

Contribution of Small-Scale Fisheries to the Livelihoods of Omani Women: A Case Study of the Al Wusta Governorate

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Abstract

Gender disaggregated data is not collected by the Ministry of Agriculture and Fisheries Wealth of Oman. Consequently, there is a deficiency of information relating to the roles of women in the national fishery. Accordingly, the present study examined the involvement of women in artisanal fisheries in the Al-Wusta Governorate. Out of the total population of approximately 400 fisherwomen, 85 (~20%) were randomly interviewed to gain greater insight into their socio-demographic status and precise function in the artisanal fishery. Field-based observations on the molluscan, holothurian and crustacean fisheries in which women were engaged were also undertaken. Interviewees (mean age of 36 years) were separated into groups based on age distribution. Over 40% of respondents were illiterate and only 20% had attained secondary level education or above. 60% of women had 4 or more children. Fishing activities involved 5-10 h a day, three times a week. Women were generally engaged in gathering (gastropods and bivalves), gleaning (sea cucumbers) and spear fishing (cephalopods and crustaceans), as well as exclusively in capture, processing and marketing of marine gastropods. Recommendations for gender-sensitive interventions, incentivisation and support are presented.

Introduction

The Sultanate of Oman is located in the south eastern corner of the Arabian Peninsula, and the Sultanate's coastline extends over 3,150 km, with three connected bodies of water within the Indian Ocean: the Arabian Gulf to the northwest, the Sea of Oman to the northeast and the Arabian Sea to the southwest (Fig. 1). The last is affected by a southwest monsoon-driven summer coastal upwelling which decreases seawater temperature and increases nutrient concentrations (Barber et al. 2001), a feature that makes the area the richest fishing ground in the Arabian Peninsula (Solanki et al. 2008). Fisheries are considered the most important non-energy source of income for Oman, with total landings of 159,000 tonnes and a value of approximately USD 319 million being reported for 2011 (MAF 2012). Nationally, the Sultanate has experienced an increased demand for

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fish and per capita consumption has been estimated as 28 kg.year⁻¹ (FAO 2010), one of the highest in the Middle East.

Oman's fisheries are divided into three broad categories *viz.* commercial, coastal and artisanal. Among these, the artisanal sector represents the mainstay of fisheries production, contributing 95 % of recorded landings in 2011. The sector is entirely occupied by small-scale fishermen who employ motorised fiberglass boats, 8-10 m Length Over All (LOA), wooden skiffs or "hori" (10-15 m LOA), traditional palm-frond "shashas" and a few large wooden dhows (10-25 m LOA) (Stengel and Al-Harthy 2002). Fishermen have been encouraged and subsidised technically and financially by the government, and, in recent years, significant progress has been made in improving the sector, including an increased number of landing harbours and the construction of on-site market places, processing and cold-storage facilities. Several studies have examined the structure and operation of Oman's small-scale fishery (Siddeek et al. 1999; Al-Oufi et al. 2000; Al-Subhi et al. 2013), but these have mainly emphasised institutional and personal capacity-building of fishermen, rather than fisherwomen. The general lack of interaction between fisherwomen, fisheries departments and fisherwomen's government and non-government agencies in Oman has resulted in a lack of initiatives directed towards them. This gender bias has resulted in the activities of women generally being unrecognised and their contribution has largely gone undocumented.

In contrast to the Arabian peninsula, where the activity of womenfolk in fisheries has received comparatively limited attention (Egypt: Ashworth et al. 2004; Yemen: United Nations 2007; Oman: William 1979; Al-Rashdi et al. 2007a; Bose et al. 2013), their involvement in the fisheries of Asia, Africa, Oceania, Latin and North America and Europe has been extensively reviewed (Merrikin 1987; Kyprianou 2001; Williams et al. 2002; MacAlister et al. 2002; Sharma 2004; Choo et al. 2006). Traditionally, Omani women from coastal communities have been engaged in fishing and fishing-related activities. However, economic growth, driven by the energy sector and subsequent increase in the availability of imported foodstuffs and an expatriate workforce, has outwardly resulted in coastal women being gradually pushed out of the fishery and replaced by foreign labourers. The lack of national gender disaggregated data on fisheries employment makes it difficult to gauge the precise importance of women in the sector.

Disparities in gender affect livelihoods of women, children, the household and ultimately the community. Hence, methods of improving women's income, education and ability to participate in decision-making processes will enhance the capabilities not only of the household but society in general (Weeratunge et al. 2010). In order to measure gender inequalities and thereby devise policies for change, baseline information is required. Accordingly, the present study was initiated to determine the contribution of small scale fisheries to the livelihood of Omani women. The socio-economic characteristics and associated issues, including obstacles hindering the entry of women into the fishery, competitive exclusion and others are considered, together with recommendations to enhance the future activities of female fishers in the sector. Additionally, observations were made on the general operations of specific fisheries of the Al-Wusta region.

Materials and Methods

Description of study area

Al-Wusta (Fig. 1) is one of seven coastal Governorates of the Sultanate of Oman. Approximately 400 km south of the nation's capital Muscat, Al-Wusta is the second largest Governorate in the country. With its Arabian Sea coastline, the region includes tracts of the Empty Quarter desert or Rub' al Khali, the largest sand wilderness in the world (Vincent 2008). Al-Wusta has four main fishing communities with the majority of fishers being *Bedouins*, whose livelihood activities are primarily livestock raising and fishing. The Omani population of Al-Wusta is about 19,000 (with a population density of 0.4 persons.km⁻¹) of which 55% are females (MoNE 2010). The number of traditional fishermen in the region is approximately 4,500, who contribute about 24% to national fish production (MAF 2012). The Governorate is also well recognised among other coastal regions for traditional shark salting and drying in which Bedouin women have historically been engaged. The dried shark, locally called “*awal*”, is one of the traditionally favored seafoods of Oman.

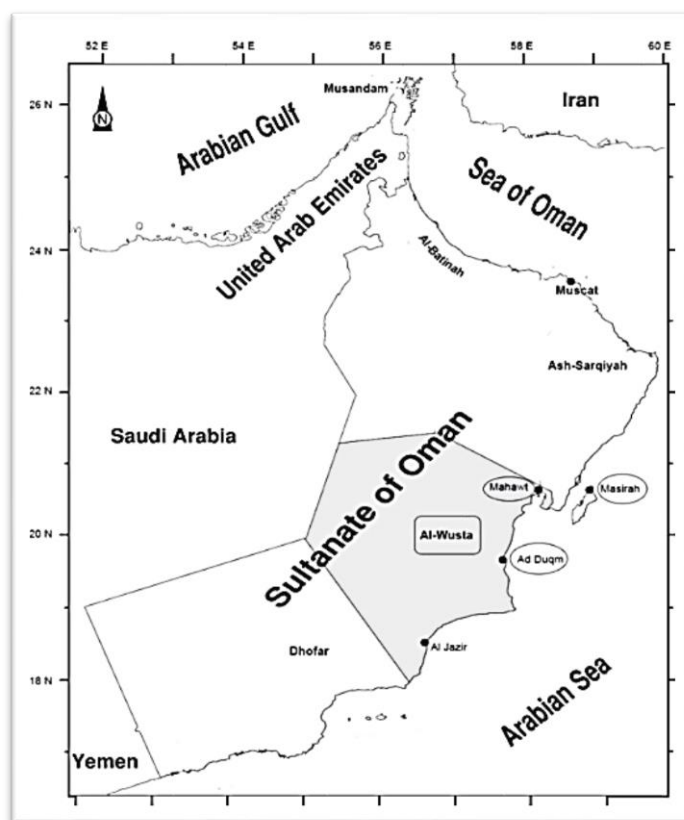


Fig. 1. Map of study area showing extent of the Al-Wusta Governorate and location of Oman.

A primary census of women involved in the fisheries was estimated by Al-Wusta Fisheries Department to be approximately 400 or around 9% of the total number of fisher folk. However, the Department recognised the need for more information on the participation of women in fishing and fishing related activities. Accordingly, three of the four fishing communities, covering the majority of fisherwomen, were surveyed: *Mahawt*, *Masira* and *Al Duqm* (Fig. 1). The activities of fisherwomen in these communities are more diversified than elsewhere nationally. Participants of the survey were randomly selected for interview.

Survey method

The survey was carried out using a questionnaire developed using FAO guidelines (FAO 1999). The questionnaire contained information on target species and their fisheries, socio-economic characteristics of the respondents and highlighted problems and requirements of the women in their fishery. Three local female residents from each of the surveyed communities, holding undergraduate or high school qualification, were hired for the purpose of conducting the interviews. Following the respondent's answers, group discussions consisting of six experienced fisherwomen, headed by a project leader and Regional Fisheries Official, were held at each surveyed community to determine problems that were faced and also to clarify some of the answers from the questionnaires. Field observations were also undertaken during the survey to ground test answers and to obtain basic information on fishing areas, species collected, and fishing and processing techniques employed.

Identification keys

Fished organisms collected during the field survey were classified using the keys and guides of Bosch and Bosch (1982); Smythe (1983); Donald and Bosch (1989); Bosch et al. (1995); Al-Abdessalaam (1995) and Shallard et al. (2009).

Results

Socio-economic observations

Eighty five individuals, representing over 20% of all fisherwomen of the Al-Wusta Governorate, responded to the questionnaire. General results showed that women are involved in marine invertebrate gathering, gleaning and spearing, all of which tended to be near-shore activities. The common, scientific, and local names of invertebrate species collected are listed in Table 1.

Table 2 summarises the socio-economic background of respondents who varied in age between 18 and 60 years, with a mean of 36 years. The largest age group (34%) was between 21-30 years, while the smallest group was made up of women of 50+ age group (6%). Over 40% of the respondents were illiterate with only 20% having attained secondary level education and above. More than 50% of the respondents were married, with 19% having been divorced. Three-quarters of the fisherwomen had children, with almost 60% of the respondents having four or more children (Table 2). The youngest age group was childless.

Of all respondents, 90% indicated that the major reason for their involvement in fishing and fishing-related activities was to generate self-gain and contribute to family income while 10% indicated that their motivation was for tradition and fun. The results also revealed that 5-7 h and 8-10 h were spent for fishing by 46% and 54% of the interviewed women, respectively, 3 days a week. Answering the question, "do you own a boat", 5% responded yes, and 55% assisted their families in boat-related fishing activities.

Table 1. Taxonomic group, English, scientific and local name of species fished by women of the Al-Wusta Governorate, Sultanate of Oman.

Group	English name	Scientific/ family name	Local name
Gastropods	Top shell	<i>Trochus erythraeus</i> (Brocchi, 1821)	Hilwan
	Whelk	<i>Babylonia sp.</i>	Buwaini
	Top shell	<i>Trochus sp.</i>	Shafeil
	Chitons	<i>Chiton sp.</i>	Shanha
	Top shell	<i>Trochus sp.</i>	Sharkhali
	Turban shell	<i>Turbo coronatus</i> (Gmelin, 1791)	Toga'a
	Murex	<i>Murex scolopax</i> (Dillwyn, 1821)	
Echinoderms	Sea cucumber (Sandfish)	<i>Holothuria scabra</i> (Jaeger, 1935)	FeikAlBahar
	Sea cucumber (Lollyfish)	<i>Holothuria atra</i> (Jaeger, 1833)	Abu-Areif
	Black sea cucumber	<i>Holothuria leucospilota</i> (Brandt, 1835)	Abu-areifnaqli
Cephalopods	Cuttlefish	<i>Sepia pharaonis</i> (Ehrenberg, 1831)	Ghutru
	Sand bird Octopus	<i>Octopus aegina</i> (Gray, 1849)	Terbaha
Bivalves	Rocky Oyster	<i>Saccostrea cucullata</i> (Born, 1778)	Zokah
	Venus clam	<i>Circeia callipyga</i> (Born, 1778)	Doak
	Callista clam	<i>Callista erycina</i> (Linnaeus, 1758)	Doak
Crustaceans	Blue swimming crab	<i>Portunus pelagicus</i> (Linnaeus, 1758)	Hargoom

Table 2. Socio-demographic characteristics of randomly interviewed fisherwomen derived from three main fishing communities of the Al-Wusta Governorate, Sultanate of Oman (n=85).

Variables	Frequency	Percentage
Age Group		
11-20	6	7
21-30	29	34
31-40	20	24
41-50	25	29
51-60	5	6
Educational Level		
Illiterate	34	40
Primary	23	27
Preparatory	11	13
Secondary	16	19
University	1	1
Marital Status		
Married	47	55
Divorced	16	19
Single	15	18
Widow	7	8
No. of Children		
0	20	23
1 to 3	15	18
4 to 6	24	28
7 to 10	26	31

Figure 2 presents responses to questions relating to perceived limitations to sustained female participation within the invertebrate fisheries of Al-Wusta. The major issue of significance was distance from collection sites, which was cited by 97% of respondents as being restrictive. Low market price for catch was also considered an important factor, being mentioned by 82% of respondents. Lack of provision for financial and technical support (61%) represented the third most commonly cited limitation (Fig. 2) with overfishing (22%) and pollution (9.4%) being the fourth and fifth concerns respectively. Figure 3 provides a synopsis of replies to questions associated with perceived requirements for sustaining female activities within Al-Wusta's invertebrate fisheries. Mirroring perceived limitations, respondents indicated transportation (91%) and marketing (85%) as the key needs, followed by access to subsidies (72%). Establishment of fishing boat licenses and training programmes were viewed as necessary by 58% and 49% of the interview pool respectively.

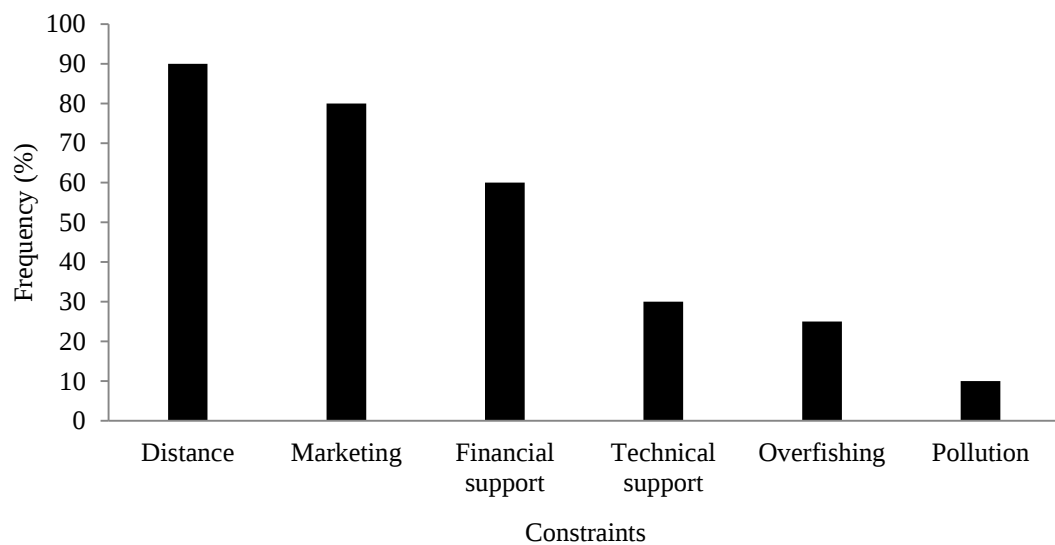


Fig. 2. Constraints perceived by fisherwomen as limiting their efficiency within, and management of the invertebrate fisheries of Al-Wusta Governorate.

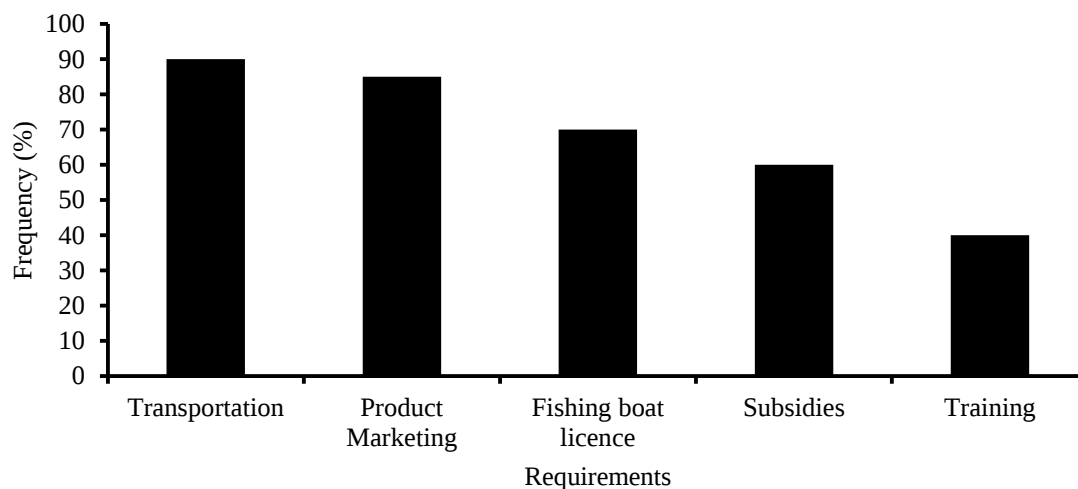


Fig. 3. Survey results summarising fisherwomen's perceived needs for enhancing their efficiency and role within the Al-Wusta Governorate invertebrate fisheries.

Molluscan fishery observations

Near-shore activities of fisherwomen concentrated on five invertebrate groups (Table 1) with fishing effort being greatest for gastropods followed by cephalopods, bivalves, echinoderms and, crustaceans respectively (Fig. 4). Eight species of gastropods or snails (Fig. 5) are fished and two products, namely the operculum and meat are derived from collected animals.

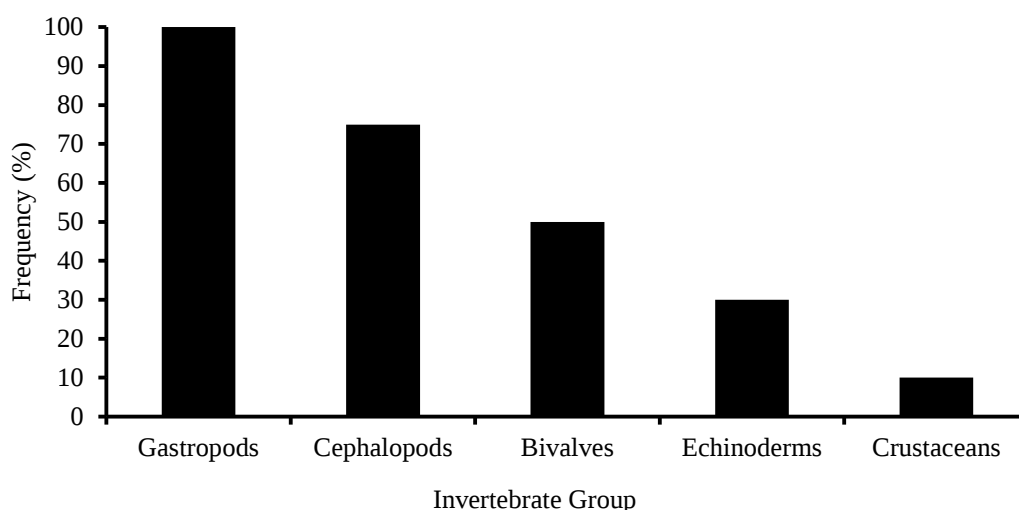


Fig. 4. Species prioritised by Al-Wusta fisherwomen by taxonomic grouping.

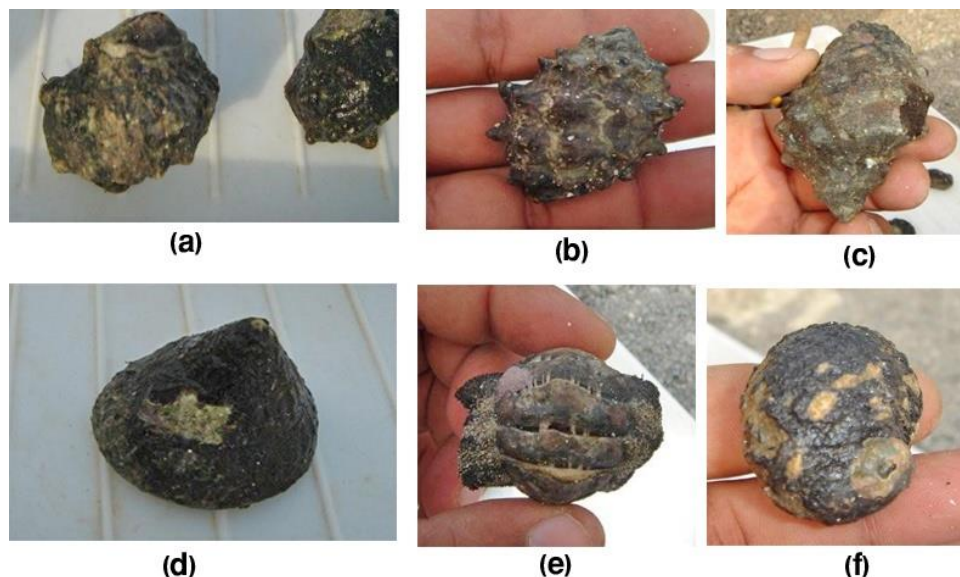


Fig. 5. Different species of snails collected by women at Al-Wusta Province: (a) *Trochus* sp., (b) *Babylonia* sp., (c) *Turbo coronatus*, (d) *Trochus erythraeus*, (e) *Chiton* sp., (f) *Trochus* sp.

In Al-Wusta, the snail or “*Rahas*” fishery, which takes place on rocky shores between September and May, is exclusively carried out by women who operate three days a week during low tides. Women gather at a predetermined spot from where they either hire a vehicle and driver or take the help of family and/or friends for transportation to fishing areas, which are on an average 4 km away. Fishing gear includes a spear, knife, bag and sometimes gloves and plastic sandals or shoes (Fig. 6).



Fig. 6. Fisherwoman of Al-Wusta Governorate a) holding her main fishing tools; an iron bar used for prying open and to assist in capture of cephalopods, a knife and collection bag, and b) gathering snails from intertidal rocky shores.

The operation, inclusive of travel, takes between 5-10 h. Collected snails are boiled in seawater for one hour after which the meat and operculum are extracted. Meat is then threaded on nylon twine using a needle with a specialised, rounded eye and the resultant meat necklace hung to dry (Fig. 7). Necklaces or “*mishkak*” comprise 30-50 pieces of meat and each fisherwoman makes 3-5 necklaces per trip, equivalent to 90-150 snails per day. Each string is sold locally for USD 7.75, although double this price can be obtained when sold to tourists through middlemen. The opercula requires a further boiling step before drying after which the resultant fingernails or “*dhufarn*”, may be mixed with frankincense which is burnt for scenting and perfuming (Fig. 8).

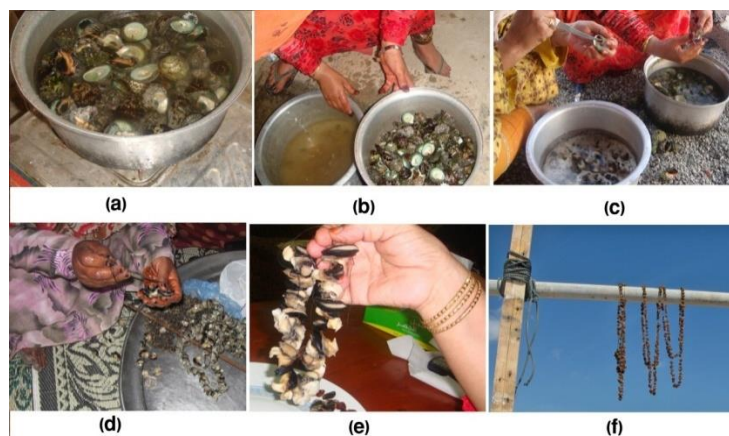


Fig. 7. The sequence of processing used during gastropod handling: (a) boiling, (b) cleaning, (c) meat extraction, (d & e) meat threading, (f) completed meat necklace and direct sun drying.

This product is widely recognised and used by Omani women and is sold for USD 2.33 by filling a tea cup which may contain 20-30 fingernails. Al-Wusta fisherwomen also spear cephalopod molluscs (cuttlefish and octopus), with the catch being sold to local restaurants or kept for family use. Bivalves, including clams, oysters and mussels, are widely collected along Oman’s coasts by both women and children. Al-Wusta Governorate is no exception to this rule and several

species (Table 1) are taken, although at lower rates than elsewhere in the nation. For this reason, the fishery, which takes place during low spring tides, is considered mainly as subsistence activity.



Fig. 8. Processed snail's operculum and its utilisation: (a) extraction, (b) dried operculum, (c) admixing with frankincense (*Olibanum*) and, (d) burning the mixed product over hot charcoal for scenting.

Echinoderm and crustacean fishery observations

Sea cucumbers or sandfish are collected by both men and women, mainly in the Mahawt area of Al-Wusta (Fig. 1). Three species are fished (Table 1) with *Holothuria scabra* (Fig. 9) representing the main target animal. In the sea cucumber fishery, rather than working independently, women are contracted by specialist traders to collect animals. The trader provides transportation to and from the grounds, where women glean the near-shore area (Fig. 9). The trader also supplies boats, where necessary, and guarantees purchase of catch. In the case of crustaceans, the Mahawt area supports an important shrimp fishery (Mohan and Siddeek 1995) and is also an active region for crabbing. A small number of women are engaged in both shrimp cast-netting and crab spearing, but their catch is used for subsistence purposes only.

Discussion

Women are engaged in fishing activities along the entire coast of the Sultanate of Oman and they play a key role in the exploitation of underutilised invertebrate resources. This was found to be especially the case for gastropod molluscs where, in the Al-Wusta Governorate, womenfolk are exclusive participants in the fishery. Furthermore, they manage the preparation and sale of snail products which are traditionally consumed as a means to control and treat diabetes and hypertension (Engmann et al. 2013; Malik et al. 2011). Three fishing methods are employed by the women viz. gathering (gastropods and bivalves), gleaning (sea cucumbers) and spear fishing (cephalopods and crustaceans). In Al-Wusta, women are also engaged in collection of low value bivalves. Women have important, although diminishing, contributions to the more valuable holothurian fishery and participate in the subsistence gathering and capture of cephalopods and

crustaceans. Some also assist family members in artisanal fishing activities. They have active involvement in processing and marketing of products; activities that play an important role in supplementing not only family income, but also in providing a personal revenue stream and greater financial independence. A proportion of fisherwomen even possess boats. Socio-demographic data collected during this study revealed that the majority of the respondents fell in the 21-30 year age group and participation of women in fishing activities fell with increasing age. Similar findings have been reported for Nigerian fisheries (Odulate et al. 2011) where a higher percentage of female participants were also found in the 21-30 year age bracket.



Fig. 9. Women gleaning for sea cucumbers (a, b) and (c) *Holothuria scabra*.

Irrespective of the diverse activities of Al-Wusta fisherwomen and regardless of the time invested in the sector, which often exceeds eight hours a day, they receive only limited support from government agencies, NGOs, fishermen's cooperatives, or other interest groups. Similar situations are experienced on a global basis (Browne 2002; Göncüoğlu and Ünal 2011), although significant headway has been made in establishing fisherwomen's cooperatives and developing roles in fisheries co-management in some areas (see Williams et al. 2002; Choo et al. 2006). In Oman, there is an active Women's Association (OWA), a stated aim of which is to provide support services to women, which include job training (Al-Talei 2010). However, OWA meetings generally take place in towns. Fisherwomen are thus marginalised due to poor communication, their geographic dispersal and by the lack of transportation. However, Oman's Ministry of Agriculture and Fisheries Wealth (MAF) has recently initiated an innovative scheme, creating the Department of Rural Women, which will take account of the role of women in all fields of agriculture, including fishing, while providing direct assistance in terms of technical and financial help. Whether this new organisation will have the desired effect in terms of benefitting fisherwomen must be continuously monitored and evaluated.

The Government of Oman recognises that development gaps exist between Governorates (MoNE 2009) and, although Al-Wusta has ample school and classroom facilities, the level of literacy, when considered on a national basis, is generally quite poor. This situation was reflected

in the sample population, with 40% of fisherwomen being illiterate and a further 40% only attaining preparatory, or lower level schooling. Literacy rates among artisanal fisher folk in developing nations are commonly considered low (Akpaniteaku et al. 2005; FAO 2006; Maddox 2007) and this can result in reduced abilities to access and respond to available information, participate in training sessions and to become engaged in sustainable marine resource management, marketing operations, and more (World Bank/FAO/IFAD 2009). While the government recognises that literacy will empower Omani women and provide the means for them to organise independently and lobby more effectively (UNICEF/MoNE 2006; Al-Talei 2010), the situation in Al-Wusta may be complicated by the strong patriarchal culture combined with the semi-nomadic existence. Furthermore, government vocational and training centers tend only to be in larger towns, away from seasonal fishing encampments, which restrict access of fisherwomen to educational opportunities (literacy and technical training). These constraints could be overcome with the development and use of gender responsive mobile training centres that should include education on the transfer of alternative fishing technology that may enable acceleration of the development process in harvesting, processing, product quality and safety, and marketing sectors.

Lack of financial assistance was considered by respondents as being a significant constraint to enhancing their livelihoods. Associated with this were requests for subsidies, fishing boat licenses, assistance with marketing, training, and transport. Again, the educational and societal marginalisation of Al-Wusta's fisherwomen appears to work against them. The poor and needy in Oman are entitled to financial assistance through programmes administered by the Ministry of Social Development. Moreover, the Government has developed support and training platforms to assist those susceptible to poverty, especially widows and divorced women, who represented 27% of the sampled group. Specific funds for small projects and/or for family financing, are available through the Agriculture and Fisheries Development Fund (AFDF), administered by the MAF and the Sanad Project, which is administered by the Ministry of Manpower and Oman Development Bank (UNICEF/MoNE 2006). However, illiteracy, social marginalisation of the fisherwomen group and lack of gender-sensitised cooperatives and training programs, have led to overall poor communication of available opportunities. This limitation might be overcome with increased and targeted extension activities by both Ministries of Agriculture and Fisheries Wealth and Social Development, other government agencies, the OWA and NGOs.

Field observations indicate that at present the molluscan fisheries in which Al-Wusta women are engaged appear to be sustainable. Overall efficiency and perhaps product shelf life could nonetheless be enhanced with provision of basic training on more efficient gears and processing technologies. Micro financing, through the Sanad Project or AFDF for example, could be used to support training in entrepreneurial activities such as the use of shell by-products to make buttons and ornaments for the growing tourist industry. The fishery for sea cucumbers in Oman is exploited by both genders (Al-Rashdi et al. 2007a) with women being engaged in gleaning and collection and men in processing and marketing. Similar observations have been made for the sea cucumber fishery of Tamil Nadu state, India (Radhakrishnan 1994). However, unlike the situation in Oman, fisherwomen societies have been formed in every village in which holothurians are processed. In Oman, the *H. scabra* fishery has declined in the recent past and this has led fishers to target species of lesser value, including *H. atra* and *H. Luecospilota* (Al-Rashdi et al. 2007b). This situation is

not exclusive to Oman and has been recorded elsewhere globally (e.g. Hasan 2005; Conand 2008; Anderson and Mills 2011). The collapse of the Al-Wusta holothurian fishery has resulted in a significant decrease in the number of women in the sector. Thus, in 2004, more than 50% of the fishery's workforce was made up by women but this has now declined to less than 20% (Al-Rashdi and Claereboudt 2010). This has occurred due to competitive exclusion. When prices of sea cucumbers increased, this led to increased entry of men into the fishery, even though initially this was considered a "woman's job". As near-shore stocks of sea cucumber declined, fishers were forced into deeper waters which barred women due to clothing restrictions and safety considerations. This situation may be reversed in the future following the introduction of a seed production programme (Al-Rashdi 2012). Such initiatives have been successfully implemented in a number of countries with involvement of women in the grow-out process (Eckhaut et al. 2008). Clearly, it is the middleman that presently makes the largest profit from Omani holothurian fisherwomen, since it is in processing and grading that the largest margins are achieved (Ferdouse 2004). Training of women in processing and grading, together with assistance in entering the international market, would increase their revenues substantially.

There are two main needs of the Omani fisherwomen: institutional and personal capacity building. Within these needs, three programs are recommended for consideration: 1) development programs, which may include setting up gender appropriate legislation, road mapping, and policies, including subsidising and incentivising fisherwomen in a manner similar to that provided for fishermen and assistance in forming fisherwomen cooperatives and associations; 2) training and extension programs, to provide fisherwomen with appropriate technology transfer, as a means for adding value to their products, methods for improving their harvesting and post-harvesting handling and marketing and 3) research programs, including more in-depth socio-economic studies, taxonomy of the species collected and stock density, distribution, and enhancement measures for depleted species such as the sea cucumber *Holothuria scabra*.

Omani women appear to already make important contributions to fisheries, but the present study and analysis of appropriate next steps indicates that targeted interventions are needed to improve their recognition and ability to achieve their potential in the sector.

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