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Issue Brief

Climate Change and livelihoods in Yemen: Policy Implications for Sustainable Rural Development Strategy

The Case of Socotra

November 2012

United Nations Development Programme

ENVIRONMENT AND ENERGY



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1.1 Introduction: Livelihoods Context and Climate Change in Yemen

- 1- Yemen is an arid Middle Eastern country, occupying an area of about 527,970 square kilometers at the southern end of the Arabian Peninsula. In 2009, Yemeni total population reached about 22.5 million, of which about 75 percent are in the rural areas. The annual population growth rate of Yemen is about 3 percent which puts much pressure to the limited basic infrastructure and services such as water, education, health and access roads. Yemen experiences numerous development challenges which include high population growth rate and poverty, inadequate access to basic social services, limited infrastructure, high illiteracy rate, low per capita income, slow economic growth, and environmental degradation. Poverty is among the largest challenges to Yemen's development. Rural poverty in Yemen is also more pronounced in rural areas.
- 2- Although rural areas have 72.6 percent of the total population, it accounts for 84 percent of the poor. On the other hand, urban areas have 27 percent of the total population, but accounts for only 16 percent of the poor. Agriculture remains the major livelihood activity in rural Yemen. However, agriculture productivity is constrained by numerous factors which include droughts, rain variability, declining underground water tables, and land degradation. Yemen's natural resources are the basis of the national economy. The depletion or degradation of these resources represents not only a loss of the country's national capital but undermines the sustainability of its economy.
- 3- Fisheries, regarded as the Yemeni economy's third sector in order of importance, contributes a 1.7% share to the country's GDP, and more than 500,000 people depend directly (2 million including dependants) on fishing as their principal source of income. The fishing sector offers great promise, for the country's economic development and is expected to play a vital role in providing food security to its people, in promoting pro-poor economic growth through job creation, and also achieve diversification of sources of income in the national economy, contributing through all these means to the country's overall achievement of MDG's by 2015 (NFSS 2011).
- 4- As such, these statistics predominately indicates that Yemen is largely a rural society. However, Yemen has no rural development strategy through which rural poverty, and livelihoods are addressed in a structured and coherent manner. Yet, as there is no rural development strategy in Yemen, high levels of poverty often have led to environmental degradation in rural areas. Households are living well below subsistence levels and use natural resources such as land, water, forests at rates that exceed sustainable limits for recovery or renewal. The poor have no other option than to adopt short-term survival strategies, which do not incorporate longer-term resource management considerations. As such, natural resources have been experiencing heavy pressures and rapid degradation.
- 5- Additionally, as climate change is increasingly becoming more noticeable, Yemen in large and rural areas in particular are highly vulnerable to its sever impacts because of its fragile socio-economic development and inadequate adaptive capacity. Rural Yemen in particular is highly vulnerable to climate change potential impacts because of its inadequate adaptive capacity. The rural communities are mainly dependent on access to climatic sensitive natural resources including for instance agriculture, fisheries, and forests upon which rural inhabitants construct their livelihoods. Counting on the current climate change projections

indicate that Yemen is anticipated to experience steadily rise in temperatures, and an increase in variability of rainfall and in heavy precipitation events.

- 6- The potential impact of climate change on the rural livelihoods in Yemen is expected to turn the current sustainability challenge further complicated. Poverty is expected to increase due to declining access to water and decreasing agriculture productivity, or even asset destruction which would push poverty to higher levels. Unless adequate adaptive capacity considerations are built into the development planning in Yemen at large, and rural adaptation planning in particular, climate change implications on rural livelihood sustainability is expected to become further challenging. Rural livelihoods is expected to turn down due to declining access to water and decreasing agriculture productivity, sea level rise across coastal areas, or even asset destruction from severe floods, and climate change compounded natural disasters.
- 7- This article aims at exploring Yemen rural livelihoods context in addition to the compounding effects induced by potential climate impacts. The case of Socotra will be used to inform the analysis and discussion throughout this policy article. In addition, this article aims at providing insightful policy implication for sustainable rural development strategy in Yemen building on the evidence substantiated in the paper. The findings across this article are based on UNDP Country Office's mission report produced by the author's covering a period of 4 days to Socotra from 8th through 15th September 2012. Throughout the mission, several visits, and consultative meetings with key local institutions, and development agency branch offices in Socotra including Environment Protection Authority (EPA), local councils and the Community Based Organizations and Non-Governmental Organizations (CBOs/NGOs), as well as local community representatives, and protected area managers were conducted. In addition, discussions and interviews with local people were conducted (survey questionnaire were the tool for collecting data from about 50 local respondents).

1.2 Socotra Archipelago background information

- 8- Biodiversity context of the Socotra Archipelago: Owing to its remote geographic location (480 km south of the Arabian Peninsula and 240 km east of the Horn of Africa) and long isolation, the Archipelago is a globally significant centre of biodiversity ranked by botanists among the top ten islands in the world in terms of botanical diversity. It is well-known historically for its unique vegetation with spectacular plants such as dragon blood and frankincense. The archipelago has a remarkably high proportion of endemic flora and fauna – all of the terrestrial mollusks, 90 % of the reptiles (over 30 vertebrates) and 33% of the plants (307 species) are endemic to the Archipelago making it one of the most important centers for biodiversity that are entirely arid and characterized by concentrations of high endemism. Bird Life International recognizes 22 important bird areas within the archipelago, and it forms one of the world's 221 globally important Endemic Bird Areas. The Worldwide Fund for Nature (WWF) lists it as one of their 200 Eco-regions and it is also included in the regional network of important Marine Protected Areas. It was designated by UNESCO Man and Biosphere Reserve Framework as Biosphere Reserve in 2003 and was also listed by UNESCO in the World Heritage Site in 2008. The archipelago has such a unique assemblage of animal and plant species that it is often referred to as “the Galapagos of the Indian Ocean”.

9- Socotra biodiversity conservation policy context: Socotra is classified as the most important center for biodiversity within the Horn of Africa:

- It is one of the WWF's global 200 eco-regions;
- It has been designated as a Man And Biosphere reserve by UNESCO; and
- It is listed as a World Heritage Site since 2008.

10- Socotra could be considered one of the limited areas in Yemen where considerable information and data has been collected on its biodiversity and natural resources. A zoning plan known as the Conservation Zoning Plan (CZP) was developed through the first UNDP intervention and adopted by presidential decree in 2000. Within the Island, there are about 32 listed protected areas, and 10 of which are marine covering an area of about 2830 Km² and 1668 Km² of land and marine ecosystems respectively. Five protected areas have been established and operational and managed by local community demonstrating approaches for sustainable approaches for livelihood development. Only 5 of these listed protected areas have management plans, but none of them have a business and/or tourism management plans, or any other management tools. The CZP constitutes the backbone of sustainable development and conservation of biodiversity on the Archipelago and as such classifies land according to four main categories:

- Resource Use Zone;
- General Use Zone;
- National Park Zone; and
- Nature Sanctuaries.

11- Although the CZP plan was developed in a consultative manner, it remains an ambitious plan which imposes on the local and central administration very strict conditions for development activities, and has created several conflicts between the EPA and other development institutions including the local population. During the SGBP project Mid-term Review (MTR) interviews, local administration has confirmed that this plan is not being used locally or centrally as a basis for any decision regarding development activities. Moreover, an extensive and comprehensive Master Plan for Socotra was developed with EU funding between 2000-2002 and endorsed by Ministerial Decree in 2004. However, only minor elements of this plan (such as the Roads Programme) is used as a basis for development, but the Master Plan itself is not used as a basis for land-use planning in Socotra.

12- Political and Administrative Context: Socotra is divided into two districts: Hadibo and Qalansiya. Each of them has a General Director who is appointed by the Government and reports directly to the Governor, and elected Local Council. The EPA branch office as an affiliated agency of the Ministry of Water and Environment (MoWE) is responsible for management of environmental issues on the island. Consent on a need for a special law for Socotra based on UNESCO status and vast interest of international donors has been reached by relevant ministries and representatives of local authorities. An initial proposal of “Socotra Archipelago Sustainable Development and Environmental Management Authority” was developed with support from the current UNDP project. However, until recently, the political and administrative context of the Archipelago has changed (see mission findings below).

13- Socio-economic Situation: The key productive activities on the Island are pastoralism and fishing, and a population of about 44,000 inhabitants¹ is divided between pure pastoralists and those who practice a combination of pastoralism and fishing. Fishing is possible for two-thirds of the year only, outside windy season from June till September when the sea is too rough even for big ships to anchor near the coast. Other sources of revenue and income on the island are (i) remittances by the large Socotri community in the Gulf; (ii) government employment; (iii) tourism which is increasingly becoming a source of hard cash on the Island. However due to its long isolation and distance from the Yemeni mainland, Socotra is one of the poorest and most disadvantaged areas of Yemen.

1.3 Main Livelihoods of the Local Socotri

1.3.1 Main Livelihood activities

- 1- Socotri society is largely still remaining rural one with exception of the capital Hadibo, and Qalansia towns which found to have different modest municipal services, and employment structures including governmental jobs and trading as dominated by immigrants. However, in rural Socotra, the major livelihoods upon which the locals rely are livestock, and fishing. According to the local council officials, fishing community is estimated to stand for around 50 percent of the population. Whereas, livestock grazing is accounted for about 40 percent of the Socotra total populations. The remainder population was almost reported to be engaged in palm tree plantation, honey production, eco-tourism, trading (i.e. mainly predominated by immigrants from inland), and labor work. The major livelihood activities found being fishing and grazing. Notably, farming was found to be neglected across the island with only few palm tree plantations and scattered home gardening activities.
- 2- The livestock grazing communities are largely nomadic and their livelihoods depend on access to natural resources. As far as the article's is concerned, drought found to be the key factor which largely determines the livelihood vulnerability context in Socotra. About 80 percent of the livestock grazing communities' respondents indicated that drought stands alone as the primary livelihood constraining factor that exacerbate their vulnerability context under which as an adaptive strategy migration from one place to another usually take place- searching for water, and graze. Also indication was made about their worsening livelihood vulnerability by experiencing the recent terribly prolonged and harsher drought. Among others, access to water, food security, and alternative income-generating opportunities were identified as the most critical livelihood priorities, and goals respectively.
- 3- As pointed out earlier, the article came out with initial conclusions regarding the livelihood implications of experiencing increasing prolonged, and harsher drought which is believed to be attributed to climate change suggests that the vulnerability context under which the poor live will plausibly further deteriorate. With absence of alternative environmental friendly livelihoods including livestock and vulnerability reducing interventions, over-grazing is expected to experience an increasing trend under changing climate and hence adds further loads on the already threatening biodiversity richness of the island. On this regards, this article also concurs with findings of several studies related to climate change and biodiversity of

¹ Several doubts were raised to the attention of the mission claiming the inaccuracy of the population of Socotra

Socotra including for instance: *The Climate of Socotra Island (Yemen)* by Paul Scholte and Peter De Geest in addition to *Will dragonblood survive the next period of climate change* by Fabio Attorrea et al. In such sense, projected climate change impacts will not only lead to deterioration of Socotra ecosystems which would have negative consequence on Socotra unique biodiversity richness but plausibly will also result in loss of several associated livelihoods including for instance the growing eco-tourism opportunities in the Island, among others.

- 4- Therefore, proper adaptation measures should be put in place to ensure that climate change impacts on Socotra unique biodiversity richness is mitigated. It worth-mentioning that Adeeb's nursery in Socotra represents a unique success story as it has put local knowledge into a practical perspective which would render effective biodiversity adaptation services under changing climate. For instance, Adeeb's nursery has successfully reproduced about 25,000 seedless (initially about 25 seedless were requested to be reproduced by Adeeb's nursery) of dragon blood and transferred into their home town. The local knowledge has proved to be effective in reproduction of the dragon blood seedless which reportedly goes even beyond the expectation of botanical experts. As such, the article recognizes the success of Adeeb's nursery and strongly recommends building on this experience through maximizing local knowledge utilization for conserving the rare and unique biodiversity of Socotra under changing climate.

1.3.2 Poverty profiles

- 5- The article thought of that poverty gap is relatively deep in Socotra as the majority of local inhabitants may well live below the national income poverty line. This remark was made based on several findings but mainly in that the rural local Socotr's engagement in farming is evidently neglected which continuously therefore places their livelihood security under extremely severe vulnerability. The following provide further support to the earlier remark. For instance, about 70 percent livestock grazing community respondents respectively indirectly indicated their high levels of income poverty, in addition to their lack of access to proper alternative physical, financial, natural assets including for instance fishing boats, adequate savings, farming lands for livelihood diversification. Similarly, about 65 percent fishery community respondents were also found to lack access to adequate savings, farming lands. In addition, both communities pointed out their lack of access to appropriate household amenities like separate hygienic facilities, and suitable shelters.
- 6- About 90 percent of respondents indicated that their household monthly spending more frequently happens to exceed income by an average of about 50 percent, and that income-spending difference is usually covered either by borrowing, or family immigrant's² financial transactional backing, or selling of livestock in case of emergency. As indicated earlier, lack of access to land has hampered subsistence farming for securing basic horticultural household needs. Household income poverty trap is explained by the higher livelihood food security vulnerability as well as dependence on buying food commodities from the market at higher transaction costs as compounded by the expensive delivery charges from mainland to the Island under which spending thus unsurprisingly exceeds income levels.

² The number of Socotri immigrants is estimated about 10,000 in the Gulf courtiers but mainly in Emirates

7- The article have also closely ascertained spread of deprivation among the two aforementioned communities by noticing the physical appearance of shelters, and attached amenities, among others, which makes them the worse off in terms of poverty. These findings related to the socio-economic profile confirm the high livelihood vulnerability context in terms of food security under which major Socotri rural communities live which would further intensify under a changing climate due to exposure and sensitivity to climatic conditions including droughts which has already been noticeably increasing across the island over the last decade. On the other hand, those local respondents engaged in eco-tourism, honeybee-based activities were fond being better off due to higher incomes, lower vulnerability and relatively enhanced access to assets including sufficient financial savings as well as proper shelters, and separate hygienic amenities.

1.4 Development, conservation, and sustainable growth potentials

1.4.1 Island-wide carrying capacity limits and implications

8- As indicated earlier, livelihood vulnerability and poverty prevalence are among the major challenges for Socotra biodiversity conservation. In addition, access to natural resources for livelihoods remains unavoidable for the majority of the rural inhabitants. On the other hand, the level of development is relatively weak and alternative income-generating activities have been increasingly growing but still at smaller scales. Furthermore, several land allocations were seen to take place along the coastal areas for potential real estate speculation. The current ongoing real estate speculation is assumed to be driven by the ecotourism development potential of the Island. Not surprising that recognition of Socotra as a global natural reserve by UNESCO in 2008 would attract increasing development and economic investments to the Island contributing to soaring coastal land prices dominated by private sector demands, and land speculator interests.

9- Although the diverse developmental needs are recognized, greater emphasis should be placed on the island-wide carrying capacity limits which is expected to decline further under changing climate due to experiencing droughts which has several implications on the rural livelihoods of Socotra and the agricultural, and eco-tourism potentials of the Island. In other words, achieving sustainable development and conservation outcomes cannot be ensured in isolation from full enforcement of the CZP framework and utilization of climate change implications into the Island spatial land-use planning and decision-making processes. Quoting eco-tourism development potential as an example, the Director General of the Tourist Department in Hadibo District indicated the carrying capacity of the sector is yet unknown. In addition, eco-tourism rules and regulations have not been enacted in order to control potential biodiversity damaged associated with tourism activities. The General Director has also added that lack of appropriate coordination among the various partners in addition of failing to promote eco-tourism development in accordance with the sector carrying capacity sustainable limits would cause severe biodiversity damages and hence drastically undermine the economic potential of Socotra Island.

10- Generally speaking, the carrying capacity limits of the Island to accommodate various ongoing and potential development and investments projects have not yet been clearly defined- Socotra carrying capacity under changing climate needs to be assessed to provide feedback for sound spatial land-use planning of the Island. Processes for enabling biodiversity mainstreaming into environmentally deliberate spatial land-use

planning and decision making process is still at early stages. Consequently, the article confirm that criticality of enforcing environmentally sound land allocations, and development through proper Environmental Impact assessment (EIA) according to the CZP to ensure sustainable development of the island.

1.4.2 Socotra eco-tourism potential

11- The unique landscape, botanical, marine, bird biodiversity features of the Island offer tremendously attractive destinations, but also yet still have high eco-tourism growth potentials. However, the current level of tourism services and facilities across the Island was found being extremely weak. Unsatisfactory tourism services and facilities in terms of accommodation, licensed tour operators, knowledgeable, and trained tourist guides, camping, among others reduces the possibility of realizing the whole tourism potential of island while. According to the Director General of the Tourist Department in Hadibo District, about 19 tourist agencies (4 of them are local) operate in the Island but a key concern is that the majority of these agencies work without licensing. Also, the camps and hotel services are well below satisfactory and lack compliance in provision of environmental friendly services. Moreover, proper communication systems, and emergency support facilities are entirely lacking. In addition, lack of distinguished branding and not well-defined eco-tourism products was confirmed by the article as a major obstacle for promoting Socotra to particular tourist market segments. Ecotourism is understood in a broader sense and most of the tourist attracted as Socotra provides a low cost destination.

12- Surprisingly, it worth-mentioning that although the current level of tourism services and facilities was found being relatively unsatisfactory, tourist statistical records as per the tourism office has shown an incremental trend since 2001. However, the number of the tourist in 2011, and 2012 has declined due to exceptional situation attributed to recent political and security unrest in the country. It should also be born in mind that the recent political and security situation in the country has not only negatively impacted the number of tourists but also the welfare of those mainly depends upon tourism for their livelihoods. Table 1 outlines the tourist statistics as per the Director General of the Tourist Department based in Hadibo:

Table 1. Tourist statistics in Socotra from 2001- till 1st quarter of 2012												
Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012 (1 st Q)
# tourists	188	283	363	527	986	1126	2526	3517	3786	3788	1305	261

13- This article finds that promotions of eco-tourism throughout SCDP, and SGBP has been fulfilling and sounds to have produced sustainable impact, and contributed towards poverty reduction in the Archipelago of Socotra. According to the Manager of the Socotra Ecotourism Syndicate (SES), initial revenues generation from eco-tourism in the Island considering the current facilities and service conditions is estimated about US\$ 2 million annually giving the number of tourist turnover in 2010. Nevertheless, as indicated earlier the vast eco-tourism growth potential in Socotra remains highly untapped due to several reasons including poor tourist services. The SES also indicated that the current number of local direct beneficiaries is limited.

14- An approximate number of the current eco-tourism beneficiaries were estimated as follows: about 40 general guides, 100 drivers, 20 cook, 12 cave guides, camel tour owners, and guides, diving guides, boat

operators, 5 hotels, 15 tour agencies, and about 200 protected area members, and rotational guides. In general, the total household indirect beneficiaries could be estimated about 300-400 families based on the aforementioned estimated number of directed beneficiaries. Putting the incremental tourist trends specific to Socotra and the number of beneficiaries into a perspective, improving the level of services would hence generate higher revenues, provide more employments, and achieve greater poverty reduction targets.

- 15- On the other hand, the Manager of the SES indicated negative side effects associated with tourism activities in Socotra. As far as eco-tourism is concerned, security threats (i.e. lack of security plan for open island with tourist season peaks towards end of each year), locally unfavorable cultural changes, and habitat degradation, diseases transfer (i.e. potentially either from a number tourists seeking low-cost tourist destinations or transfer of HIV/Aids as a matter of lack of awareness). Nevertheless, as discussed earlier, the articles concludes that some of the aforementioned concerns such as diseases transfer, and habitat degradation associated with tourism in the island are likely attributed to lack of branding for promoting Socotra as a globally recognized unique site for biodiversity richness, among others.
- 16- Instead, Socotra currently sounds to be relatively perceived by considerate category of tourists as a low-cost tourist attraction rather than a branded eco-tourism destination for satisfaction of particular market niches including for instance trekking, bird watching, botanical, marine and landscapes site seeing. This can be further supported by the finding that about 95 percent of the local respondents were found to have inadequate awareness when questioned about the key eco-tourism products of the Island. On this regard, the article quotes some of the well-known country specific tourism brands such as “Malaysia Truly Asia”, and “Incredible India” for Malaysia and India respectively. Recognizing the need for changing such perception, the missions re-confirm that defining brand for Socotra will more likely differentiate its unique eco-tourism products and hence reduces the indicated side effects of low-cost tourism market. In addition, the article findings suggest that developing Socotra eco-tourism brand and improving the levels of service provision will not only help reduce the existing unfavorable impacts but also contributes towards realizing the full potential including expansion of beneficiary base. However, under changing climate, these eco-tourism opportunities may not be sustainable if unique biodiversity richness of the Island is not maintained through proper adaptation measures such as utilizing of local knowledge for replication of threatened species as indicated earlier.

1.5 Concluding Policy Implications, and Recommendations

1. As far as climate change is concerned, livelihood impacts including noticeable droughts prolonged and harsher drought across the Island, sea level rise have been noticeably started to affect the biodiversity and livelihoods of the poor Socotri. As such, the findings of this article suggest that livelihood vulnerability context in Socotra under which the poor live will plausibly further intensify leading to greater livelihood hardship, and hence pushing poverty deeper and higher levels. Under such condition, lacking of proper climate change adaptation measures will render livelihood sustainability in the Island hard to achieve. Therefore, as water shortage has been identified among the higher livelihood priority across the Island, this note recommends, among others, promoting proper adaptation measures including rainwater harvesting for domestic household and livestock uses. Therefore, the full sustainable economic development potential of Socotra Island eco-tourism and livelihood sustainability

cannot be realized unless vulnerability context under which the poor live is sustainably reduced. In addition, as local knowledge has proved to be effective in reproduction of the dragon blood seedless by Adeeb's nursery, this article strongly recommends expanding such experience for conserving the rare and unique biodiversity of Socotra under changing climate.

2. Since climate change impacts has been noticeably started to affect the livelihoods of the poor, proper adaptation planning through climatic sensitive land-use planning is critical to avoid the sever potential impact of changing climates including for instance droughts, sea level rise. As yet, rural development strategy is non-existent in Yemen; this article recommends developing such strategy to promote rural development as well as ensures climate-resilient livelihoods across highly vulnerable rural communities in Yemen. In addition, in coherent and coordinated manner, this note recommends taking natural resources carrying capacity limits into account in order to ensure sustainable rural livelihoods in Yemen. Additionally, promoting environmental friendly livelihoods and services including Green Economy (GE) infrastructure in rural Yemen is recommended.

Acknowledgments

The authors would like to express thanks and appreciation to UNDP Yemen CO senior management for advice and support. Also, the authors would like to extend thanks, and sincere appreciation to the Boots on the Ground's regional advisor based in Cairo, Marwan Owaygen, as well as Boots on the Ground's colleagues in HQ (particularly Pia Treichel, Cristina Colon, Rebecca Carman, among others) for continuous advice, facilitation, and guidance, and knowledge sharing. The authors would like also to express thanks to the Environment Protection Authority (EPA, Yemen), for valuable discussions, facilitations, and knowledge sharing. The authors would like also to express special thanks to key local institutions, and development agency branch offices in Socotra including Environment Protection Authority (EPA), local councils and the Community Based Organizations and Non-Governmental Organizations (CBOs/NGOs), as well as local community representatives, and protected area managers.