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How Plantations Can Affect Sustainable Forest Management in Iran

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Abstract. From a forestry point of view, Iran is divided into five vegetation regions and during 1960-1999, afforestation amounted to 2221000 ha of total area planted. The annual rate of forest plantations establishment is 63000 ha, the majority being implemented under government investment. Tree species planted are generally limited to indigenous or acclimatized exotic species. To ensure maximum success, most plantations are irrigated during 2-3 seasons. Water shortages are a major constraint to planting, particularly in arid zones. Site preparation costs are high and establishment of irrigation facilities also are very expensive. The state grants substantially support to promote private investment in fast growing tree species plantations, which amount of 150000 ha of which, 35% are young stands. The present evaluation of trees outside forests in Iran is incomplete duo to lack of comprehensive data and information. In 2000, it was estimated that orchards accounted for 1704000 ha, about 14% of the total forest area of Iran. Collaborative efforts between government, municipalities, NGOs and citizens' groups have led to the establishment of a quite dense network of urban and peri-urban forests in Iran, estimated in 1996 to be 530288 ha (mean annual area treated 3760 ha). Urban and peri-urban forestry is gaining momentum in the country and many provinces have developed their own urban forestry establishment programmes. Result showed that the current situation of Iran's natural resources is a reflection of its past and present social, ecological, technological, economic, political and administrative measures. Technical or engineering solutions are not enough and they need to take into account the needs, priorities and aspirations of the rural poor.

Keywords: Plantation, Forest, Tree, Urban, Establishment

1. Introduction

Iran covers an area of 1.65 million km^2, enclosed within 8731 km of frontiers, of which 2700 km of coastline boundaries, and 6031 km of land borders. Almost 60% of the country is mountainous, while deserts of the High Central Plateau cover one third of the territory. Iran displays a variety of climates ranging from hyper arid (centre and east regions) to Mediterranean semi-arid and sub-humid (mountain regions) and humid (Caspian coastal area, Azerbayejan-e-gharbi province and southwest Zagros mountainous regions). With mean annual rainfall of 253 mm, Iran is drought-prone; precipitations being erratic and highly variable.

Being endowed with a rich diversity of ecosystems, plant and animal species, Iran is one of the world's most important gene pools; it counts 8200 plant species (1900 endemic), over 500 bird species and 160 species of mammals. Five plant species, 20 mammals, 14 birds, eight reptiles, two amphibians, seven fish and three invertebrates are considered either endangered, or threatened and vulnerable. Historical evidence indicates that the vast, arid areas of central Iran, were once covered with valuable range and forest vegetation. Human activities are believed to have strongly contributed to desertification. The main land use categories of Iran are the following:

Forests (12.4 million ha, 7.4% of territory); Rangelands (90 million ha, 55% of the country); Deserts (34 million ha, 21% of the country); Cultivated lands (23.6 million ha, 14.4% of territory) exceed by far the

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forest land area; Urban and rural settlements, infrastructures and water bodies (4 million ha, 2.2% of the national territory). The total potential of arable land amounts to 37 million ha (17 million ha under irrigation and 20 million ha rain fed).

From view point of surface water and groundwater resources it's divided into 37 basins and 174 watersheds, the country is drained by 3450 permanent and seasonal rivers. The Persian Gulf and the Caspian Sea receive the highest flows. In 1996-97 precipitation generated 330 billion cubic metres (BCM) of surface water, 130 BCM renewable water and 126 BCM harvestable water resources, of which 87.5 BCM were harvested (94% used by agriculture). About 70 BCM groundwater were discharged in 1996 by 275300 semi-deep wells, 100700 deep wells, 46700 springs and 32000 qanats.

1.1. Forests and Rangelands Global State

As a result of losing ownership and usufruct rights, the ex-owners and the traditional forest dwellers/users lost interest and sense of responsibility towards sustaining and protecting forests and rangelands, used since without restraint to face growing demands that came with population growth. Forests occupy 12.4 million ha (7.4 % of country) and include 1.9 million ha of productive commercial forests. The rest amounts to 5.5 million ha (West and Zagros), 2.5 million ha (South and desert), and 2.5 million ha in other regions. Rangelands include lands covered by natural grassland, shrub-land and a combination of both. Iran's rangelands occupy 90 million ha (54.8% of country area); the condition of 16% of the rangelands is excellent, whereas 66% are in favorable to fair condition and 18% are in poor and degraded form.

1.2. Deforestation

The overall deforestation figure for the period 1958–1994 is widely accepted as being equal to about 5.6 million ha. The rates of deforestation according to the widely accepted classification of forests in Iran were as follow: Caspian broadleaf deciduous forest (1.5 million ha); Arasbaran broadleaf deciduous forest (100000 ha); Zagros natural forests (1.7 million ha); Irano-Touranian Central Forests (2 million ha); and Semi-savannah subtropical forests (300000 ha).

1.3. Change in Vegetation Cover

No assessment has been made on the forest annual cover changes in Iran. However, considering that the present deforestation is limited, the average annual plantation rate of 63000 ha should result in a slight positive change in national vegetation cover.

1.4. Natural Forests

From a forestry point of view, Iran is divided into five vegetation regions as follows: Hyrcanian broad leaved forests [1905000 ha] along the Caspian coast; Arasbaran forests (150000 ha) of North Western Iran; Irano-Touranian arid forests (2895000 ha) in the Central Plateau Region; Zagrosian forests (5050000 ha); and Persian Gulf and Sea of Oman tropical arid forests (2400000 ha).

1.5. Planted Forests

During the period 1960-1999, afforestation amounted to 2221000 ha total area planted (all categories inclusive). The annual rate of forest plantations establishment is 63000 ha, the majority being implemented under governmental investment. Tree species planted are generally limited to indigenous or acclimatized exotic species. To ensure maximum success, most plantations are irrigated during 2-3 seasons. Water shortages are a major constraint to planting, particularly in arid zones. Site preparation costs are high, and establishment of irrigation facilities is very expensive. The State grants substantially support to promote private investment in fast growing tree species plantations (poplar), which amount to 150000 ha of which, 35% are young stands.

1.6. Trees outside Forests

The present evaluation of trees outside forests in Iran is incomplete duo to lack of comprehensive data and information. In 2000 it was estimated that orchards accounted for 1704000 ha, about 14% of the total forest area of Iran. Collaborative efforts between government, municipalities, NGOs and citizens' groups have led to the establishment of a quite dense network of urban and peri-urban forests in Iran, estimated in

1996 to be 530288 ha (mean annual area treated 3760 ha). Urban and peri-urban forestry is gaining momentum in the country and many provinces have developed their own urban forestry establishment programs.

2. Result and Discussion

2.1. Causes and Effects of Deforestation and Degradation

Some of the salient indirect causes to deforestation and degradation are: land and water tenure and users' rights and incentives: These include: incentives granted to enhance agricultural production, which have constituted an encouragement to extend the areas cultivated by converting, with the State's consent significant forest and rangelands to agriculture land; indirect incentives granted for forest and rangeland exploitation, through omitting to tax products and incomes derived from such operations; promoting excessive water mobilization as an encouragement to the extension of productive irrigated agriculture, mostly implemented through forest and rangeland clearing; and land nationalization, which is held responsible for the breakdown of traditional systems of forest and range management, resulting in the disintegration of the forest and range resources.

Poverty triggering factors: These include: Unchecked population growth which inevitably results in extreme pressure being exerted on the limited natural resource base available to the country; Poverty, which concerns 40 % of the rural population that attempt to maintain basic living standards by increasing livestock numbers on the already overcrowded rangelands; and Lack of investments and on off-farm job and revenue opportunities that compel more people to depend increasingly on marginal lands, at the expense of former forest and rangelands for their crop production.

The response capacity to forest and range misuse issues is weak, because: inability to react on a timely basis to misuse and calamity impacts, for lack of timely and reliable data and information; top-down approach adopted to trigger community involvement in the process of natural resources rehabilitation has not set in motion the required sense of ownership of, and responsibility for, the resource that may lead to sustainable success; and some gaps in knowledge related to natural resources, participatory procedures.

Natural resources degradation results in poverty expansion. Besides the traditional "underclass" often identified among forest and rangeland dwellers, the new population groups affected by poverty are the rural-to-urban migrants, the landless and near landless, the disabled, and the rural female group. The collapse of various production systems, which are not economically viable anymore, forces more rural population to migrate to cities. Regarding the extent of deforestation, clearing forest for agriculture, forage production and firewood and charcoal has reduced forests by 30 % over the last 40 years.

2.2. Development Choices

Iranian foresters have gained much valuable experience in such fields as sand dune fixation, mangrove regeneration, poplar and other fast-growing species plantation, management of non-wood forest products, development of extensive urban and peri-urban forests, development of intermediary forms of participation to forest and range sustainable management. Despite imposing resource rehabilitation programs, government has not significantly and sustainable contributed to poverty alleviation among forest and rangeland dwellers; following nationalization of all lands, rapid population growth as well as unsustainable human activities and other natural causes, Iranian forests and rangelands have lost very substantial areas in the last decades.

Planning and decision-making are highly centralized, leaving little space for provincial and local initiatives to program and project formulation, planning and decision-making;

Re-assess the country's training needs for participatory forest and range protection, rehabilitation, management and development is necessary

2.3. Natural Resources Use and Management

Socio-economic values of forests and rangelands is very significant as more than 5 million people live in forests or in their vicinity, while 450,000 persons live permanently on the rangelands; and planted forests are established without any preconceived idea of their future sustainable management. Trees outside forests are

not yet well perceived in terms of their actual or potential contribution to the national economy and to the well being of people.

The current situation of Iran's natural resources is a reflection of its past and present social, ecological, technological, economic, political and administrative measures. Technical or engineering solutions are not enough, and so they need to take into account the needs, priorities and aspirations of the rural poor.

So, it's recommended that: Adopt participatory planning and resource management approaches to sustainable forest resources management, for biodiversity conservation; Assessing and monitoring ecosystems; Participatory planning and management become a standard approach to understand the needs and aspirations of communities and individual families to contribute in those matters that directly impact upon their sustainable livelihoods; Poverty alleviation and support to local communities: Enhance and promote long-term employment and revenue opportunities among forest and rangeland dwellers by strengthening stakeholders' interest and investments in sustainable resources management; and development and widespread distribution of alternative domestic energy: Provide alternative domestic energy sources to cover the entire rural countryside.

Promoting more environmentally and people friendly approaches to agricultural development and expansion, by adopting efficient and non-destructive production systems, particularly in mountain areas, and rehabilitating lands that have been exhausted of their productive potential, to their initial land-use choice and improve land productivity and soil fertility in rehabilitation of degraded lands, including incorporating trees and planted forests in the landscape must be taken into consideration.

2.4. Enhancing the Role of Planted Forests

Integrated planted forests in a broader land-use context in an attempt to respond to the priority needs and aspirations of people; maintain or increase the present rate of afforestation/reforestation; and government prepare arid, semi-arid and tropical silvicultural and management models as well as guidelines for the rehabilitation, silvicultural treatment, management and development of mangroves, fodder tree plantations, and *Haloxylon persicum* stands developed through plantations and seeding.

Grant more support to farmers to maintain and expand poplar and fast growing species' plantings for shade, shelter and other uses; promoting trees outside forests in private holdings, particularly in agroforestry where trees support agriculture and livelihoods; developing an adapted cilviculture for the specific needs of urban/peri-urban forests and publish silvicultural guidelines for various species in different ecological contexts; considering the productive capacity of the urban and peri-urban forests and prepare management plans accordingly; promoting the planting of trees outside forests, mainly fodder trees in sylvo-pastoral systems; and arrangement of a short training course on the silvicultural treatments of fodder tree and shrub species and on sylvo-pastoral management of recently rehabilitated wooded rangelands.

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