

## **Title page**

**Title:** Tackling alcoholism and domestic violence in fisheries - a new opportunity to improve wellbeing for the most vulnerable people in global fisheries.

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## **Abstract**

The UN Sustainable Development Goals (SDGs) principle of 'Leaving no one behind' focusses global attention on the poorest and most vulnerable people. As different sectors grapple to engage meaningfully with this principle, we posit that greater consideration of social problems in fishing-dependent communities, such as alcoholism and domestic violence, presents an opportunity for fisheries governors to contribute to the SDGs mandate. We further argue that governing marine resources in ignorance of these problems can risk harming some of the most vulnerable people in fisheries. Using subjective wellbeing data from women living in two small-scale fishing communities in India and Sri Lanka, we demonstrate the prevalence and impact of alcoholism and domestic violence in fishing households. We further highlight how policies which restrict access to marine resources can undermine important coping strategies, in particular the ability of women to act as *independent income-earners*, exacerbating harm to already vulnerable women. A scoping review of the literature reveals that alcoholism and domestic violence are reported in certain fisheries around the world, and we theorise how this may relate to the nature of fishing life, and growing stresses regarding the future of fishing. Tackling the burdens of alcoholism and domestic violence in fisheries, where it is an issue, is an opportunity to improve wellbeing for men, women and their families. The paper concludes with tangible actions which marine resource governors could adopt to contribute to the 'leave no one behind' ethos.

**Key words:** abuse, access, conservation, gender, marine, vulnerability.

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## 1 **1. Introduction**

2           The principle of ‘leave no one behind’, which underpins the 2030 agenda for  
3 sustainable development, is built on global recognition that ending extreme poverty and  
4 reducing inequalities requires the prioritisation of actions benefiting the poorest and most  
5 marginalised people (Stuart and Samman 2017). The principle commits the global community  
6 to ‘put the last first’ (Chambers 2014), however translating the rhetoric into meaningful  
7 change is difficult because prioritising the poorest, the socially excluded, and hard to reach  
8 groups, is often politically and economically challenging (Wise and Hind 2016).

9           This challenge is particularly acute in fisheries, which must create synergy between  
10 the often competing agendas of improving human wellbeing alongside sustainable use and  
11 protection of the marine environment (Howe et al., 2014; Costanza et al., 2016). The  
12 contributions of the fisheries and marine conservation sector could, and should, reach beyond  
13 Goal 14 ‘Life Below Water’ to engage with the Sustainable Development Goals more broadly.  
14 New thinking and innovation is required to achieve sustainable oceans, whilst also securing  
15 livelihoods and enhancing the wellbeing of the millions of people who depend on the sea for  
16 a living; capture fisheries and aquaculture provide direct employment for some 200 million  
17 people globally. Of these, women represent an average participation rate of almost 50% in  
18 fisheries activities, including full and part time fishing and post-harvest activities, with women  
19 accounting for 25–50% of the small-scale fisheries catch (World Bank 2012, Harper et al.,  
20 2013). If statistics for gleaning and aquaculture were included, these figures could be higher  
21 (Weeratunge et al 2010).

22           Whilst SDG 14 includes ‘access for small-scale fisheries to resources and markets’ as  
23 one of its targets, the reality is that this often sits uncomfortably alongside parallel targets  
24 which are dominated by resource sustainability, conservation and protection. In light of

25 unprecedented levels of environmental, economic, and social change experienced  
26 throughout global fisheries, well-functioning family and community structures are crucial to  
27 building resilience to change, and securing long-term survival of sustainable fisheries and  
28 those who depend upon them.

29         When applied to fisheries, the UN Sustainability ethos to place greater attention to  
30 the poorest and most vulnerable already fits well with growing arguments about the need for  
31 more thorough analyses of the complex causes of poverty in fisheries (Bene and Friend 2011),  
32 including analyses of wellbeing (Coulthard et al 2011, Johnson et al 2018), and the importance  
33 of gender in any approach (Harper et a 2013). Whilst the significant role that women play in  
34 fisheries is increasingly recognised in the fisheries literature, the most recent research  
35 stresses the need to go beyond the discussion of women’s roles per se, to address the broader  
36 “structures of discrimination”, which hinder women’s wellbeing and equality within the  
37 fisheries sector (Weeratunge et al 2010, Locke 2017:2).

38         Drawing on a social wellbeing methodology, this paper begins by presenting empirical  
39 evidence which demonstrates the particular importance of *good marital relations* in women’s  
40 self-assessments of wellbeing, and the significance of alcoholism and domestic violence on  
41 women living and working in fishing communities in Sri Lanka and India. The influence of  
42 marital relations over women’s wellbeing is well documented in the literature, especially in  
43 the context of South Asia where this research took place. Structures of patriarchal power  
44 (Molyneux, 1985; Agarwal 1988), gender inequalities, devaluation of women (Kabeer, 2005),  
45 unequal access to resources (Fisher and Naidoo 2016), and Dowry (Srinivasan and Bedi, 2007;  
46 Pandey et al., 2009) are but some of the contextual factors used to explain high rates of  
47 domestic violence in South Asia, reported as being the highest in the world (WHO, 2013).  
48 However, this study of women’s wellbeing in a *fisheries* context (all respondents were or had

49 been married to fishermen) warranted further exploration as to some of the implications for  
50 fisheries governance, and in particular, marine conservation approaches which, in both study  
51 areas, restricted women's access to marine resources.

52 Utilising existing theory on women's empowerment, gender equality, and the  
53 importance of women's *independent income* on overall household wellbeing, we argue that  
54 if care is not taken, governance approaches which restrict access to marine resources can  
55 inadvertently undermine wellbeing, and crucial coping strategies used by women to adapt to  
56 changing resource access. This is particularly problematic in households that experience  
57 alcoholism and domestic violence, where restricting access to vital marine resources risks  
58 placing already vulnerable women into greater harm. In essence, this works directly against  
59 the UN mandate to prioritize the poorest, and conflicts with SDGs 1 to 'end poverty' and SDG  
60 5 to achieve 'gender equality and empower all women and girls'. We emphasize this point  
61 using a vignette of marine conservation from our India case study.

62 We broaden the significance of these findings with a scoping review of the literature,  
63 which highlights cases of alcoholism and domestic violence reported in fisheries communities  
64 around the world. We theorise that these cases may be underpinned by the particular nature  
65 of fishing work, social relationships within the fishing community, and the common stresses  
66 placed on marital relations in the home, stresses which may be growing as families struggle  
67 with uncertain fishing futures. Directly addressing the burdens of alcoholism and domestic  
68 violence in fisheries worldwide presents a new and under-utilised opportunity to improve  
69 wellbeing for fishermen and (fisher)women, especially those who are most vulnerable,  
70 contributing directly to the 'leave no one behind' ethos. The paper concludes with tangible  
71 suggestions for all *marine resource governors*, an inclusive term which recognises the plurality  
72 of different peoples who make decisions and influence how marine resources are used

73 (Kooiman et al 2005, Kooiman and Bavinck 2013). This includes policy makers and  
74 practitioners who identify with marine conservation and fisheries management, but also  
75 extends to community leaders, boat owners, and fishing families themselves, important  
76 actors within fisheries who harbour great potential to really tackle the type of social problems  
77 discussed in this article.

78

## 79 **2. Exploring subjective wellbeing of women in fishing communities**

80 Social wellbeing has received growing recognition as a holistic and multidimensional  
81 framework and methodology capable of capturing the diversity of peoples' lives, with  
82 particular relevance to understanding how people engage with the natural environment (Daw  
83 et al 2015), including fisheries (Coulthard et al 2011, Weeratunge et al 2014; Voyer et al 2017).  
84 We define social wellbeing following Gough and McGregor (2007) as a combination of three  
85 inter-related dimensions i) a *material* dimension which emphasizes the resources people have  
86 and the needs they are able to objectively meet with those resources; ii) a *relational*  
87 dimension which considers how people act, through relationships with others, to pursue  
88 wellbeing; and iii) a *subjective* dimension which assesses how people think and feel about the  
89 quality of life they can achieve.

90 This approach is innovative in that it combines both objective and subjective  
91 assessments of wellbeing, and creates a space for people's own criteria of wellbeing, enabling  
92 researchers to measure what matters most in peoples' lives. Data presented here were  
93 collected as part of a wider study using a Social Wellbeing framework, including men and  
94 women living in fishing-dependent societies in India and Sri Lanka (ESRC grant ref  
95 ES/I009604/2, see also Coulthard et al (2014)). Whilst all three inter-related dimensions of

96 wellbeing (material, relational and subjective) were studied, this article focuses on a subset  
97 of this data: the subjective dimension of wellbeing, as expressed by women.

98         Whilst men occasionally mentioned social problems such as alcoholism in the  
99 community, we focus here on the narratives of the women, as they give a more detailed  
100 insight into the impacts on home life, and reinforce an often marginalised perspective about  
101 how women think and feel about things that matter most to them. Focusing on women's  
102 wellbeing in fishing communities is all the more significant given their recognised role in  
103 bringing up and shaping future generations of fishers (Thompson, 1985; Symes and  
104 Frangoudes, 2000; Gustavsson and Riley, 2018). As Neis et al., (2013) note, a gender-and  
105 generationally-blind approach to fisheries and marine resources has resulted, not only in  
106 missed opportunities for sustainability, but increased vulnerabilities and reduced resilience  
107 for many fisheries.

108         Research was conducted over an eight-month residential period in two villages  
109 located in Rekewa Lagoon in Sri Lanka, and bordering the Gulf of Mannar Biosphere Reserve  
110 in Tamil Nadu, India. In both study areas, fishing is small-scale with high livelihood  
111 dependence on marine resources and women, in particular, regularly experience significant  
112 restriction of their livelihood activities through marine conservation legislation. In the Sri  
113 Lanka study, women are involved in coral and shell collection (Weeratunge 2010) which,  
114 historically, have constituted important economic resources, especially for women from the  
115 poorest families in Rekewa (FAO 2005). Coral mining, predominantly used in paint  
116 manufacture, was practiced widely in the Rekewa region, however the nation-wide coral  
117 mining ban in 1983, and the 2005 tsunami, which destroyed many of the kilns necessary for  
118 coral processing, has meant significant reduction in this practice. In Rekewa today, many



119 women are involved in landing site activities such as cleaning nets, separating and packing  
120 fish, and loading nets into boats, activities which are largely dependent upon good relations  
121 with – usually male- boat owners and fishermen (this research). In the India study, which we  
122 re-visit as a detailed vignette later on, women are involved in the collection of seaweed which  
123 is sold locally, and occasionally accompany their husband at sea to help fish, or gain access to  
124 offshore seaweed banks. Creation of the Gulf of Mannar Marine Reserve in 1989 resulted in  
125 the banning of all seaweed collection, creating significant conflict between fishing villages and  
126 local authorities, as is often reported in the national media (New Indian Express 2018).

127         A total of fifty in-depth semi-structured interviews were conducted with women at  
128 both sites (Sri Lanka: n=30, India: n=20), all of whom were, or had been, married to fishermen,  
129 and with an age demographic ranging from 30 to 70 years. Interviews, which lasted up to  
130 two-hours in length, explored women’s subjective wellbeing (ie their own subjective  
131 evaluation of life domains they deem to be important for wellbeing). An adapted Global  
132 Person Generated Index (GPPI) facilitated discussion and ranking of self-nominated life  
133 domains (Camfield and Ruta 2007; Coulthard et al., 2014). The GPPI tool asks respondents to  
134 nominate up to five areas (wellbeing domains) that they consider most important for their  
135 capacity to ‘live well’ in their respective communities. For each domain, respondents are  
136 asked to explain their selection, and to then score each using a Likert scale to indicate their  
137 level of satisfaction (where 1 represents ‘the worst you can imagine’ and 5 represents ‘exactly  
138 as you would like it to be’). The GPPI was followed by a more in-depth interview, which asked  
139 respondents to explain their selection of domains and allocated scores, and encompassed  
140 several quality of life questions, which included asking about the happiest and most difficult  
141 times in their lives.

142           It was through this process that the importance of having a ‘good husband’, often  
143 described as ‘one who avoids alcohol and violence’, emerged as an important part of living  
144 well. The openness with which women spoke about close relationships, a topic notoriously  
145 difficult to research (Jha and White 2016), is testimony to the interviewers’ approach and  
146 patience. Both interviewers were women, fluent in the local languages (Tamil and Sinhala),  
147 and had spent significant time living close to the research village. It also speaks to the value  
148 of using open-ended questions. The approach avoided questioning about marital conflict  
149 directly, but empowered respondents to bring to the agenda the parts of their lives which  
150 they deemed to be the most important, and that they felt comfortable to share,  
151 demonstrating the contribution of qualitative methodology in wellbeing research (Camfield  
152 et al 2009, White, 2014). In most cases, the in-depth interviews were conducted during a  
153 second phase of the research, and constituted part of a repeat visit to the household, which  
154 may also have helped establish rapport and trust.

155           Data from the two study sites were combined (Fig. 1), due to similarities across the  
156 study areas, and given that our purpose here is to illuminate the significance of marital  
157 relations, alcoholism and domestic violence in women’s lives, rather than to explore  
158 differences between sites. However, we also note and explain those wellbeing domains that  
159 are specific to each site in order to capture the influence of local context.

160   **[Insert table 1]**

161

162 Wellbeing domains marked (SL) indicate those domains which were mentioned only by  
163 women in the Sri Lankan study and include ‘Happiness of others’, ‘Religion’ (living according  
164 to Buddhist teaching), ‘having nice clothes’ and ‘owning a vehicle’. The latter is particularly  
165 important to women in the Sri Lankan context due to the remote location of the village and

166 the need for three-wheelers for local transport and the marketing of fish. Wellbeing domains  
167 marked (I) indicate India specific domains, and include specific mention of 'dowry payments  
168 for a daughter's marriage' (in southern Sri Lanka, dowry is less prominent and marriage was  
169 discussed more generally in the context of children's happiness), and 'Access to Islands',  
170 which captures a specific conflict over seaweed collection which is currently restricted by the  
171 Gulf of Mannar Marine Reserve status (detailed later in the paper).

172 Table 1 clearly illuminates the importance of social relationships to women's  
173 wellbeing, with good marital relations (where a spouse was specifically mentioned),  
174 relationships with broader family, and relations with neighbours, appearing frequently in  
175 women's assessments of the top five most important things needed to live well. Good marital  
176 relations were joint fourth – alongside having a house to live in – as the most frequently  
177 mentioned wellbeing domain. The important role played by social relationships in enabling,  
178 or disabling, wellbeing concurs with other studies, for example Camfield's et al., (2006) study  
179 in Bangladesh, which demonstrates the centrality of relationships with spouses and in-laws  
180 to younger women's happiness in particular, and the growing literature on 'Relational  
181 wellbeing' (Gough and McGregor, 2007; White & Blackmore, 2016) – a concept which  
182 emphasizes the social and cultural construction of wellbeing and explicitly conceives the  
183 production of wellbeing through interaction with others (White, 2015, 2017).

184

185 **[Insert Fig. 1.]**

186

187 Whilst we acknowledge that our sample size is relatively small, Fig. 1 shows the  
188 average satisfaction score that women gave to each nominated wellbeing domain. Areas of  
189 particular dissatisfaction (a score of 2 or less) include fishing equipment, access to islands

190 (India), freedom from debt, daughter's marriage (India), access to a vehicle (Sri Lanka), and  
191 savings. Wellbeing domains of high satisfaction (4 or above) include public participation,  
192 clothing (Sri Lanka), and good neighbourly relations, demonstrating the important  
193 contribution of these domains to women's subjective wellbeing.

194 It is interesting to note that the average satisfaction scores for marital relations are  
195 lower than those scores allocated to family and neighbourly relationships (when analysed as  
196 separate cohorts, Indian average satisfaction with marital relationships drops further to 2  
197 'Poor'). However, one must be wary of interpreting data based on the satisfaction scores  
198 alone. Limitations include accounting for 'adaptation' where a person becomes accustomed  
199 to a poor situation over time and thus scores more highly than expected (Groot 2000, Clark  
200 2012), and cultural taboos around so clearly stating dissatisfaction with a spouse's behaviour  
201 (Ravneet and Garg 2010; White, 2014). These underscore the importance of embedding the  
202 GPI within an in-depth interview, and not as a standalone exercise. Furthermore,  
203 respondents were asked to nominate domains that were important for living well and, as  
204 such, the method may underreport domestic violence, compared with approaches which  
205 investigate its occurrence more directly. The sensitivities associated with research into  
206 domestic violence, and the common reluctance to discuss the topic for fear of reprisal, shame,  
207 stigma, and social norms/ expectations are well documented (Pandey et al., 2009; Ravneet  
208 and Garg, 2010).

209 In India, 45% of interviewees reported exposure to alcoholism, and 30% had  
210 experienced (physical) domestic violence, with similar levels reported in Sri Lanka (40% and  
211 30% respectively). In several interviews, women expressed that they were 'fairly satisfied'  
212 with their marital relationships, but detailed aspects of violence later in the interview. In at  
213 least three of the interviews, women stated that they were now satisfied with their marital

214 relationships following a past period of domestic violence, which they felt had improved  
215 following an intervention, often from extended family or the village council. Busby's (2000:  
216 196-199) anthropological study of a South Indian fishing village nicely captures the limitations  
217 of researching domestic violence in South Asia, describing how violence is commonly  
218 normalised as an 'expected' part of life, and that its prevalence does not deter women from  
219 describing their husbands as 'good men', 'kind' and 'dependable'. Her interview with  
220 fisherman Varghese and his wife (following his wife's unexpected disclosure of her back  
221 problems caused by his beatings) is particularly powerful:

222

223 *"It's because he beat me", she said, indicating Vaghese with a nod. 'He beat me up very badly*  
224 *once and it's never been the same since'. Varghese looked suitably contrite, and the other*  
225 *people present nodded and nudged him...'If he's drunk he does it...when he's drunk he causes*  
226 *lots of trouble!' Her tone was amused and indulgent, like a mother describing her son's*  
227 *waywardness, and there was general laughter at Varghese's sheepish expression...'I try to*  
228 *stop him from drinking' she went on 'but what can you do'... Apart from this occasional lapse,*  
229 *it seemed that Varghese was a model husband. 'When I am sick, he does all the household*  
230 *work, the cleaning and washing. He will even give me a bath and cook. If he is not at sea and*  
231 *not drunk he does almost everything'".*

232

233 In a similar vein to Busby's study, one interviewee in Sri Lanka (SL 4) detailed frequent  
234 episodes of serious physical abuse following her husband's alcohol consumption, including  
235 being "chased away at knife point", but lamented that she was reluctant to leave him since  
236 "he is very good when he is normal (without alcohol)". As Jayasuriya et al., (2011:1098)  
237 comment, regarding the normalisation of domestic violence in Sri Lanka, "When it is also

238 *believed that the man should be the “boss,” this creates a culture in which men are “allowed”*  
239 *to abuse alcohol or drugs and demonstrate their power over women, even in the form of overt*  
240 *violence”.*

241         These statements reveal something of the sensitivities and complexities of  
242 researching aspects of alcohol abuse and domestic violence, alongside the high occurrence  
243 with which women, at both sites, reported such problems. A regular association between  
244 being drunk and being violent was found throughout the study. All the interviewees who  
245 reported domestic violence also reported alcohol abuse, although a small proportion of  
246 women cited problems with alcohol without the associated violence (10% and 15% of  
247 respondents in Sri Lanka and India correspondingly). It is important here to consider the  
248 impacts of alcoholism on women’s lives even for those who did not report domestic violence.  
249 The majority of interviewees describe the drainage that alcohol purchases cause on already  
250 limited household budgets, with many women relying on grown-up children or extended  
251 family for additional financial support, problems that are associated worldwide with  
252 alcoholism (Kennedy and Peters 1992; Nojonen and Kantor, 2004).

253         Alcoholism and domestic violence are recognised problems in the study areas which  
254 create significant barriers to wellbeing for women and men. Alcoholism is well known to be  
255 on the increase in South Asia (Franco 2015) and, in India, it has become an important political  
256 issue, with central and state government parties advocating, and enacting, variations of  
257 alcohol bans throughout the country. Alcohol prohibition policies are often accompanied by  
258 supportive protests from women, and indeed are stimulated by them (Patnaik, 2004; BBC,  
259 2016; Thekaekara, 2016), and have been shown to reduce reported incidences of domestic  
260 violence (in India) (Luca et al., 2015).

261           Clearly, these issues are not solely limited to fishing communities. However, when  
262 such problems appear prominently within fishing communities, marine resource governors  
263 must take these into account when developing management interventions and engaging with  
264 fishers in governance arrangements. The vignette presented in the next section illustrates  
265 how women’s vulnerability can suffer when attention is not paid to gender and social  
266 wellbeing.

267

### 268 **3. Marine conservation undermining women’s wellbeing – a vignette from India**

269           In this research, the impacts of limiting access to marine resources on women’s  
270 wellbeing were particularly stark in the India study, where collection of seaweed has been  
271 heavily restricted under legislation from the Gulf of Mannar National Park and Biosphere  
272 Reserve (10,500 sq km and India’s largest marine protected area), created in 1989 under the  
273 UNESCO Man and Biosphere Program.

274

275 **[Insert Fig.2.]**

276

277

278 Twenty-one small islands off the coast of Ramanathapuram district form a protected and  
279 closed area, although they lie within reach of an estimated 125 fishing villages which line the  
280 shore (Bavinck and Vivekanandan 2011). Within this core area, the 1972 Wildlife Protection  
281 Act prohibits any entry into the park or extraction of natural resource, which includes fishing  
282 and the harvesting of seaweed, activities which are seen as a threat to the reserve’s coral  
283 reefs (Kumaraguru et al.,2000; Senthilkumar et al.,2008).

284           The reserve designation affects an estimated 5000 women from near-by fishing  
285 villages, who historically have travelled to the islands to harvest seaweed, which they sell  
286 locally for use in various industries (cosmetic and soft drinks including Coca-Cola) (CMFRI  
287 census 2005, Rajagopalan 2007). Whilst the ban on seaweed collection was enacted in 1989,  
288 Rajagopalan (2007) suggests that enforcement was weak up until 2002, which saw the  
289 establishment of the Gulf of Mannar Biosphere Reserve Trust, part of a UNDP-GEF funded  
290 project, which had financial outlays for enforcement and implementation. Our research  
291 suggests that there is still significant dependence upon (illegal) access to seaweed in the area;  
292 all interviewees stated seaweed collection as their 'predominant livelihood and income  
293 source', with 80% of respondents also being involved in helping their husbands fish, and 30%  
294 sourcing additional income from making handicrafts using seashells. Interviewees describe  
295 seaweed collection as an activity which is passed down 'from mothers to daughters', although  
296 future seaweed dependency may change in light of efforts to improve the prioritisation of  
297 girl-child education in India. Whilst a universal female education bill was passed by the Govt.  
298 of India in 1994, offering parents incentives to send their daughters to school, gender  
299 disparities persist, particularly in rural locations (Jain et al 2017) such as the Gulf of Mannar.  
300 In our research, the India cohort of interviewees were aged between 30 and 54 years and 75%  
301 had no education at all, however, 'education for children' appeared frequently in women's  
302 self-determined wellbeing domains.

303           This research, conducted in one of the villages bordering the marine park, found that  
304 the 'ability to access the islands' appeared frequently (65% of respondents) in women's top 5  
305 most important criteria for 'living well' (Table 1), and the domain scored one of the lowest  
306 satisfaction rates (average 1.8, where Poor = 2; and 1= the worst you can imagine). Both men  
307 and women feel a strong attachment to islands often describing them as 'a mother land'



308 where they have spent time fishing, collecting seaweed, and (in former times) residing on the  
309 islands for prolonged periods. Today, many women still travel to the islands to collect  
310 seaweed, which risks reprisal from the Forestry Department (the governing body for marine  
311 conservation legislation) in the form of monetary fines, gear and boat destruction or  
312 confiscation, and general intimidation.

313 Seaweed collection, which is profitable relative to other work and requires little initial  
314 investment, secures financial autonomy for woman, and is a significant income contribution  
315 to the household. The importance of financial autonomy is well recognised in the literature  
316 on women's empowerment (Kabeer 1999), and has proven to underpin family-wide  
317 wellbeing, through greater investment in child health (Mandal et al 2016), food security, and  
318 education (UN 2018). In this study, financial autonomy through seaweed harvesting seemed  
319 *especially important* for women living with alcoholism and domestic violence (almost half of  
320 all women reported alcoholism in their home, with 1 in 3 experiencing domestic violence),  
321 since it reduces the risks of earnings being squandered on alcohol consumption, and can  
322 boost status in the home, as is demonstrated in the excerpt below:

323

324 Interviewee #8: *My husband works as a crew member in a vallam boat. He is an alcoholic; if*  
325 *he earns Rs 100, he would spend Rs 80 on alcohol. I meet the family expenses from the income*  
326 *that I earn from seaweed collection....it is the main and most important source of income for*  
327 *me. Now I meet most of the family needs from my earnings. I can give food and clothes to my*  
328 *children. I can take them to a hospital if they fell ill. Without this income how can we survive?"*

329

330 In a similar vein, Interviewee #19 describes what women have achieved in the village through  
331 financial independence;

332 *“Our men mostly spend their income on alcohol. So women generate income through*  
333 *seaweed collection and slowly and steadily save money. In most of the families, women*  
334 *provide financial support during emergency. They keep their savings and make investments in*  
335 *land and building houses. It is not an exaggeration that this is a village that is made by the*  
336 *hard work of women’s labour”.*

337

338         There is some evidence from the literature that financial independence can even  
339 *dissuade* domestic violence, either by the work place providing a source of refuge for women  
340 (in this case, women frequently recalled residential periods on the islands), or by securing  
341 independent purchase of houses or land, which can bolster the power that women have  
342 within the family (Rao, 1997; Sabarwal et al., 2014, Bosak et al 2019). Drawing from John  
343 Nash’s work on cooperative bargaining problems (see also Sen 1999), Agarwal (2009) argues  
344 that owning property enhances a woman’s bargaining power within the household, and  
345 provides tangible exit options, and thus a strong fall-back position should bargaining  
346 strategies fail. If we apply this theory to the context of women’s access to marine resources,  
347 such as the seaweed resources in our India vignette, we reveal the true value of those  
348 resources for vulnerable women. Access to resources, understood as mediated both by legal  
349 rights and via structural and relational mechanisms (Ribot and Peluso 2003), not only provides  
350 income-earning opportunities (softening the household impacts of alcoholism) but also  
351 enables financial autonomy and empowerment, which may (potentially) reduce the risk of  
352 domestic violence.

353         Additionally, in this case study, women with good marital relations often describe  
354 going fishing with their husbands – either directly fishing (to contribute to household income)

355 or to travel (via the family boat) to the islands to engage in seaweed collection. Women who  
356 live with an abusive partner are *further disadvantaged* since they have reduced opportunity  
357 to fish with their husband; 66% of women who reported domestic violence in the India cohort,  
358 also commented how they were unable to fish with their husbands, as illustrated by  
359 Interviewee #6:

360 *"I want my husband to stop drinking and become a responsible person. I am very much*  
361 *interested to buy a vattai (small boat) and work along with my husband. I want to provide*  
362 *good education to my sons.... People may persuade him but it all depends upon him whether*  
363 *to change or not...I think a vattai is important to have a secure income. Owning a vattai gives*  
364 *prestige in the community. But without my husband's help, I cannot operate a vattai on my*  
365 *own".*

366 This limitation not only reduces overall household income, but often means that women have  
367 to find their own means of traveling to the islands. This typically involves either paying 100Rs  
368 to travel in a collective boat (Vallum), which is costly, often poorly timed with low tides (when  
369 seaweed is exposed for collection) and less convenient, or to self-row in their husband's boat  
370 (when not in use) which involves a high risk journey at sea. Several women in the village have  
371 drowned collecting seaweed on a rising tide, a risk exacerbated by poorly timed transport.  
372 Prior to the marine reserve legislation, women would remain on the islands to capture several  
373 low tides at a time – a more efficient and safer means of seaweed collection. This is now rarely  
374 done due to pressures from the Forest Department, in their attempts to enforce the exclusion  
375 zone.

376 In this case study, women who are already vulnerable through abusive marital  
377 relationships, *are further disadvantaged* by the island exclusion zone than those who, through  
378 healthier marital relations, are able to compensate for the loss of earnings by accompanying

379 their husbands in the boat, either for fishing or via safe travel to the seaweed beds. The islands  
380 exclusion zone has undermined women’s opportunities for resource access, and the financial  
381 autonomy this can create, and yet these can make a critical difference to women and  
382 children’s wellbeing (Agarwal 1994, 2003). This case demonstrates how marine conservation  
383 measures can inadvertently further marginalize some of the most vulnerable people in a  
384 community – abused women.

385         The final point to make in this case study is the lack of recent evidence to verify  
386 concerns that collection of seaweed has a detrimental environmental impact. Women in this  
387 study strongly attest that they avoid damaging marine habitat during collection, and that they  
388 have created and enforced informal regulations regarding the tools that can be used to  
389 harvest seaweed, and the number of harvest days which are limited and shared between  
390 different villages. To date, there have been no studies which explore whether seaweed from  
391 natural sources could be collected sustainably in the region (a much needed topic for future  
392 research). The rationale for the exclusion zones seems motivated by biosphere reserve  
393 protocol, a technical ‘wholesale solution’ to a ‘specialized problem’ (Degnbol et al 2006),  
394 which is blind to the nuanced ways that people engage with their environment (Ostrom et al.,  
395 2007), and whose application has resolved only part of the (conservation) problem, whilst  
396 exacerbating other (social) problems. As Fortnam et al (2019:323) lament in their recent  
397 gendered analysis of how men and women benefit and value ecosystem services in the  
398 context of East Africa, “time and again the failure to account for social diversity means that  
399 the most vulnerable fail to benefit...”

400         Beyond the Gulf of Mannar Biosphere Reserve, commercial harvesting of seaweed  
401 from natural sources is common throughout the southern Tamil Nadu coast, from  
402 Kanyakumari in the south, extending northwards to the Gulf of Mannar – a total distance of

403 almost 300 km known as ‘The seaweed belt’ (Krishnan and Kumar 2010a). High livelihood  
404 dependency typically characterises seaweed collection in the region, with its scope for ‘social  
405 upliftment’ of women being particularly recognised (Periyasamy et al 2014), alongside  
406 concerns for future sustainability. Krishnan and Kumar (2010a) allude to the role played by  
407 rural development projects engaging with women’s self-help groups, which may have  
408 stimulated the ‘rapid development’ of women involved in seaweed collection, with Krishnan  
409 and Kumar (2010b) describing the encouragement of ‘industrial scale’ seaweed farming,  
410 through self-help groups in Tamil Nadu, by commercial industries such as Pepsi Cola. The  
411 potential for further development and expansion of seaweed mariculture, as a significant  
412 commercial activity in India, is growing (Khan and Satam 2003), with recent communications  
413 from the 2019 India-International-Seaweed-Summit declaring seaweed cultivation as a  
414 ‘priority sector’ and ‘sunrise industry’ for India, following countries such as China, the world’s  
415 largest producer of commercial seaweed.

416

417 **4. Marine resources and their contribution to women’s empowerment – why resource**  
418 **governors must take note.**

419 *“When you own things, you have power; and when you don't, you have no voice.*  
420 *Economic bondage is demeaning, and by enabling women to make their own money, you give*  
421 *them back their dignity” (UN Women 2019)*

422

423 The above quote is from Agnes Leina, Executive Director of a Kenyan-based NGO  
424 working on indigenous women’s rights (UN Women.org), and reflects the wide-spread  
425 acknowledgement of the importance of financial independence for women’s empowerment.  
426 This is also enshrined in the first target for SDG goal 1 ‘End all poverty in all its forms’, which

427 is to: “ensure that all men and women, in particular the poor and the vulnerable, have equal  
428 rights to economic resources, as well as access to basic services, ownership and control over  
429 land and other forms of property, inheritance, natural resources, appropriate new technology  
430 and financial services, including microfinance”.

431 Marine resource governance has an enormous role to play in meeting this target. One  
432 major contribution could be to pay more attention to vulnerable women living with  
433 alcoholism and domestic violence in fishing communities and the ways in which marine  
434 resources can form critical wellbeing contributions for themselves and their families. The  
435 ways in which marine resource access translates into diverse wellbeing benefits for women,  
436 to include independent income, but also dignity, security, respect, and empowerment, are  
437 currently under-recognised and are lacking in many management considerations. The usual  
438 focus for management is fishermen’s livelihoods, since men are usually the main resource  
439 users and perceived breadwinners. In cases where alcoholism and domestic violence are  
440 widespread, the contribution of marine resources as independent income for women,  
441 underpinning household level wellbeing is enormously intensified. Such resources risk being  
442 under-reported and under-valued in resource management efforts that fail to disaggregate  
443 the wellbeing needs of different resource users (Daw et al., 2011).

444 Furthermore, many women are reluctant to leave abusive husbands due to cultural  
445 pressures and the social stigma attached to divorce/ separation, but also due to the presence  
446 of children. For example, in Subramaniam & Sivayogan’s (2001) study on domestic violence  
447 in Sri Lanka, a majority of women, irrespective of their level of education and employment  
448 status, placed the welfare of their children as the prime reason for continuing to stay in an  
449 abusive relationship. In many parts of the world, women’s access to children following a  
450 separation are inadequate and, too often, are non-existent. Even in countries where access

451 rights are legally enshrined, women who leave abusive husbands still suffer the pains of  
452 reduced access to their children. It is remarkable, but perhaps unsurprising, what women will  
453 endure in order to remain close to their children. As Goel (2005:640) comments:

454

455           “South Asian women are particularly prone to flawed solutions to battering for many  
456 reasons, but most important, cultural ideals exert tremendous pressure to accept less-than  
457 ideal solutions. The Indian feminine ideal is one of self-sacrifice, not self-preservation...”.

458

459 This – and our earlier vignette - leads us to reemphasise the importance of marine resources  
460 where they underpin *crucial coping strategies* enabling vulnerable women perhaps not to ‘live  
461 well’, but certainly to ‘live better’, and gain some degree of independence, respect, and self-  
462 worth, in situations where women remain in an abusive relationship.

463           Whilst in our India study, households were almost entirely dependent upon marine  
464 resources, it is important to note that often coastal households depend upon a mix of  
465 different income sources, and women may secure financial independence through different  
466 non-marine related activities, such as agriculture, small business, and labour. Realisation of  
467 the diversity and dynamics of ‘livelihood landscapes’ (Mills et al 2017) is an important step in  
468 establishing the extent to which women are dependent upon access to the sea, and how other  
469 activities compare in terms of accessibility, feasibility, preference, and economic value.

470

## 471 **5. Implications of findings for marine resource governance worldwide**

472           So far, this article has provided evidence from South Asia which illustrate some of the  
473 unforeseen and unexpected implications of marine conservation for vulnerable groups such  
474 as women living with alcoholism and domestic violence in their lives. In order to broaden the

475 implications of our findings, we now question the extent to which social problems such as  
476 these are being reported in fisheries throughout the world, through a scoping review of the  
477 published literature. The scoping review was done using the terms: ‘alcohol’ or ‘substance  
478 misuse’ or ‘alcoholism’ or ‘alcohol consumption’ or ‘hazardous drinking’, and ‘fishermen’,  
479 ‘mariners’, ‘seafarers’ during the years 1960-2017, using google scholar and SCOPUS search  
480 engines. We propose here, a theoretical argument using insights from our study and wider  
481 literature around the types of characteristics that may make certain fisheries more vulnerable  
482 to high levels of alcoholism and domestic violence than others. These include i) the physical  
483 and mental demands of fishing work, ii) the nature of social relations amongst fishermen, iii)  
484 household and marital strains, and iv) adverse socioeconomic conditions.

485         First, the *physically and mentally demanding* nature of work due to the high levels of  
486 stress associated with uncertain catch and incomes, and high levels of personal risk whilst at  
487 sea, are common to all fishers. Fishing is known to be one of the highest risk peace-time  
488 occupations (Roberts, 2010). Research examining how *occupational characteristics* might  
489 contribute to Intimate Partner Violence against women, indicates that men with ‘dangerous  
490 occupations’ are more likely to both exhibit violence (Melzer, 2002) and alcoholism (Pougnat  
491 et al., 2014); although it is a long standing debate as to whether “high risk” occupations attract  
492 problem drinkers or whether they create them as a result of work pressures (Plant, 1978).  
493 Either way, it may be logical to assume that higher levels of risk, uncertainty and danger in a  
494 particular occupation, including fishing, could be associated with higher levels of alcoholism.  
495 Additional data from this study (which also explored wellbeing amongst men) found that men  
496 commonly describe the need to drink alcohol following a fishing trip ‘as a release’ from the  
497 physical and mental strains endured from fishing, captured in the below quote from a Sri  
498 Lankan fisherman:



499 *“Liquor addiction is a crucial factor that decides the direction of a fisher’s life. Most of the*  
500 *fishers think liquor and drugs are essential items for their lives. They justify it, as drugs and*  
501 *liquor are mental and physical pain killers. They take liquor to forget their problems, but liquor*  
502 *and drugs decay their entire lives”* (Male fisherman, Sri Lanka #11).

503 Bhondve et al., (2013), in a study of Mumbai fishermen found that alcohol consumption was  
504 more common among fishermen who were stressed, with 31.8% blaming stress as the reason  
505 for alcohol use and 20.8% fishermen believing that alcohol increases work efficiency.

506 Second, successful fishing operations are heavily dependent upon *good social*  
507 *relationships* between fishermen (Acheson 1981). As Coulthard et al., (2014) describe, good  
508 relationships among crew members, between the crew and boat skipper, and between boat  
509 owners, all constitute important parts of a fisherman’s wellbeing. Coulthard and Britton  
510 (2015) give an example from Northern Ireland, where a skipper gave up his fishing profession  
511 citing poor crew relations as a major reason. Drinking alcohol after a fishing trip is often done  
512 with other crew members (this study), and serves to establish and reinforce bonds whilst on  
513 land (Rix et al., 1982). Closely linked to this is a fisherman’s individual status and reputation,  
514 where risk taking (Acheson, 1981) and masculinity are highly valued attributes (Pollnac and  
515 Poggie, 2008; Power, 2008) which can – in some cultural contexts- underpin peer-pressure to  
516 drink alcohol collectively. Alcohol can play an important role in enhancing as well as disrupting  
517 social relationships. For instance, research from Nigeria, which reported significant  
518 alcoholism in fishing communities, demonstrates how fishermen clearly connect their habit  
519 to their occupational and community identity:

520

521 “We drink a lot of wine in this community because we are fishermen, and we live around the  
522 river. The area is usually very cold and we take a lot of hot drinks to keep ourselves warm. We  
523 drink very well. ....” (Ediomo-Ubong, 2014; Ediomo-Ubong, 2015).

524 In addition to examples of socialised cultures of drinking, a greater risk of alcoholism  
525 can also be driven by *exploitative work conditions*, in particular, direct encouragement of  
526 excessive alcohol use and payment in alcohol by boat captains and owners (as was found  
527 throughout this study, see also Tunstall, 1962 and Setiawan et al., 2010). This exploitative  
528 arrangement encourages addiction and dependency on the boat owner, and completely  
529 excludes women from receiving fishing-based income.

530

531 Third, *strained martial relationships* can result from the very nature of fishing work,  
532 and can underpin a greater risk of alcoholism and violence (Pandey et al., 2009). Fishing is an  
533 occupation strongly associated with masculinity, pride, and sense of self-worth, and changes  
534 to traditional gendered family roles can be felt acutely at home. For example, long periods of  
535 time spent at sea can lead to frustrated re-negotiations over household roles and frayed  
536 relationships with spouses and children on return to land (Harper and Leicht, 2007). As  
537 Coulthard and Britton (2015) demonstrate in Northern Ireland, changing roles and identities  
538 within the home, particularly where women subsume the role of main income provider due  
539 to failing catches, place strains on marital relations and frequently instil a lack of self-worth  
540 amongst men (see also Kessler and McRae, 1982; Rosenfield, 1992). In their study, a majority  
541 of active fishers (59%) commented that they struggled to balance the demands of their work  
542 with the needs of their family, frequently reporting ‘marital strain’, ‘poor relationships with  
543 children’ and ‘feelings of isolation’ as barriers to their wellbeing.

544 Finally, *adverse socioeconomic conditions* – which cause stress in themselves - can also  
545 create low self-esteem and insecurity among men, who then use violence as a ‘compensatory  
546 behaviour’ (Pandy et al., 2009), where traditional masculine identities are perceived as being  
547 threatened. This was clearly demonstrated by Bhattacharya’s et al., (2011) study of domestic  
548 violence in North India, where a large proportion of women felt violence (and drinking) is used  
549 by men to release stress, anger and frustration: out of the 52% of women who reported  
550 domestic violence during the course of their marriage, 31% of these attributed it to the ‘men’s  
551 failure as a provider’ and their ‘injured masculinity’, as fuel for violence. As Kabeer (2005)  
552 comments in a more general sense: “For poorer men...the failure to fulfil their gender  
553 ascribed roles, to live up to social expectations about their capacity to protect and provide,  
554 can lead to considerable stress and demoralisation on their part as well as domestic violence,  
555 high levels of alcoholism, abandonment of their families and responsibilities”.

556

557 Our scoping review certainly highlighted significant problems of high alcohol  
558 consumption and domestic violence in particular fishing communities (van Sittert, 2001  
559 (South Africa), Ediom-Ubong, 2014; Ediom-Ubong, 2015 (Nigeria), Busby (1999) (India),  
560 Binkley (1995) (Canada). Many of these studies (as in this study) did not directly set out to  
561 explore alcoholism and domestic violence, but unearthed these as significant issues as the  
562 research progressed (e.g. Robles-Zavala, 2014 (Mexico) and Locke et al., (2017) (Cambodia,  
563 the Philippines and the Solomon Islands). Chinnakali et al., (2016) found that alcohol use in  
564 fishermen from South India was ‘extremely high’ with three quarters of fishermen reporting  
565 alcohol consumption during fishing, which concur with our findings (albeit our research draws  
566 on women’s statements about the extent of alcoholism in their husbands). Other research in  
567 different contexts has found lower proportions, for example Fort et al (2010) reported in their

568 study in France that 18.6% of fishermen were engaged in ‘hazardous drinking’, and they  
569 highlight the associated risks posed to health and safety concerns at sea.

570 Further serious issues related to alcoholism are reported in a number of studies and  
571 are related to the type of fishing, working conditions and social factors. For example, studies  
572 in Africa and Asia have associated the prevalence of substance misuse including alcohol with  
573 higher rates of HIV/AIDS compared to the general population (e.g. Allison and Seely, 2004).  
574 However, the state and extent of the literature on such topics, including government studies  
575 and statistics, is not sufficient to make generalisations. Recognising the warnings issued by  
576 Westaway et al., 2007 against stereotyping fishing communities as “feckless and reckless”,  
577 we do not argue that social problems of this nature are unique or particularly problematic in  
578 fishing communities rather than other types of communities. Many of our theorisations could  
579 hold true for other communities where people are heavily invested in, and dependent upon,  
580 threatened natural resources. Instead, we highlight that where these issues do exist, there  
581 seems to be a missed opportunity for marine resource governors to engage with fisher  
582 wellbeing and degree to which social problems of this nature are reflected in community  
583 concerns and priorities. Furthermore, as demonstrated through our vignette, management  
584 interventions which proceed without recognition of these problems, where they are  
585 prominent, risk exacerbating harm to the already vulnerable, and ultimately undermining  
586 sustainability.

587

588 Despite calls for a social wellbeing evaluation of fisheries (Voyer et al., 2017); social  
589 problems such as alcoholism and domestic violence continue to be overlooked by marine  
590 resource governance and policy. It is therefore perhaps unsurprising that the biennial ‘State  
591 of the World’s Fisheries report for 2018 (titled ‘Meeting the Sustainable Development Goals’)

592 fails to include a single mention of alcoholism or domestic violence (FAO, 2018). However,  
593 awareness of issues around mental and physical health in fisheries are growing (King et al  
594 2015) and actions such as a fisheries-specific occupational health service, awareness raising  
595 and education, or periodic medical screening, have been proposed potential solutions in some  
596 parts of the world (Woodhead et al., 2018), with fruitful collaborations between fishers'  
597 welfare groups and mental health charities (see Seafarers UK, 2018). In Vietnam, programmes  
598 seeking to address culturally rooted framings of masculinity that perpetuate violence intimate  
599 partner violence have instigated constructive discussions to understand the pressures men  
600 face in certain fishing communities and redefine masculinity in more positive terms (Hoang et  
601 al., 2013). Given the economic and social stresses which are worsening in many fishing  
602 communities around the world, the impacts on social relationships *within* the fishing  
603 household and community deserve greater attention (Binkley 1995, Nadel-Klein, 2000; Locke  
604 et al., (2017).

605

## 606 **6. Concluding remarks**

607 This paper has two key contributions. First, the research demonstrates the  
608 methodological value of researching wellbeing in a way that prioritises what people  
609 themselves feel is most important. Our results support a growing area of research which  
610 argues the importance of social relationships in shaping human wellbeing, and is evidence  
611 that a conversation around 'living well' can illuminate both highlights and lowlights of  
612 people's lives, but does so in an empowering way which enables people to respond in their  
613 own words, and on their own terms. Our discussion of wellbeing amongst women in fishing  
614 communities in South Asia forms an empirical contribution to a growing theoretical debate  
615 as to the potential usefulness of a social wellbeing approach to marine resource management,

616 in particular for assessing social impacts (Coulthard et al., 2014), and for managing  
617 environmental change in general (Milner-Gulland et al., 2014; Agarwala et al., 2014; Lange et  
618 al., 2016).

619         Second, this research illustrates the importance of understanding how men and  
620 women depend upon and access natural resources differently (Yang et al 2018). Our study  
621 from South Asia, found that women living with aspects of alcohol and domestic abuse in their  
622 homes may have a much higher dependency on marine resources than women who have  
623 better marital relations. Marine resources can serve as a critical lifeline, by enabling financial  
624 autonomy and empowerment, and increasing women’s bargaining position within the  
625 household – factors which have been proven to reduce the occurrence of domestic violence.  
626 Our vignette illustrates the important role that marine resources can play in particular for  
627 women who live with abusive husbands and in households where alcoholism is a substantial  
628 drain on financial resources. Poorly informed management interventions can inadvertently  
629 place already vulnerable women into greater harm. As we noted earlier, we do not aim to  
630 generalise or stereotype all fishing communities as violent and alcoholic. We simply highlight  
631 that where these problems exist, there is an important opportunity for marine resource  
632 governors to engage with communities on these issues rather than to sidestep what may  
633 seem to be outside their traditional remit.

634         Echoing Agarwal’s call for greater attention to women’s property rights, we call here  
635 for more attention to the plight of women in fishing communities, particularly those  
636 experiencing significant environmental change in coastal areas and declining resource access.  
637 Whilst greater recognition of the economic contributions that women make to fisheries has  
638 been long promoted (Nadel-Klein and Davis 1988; Thiessen et al., 1992; Kleiber et al., 2015),

639 we stress here the importance of recognizing the connectivity between women’s wellbeing,  
640 marital relationships, and access to marine resources. This seems to constitute an  
641 underplayed opportunity for marine resource governance to significantly contribute to  
642 Agenda 2030, by highlighting the ways in which the poorest and most vulnerable in fishing  
643 communities depend on marine resources, and taking steps to ensure such groups do not fall  
644 into further harm as a result of marine resource policy. Increased engagement with gender  
645 and social wellbeing enables marine resource governors to better understand the full extent  
646 of the social impact of management interventions and creates new opportunities to  
647 contribute to achieving the SDGs.

648           Examples of how marine resource governance could improve its contribution to the  
649 SDGs include; supporting the development of counselling, including marital, in marine  
650 resource-dependent areas; alcoholism awareness initiatives; regulating and outlawing the  
651 payment of fisher crews using alcohol; and support to/ investment in the diversification and  
652 strengthening of women’s access to sustainable and independent income sources. The latter  
653 requires a more detailed and nuanced understanding of how women’s livelihood  
654 opportunities depended upon men in their households and wider community, and the  
655 implications this has for meaningful independence. Wherever possible, these efforts should  
656 be made through collaboration with existing organisations and charities already working in  
657 the field of social welfare, women’s empowerment, and domestic violence who will hold vital  
658 skills and local knowledge. Where marine resource access is to be restricted as part of a wider  
659 policy, the full impacts on families, especially where domestic violence and alcoholism are  
660 present, must be better understood and more explicitly considered in decision-making. Small  
661 changes to incorporate consideration of these, and broader social problems, have potential  
662 to foster greater local support for resource governance which becomes more aligned with

663 peoples' wellbeing priorities. Doing so creates new opportunities for marine resource  
664 governance to contribute to the SDG ethos to leave no one behind, by placing the most  
665 vulnerable first.

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## 8. Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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**Table 1: Aspects of life deemed most important for living well by women in 2 fishing villages.**

Frequency = the no. of times each domain was mentioned as a top 5 priority.

(SL) = Sri Lanka specific domain; (I)=India specific domain.

Wellbeing domain	Frequency
Income/job	40
Health	28
Education of children (and grandchildren)	25
Good marital relations	21
House	21
Good neighbour relations	20
Good family relations (including children and extended family)	15
Access to islands (I)	13

Fishing equipment (boats, nets)	11
Free from debt	9
Good habits	8
Daughter's marriage (I)	7
Vehicle (SL)	6
Happiness of others (SL)	6
Religion (SL)	4
Nice clothes (SL)	3
Public participation	2
Savings/ gold	2

**Fig.1 Satisfaction scores for prioritised wellbeing domains**

Satisfaction scores: the average level of self-reported satisfaction for each wellbeing domain, based on how respondents felt about this area of life over the past year.

Scale: 5 = Exactly as you want it to be; 4 = Good; 3= Fairly satisfied; 2 = Poor; 1 = The worst you can imagine.

**Fig. 2. Gulf of Mannar Biosphere Reserve (Source: Bavinck and Vivekenandan 2011)**