



Impacts of the Hara Biosphere Reserve on Livelihood and Welfare in Persian Gulf



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ABSTRACT

Despite the importance of biosphere reserves in Iran's livelihood and welfare, the economic significance of Hara Biosphere Reserve has never been comprehensively studied. This study examines the current importance of Hara Biosphere Reserve (HBR) in local livelihood and welfare. Using a household survey, data were collected through a questionnaire, key informant interviews and direct observations. Two hundred and forty-four households were randomly selected from 10 villages through proportional sampling. Results showed that non-environmental income was the first driver of the total income, poverty alleviation and narrowing income inequality gap. Park income was the second. The results also showed that excluding park income from total income would significantly increase headcount poverty, widen the poverty gap, and raise the Gini coefficient. Wealthier households had the greatest absolute income from the environment, including forest, fishing and fodder. However, the poorest group had smallest absolute income from these sources. Thus, the study demonstrated that wealthier households are responsible for the overharvesting of environmental resources. Interestingly, the study showed that wealthier households are more dependent on profitable environmental incomes sources while the poorest are more dependent on non-profitable ones.

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1. Introduction

Biosphere reserves are unique ecosystems with valuable social and ecological functions. While some conservation systems have focused on conservation goals, biosphere reserves seek to protect important ecosystem values, while meeting the livelihood requirements of local residents (Nations, J.D., 2001). Accordingly, biosphere reserves provide a variety of environmental income sources for local communities. "[E]nvironmental incomes, are incomes (cash or in kind) obtained from the harvesting of resources provided through natural processes not requiring intensive management" (PEN P, 2007). As an example of the environmental income, Cambodia's Tonle Sap biosphere reserve

supports fishery for over one million people living in and around it (Bonheur and Lane, 2002). In Mexico, small-scale fisheries are supported by the biosphere reserve in the Gulf of California (Erisman et al., 2015). Biosphere reserves also contribute to animal husbandry by providing livestock feed (Singh et al., 2003). Moreover, they provide a variety of non-timber forest products (NTFPs) such as medicinal plants (Ghorbani et al., 2012). In addition to environmental incomes, biosphere reserves support a variety of non-environmental income streams like tourism. Tourism generates income for local communities while being environmentally sustainable (Jiang, 2009; KC et al., 2015; Surendran and Sekar, 2011; Xu et al., 2009).

There is now a growing interest in understanding how rural livelihoods depend on natural resources in developing countries. Vedeld et al. (2007)'s meta-study in 17 developing countries showed that environmental incomes derived from forests contributes an average of 22% of the total income of local people. In their study carried out in 24

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developing countries, Angelsen et al. (2014) found that environmental incomes account for 28% of the total household income. Moreover, the importance of environmental and non-environmental incomes on reducing poverty and income inequality have been investigated in many developing countries, including South Africa (Thondhlana et al., 2014b), Ethiopia (Gatiso and Wossen, 2015), Cambodia (Nguyen et al., 2015), Zimbabwe (Cavendish, 2000), and Nicaragua (Ravnborg, 2003). The results of the case studies have varied because of the diversity of social, economic, ecological, and political contexts. Nevertheless, environmental incomes have been shown to contribute to poverty alleviation and to reducing income inequality (Gatiso and Wossen, 2015; Thondhlana and Muchapondwa, 2014a). Environmental income is also expected to be a safety net against poverty (Shackleton et al., 2008). Moreover, environmental income is a pathway out of poverty (Fisher, 2004) and helps to equalize income (Nguyen et al., 2015). In general, due to the diversity of contexts, the relationship between household livelihood and welfare and the natural ecosystem's goods and services needs to be analyzed at the local level. This study investigates the importance of the environmental and non-environmental incomes that come from a biosphere reserve in Iran to the livelihood and welfare of people in its vicinity.

For the past 50 years, Iran's environmental degradation or annihilation has been one of the country's most important issues. Many case studies in Iran have found that local livelihoods are driving environmental degradation. For instance, Croitoru and Sarraf (2010) estimated that over the past 57 years deforestation for agriculture, firewood, and charcoal contributed to reducing Iran's forest area from 19.5 to 12.4 million hectares. Wood overexploitation, overgrazing, and overhunting were identified as the major threats to Iran's deforestation. In another study, Makhdom (2008) found local overharvesting and poverty as the main causes of environmental degradation in Iran. It is worth noting that these threats are found in all of Iran's ecosystems but at differing levels of intensity (Croitoru and Sarraf, 2010). Ghasemi et al.'s (2010) case study in South Iran found that overharvesting of mangroves was placing undue strain on the region's mangrove ecosystem.

Nearly 10% of Iran's population lives in and around forests that they need for survival (Peter, 2004), but there is little information about the relationship between household welfare and sources of Iran's environmental and non-environmental incomes. So, given the importance of livelihood drivers in environmental degradation in Iran and the importance of environmental incomes on local livelihood more studies are needed to investigate and quantify the economic value of environmental goods for livelihood and welfare in Iran.

In addition, understanding and analyzing livelihood and welfare can be the first step in limiting environmental degradation. According to Mamo et al. (2007), understanding the importance of environmental income and its quantity in the livelihood of local people may work as an input to conservation policy through determining the potential loss to the local people. Thondhlana et al. (2012) also concludes failure to understanding how various income sources contribute to local livelihood and welfare may result in designing inappropriate conservation strategies which eventually lead to unsustainable outcomes like overuse of resources and conflict. Furthermore, misguided conservation strategies may result in resentment of conservation policy (Anthony, 2007), promote illegal activities and exacerbate environmental degradation (Hamilton et al., 2000; Watts and Faasen, 2009).

In sum, livelihood analysis seems to be the first step in reducing pressure on the environment through its contribution to the design of more effective conservation programs. In the next step, designing more sustainable, adaptive, and long-run conservation policies would reduce conflict between parks and people. In this work, we begin by describing the importance of all incomes that come from one of the most important biosphere reserves in Iran. We then suggest ways to establish a sustainable park-people relationship. We elaborate on this relationship in the next section.

1.1. Status of Park-People Relationship in the Area

Hara biosphere reserve is being managed by two governmental organizations: the Forest, Range and Watershed Management Organization and Department of Environment. This area is now under three management systems as national park, international wetland, and biosphere reserve (Zahed et al., 2010). Although it is considered as a national park, park authorities and government let people use the park. Biosphere reserve management system enables environmental managers to follow both environmental conservation and local livelihood development goals. Now, Hara Biosphere Reserve supports the livelihood of several thousands of people living in rural adjacent areas, directly or indirectly. For example, rural households harvest the leaves and branches of mangrove trees as their domestic animals feed. Moreover, Hara Biosphere Reserve is a place for fishing and supports the livelihood of thousands of fisher households, particularly small-scale fisheries. Fisheries in Hara Biosphere Reserve are a profitable activity, because the equipment's necessary for fishing in Hara Biosphere Reserve is less than those necessary for fishing in the sea and the amount of fish is higher in Hara Biosphere Reserve. It is an advantage, especially for small-scale fisheries. Households derive almost all of their fishing income from fishing in the Hara Biosphere Reserve. Moreover, Hara Biosphere Reserve supports tourism. Households engage in fishing, subsistence animal husbandry, wage activities and ecotourism. Partly in response to overharvesting, park authorities have increased their monitoring in this area and restricted some uses. For example, they have restricted harvesting the leaves and branches of mangrove trees in the Hara Biosphere Reserve. Moreover, entry into fisheries is impermissible in some months of the year. These activities are reasonable from a conservationist standpoint even though they are unpopular with residents. Moreover, direct observation and interview with rural elders reveal that more restrictions, far from reducing overharvesting, have increased the amount of illegal activity in the reserve. For instance, many residents illegally enter the fisheries by bribing the authorities. The challenge in the Hara Biosphere Reserve is the preservation of the value of this important ecosystem without depriving the local population of their livelihood.

This area has the commercial and trading potential to attract more visitors. The recreation valuation of Hara Biosphere Reserve is indicative of its economic importance. Since managers and decision makers have neglected the reserve, it there is a need for more facilities for visitors (Dehghani et al., 2010). In fact, because natural assets do not trade in ordinary markets, often, they are ignored in policymaking and priority-setting, leading to degradation or depletion of resources. This undermines the functioning and resilience of ecosystems, thus threatening their ability to supply present and future generations. The economic valuation of ecosystem services can be used to enhance public awareness, and it can help policymakers decide how best to allocate resources (de Groot et al., 2012).

1.2. Objectives

This study generally aims to explore the importance of HBR in local livelihood and welfare. However, the importance of specific incomes from HBR is also comprehensively investigated. More specifically, this study answers the following questions:

1. How important is Hara Biosphere Reserve for the livelihood of different income groups?
2. To what extent does the Hara Biosphere Reserve contribute to poverty alleviation and to reducing income inequality?
3. How does household poverty status influence environmental income from the park?
4. How do intra- and extra-household variables influence the income from the park?
5. How can a sustainable park-people relationship be practiced in the Hara Biosphere Reserve?

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