FORMEC 2010
Forest Engineering: Meeting the Needs of the Society and the Environment
July 11 – 14, 2010, Padova – Italy

FOREST OPERATIONS MANAGEMENT AND TIMBER PRODUCTS IN THE HYRCANIAN FORESTS OF IRAN

Seyed Mohammad Hosseini

Ministry of Sciences, Research and Technology
Shahrake Guods
Tehran, Iran
e-mail: S_hoseini99@hotmail.com

Keywords: Forest operation, Timber products, Mechanized logging and Hyrcanian Forests

Abstract: *The Northern Forests of Iran (i.e. the Hyrcanian Forests) are located in north of Iran, near the Caspian Sea. These forests cover 1.8 million hectares of land area and are completely natural and broadleaf forests. The harvesting operations were changed from non- mechanized logging to mechanized logging systems during last decade. In the same time, non- industrial timber products were changed to industrial products that charcoal products nearly 39 times were decreased versus last decade.*
Timber products and forest operation management in the Hyrcanian forests of Iran during last 10 years will be discussed in this paper.

1. Introduction

According to the available definition of the Food and Agricultural organization (FAO) agreed on by all member states, "forest is area covered by trees with the height of 5 meters as well as the canopy cover of more than 10 percent, covering a minimum area of 0.5 hectares at least". In this definition, the capability of trees to reach to the height of 5 meters is emphasized and therefore, plantations on agricultural lands or in urban areas do not include the instances of this definition. In line with this definition, Iran's forest area is estimated at 12,400,000 hectares. Some countries however, use other indicators to determine their forested areas based on the significance of forests in their regions. Therefore, in view of the scattering of forested areas and legal restrictions in Iran, which are among some of the preventive factors for defining forests, a canopy cover of more than 5 percent is accepted for the definition of forest areas here in Iran.

Table 1. Forest vegetation in Iran

Forest types	Dry &Semi-Dry	Caspian	Total	Percentage
Closed Forests*	755,777	940,826	1,696,603	12.0
Semi-Closed Forests*	2,806,846	593,927	3,400,733	23.9
Open Forests*	7,842,183	313,133	8,155,316	57.4
Mangrove Forests	30,400	0	30,400	0.2
Planted Forests	919,468	0	919,468	6.5
Total	12,354,673	1,847,886	1,420,255	100.0

*Canopy Density in closed forests is more than 50 percent, in semi closed forests is 25 to 50 percent and in open forests is 5 to 25 percent.

According this definition, Iran's natural forested area is estimated at 13,283,901 hectares Adding another 919,468 ha of plantations to this figure, Iran's forest area is estimated at about 14,202,559 ha (equal to 9

percent of the country's land area) and as a result, forest per capita is 0.2 ha as compared with the global standard of 0.8 ha. Iran's forests are divided into two areas including the Caspian forest in the areas here in Iran. This is shown in the following table (FROM, 2005).

2. The Hyrcanian Forests

These forestlands are located in the northern part of Iran, also known as the Caspian forests or Hyrcanian forests; belong to the end of the third geological era. The Caspian forests are known as the oldest forests in the world. These forests form a rather narrow green belt bordering the northern part of the Alborz Mountains and extend from Astara in the west of Gilan Province to Giledarreh in the east of Golestan province, and are about 800 kilometers in length and 20 to 70 kilometers in width (Fig. 1). The Caspian forests are extended at the altitude of a maximum of 2800 meters from sea level and comprise a mixture of beech, blue beech, oak, maple and alder. Fertile soil, proportionate precipitation and high humidity have created a varied collection of plants in this region, including about 80 species of trees- mainly deciduous species- as well as four species of conifers and 50 species of shrubs of which the most important are: *Fagus orientalis*, *Acer insigne, Acer Cappadocicum*,*Ulmus glabra, Fraxinus excelsior, Tilia begonifolia,Cerasus avium, Quercus castaneifolia, Zelkova carpinifolia, Alnus subcordata and Carpinus betulus.*
The area of these forests is about 1,847,886 hectares of which 940826 hectares closed forests, 593,927 hectares semi-closed forests with 25-50 percent canopy cover and 313,133 ha open forests with 5-25 percent canopy cover. Due to the eco-systemic and environmental values of these forests as well as their socio-economic role in the lives of the people in this territory, these forests are known as one of the most basic resources for wood production and have a big share in supplying wood to the related industries.

3. Timber products

The total timber products are nearly 0.9 million m^3 which charcoal and logs are 48884 m^3 and 320349 m^3 respectively. The charcoal products have been reduced nearly 42 times compared with last decade (Table 2). Comparing with total timber products, the percentage of charcoal was 8.1% in year 2000 and 0.53% in year 2009 (Fig. 2). The scientific forestry planning started nearly 40 years ago with introducing of shelterwood and selection methods in these forestlands. This new managing system, tried to replace mechanized logging system instead of old mechanized systems which were generally non-mechanized.

Table 2. Timber products in the Hyrcanian Forests of Iran during last decade.

Year	Charcoals (m^3)	Logs (m^3)	Total timber (m^3)
2000	115266	340976	1418522
2001	91068	294681	1231810
2002	54834	319116	1218661
2003	36636	325799	1203286
2004	27330	315945	1026511
2005	21186	291453	985483
2006	17154	273631	886375
2007	11112	258433	847742
2008	5568	285387	844476
2009	4884	320349	919550

Sustainable forest decision making in these forests started nearly 10 years ago. The main objectives of this project are as: forestry management based on sustainable development; attending to all forest potential sources instead of timber products only, conservation and mechanized harvesting operations (Hosseini et al, 2007. By this new situation, mechanized harvesting systems nearly 80% increased versus previous decade (Fig. 3). Meanwhile, the quality of timber products during the non-mechanized logging systems were low quality like charcoal and firewood, while since mechanized logging systems were developed, high quality products like logs were increased. Table 2 shows, the percentage of log products in year 2000 was 24% while in year 2009 increased to 34.8% of total products.

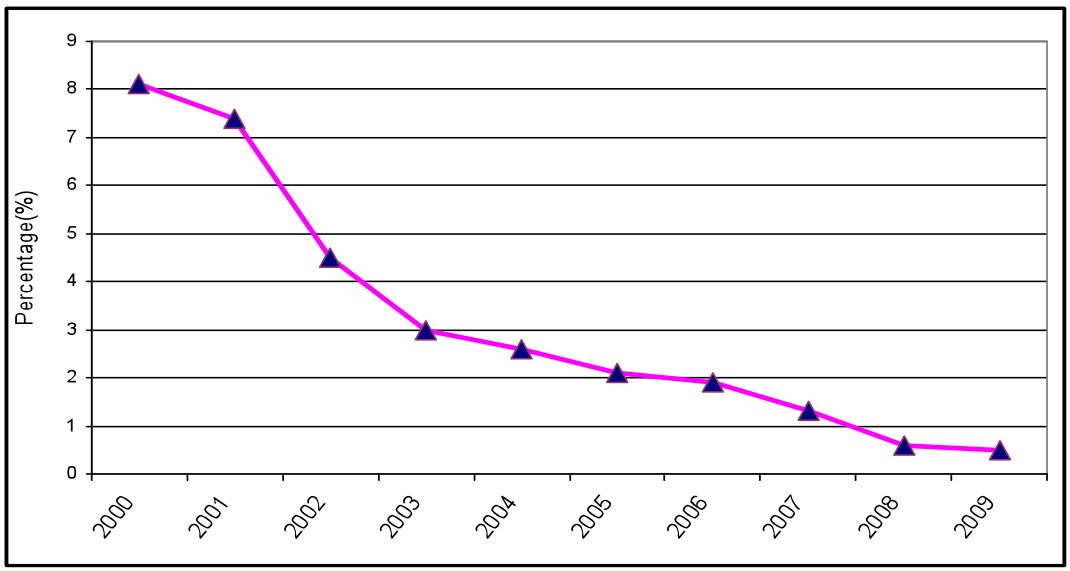

Figure 2. Charcoal products (in percentage) in the Hyrcanian Forests of Iran during last decade

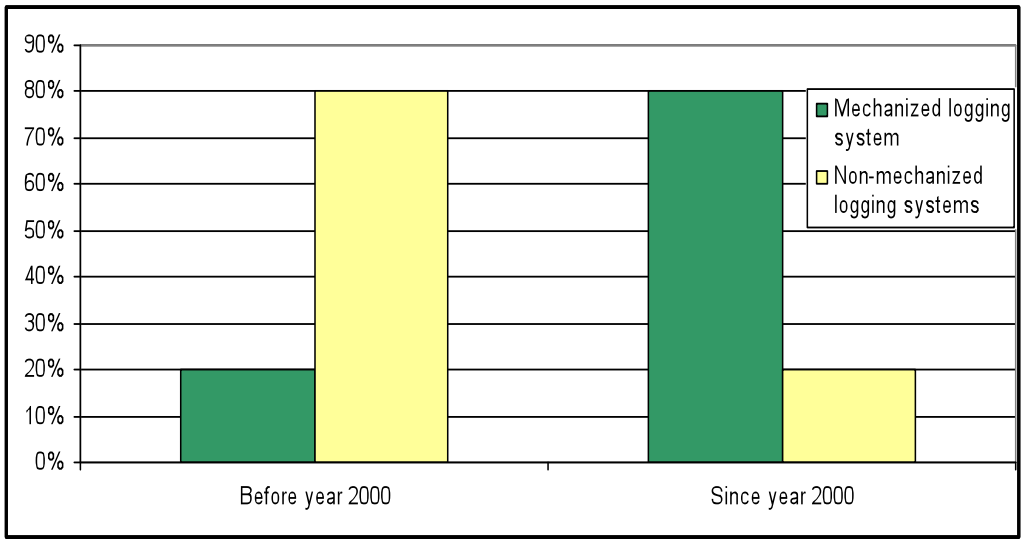

Figure 3. The process of mechanized and non-mechanized logging systems in the Hyrcanian Forests of Iran during last decade.

4. Conclusion

Sustainable forest management in the Hyrcanian Forests of Iran started nearly 10 years ago. In new decision making of forestry management, it is purposed to not only the quality of timber products must to developed, but mechanized logging systems should be developed. At the moment, all state and private forest companies try to changing their harvesting machines as mechanized and timber products as high quality.

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