Using social marketing to foster sustainable behaviour in traditional fishing communities of southwest Madagascar

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SUMMARY

From April 2009 to November 2010, a social marketing campaign was designed and implemented in southwest Madagascar to encourage fishers to give up destructive fishing methods and to improve the awareness and enforcement of local laws (*dina*). The campaign, which targeted local leaders and fishers, was designed using results from formal and informal social surveys and focused on removing locally perceived barriers to behaviour change. In this paper, we describe the campaign from design to implementation, and evaluate its effects through surveys of 500 fishers and local leaders, and preliminary observational data on *dina* enforcement and use of destructive fishing techniques. Results after one year showed improved knowledge and positive attitudes about *dina* among leaders and fishers, moderate increases in the enforcement of *dina*, and moderate decreases in the use of destructive fishing methods. Our findings demonstrate the power and suitability of social marketing as a tool for fostering sustainable behaviour in traditional fishing communities, when combined with good governance and enforcement strategies.

BACKGROUND

Marine biodiversity and food security are widely threatened by overexploitation of coastal resources and climate change. Most top-down or government-led fisheries management initiatives have failed to control these crises (Alcala & Russ 2006). In response to this, community-based approaches to marine conservation have proliferated and some have begun to demonstrate successes (Ferse *et al*. 2010, Gutierrez *et al.* 2011, Cinner *et al.* 2012). A key element of these community-based initiatives is education about ecological and biological processes and the impact of anthropogenic pressures on those systems (e.g. Casia 2000, Varney *et al.* 2010). However, psychological studies have consistently shown that increasing knowledge through education does not necessarily lead to a change in actions or behaviour (Thompson 2008, Schultz 2011). Furthermore, many environmental education outreach activities and programmes fail to incorporate adequate research and monitoring elements (Carleton-Hug & Hug 2010) and therefore cannot verify the usefulness of these interventions.

Social marketing - the application of commercial marketing techniques to effect positive social change (Butler *et al*. 2007) - emerged in the early 1970s (Fox & Kotler 1980), and has since grown as a tool to promote positive social change. These techniques have proven to be an effective method for achieving sustained behaviour change across a range of subjects and audiences (McKenzie-Mohr 2000, Schultz 2011). Of primary importance to the theory of social marketing is the identification of barriers to behaviour change, as it is these that must be removed in order for the more positive behaviour to be accepted (McKenzie-Mohr 2000). The public health sector in particular has used social marketing techniques since the early 1970s. Conservation organisations have begun using social marketing techniques with increasing frequency over the last decade (Lynn 2001) but until recently, social marketing has rarely been used in local fisheries conservation and management (Thompson 2008).

Here, we present a case study of a social marketing campaign implemented in southwest Madagascar from 2009-2010 that aimed to change local attitudes and behaviour towards destructive fishing practices. The 'product' marketed was pride in being responsible fishers. The campaign was jointly designed and implemented by two non-governmental organizations – Blue Ventures and Rare.

ACTION

Study area: The Velondriake locally managed marine area, southwest Madagascar (Fig. 1), is home to approximately 7000 semi-nomadic, sea-faring Vezo people (Harris 2007) who rely heavily on the local marine and coastal resources for subsistence, income, housing materials and cultural identity (Astuti 1995). Destructive fishing techniques employed by both local and migrant fishers, local and commercial overexploitation, and coral bleaching have degraded the local marine and coastal ecosystems along the coast (Harris 2011).

Since 2004, management activities within the locally managed marine area have focused primarily on short-term closures of octopus fishing areas (Harris 2007). Early success with these allowed for the implementation of other resource management initiatives including coral reef permanent reserves (Westerman & Gardner 2013), temporary mangrove closures, and aquaculture development (algae and sea cucumber). At the same time, the process to create a legitimate governance system was begun with a local set of laws called *dina*, which were ratified by the regional Malagasy court system in December 2006. The *dina* bans the use of destructive fishing practices – poison fishing, beach seining, and overturning living coral – within the entire protected area, governs permanent reef reserves, and regulates the octopus closures (Andriamalala & Gardner 2010). With help from local community members, the *dina* is enforced by the Velondriake Committee, an elected body of representatives

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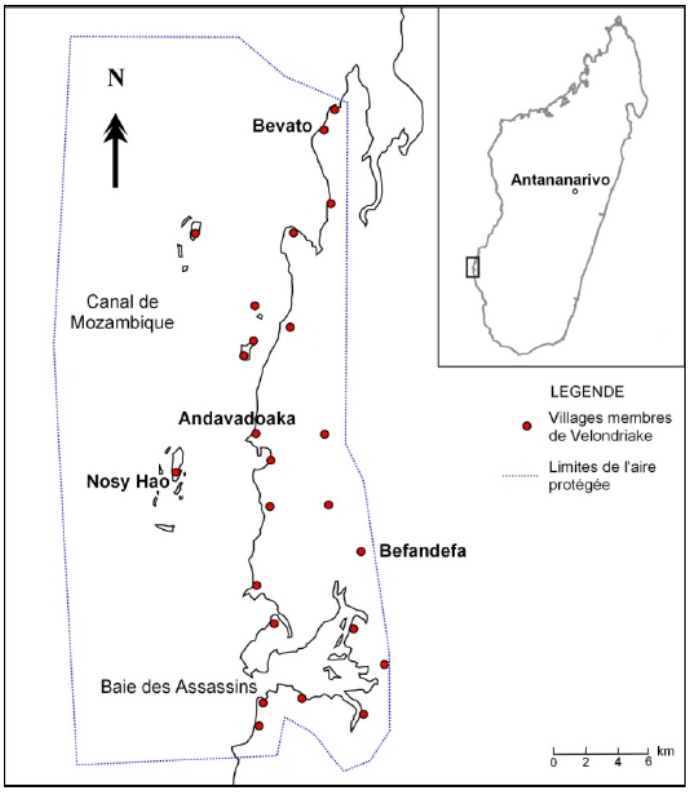

Figure 1. Map of Velondriake locally managed marine area and member villages.

from each of the 25 participating villages, who receive technical and financial support from Blue Ventures. The Committee is also responsible for overall management and guidance of activities. The Velondriake locally managed marine area is legally recognized as a protected area (IUCN category V) within Madagascar's protected area system (known by its French acronym SAPM) and was granted temporary protected status by inter-ministerial decree in December 2010; definitive protected status is expected in 2014.

Problem definition: Despite local will to reduce destructive fishing practices, adherence to, and enforcement of, the *dina* has been weak (Blue Ventures unpublished data). A partnership between Blue Ventures and Rare was therefore launched in 2008 to increase ownership, compliance and enforcement of the *dina*. A participatory 'problem mapping' exercise was conducted with local leaders and members of the Velondriake Committee, during which the use of destructive fishing practices was identified as a critical problem. Moreover, the overt and highly-visible nature of destructive fishing practices created the impression that the *dina* was powerless and irrelevant. The decision was therefore taken to focus the campaign on enforcement of the *dina* to reduce the use of destructive fishing practices.

The two principal destructive fishing techniques were beach seine net fishing and poison fishing. Seine netting, where small mesh nets are dragged through areas of coral reef and seagrass beds, damages the structure of these habitats and reduces ecosystem quality through the indiscriminate removal of species, especially juvenile fish (Tietze *et al.* 2011). Employing 4-10 men, usually migrants, this method is very labour and time intensive (Gough *et al*. 2009). In order to gain a better understanding of this issue we held one focus group meeting with the migrant fishers and a number of one-on-one discussions with local beach seiners. Poison fishing is not as common as beach seining, and its use decreased over the last decade in most of the Velondriake area. Poison fishing, using a form of cyanide from *Euphorbia* cf *tirucalli* is particularly destructive as it indiscriminately kills juvenile fish and invertebrates (Kamat *et al*. 1997). The method is primarily used by migrant communities from inland villages outside the Velondriake locally managed marine area, many of whom lack fishing skills.

Target audiences: The problem mapping exercise generated information on the use of destructive practices and the sectors of the community that utilise them; these results were then supplemented and validated through key informant interviews with scientific experts, local leaders and community

Table 1. Characteristics of campaign audiences, desired behaviour change and barriers to behaviour change.

Audience	Characteristics	Desired behaviour change	Barriers to behaviour change
Leaders	Include Velondriake Committee representatives, village presidents and elders, and respected individuals within community. Are mostly fishers.	Increased role in *dina* enforcement (giving warnings, reporting cases to Velondriake Committee, investigating cases, contributing to fining process). Also increased involvement in educational outreach and meetings about the *dina*.	Lack of leadership skills, fear of the offender, and not wanting to denounce other community members.
General fisher population	General fisher population of Velondriake.	Increased role in warning offenders, reporting offenders to leaders, and supporting leaders in their actions. Also increased leadership within their family and peers to abide by and enforce *dina*.	Sense of lack of responsibility in enforcing *dina* (perceived as leaders' responsibility only), fear of offenders, not wanting to denounce community members.
Users of destructive fishing practices	Primarily migrant fishers spending only a few days in locally managed marine area, but some are resident. Migrants claim not to know other, less destructive forms of fishing, and many are not aware of, or don't understand, the *dina*.	Stop using destructive fishing practices, or modify techniques to avoid dragging nets over coral and seagrass beds. Also increased compliance with zoning and other *dina* rules.	Resistance to invest in less destructive nets, lack of knowledge of less destructive gears, belief that beach seining is part of their culture, and disrespect for locally managed marine area rules.

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members. Three key target audiences were identified; local leaders, the general fishing population, and fishers using destructive practices (Table 1). All audiences are characterised by low education and literacy levels, but are knowledgeable about the marine environment and threats to it.

Pre-campaign survey: A pre-campaign survey was conducted in 2009 to assess the target community's baseline knowledge, attitudes, and perceptions about the local marine environment and the *dina*. Using a stratified random sampling protocol to ensure the representation of target audiences, we surveyed 455 people (approximately 13% of the Velondriake locally managed marine area's adult population) including 71 pirogue (fishing canoe) owners and 70 village leaders. The survey did not specifically target users of destructive fishing practices, as they are generally not receptive to formal discussions and can be aggressive. The survey also helped to identify trusted sources of information and the best ways to communicate campaign messages by assessing community perceptions of the different ways already used to communicate environmental information in the area.

Campaign design and implementation: The campaign was designed using the campaign theory of change formula (Jenks *et al* 2010): K+A+IC+BR=BC=TR=CR, where K = knowledge, A = attitudes, IC = interpersonal communication, BR = barrier removal, BC = behaviour change, TR = threat reduction and CR = conservation result. The theory and assumptions guiding the development of the Velondriake campaign are presented in Table 2.

Using our information about the target audiences, we designed a campaign slogan and logo, suitable behaviour change messages, and marketing materials used to spread those messages and encourage change. These were tested for effectiveness with the target audiences through focus groups. Recognizing pride that target audiences feel in being 'Vezo' (i.e. being skilled fishers who can live off the sea), the slogan

Table 2. Campaign goals following the theory of change

Component of theory of change	Application to Vezo Aho campaign
Knowledge	Local leaders and the fishing community will gain knowledge about the Velondriake *dina* and its importance for sustaining local fishing resources
Attitudes	Several workshops and village events will make the Velondriake leaders and fishing community feel more responsible for enforcing the *dina*
Interpersonal communication	Local leaders and the fishing community will talk amongst themselves about beach seining and poison fishing, and how to halt its use in Velondriake
Barrier removal	Blue Ventures will run leadership training for leaders and assist Velondriake during *dina* enforcement.
Behaviour change	Leaders will complete *dina* enforcement procedures on all cases; the fishing community will report *dina* infractions
Threat reduction	All forms of illegal, destructive fishing techniques - particularly beach seining and poison fishing - will be reduced.
Conservation result	There will be an increase in the near shore juvenile fish and reef fish in terms of biomass, abundance and diversity by 5% by 2015, compared to a control site.

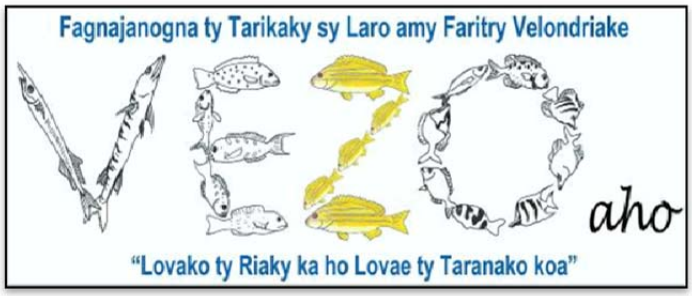

Figure 2. Campaign logo and slogan.

chosen for the campaign was "Vezo Aho" (I am Vezo), with a campaign title "stop beach seining and poison fishing in the Velondriake area", and a by-line "the sea is my heritage and that of my descendents" (Figure 2).

A number of marketing materials carrying these messages were created, including T-shirts, posters, radio broadcasts and songs. Each was designed specifically for the different target audiences to address their individual barriers to change. For example, the message on T-shirts for leaders said "I enforce the *dina* against beach seiners and poison fishers", while T-shirts for fishers said "I report poison fishing and anyone breaking the Velondriake *dina* to the Velondriake Committee and village president". Posters displayed similar messages, and those distributed to destructive fishers outside of Velondriake said "come fish with us, but leave your beach seine net and poison behind". In addition, pirogue owners had the opportunity to have the slogan and messages ("I don't poison fish or beach seine, I dive or use a line or net when fishing") painted on their sails to demonstrate their pride in being Vezo and support for marine resource management. A total of 900 T-shirts and 600 posters were printed and distributed, and 170 pirogue sails were painted with the campaign slogan. Three large festivals were held to celebrate the end of the campaign, whose messages were also reinforced through poetry contests, radio broadcasts, 23 theatre performances and two songs composed by community members.

Seventy local leaders also received training at the start of campaign implementation to enhance the Velondriake Committee's leadership skills and their ability to effectively enforce the *dina*. Training focused on sharing information about the qualities of a good leader and conflict resolution.

Post-campaign evaluation: In late-2010, a post-campaign survey was conducted within Velondriake, using the same survey instrument as the pre-campaign survey, to measure changes in knowledge, attitudes and behaviours and record exposure to campaign messages. Five hundred people (approximately 15% of adults within Velondriake) were surveyed using a stratified random sampling protocol, including 111 pirogue owners and 71 leaders. A second follow-up survey was conducted in early 2012 with 170 interviews of 119 pirogue owners and 51 leaders, to evaluate the durability of changes to knowledge, attitude and behaviours. Supplementary observational data were collected during and after the campaign to further monitor and evaluate campaign effectiveness, i.e. actual changes in behaviour (see Figures 3 & 4). A log book was maintained in each village to record *dina* infractions and known incidences of beach seining and poison fishing. Information in the log book was checked for accuracy by Velondriake Committee members and supplemented with additional information.

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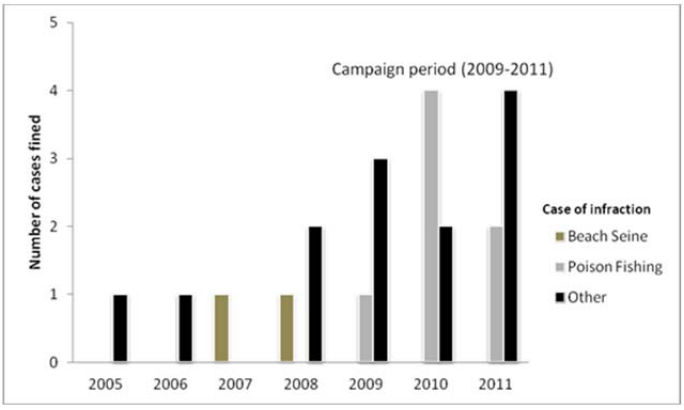

Figure 3. Number of times the *dina* was successfully enforced following infractions during 2005-2011.

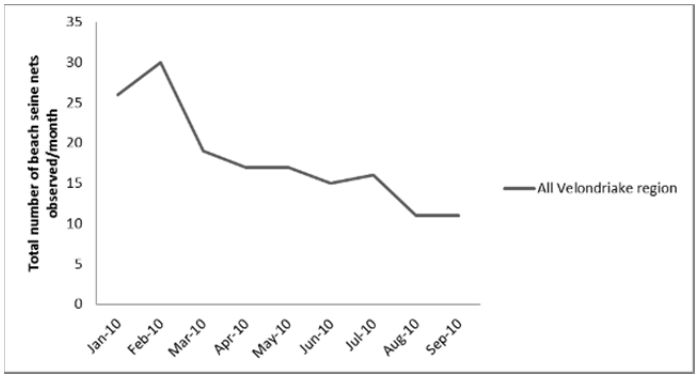

Figure 4. Change in observed beach seine net frequency in Velondriake from January to September 2010.

CONSEQUENCES

Survey results from 2009, 2010 and 2012 show increases in awareness of, and responsibility for, the *dina* amongst local leaders, the fishing community in general, and pirogue owners (Table 3). These self-reported changes in awareness and attitudes appear to be reflected in behaviour change with regards to *dina* enforcement in that the number of cases increased from the start of the campaign period (Figure 3).

Behaviour change, in terms of a reduction in use of destructive fishing techniques, was assessed through key informant interviews and directly through records in village log books. In 2010, during the campaign implementation period, the number of beach seine nets recorded in use along the Velondriake coastline decreased by 63%, from a high of 30 in February to 11 in September (Figure 4).

DISCUSSION

Our results indicate that the social marketing campaign was successful in improving knowledge of, and attitudes towards, the *dina*, increasing *dina* enforcement, and so reducing the practice of destructive fishing. This is likely to be due in part to the integration of the social marketing strategy into the existing Velondriake governance system, with its established rules and enforcement mechanisms. We do not know, however, whether observed decreases in destructive fishing are due to the fishers themselves giving up the practice because they now understand the ecological threats as a result of the campaign, improved enforcement as a result of the campaign, or other factors We believe that the time spent identifying target audiences and analysing their current knowledge, attitudes and barriers to behaviour change was critical in the development of the campaign, enabling targeted messages to be developed for each audience.

We have also identified several shortcomings of our campaign. First, we failed to adequately address the barriers to behaviour change faced by migrant fishers – for logistical and financial reasons, we could not offer either suitable alternative fishing methods or livelihood options. Secondly, other than painting their sails, we did not specifically target pirogue owners in the campaign with any materials or individualised messages, but rather included them as part of the general fisher community. This is a missed opportunity as we could have leveraged their high decision-making power with regards to fishing techniques, as well as their cultural leadership role as trend-setters. In general, having a number of target audiences made the campaign difficult to manage, in terms of collecting information, monitoring and evaluation. Finally, while we targeted community leaders, we failed to adequately incorporate government officials such as the mayor and Ministry of Fisheries into the campaign, leading to a missed opportunity to reinforce messages and acquire more robust institutional support for *dina* enforcement and application.

The spatial context of Velondriake, and having three target audiences, contributed to high campaign costs; materials such

Table 3. Survey results demonstrating changes in knowledge, attitude, interpersonal communication and behaviour amongst two target audiences.

Indicator (%)	2009	2010	2012
Leaders aware of the *dina*	76	96	94
Pirogue owners aware of the *dina*	71	89	96
General fishers aware of the *dina*	54	82	-
Leaders who say they are responsible for *dina* enforcement	88	97	94
Pirogue owners who say they are responsible for *dina* enforcement	54	64	74
General fishers who say they are responsible for *dina* enforcement	51	63	-
Leaders who have talked to someone about no longer using beach seine fishing (poison fishing)	33 (33)	83 (85)	61 (63)
Pirogue owners who have talked to one another about no longer using beach seine fishing (poison fishing)	13 (13)	43 (43)	61 (61)
General fishers who have talked to one another about no longer using beach seine fishing (poison fishing)	12 (13)	48 (48)	- -
Pirogue owners who have warned *dina* breakers	11	28	40
General fishers who have warned *dina* breakers	13	23	-
Leaders that have helped with *dina* enforcement	11	48	59
Pirogue owners who have helped with *dina* enforcement	7	22	32
General fishers who have helped with *dina* enforcement	7	16	-

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as T-shirts and posters could not be printed locally, while the dispersed nature of the 25 target villages incurred high transportation costs. In addition to direct campaign running costs (approximately 40,000 US$), design, implementation and evaluation of the campaign required the dedicated time of Blue Ventures staff, Velondriake Committee members and community leaders. Lessons learned during the campaign continue to guide outreach activities related to the LMMA, introducing the concept and methodology of social marketing and jump-starting similar campaigns within broader conservation programs.

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