Overview Of Intertidal Invertebrates Harvesting And Their Use In Western Indian Ocean (WIO) Region

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Background
Bait harvesting is the collection of marine invertebrates in the intertidal area of marine ecosystems for use as fishing baits by artisanal fishermen and recreation fishing. They are also harvested for food by coastal communities. Information on bait harvesting in the Western Indian Ocean (WIO) region is scarce, however some data is available from South Africa and Kenya and very little from other WIO countries. Use of natural baits for fishing is done by both artisanal and recreation fishermen as they are incorporated in baited fishing gears. Artisanal fishermen have preference for natural bait due to the ease with which they are obtained, their low cost and better performance than artificial baits. Lack of a bait harvesting policy contributes to the unregulated harvesting of natural bait without much restriction. Information on bait harvesting will inform on the marine invertebrate species targeted for harvesting. This awareness will help in the drafting of regulation and other guidelines regarding their use to safeguard from over harvesting and endangering the species. This will also go a long way in protecting ecosystem processes linked to these species.

Method
In order to establish the extent of bait harvesting in the WIO region, we recently undertook to review information available in Somalia, Kenya, Tanzania, Mozambique, Madagascar and South Africa. This was done by analysing available published data on Google scholar using the following combination of words; (bait* and marine), (bait* and polychaetes), (bait* and gastropods), (bait* and crustaceans), (bait* and WIO), (bait* and specific country names), and (bait* and impact and management). Unpublished data was also obtained from the region. For South Africa only data from the Indian Ocean was included in the review. The World Register of Marine Species and the World Polychaete Database were used for verification of species names.

Results
The search yielded 76 records of which 46.1% were peer reviewed articles, while unpublished community knowledge, unpublished reports, theses, databases and field guides accounted for 18.4% 13.2%, 9.2%, 7.9%, 5.3%, respectively. Most of the information was from South Africa and the least from Tanzania and Mozambique. There
was no information available from Somalia. The review established that 60 taxa are utilized as baits in WIO countries of which phylum Mollusca, Arthropoda and Annelida account for the most harvested taxa of marine invertebrates. They represent 41 genera and 42 species. However, the preference for each taxa is country dependent with the former and latter being the preferred phylum in South Africa and Kenya respectively. Other less common groups are Porifera, Nemertea and Echinodermata. South Africa harvested four times more bait taxa than Kenya and Madagascar who target nine taxa each with each of the other countries harvesting 5 taxa each. Most of the bait harvested is used for fishing whereas some are utilized as food and incense in the respective WIO countries especially South Africa, Mozambique, Kenya and Madagascar. Harvesting methods are varied, and include digging by hand, use of equipment such as shovels, suction pump, prawn pump, blade, digging stick, wire, nets, tin can, pusher, harpoon and trampling on the sediment.

**Conclusion**
The review observed that despite the fact that there is harvesting of marine invertebrates for use as baits, there is limited information available from most of the countries. There is also a likelihood of underestimating the number of species targeted throughout the WIO region, due to limited studies and lack of taxonomic expertise especially outside of South Africa. This creates a problem in identification and documentation of the diversity of species utilized. For example 18 taxa were identified only to genus, family or class and others were known only in the local language. This indicates the need for more studies in the region, especially at a time when demand for fishing baits is expected to rise. There is need to have accurate information to guide decision making in the WIO region.