Biological variables in Iranian EISs

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Abstract

The quality of Environmental Impact Statements (EISs) of projects plays a key role in the decision making process of development projects and can be used as an indicator of the effectiveness of an EIA system. At the time of data collecting (2006), 337 EISs were archived in the EIA Bureau. We could collect 96 EISs out of these from 1996–2006. We examined which of the major ecosystems were identified as potentially affected by the proposed projects. We examined also whether the species of the Red List were identified as potentially affected. We found that protected areas were most often considered as potentially affected, and not surprisingly, mainly large mammals and birds were considered as potentially threatened by development projects; threatened plant species were considered by only 10% of, and invertebrates were never considered in the investigated EISs.

Keywords*: Environmental impact statements, affected ecosystems, protected sites, protected species*

1. INTRODUCTION

Assessing the likely impacts of projects on biodiversity and other ecological variables should be an essential part of an EIA (CBD, 2001, Slootweg and Kolhoff 2003). Article 14 of the Convention on Biological Diversity (CBD) requires parties to apply EIAs to projects that potentially negatively impact biodiversity (CBD, 2001). There are a number of studies that identified the level of documentation of biodiversity as well as explored the deficiencies in biodiversity impact assessment (Thompson and Treweek 1997; Treweek and Thompson 1997; Atkinson et al.2000; Slootweg and Kolhoff 2003; Tinker et al. 2005).

In any EIA system, the quality of EISs plays a vital role in the decision making of proposed projects and can be used as an indicator of the effectiveness of EIAs (Lee et al. 1994; Thompson and Treweek 1997; Barker and Wood 1999; Morrison-Saunders et al. 2001).

Some studies assessed the level of documentation of biodiversity-relevant impacts and explored the deficiencies in their assessment (Thompson and Treweek 1997; Treweek and Thompson 1997; Atkinson et al.2000; Slootweg and Kolhoff 2003; Mandelik et al. 2005; Tinker et al. 2005).

Because of the importance of designated areas (national parks, protected areas, wildlife refugees, natural reserves, etc.) for biodiversity conservation in Iran, we studied which of the major ecosystems were identified as potentially affected by the proposed projects. We examined also whether the species of the Red List were identified as potentially affected.

2. MATERIALS AND METHODS

In Iran, EIA became obligatory for large projects in 1994. At the time of data collecting (2006), 337 EISs were archived in the EIA Bureau. We could collect 96 EISs out of these from 1996–2006. We classified them in 17 classes which reflect major project types in Iran, e.g. *Oil and gas pipelines and reservoirs, Industrial complexes, Steel melting plants, Dam construction* and *Hydro-power plants, Power plants,* and *Oil and gas refineries* and *Oilfield developments*.

We examined which of the major ecosystems such as deserts and semi-deserts, rivers, mountains, forests, lakes, intertidals, mangroves, estuaries and coral reefs were identified as potentially affected by the proposed projects. In Iran, areas protected by the Department of Environment (DoE) cover 8.5 million hectares (about 5% of the land area). The total area of National parks (11 sites) is 1.3 million hectares; Wildlife refuges (25 sites) cover 1.9 million hectares, and protected areas (IUCN class IV and V; 47 sites) 5.3 million hectares (0.79%; 1.16% and 3.23% of the country's area, respectively; CBD, 2005). Iran has five National Nature Monuments and nine UNESCO Biosphere Reserves. One of the National Parks, nine of the Wildlife Refuges and ten of the Protected Areas were established primarily to protect wetland ecosystems, while a further two Protected Areas and a Wildlife Refuge incorporate important wetland habitat. In Iran, 22 wetlands out of the 63 internationally important wetlands are identified as Ramsar Sites (1.5 million hectares;

Scott 1995; Ramsar Bureau, 2008). These sites harbors 95 threatened species of the IUCN Red List (IUCN 2008). We examined whether the species of the Red List were identified as potentially affected. At the species level, 96 species are internationally threatened on Iranian territory (19 mammals, 22 birds, 10 reptiles, 4 amphibians, 14 fishes, 8 cartilaginous fishes, 5 insects, and 14 cnidarians; IUCN 2008). Out of 144 mammal species in Iran, 25 species (18%) are recorded in the IUCN Red List (IUCN 2006).

3. RESULTS

The ecosystem types potentially affected by projects, based on their consideration in the corresponding EISs in Iran, are listed in Fig. 1. Deserts and semi-deserts were most often considered as potentially affected, followed by rivers and mountains. Some projects even risked to affect unique and fragile ecosystems such as mangroves and coral reefs.

Protected areas were most often considered as potentially affected, but even national parks and highly sensitive Ramsar sites were considered to be threatened by several projects. The latter are already threatened in Iran by drought and other consequences of climate change. Not surprisingly, mainly large mammals and birds were considered as potentially threatened by development projects; threatened plant species were considered by only 10% of, and invertebrates were never considered in the investigated EISs.

In general, we found that potential effects of projects on the biological variables were not properly identified. They mostly were not identified or they have been discussed in general cases such as “impacts on plants”, “impacts on animals”, and so on. Usually, no further information were presented about the prediction of potential changes in density, population size, productivity, etc. is included in the statements.

In the statements, usually monitoring plan is misunderstood with pollution control plan (METAP, 2002). That is why, practitioners tried to suggest monitoring actions only for physical conditions such as air, water and soil quality. Most often monitoring of the biological variables is not part of the statements.

4. DISSCUSSION

The “biodiversity” term is seldom used in the studied EISs (Atkinson et al., 2000; Gontier et al., 2006) and not enough attention is paid to biological variables at different scales (Gontier et al., 2006) such as genetic, species, community and ecosystem diversity as well as ecological interactions (Atkinson et al., 2000; Mandelik et al., 2005). Hence impact assessments, particularly assessment of impacts on biodiversity, are mostly descriptive and without temporal and spatial scales (Mandelik et al., 2005; Gontier et al., 2006).

We found that deserts and semi-deserts, followed by rivers and mountains were most often potentially affected by projects, but even unique ecosystems were at risk in some cases.

Nowadays, Iranian ecosystems, in particular wetlands, are experiencing a high pressure by climate change. In addition to that, construction of large dams on the main rivers, high level of exploitation of wetlands, diversion of water for domestic consumption, irrigation purposes and industrial uses pose particularly large threats to wetlands (Scott 1995). Protected areas containing highly vulnerable species are also at particularly high risk. Therefore, a better consideration of biological variables in Iranian EISs would be vital.

Iran is a vast country subject to diverse climatic and environmental conditions and hence harbors an immense diversity of terrestrial and marine species. Many ecosystems are under pressure and also many species are threatened, endangered or critically endangered. Information about the condition of these species is not available and up to date. Maybe, more studies have been carried out about top predators and large mammals but there is a big gap of data for the others, particularly in case of plant species. Out of more than 8000 plant species in Iran, which mostly are not placing in the protected sites, more than 2000 species are threatened. However, the level of risk (threat) still is not clear and updated for approximately all of them. In Iran, only a few sites are protected because of the protected plant species but for many others even their spatial distribution is not properly prepared. Therefore, because of the lack of data about biological variables, identification of biological impacts is coming very difficult in EIA studies.

We found also that usually biological variables were not involved sufficiently in the monitoring plans. It is because data which used for EIA are based on the literature review and not based on some survey that can show the current state of the biological conditions. So, when there is no design for taking the biological data, it is hard to establish a monitoring plan for them and compare the post- and pre- project states.

We conclude that although pressures on biological environment is exceeding because of the new projects, practitioners do not pay enough attention to the biological variables in the EIA studies. To improve the quality of EIA studies, we suggest that impacts of the projects on biodiversity components and ecosystem functions should be taken into account at all stages of EIA.

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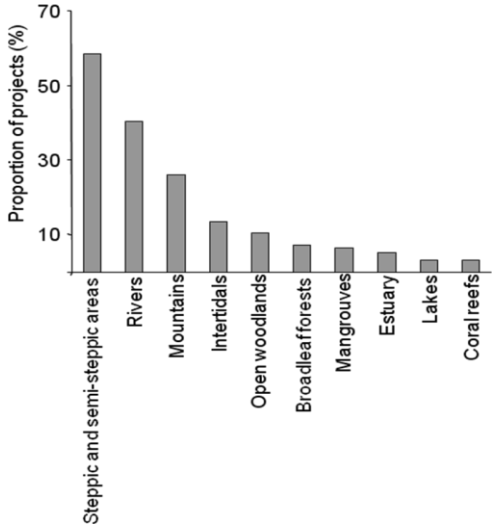

Fig. 1 Proportion of projects potentially affecting the 10 ecosystem types listed on the x-axis (based on whether the particular ecosystem type was mentioned in the EIS of the corresponding project).

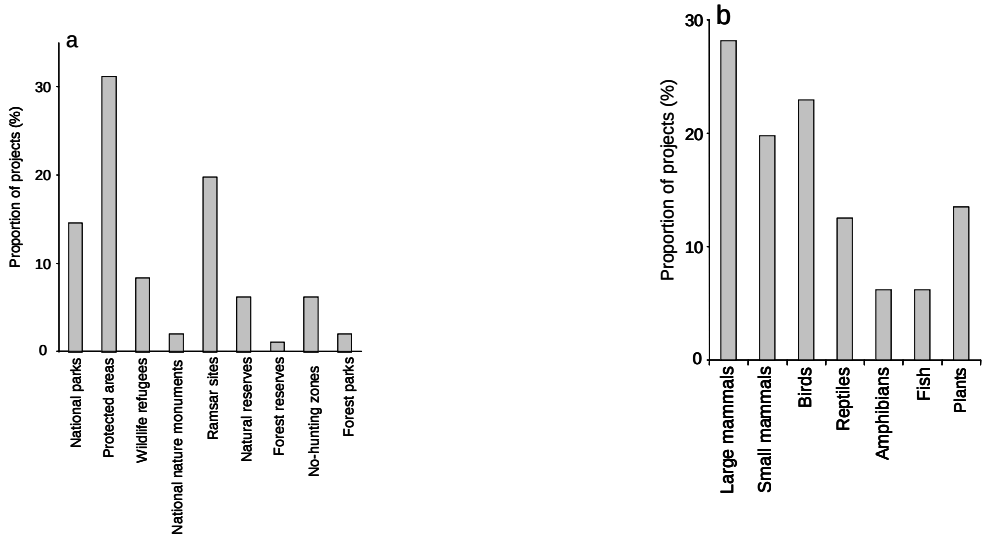

Fig. 2 a) Proportion of projects potentially affecting the designated areas listed on the x-axis (based on whether the particular designated area was mentioned in the EIS of the corresponding project); b) proportion of projects potentially affecting Red List animal and plants species of the groups listed on the x-axis (based on whether animals of the particular group were mentioned in the EIS of the corresponding project).