The Evaluation of Artvin Regional Directorate of Forestry In Terms of Criteria & Indicators in Sustainable Forest Management

Burak Çavdar[1], and Hacı Ahmet Yolasiğmaz[1]

[1]*Artvin Coruh Universty, Faculty of Forestry, Artvin, Turkey.*
E-Mail: burakcavdar60@gmail.com

Abstract:

Depending on increasing population and developing industry, the demand for natural sources has gained variations increasingly. Structural degeneration of forests, fragmentation of forests, formation of isolated areas, and decrease in biological diversity have guided the countries towards agreeing in a common point. After biological diversity agreement, the concept of sustainable forest management (SFM), which is defined in international process, appeared. SFM is monitoring the conditions of forest sources numerically by introducing new standards to the world forestry with six or seven criteria and over thirty contingent indicators. Our country, due to its geographical location, has been involved in Pan Europe and Near East processes and it has been following its forests with 6 criteria and 28 indicators which appeared in this processes. In the new process, Turkey aims to take place in the world scale by increasing the quality standards as a result of increasing certified forests and developing economy in all fields with 150 years of knowledge about forestry. In this paper, SFM criteria and indicators set in Turkey (C&I) is discussed and international processes and the concept of SFM have been summarized. Correspondingly, the status of Artvin Regional Forest Directorate was evaluated according to the current set of C&I on the bases of last five years. Sustainability of Artvin Regional Directorate of Forestry has been introduced with scoring system by accepting the whole country values as a threshold.

KeyWords: Forest Management, Sustainable Forest Management, Artvin Regional Directorate of Forestry

Introduction:

Several reasons like industrial revolution of the 19th century, rapid urbanization and over population have led to environmental pollution, global warming, reduced biodiversity, deforestation and structural deformation, therefore making it necessary to act for the environment globally. The first convention which imposed environmental responsibility on the nations of the World was conducted in 1972, under the name of Stockholm Conference, which had concluded with the establishment of the United Nations Environment Programme (UNEP) focusing on the international coordination and planning. The Brundtland Report was published in 1987 and a series of Forest Europe Ministerial Conferences were held focusing on the common opportunities available in and common threats to the forests and forestry (Rametstenier, 2000).

The United Nations Conference on Environment and Development (UNCED), which took place in 1992 in Rio de Janeiro, and the following agreements on biodiversity and on combating desertification and climate change brought forward 6 basic documents. This conference, essentially stressing an environment friendly and sustainable development, has shaped the World's Forestry Today. The Intergovernmental Panel on Forests (IPF), and its successors, the Intergovernmental Forum on Forests (IFF) and United Nations Forum on Forests (UNFF) was established in the 2 decades following the Earth Summit in order to ensure the application and to keep track of the recommendations defined in this summit and several decisions were made and implemented in the subsequent conferences (URL-2; ÇOB, 2009).

Many countries have taken part in continental or regional processes according to their geographical locations in order to meet the SFM which was jointly defined in Helsinki. Our country has taken part in both Helsinki (Pan-European) and FAO-UNEP (the Near East) processes due to its geographical location and have generated an authentic set, namely SFM C&I, which blends the criteria and indicators of both processes (Özcan, 2008, Anonymous, 2000c).

Thus, while this report aims to determine the ability to validate data into the set of SFM Criterias & Indicators in terms of quality and quantity; it also reveals the compatibility of the data collected from the research area of Artvin Forestry Enterprise with the SFM C&I of General Directorate of Forestry; displays the shortcomings of the data collection and evaluation processes conducted by the General Directorate of Forestry and shows the change in the forest structure.

Materials & Methods:

Technical, economical and social data collected from Artvin Forestry Enterprise and from the forestry departments of Artvin Regional Directorate of Forestry were utilized and forest management plans obtained from the forestry departments of the Artvin Forestry Enterprise were used in this research.

The area of research is the Artvin Forestry Enterprise which is attached to the Artvin Regional Directorate of Forestry. The area of research mainly constitutes of the river basin provides water to the Borçka and Muratli Dams and which is mostly managed for timber production. The area of the Artvin Forestry Enterprise is located between the latitudes of 41°-22'-35", 40°-54'-55" N and the longitudes of 41°-53'-37", 41°-31'-33" E. This area of Mediterranean, Black Sea and partly Continental climate proved to have a rich flora and fauna with the early studies (Eminagaoğlu and Bak, 2009; Anonymous, 2006). The area has an average slope of 60% and is susceptible for soil erosion. Artvin Forestry Enterprise consists of Artvin, Saçinka, Madenler, Atila, Ortaköy, Taslica, Tütüncüler and Zeytinlik forestry departments. The total surface area is 109.299,3 hectares; 81.069,9 hectares of forestland and 28.229,4 hectares of opennes (Anonymous, 2011c; URL-7). 66% of the total area is forestland and 48% of this forestland is high forest, %50 is degraded forest and %2 is degraded coppice.

The SFM C&I is prepared in compliance with the scale of the Department of Forestry. The data collected from the reports is passed to the Regional Directorate of Forestry and General Directorate of Forestry built up the basis of the Artvin Forestry Enterprise and was evaluated in order to be treated in the SFM C&I set. The quality and quantity of the data in respect to the criteria and indicator were provided. Last 5 years was taken as the time scale. Quantitative and qualitative aspects were also mentioned in the generalization of the data collected; data was compared against the countrywide average and threshold values were defined for some indicators and parameters.

The scoring system which was introduced by Mrosek (2002) and Sener (2009) was adopted in the evaluation of the forestry institution in the SFM process. In this system; 0 points were regarded negative, 1 point was regarded as average and 2 points were regarded as positive. In the evaluation process; each indicator of the SFM C&I set was scored separately and 0 was allocated to the indicators below the countrywide change in Artvin Forestry Enterprise in the last 5 years. 1 was allocated to the indicators near the country-wide change and 2 was allocated to the indicators above the countrywide change. As the current Forestry Enterprise SFM set includes 28 indicators, the threshold value was taken as 1.5 and the total threshold value for the positive sustainability was determined to be 42. The data from the department was then tested to see if it will be able to meet the threshold. Another evaluation was also performed according to the total score obtained.

Results and Discussion:

In this section of the study, the records from the Forestry Enterprise of two inventory periods, 2006-2008 and 2009-2011, and the data from last 5 years were compared with respect to the current criterias and indicators of the Forestry Enterprise in order to detect the condition of the sustainable forest management of the Forestry Enterprise and so the change in the period of last 5 years was revealed and a scoring was performed based on Turkey's countrywide average.

The data consisting of two inventory periods which were obtained using the forest

management plans is presented in a table; the data showing the change in the Forestry Enterprise in 5 years period is presented in a separate table and an evaluation was performed with respect to the criterias and indicators.

Criteria#1 Forest Resources:

According to the data from the last inventory year for the indicator of forests and the other resources (I-1), it was determined that 54.3% of the total forestland of the Artvin Forestry Enterprise was productive forest and 45.7% of the total forestland was degraded forest; 34% of all the forestland is composed of coniferous trees, 43% is broadleaf trees and the remaining %23 is mixed forest. When the two inventory periods were inspected, it was seen that the area of coniferous and broadleaf forests were increased and the area of mixed forest was decreased by 13.7%. The change is below the countrywide average, yet the increase in the area of coniferous and broadleaf forests has led the area to be evaluated as average and therefore one (1) point was given.

The total growing stock, biomass and carbon stock (I-2) is increased to 5.1% for the indicator of according to the data from the two inventory periods. The total growing stock consists of 55% coniferous forests, 10% broadleaf forests and 35% mixed forests. 2% of increase in the total growing stock calculated considering the increase in the coniferous and broadleaf growing stock and the decrease in the mixed forest area.

Nevertheless, according to the biomass and carbon stock evaluations conducted using Asan (2010) coefficient, the total amount of biomass is increased by 6.8% and the carbon stocked in the forest soil is also increased by 6.8% in the last inventory year. The reason behind this increase is the coniferous species of trees. As a matter of fact, a decrease in the broadleaf biomass and broadleaf related carbon has been spotted. As the change was just below the countrywide average, this indicator was evaluated as average and therefore one (1) point was given.

In terms of the planted and barked bole volume increment (I-3); the total increase in Artvin Forestry Enterprise is provided 48% from coniferous, 9.5% from broadleaf and 42.5% from mixed forests. The increment of the coniferous and broadleaf species is also paralleled with the increase of growing stock value. On the other hand, the 2% growing stock increase in the mixed forests is matched with the 2% increment. As the change was above the countrywide average, two (2) points were given.

When two inventory periods were compared for the forestland with a forest management plan (I-4), we saw that there were expired plans in the first inventory period (2008) and there were both completed and ongoing plans and also areas with no forest management plan in the second inventory period (2011). The change was below the countrywide average. As there were areas with no forest management plan by the end of the last inventory period and a decrease of 29.8% was calculated, yet considering the reason behind this decrease was occurring due to the area given to the national parks, it was regarded as average and one (1) point was given.

It is obvious that a hard work is done when the last 5 years are examined in terms of cadastral surveys (I-5). Nevertheless, the total area of registered land is 94% of the total forestland. The records show that 67% of the cadastral surveys were completed by 2011 (Anonymous, 2011). As the change is above the countrywide average, two (2) points were given (Çavdar, 2012).

Criteria #2 Biological Diversity:

The region involving the Artvin Forestry Enterprise has a rich flora due to its geographic location and climate which combines the characteristics of Black Sea, Mediterranean and Continental climates. Whether no detailed identification research was conducted regarding the flora and wild life in Artvin Forestry Enterprise, there are several scientific studies and projects focusing on the flora and wild life of the region. As a matter of fact, the area is known for its unequalled richness of

vegetation and wild life diversity, not to mention several endemic species were identified.

An increase of 46% in the amount of forest patches and a decrease in the distance between these patches were seen in the comparison of two inventory periods with regard to the forest density(I-1). 56% of these patches comprise forest areas covering less than 10 hectares and 16% of these patches comprise forest areas covering more than 100 hectares. The change in the patchiness is above countrywide average, yet due to the reason behind patchiness rise from natural causes and no geographical information systems were utilized in the assessments, this data was assumed unhealthy and it was evaluated as average and therefore one (1) point was given.

Silviculture practices (I-2) have gradually increased to a cumulative ratio of 550% in the last 5 years in Artvin Forestry Enterprise coupled with the increase of 698% in terms of forest care, as handled under the title of other forestry activities. As the change is above the countrywide average, two (2) points were given.

The total regeneration area was increased by 30% in the last 5 years in terms of regeneration reliability (I-3) and natural regeneration was mostly adopted in this process. Besides, while natural regeneration areas were successfully increasing, the artificial regeneration areas couldn't match this success. As the change is above the countrywide average, two (2) points were given.

The area of seed stands in Artvin Forestry Enterprise were decreased by 9.6% in the last 5 years considering the seed resources (I-4) which was also coupled with the 90% decrease in the other seed resources. As the change is consistent with the countrywide average, one (1) point was given (Çavdar, 2012).

Criteria #3 Health, Vitality and Integration:

Viable production and service functions in forest ecosystems are achieved only when provided with a healthy structure. As these ecosystems consist of a complex structure which involves many subsystems, they need to be observed and evaluated with regard to many factors affecting ecosystem's health, vitality and integration.

The forestland affected by natural factors (I-1) in Artvin Forestry Enterprise is decreased by 78% in the last 5 years. This decrease owes it to the combat with pests. As the change is above the countrywide average, two (2) points were given.

In terms of natural regeneration area (I-2); the total regeneration area in Artvin Forestry Enterprise consists of 62% natural and 48% artificial regeneration areas. According to the mean values, 42% of the natural regeneration was successful in the last 5 years. The area of regeneration was increased by 154% and the success rate was increased by 134% in the last 5 years. As the change is above the countrywide average, two (2) points were given.

No consistent change was observed in terms of illegal occupation of forestland and no crime (I-3) was committed regarding illegal occupation as of 2011. A change was spotted between the years 2007 and 2010 and as there was no record for the last year, the average of the last 4 years shows an increase of 495%. The change is above the countrywide average, yet given the smallness of the crime related areas, the indicator was evaluated as average and one (1) point was given.

Firewood consumption (I-4) in Artvin Forestry Enterprise was increased by 23% according to the data from 2011. As the change is negatively above the countrywide average, one (1) point was given.

The loss due to wildfires (I-5) was minimal in the last 5 years. Only a 0.5 hectares of forestland was burnt down due to wildfires in 2011. As the change is positively below the countrywide average, two (2) points were given.

A minor damage was spotted due to grazing (I-6) in 2007 and 2008 in Artvin Forestry

Enterprise. As the change is positively below the countrywide average, two (2) points were given.

In terms of licenses and servitudes (I-7); the total area subject to servitudes was decreased by 22% and the total amount of licenses given was decreased by 72% in the last 5 years. While the number of the paid licenses was increased relatively, the number of licenses given was decreased in total. The change is below the countrywide average. Yet, considering 1.4% of the total area is subject to licenses and given this rate is 0.3% countrywide, it was understood that the licensed area in proportion to the general area was above the average therefore it was evaluated as average and one (1) point was given (Çavdar, 2012).

Criteria #4 Production Capacity and its Functions:

In terms of integrated forest management plans (I-1); 6 out of 8 forestry departments of the Artvin Forestry Enterprise had their forest management plans prepared functionally. As Atila was classified as a national park, a long-term development plan was prepared for the management of the area. In fact, considering the new plans are prepared functionally countrywide, a positive tendency was observed and two (2) points were given.

Industrial timber production (I-2) was decreased by 40%, yet an increase in the mine timber and fibre-chip wood production was spotted as of 2011. The reason behind the increase in industrial timber production in 2007 and 2008 was the increase in the pests in the recent years (Anonymous, 2009). The change is below the countrywide average. Yet, considering the decrease in the firewood demand and the increase in the monetary value of the timber produced, it was evaluated as average and one (1) point was given.

In terms of increment-production equilibrium (I-3); the annual allowable cut (AAC) rate equals to 14% of the total increment in Artvin Forestry Enterprise. This trend serves for the purpose to increase the planted growing stock in terms of increment-production equilibrium. The change seems to be above the countrywide average. Yet, considering the production exceeded AAC between the years 2007 and 2010, this indicator receives one (1) point.

There is no practice available for non-timber forest products (I-4) in Artvin Forestry Enterprise. Therefore, this indicator receives zero (0) points.

Criteria #5 Protective and Environmental Functions:

The infrastructural facilities in Artvin Forestry Enterprise like settlements, roads, dams etc. are protective areas designated for flood and landslide protection. A 19% decrease in the protective areas was observed. Water basin protection area was increased by 1.6% due to the dam built in the Çoruh basin and land protection area remained the same. As the change was parallel with the countrywide average, each indicator received one (1) point, adding up to three (3) points in total (Çavdar, 2012).

Criteria #6 Socio-economical Functions:

It is observed that the value of the timber produced (I-1) was increased by 81% in the last 5 years. Despite the fact that industrial timber production was decreased, this increase in the value was due to the increasing market price of the timber. As the change was above the countrywide average, two (2) points were given.

As non-timber production is out of question, non-timber production value indicator (I-2) was evaluated as zero (0) points.

While the number of temporary and permanent workers was decreased, the number of technical personnel and other officials were increased in term of creating jobs (I-3). As the temporary workers were made permanent in 2007, the number of permanent personnel due increased. Besides, the decreasing loss due to pests in Artvin forests resulted in a decrease in the production

therefore a decrease in the employment (Anonymous, 2011a). The change was above the countrywide average, yet considering the decrease in the employment numbers, the indicator was evaluated as average and therefore one (1) point was given.

Artvin Forestry Enterprise didn't cooperate with forest dwellers and non-government organizations (I-4). The local people living in the Artvin Forestry Enterprise district are hired for the silvicultural practices like maintenance, cutting, regeneration etc. However, there is no protective practice in terms of village legal entity. In this context, indicator received zero (0) points.

In terms of forest crimes (I-5); 2007 was the year with most crime and 2011 was the year with least crime. The crime rate is gradually decreased due to the protective activities and out-migration. As the change was above the countrywide average, two (2) points were given.

Total of 28 indicators were investigated above for last 5 years and Artvin FE scored 36 points which means it has a trend of average sustainability. In this context, it can be said that Artvin FE is working on to realize the SFM.

An economical analysis, which wasn't included to the SFM C&I set, needs to be conducted in order to reveal a departments actual sustainability state. When the profit and loss statements of the department were examined, we can see that the loss of 6.4 million TL in 2007 was increased by 93.7% to 12.4 million TL in 2011. In other words, the department investigated from the point of SFM, is in a really bad shape when its profit and loss condition is added into the equation (Çavdar, 2012).

Conclusions:

This study introduces the evaluation method of the 'Sustainable Forest Management' on a Forestry Enterprise level using a set of criterias and indicators defined by the General Directorate of Forestry. Current situation shows that both the collection of the data for the SFM C&I set and the quality of that data have proved insufficient.

Important evaluations regarding several criterias and indicators are first conducted on the General Directorate of Forestry level using stand parameters and then generalized, especially in the process of collecting data on a FE level. Data recording and reporting system may be altered at the General Directorate of Forestry while preparing SFM reports, in order to obtain more accurate results.

Criteria #1 shows that the forestland, growing stock, increment and cadastred forestland were increased but the forestlands with a management plan were decreased.

According to the data related with Criteria #2, silvicultural practices and regeneration reliability shows a positive increase; and it was observed that most of the regeneration practices involved natural regeneration and their success rate was high. A negative increase in the disturbed forest rate was spotted, yet the data was unreliable therefore, this indicator was not properly measured. On the other hand, seed stands, seed gardens and the other registered seed sources show a decrease in the area.

Criteria #3 shows that the area affected by natural factors was decreased. Natural regeneration areas show a positive; firewood collection and illegal occupation areas show a negative increase. There is a decrease in grazing damage and wildfires. However, areas subject to certification and servitude are increased.

According to Criteria #4, areas managed by integrated plans were increased and these plans were prepared for functionality. No non-timber production was done and timber production was decreased; the total amount of increment and AAC were increased yet the timber production was decreased therefore providing a better level of increment-production equilibrium.

Criteria #5 shows that there was a decrease in the protected areas due to their protective

properties; and an increase in the water basin protection areas.

According to Criteria #6, the market value of timber was increased and forest crimes and number of jobs created were decreased. There is no record of non-timber production and cooperation with non-governmental organizations.

Artvin FE, when evaluated according to the SFM C&I set (which provides a range of score between 0 and 56), obtained 36 points in total and 1.29 points in average. It s clear that Artvin FE needs to improve on many aspects. The forestry industry is a combination of a business organization and a governmental institution. Artvin Forestry Enterprise is having a deficit in its budget for years now. This is mostly because the social and ecological values cannot be materialized and because it has to finance the Regional Directorate of Forestry as it is a branch of Artvin FE. If the profitability of the department is to be added into the equation, Artvin FE will suffer a negative evaluation. As a conclusion, it will not be accurate to say Artvin FE is successful, given the numerical results of this study and the management being in the loss.

References

Akyol, A., 2004. Türkiye'de Sürdürülebilir Orman Kaynakları Yönetim İlkeleri, Göstergeleri ve Uygulamalar, SDÜ Fen Bilimleri Enstitüsü, Master Thesis. 2004, Isparta.

Akyol, A., 2010. Sürdürülebilir Orman Yönetimi Ölçüt ve Göstergelerinin Türkiye Modeli. SDÜ Fen Bilimleri Enstitüsü, Phd. Thesis, 2010, Isparta.

Anonymous, 1993, Birleşmiş Milletler Çevre ve Kalkınma Konferansı, 3-14 Haziran 1992 Rio de Jenerio, Çevre Bakanlığı Yayınları Yeşil Seri:3 Ankara.

Anonymous, 2006. Artvin Orman Bölge Müdürlüğü Saçinka Orman İşletme Şefliği Orman Amenajman Planı

Anonymous, 2009, Artvin Orman İşletme Müdürlüğü 2009 Kriter ve Gösterge Değerlendirme Raporu, Artvin.

Anonymous, 2009b Artvin Orman Bölge Müdürlüğü Sürdürülebilir Orman Yönetimi Çalıştay Sonuç Raporu, Artvin.

Anonymous, 2011. Artvin Orman İşletme Müdürlüğü 2011 Kriter ve Gösterge Değerlendirme Raporu, Artvin.

Çavdar, 2012 The Evaluatıon Of Artvın Forestry Enterprıse In Certıfıcatıon Process, AÇÜ Fen Bilimleri Enstitüsü, Master Thesis, 2012.

ÇOB, 2009, Sürdürülebilir Orman Yönetimi, Stratejik Planlama, Standart Dosya Planı ve Resmi Yazışma Kuralları Hizmet içi Eğitim Semineri, 6-8 Ekim Antalya, Strateji Geliştirme Daire Başkanlığı, 2009.

DPT, 2001. VIII. Beş Yıllık Kalkınma Planı, Ormancılık Özel İhtisas Komisyonu Raporu, Uluslararası İlişkiler ve Karşılaştırmalar, Ankara.

Durusoy, İ., 2002. "Sertifikasyon ve Türkiye Ormancılığında Gerekliliği, Olabilirliği, Uygulanması Sürecinde Karşılaşılması Muhtemel Darboğazların ve Fırsatların İrdelenmesi" Karadeniz Teknik Üniversitesi Fen Bilimleri Enstitüsü, Yüksek Lisans Tezi, İstanbul.

Eminağaoğlu, Ö., Bak, F.E., 2009, Dendroflora of Artvin "Droc. Of The International Conference of the Biological Diversity od Adjara (southColchic)",94-108, 2009.

Fisunoğlu, M., 1998, Sürdürülebilir Kalkınma ve Ekonomi, Sürdürülebilir Kalkınmanın Uygulanması, Tartışma Toplantısı, TÇV Yayın No:126, s 61-75, Ankara.

İlter, E., Ok, K., 2004 Ormancılık ve Orman Endüstrisinde Pazarlama İlkeleri ve Yönetimi. Ofset Matbaacılık, Ankara.

Mrosek, T., 2002. Development and Testing of a Criteria and Indicators System for Sustainable Forest Management at the Local Level. Case Study at the Haliburton Forest & Wild Life Reserve Ltd., Canada. Doctor of Philosophy (Ph.D.), Graduate Department of Forestry, University of Toronto

OGM, 2006, Orman Genel Müdürlüğü, Orman Varlığımız, Ankara, 2006.

OGM, 2008, Sürdürülebilir Orman Yönetimi 2008 Kriter ve Gösterge Raporu, Ankara.

OSİB, 2011, Ormancılık İstatistikleri 2010, Orman ve Su İşleri Bakanlığı, Ankara

Otrakçıer, T., 2006. Sustainable Forest Management Criteria and Indıcators, GDOF Strateji Geliştirme Daire Başkanlığı, Ankara.

Özcan, M., 2008. Avrupa Birliği Ormancılık Politikaları ve Türkiye Ormancılığının bu Politikalara Uyumu, SDÜ Fen Bilimler Enstitüsü Yüksek Lisans Tezi, 2008, Isparta.

Rametsteiner, E.,2000, Sustainable Forest Management Certification, The Ministerial Conference on The Protection of Forests in Europe Liasion Unit, Vienna.

Şener, F.N., 2009 Türkiye'de Sürdürülebilir Ormancılık Uygulamalarının Sertifikasyon ve Akreditasyonunda Sivil ve İdari Yapılanma[Andırın ve Gökson Orman İşletme Müdürlükleri Örneği (2003-2007)].

URL-1:http://www.web.ogm.gov.tr/diger/SOYKriterleri/Dokumanlar/RİO Zirvesi.pdf Erişim tarihi: 13.10.2011

URL-2:http://www.web.ogm.gov.tr/diger/SOYKriterleri/Dokumanlar/IFF.pdf erişim tarihi: 11.09.2010

URL-3:http://www2,cevreorman.gov.tr/yasa/yonetmelik.asp Erişim Tarihi: 16.09.2011