishing vessel inspections.
- Understood the legal implications of non-compliance, including the various penalties.
- Understood how enforcement of the law leads to sustainable fisheries and protects fisher's livelihood.

Appendix 2

Table 3.

Table 3
Comparison of the responses of all 33 learners (skippers, monitors and FCO's) to the question "Have you made any changes on your boat and/or to the way you fish since you attended the course? " All "No" responses are in bold and all "Yes" responses are non-bold.

	RESPONSE						
	Gear use	**Relationships with MCM and FCOs**	**Attitude (view of the sea, and fisher's role)**	**Logbooks**	**Pollution**	**Compliance**	**Seabirds**
Skipper (small pelagics)	Y—now we use Tori Lines inshore and offshore	Y—get along much better now that there is an understanding between all the parties involved	Y—we do the work now and try save the ecosystem	Y—we write everything down now and have had observers onboard and inspections and there have been no problems at all.	Y—we put all of their garbage and oil in bins and bring it back to land to dump	**N – we are and have been compliant**	Y—now flies tori lines and has taught the crew about their importance
Shore Skipper (small pelagics)	Y—we use gear which tries to keep sharks away	Y—there is a better understanding of what we do and why we do it	Y—we speak to fishermen in and around the harbour	Y—they are all up to standard	Y—it is all kept on board	Y—course clued them up on the ecosystem	**N/A as purse seine net**
Skipper (small pelagics)	**N—always used the same gear**	**N—always been good**	**N—always been the same**	**N—always up to date**	**N—always keep it on board**	**N—always been complaint**	**Penguins do not eat Sardines so do not understand why they have to close certain areas. We never fish near penguins and black cormorants.**
Skipper (small pelagics)	**N—use the same gear**	**N—if you stay in the good books and treat them well they will treat you well**	Y—I have always loved the sea but now it is good to know how to save fish for the future	**N—always been a top priority**	**N—have always brought it back**	**N—always been in line**	**Has never seen a penguin 10 miles from the islands, if the distance changes to 20 the fishing factories might as well be closed down. Why dont they change the distance to 2 or 3 miles from the island shores.**
Skipper (small pelagics)	**N—not their boats**	**N—but the relationship is good and has been for a while**	**No—live and let live—conservation is important**	**N—always been good**	**N—always gets brought back**	**N—full compliance**	Y—think the restricted fishing areas 10 miles off the coasts of islands are good and that conservation is important
Observer (small pelagics)	**N**	**No, always been good**	Y—course has helped as the fishermen understand observers better	**No, logbooks are still good**	**No comment**	**No, compliance is the same**	**No, says they dont catch any birds**
Monitor (small pelagic)	**N**	Y—getting better	Y—especially towards monitors	**N**	**N**	N	No comment
Monitor (small pelagic)	**N**	Yes, the fishermen understand more and are more friendly now	**N**	**N**	**N**	N—it is the same	No comment
Monitor (Small pelagic)	Y—the fishermen have changed their gear to prevent the animals being killed – never see dead animals on deck anymore	Y—it has improved. The fishermen used to be stubborn	**No comment**	Not sure, but they are always up to date	**N—bring back all pollution**	N—they are all compliant	Yes, there are no more dead birds anymore
MCM FCO (tuna sector)	**N**	**N—always been good**	**N—some are negative but the rest have a good attitude**	**N—they are good**	**N—they are good**	N—they are good	N
MCM FCO (tuna sector)	**No comment**	Y—if you approach fishermen nicely they will comply with you	**N—some nice and some not**	Y—the logbooks are improving	**No comment**	No, if you are nice they will comply	No comment
Skipper (tuna sector)	**N**	**N—always been good**	**Y—stop pollution and looking after environment**	**N**	**N**	**N**	**N**

Table 3 (*continued*)

	RESPONSE						
	Gear use	**Relationships with MCM and FCOs**	**Attitude (view of the sea, and fisher's role)**	**Logbooks**	**Pollution**	**Compliance**	**Seabirds**
Skipper (tuna sector)	**N**	**N—MCM is pathetic for the most part, some of the staff are OK**	Y—always loved the sea but he does look at it from a different angle	**N**	**N**	N	N
Skipper (tuna sector)	**N—it is the same**	**N—they do more checks and are a hassle**	Y—he has always had respect for the sea but it is good to know more details about it and stick within permits conditions	**N**	**N—always brought stuff back**	N—about the same	Y—we now use red poles on the front of the boat to deter the birds. *We also now release all of the sharks, remove all of the hooks as much as possible and cut the line where it is not possible to release.
Mate (Tuna sector)	**N—cannot really change tuna pole**	**No comment—skipper deals with them**	Y—he is harder on crew and makes sure they release all sharks and birds	**No comment—skipper does log book for MCM**	**N—bring everything back to shore, skipper installed milk bottles at everyone's stations for them to put cigarette butts into them**	N	Y—we have changed methods of hook removal. Makes sure all of the animals such as sharks and birds are treated well and released according to the methods shown at training.
Mate (Tuna sector)	**N—the same gear**	**N—never see them until they are coming to change rules.**	**N—always been conservation orientated**	**N—the same as always**	**N**	Y -we try and spread the word	Y—we now throw out bait which sinks (i.e. the head is removed), this prevents birds taking it
Skipper (tuna sector)	**N—no real change**	**N—same as before**	**N**	**N**	**N**	N	Y—now we know how to release birds in a proper manner
Skipper & Shore skipper (tuna sector)	**N**	**N—its pretty good**	**No, always loved animals and birds, but has started educating crew**	**N—always has been 100%**	**N—always brings all rubbish back and tells cook not to throw anything overboard**	N—always has been 100%	Y—stopped throwing cigarette butts overboard for seabirds and now uses training to remove hooks properly
Skipper (Tuna sector)	Y—now added some gear to remove hooks from sharks	**N—no real difference**	**No, always tried to be as conservation oriented as possible**	**N**	**N**	N	Y—the way we handle them: the correct way to approach them and protect bird
MCM FCO (Tuna sector)	N	Y—we now respect each other	Y—there is a trend where people are starting to look out for the environment	Y—they are getting better	Yes, they bring it all back	Yes, they are all compliant	No comment
Skipper (Tuna sector)	N	Y	**N—we have always respected the sea and sea life**	Y	**N—always brought plastic and rubbish to shore**	Y – after training	N
Skipper (Tuna Pole sector)	N	N	Y—before, we had a take what you can attitude. Now, we have a take care where you can	N—taking care of the resources is practical, not academic [i.e. about the forms]	**N—always anti-pollution**	N—compliance is mostly self-imposed	Y—I used to see birds as pests. Now I have a new appreciation for the place of birds in the ecology
Skipper (Tuna Pole sector)	N	Y—before, I was very apprehensive in assisting and sharing knowledge. After, I will oblige in anyway possible	Y—greed has always been our downfall in many collapsed fisheries. Now, less can be more if quality is key	**N**	**N**	N	Y—having been shown the correct procedures, I feel more confident in successful releases of seabirds.

Skipper (Hake Trawl sector)	Y—we use lighter gear	**N**	**N**	**N**	**N**	Y—and we tell others about the newfound respect	N
Skipper (Hake Trawl sector)	**N**	**N**	**N**	**N**	**N**	N	N
Skipper (Hake Trawl sector)	**Y**	**N**	**N**	**N**	**Y—nothing goes overboard**	N	**Y—we make sure the tori lines are out correctly**
Skipper (Hake Trawl sector)	Y—use square net shape to let some species go.	Y—now we have a good relationship.	**N**	**N**		Y—We are sticking to the rules.	Y – we use tori lines, and stop processing while shooting. Although we have some problems with the lines.
Skipper (Hake trawl)					Y—since the training, I am more aware of pollution. There is now a strict rule: nothing goes overboard.		Y – Our outlook on tori lines has changed completely. Never understood exactly but now all misconceptions are gone: now understand why and how it works.
Skipper (Hake trawl)	Y—did not know much of fish gear in all sectors. Now know why it is important to make use of the right equipment for a specific species.	Y—did not know how to contact in various departments of MCM. Now have met the correct person like the Monitors etc.	Y—did not understanding the view of the sea and livelihood—now I have a better understanding why we as nation must look after our Marine resources.	Y—did not know about the importance of recording catches. The reasons for the annual research to announce Biomass and Quotas.	**N**	Y—Did not know the importance of Compliance—I learn a lot of the reasons for the permit conditions	Y—Did not know of the lively hood of Seabirds. The importance of all Seabirds on our Islands and how many of them are there along our coastline.
Skipper (Hake trawl)		**N—no change. Still think MCM is useless.**			Y—nothing goes overboard. There are enough landfills on land. Cos tomorrow we have to work there again, and then the stuff you put in the sea, you catch in your nets again (cables, wires, nets).		Y—I watch the birds now. You get the hardegat ones who catch on the line (the small ones). Can release the gannets from the nets. We try to limit the splices.
Skipper (Hake trawl)			Y—a long term view is necessary (operationally and for the resource). Big trawls don't get good production necessarily. Proper management is needed. You can't expect to put a damaged hake at the start of the conveyor belt in the factory and expect to get a good PQ at the end.		Y—get bits, netting, tins, etc. all together—make it a rule to put it all in containers on board. Make sure plastic doesn't go overboard.		Y- Prevent any harm to birds whatsoever.
Skipper (Hake trawl)			Y—need to make crew aware of what they are doing. Try to prevent crew form doing something they not supposed to like throwing things overboard etc.		Y—started keeping track of litter in logbooks.		Y—Still use tori lines. Understand them more now, why we must use them and why they are needed.
Mate (Hake trawl)	Y—mesh size is bigger now				Y—have a big net at the fornt of the boat which holds everything and makes sure nothing goes overboard.		

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