



WHAT IS A FOREST? DEFINITIONS DO MAKE A DIFFERENCE AN EXAMPLE FROM TURKEY

*H. Gyde LUND*¹

¹⁾ Consultant, Forest Information Services, 6238 Settlers
Trail Place, Gainesville, VA 20155, USA.
email: gyde@comcast.net

Abstract

Estimates of forest area vary according to source and definition. How forest is defined can influence how deforestation, reforestation and afforestation can be interpreted. This paper, for example, illustrates some of the difference for estimates of forest land in Turkey and the Food and Agriculture Organization (FAO) of the United Nations and how different definitions of forest may be interpreted for deforestation, reforestation, and afforestation. Lastly I provide some suggestions for developing clearer definitions.

Keywords: Forest, deforestation, reforestation, afforestation, Turkey.

Özet:

Orman alanına ilişkin tahminler çeşitli kaynaklarda değişik tanımlara göre farklılık arzeder. Ormanın nasıl tanımlandığı ormansızlaşma, tekrar ormanlaştırma ve ormanlaştırmanın nasıl yorumlanabileceğini de etkileyebilir. İşte bu makale, Türkiye’de orman sahalarına ilişkin tahminlerin FAO’dan farklılıklarını ve ormanın farklı tanımlarının ormansızlaşma, tekrar ormanlaştırma ve ormanlaştırma açısından nasıl yorumlanabileceğini örneklendirmektedir. Ardından, daha açık tanımlar geliştirmeye yönelik bazı öneriler ortaya koyuyorum.

Keywords: Orman, ormansızlaşma, tekrar (yeniden) ormanlaştırma, ormanlaştırma, Türkiye.

a forest where it previously occurred; and ‘*deforestation*’ - the removal of a forest.

Introduction

A confession – I know nothing about Turkey or its forests. However, I do know something about terminology and definitions especially for the terms ‘forest’ and ‘forest land’. My observations and interpretations are those of an outsider looking in without any input other than that which I could find on the Internet. They are reflections of those that any reader may have.

The definitions that I cite are taken verbatim from the source documents. I commented on the definitions provided – not on what the author wanted to or should have written. I used Turkey as an example only because *Avrasya Terim Dergisi* is a Turkish journal and that seemed to me to be appropriate. I could have used almost any other country and the observations would have been the same. Anyway, here is what I noted.

The Situation

According to the General Directorate of Forestry (GDF 2009), Turkey’s forest area in 2004 was 21,188,746 ha. In 2010, while the Food and Agriculture Organization of the United Nations (FAO) shows Turkey’s forest area is about 11,334,000 ha (FAO 2010b). Did Turkey lose nearly one-half of its forest area in just 6 years? No, yet the same data and sources were used for both statistics. So why the difference - the use of different definitions of what is considered ‘forest’ (Figure 1).

And how ‘*forest*’ is defined can affect words like ‘*afforestation*’ - the creation of a forest where none previously existed; ‘*reforestation*’ - the reestablishment of



Figure 1 – Scene from the road to Ephesus. What areas are counted as ‘forest’?

Surprisingly, there are a multitude of definitions on what constitute a forest. Initiated by a request in 1998 from the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat, through the Subsidiary Body for Scientific and Technological Advice (SBSTA) and the International Union of Forest Research Organizations (IUFRO), I was among those who were asked to help define ‘forest’ and associated terms. Since then, I have been assembling various definitions of ‘forest’ or ‘forestland’ from dictionaries, glossaries, International organizations, national agencies and localities (provinces, states, counties, cities, etc.) To date, I have found nearly 1600. The definitions can be grouped into roughly four categories - Administrative, land cover, land use, or potential land capability (Table 1).

Table 1 - Summary of number of published definitions of ‘forest’ found as of 10 March 2013 (Lund 2013)

| Definition Type | Scope | | | | Total |
|--|---------|---------------|----------|-------|-------|
| | General | International | National | Local | |
| Administrative | 20 | 0 | 103 | 20 | 143 |
| Cover | 229 | 96 | 514 | 103 | 942 |
| Use | 62 | 47 | 201 | 110 | 420 |
| Land Capability (Biome, Ecosystem, Ecological, etc.) | 23 | 6 | 46 | 17 | 92 |
| Total | 334 | 149 | 864 | 250 | 1597 |

In the same search, I found nearly 240 definitions of tree (Lund 2013). While a 'tree' is usually considered a single-stemmed woody perennial, some national definitions include: palms, bamboo, shrubs, vines, creepers, stumps, canes, brushwood, bushes, climbers, coppice shoots, orchids, and roots (Lund 2002).

Lands considered administrative units are frequently identified on maps from cadastral surveys or from markings on the ground. Land potential is often based upon the soil, climate and location; land cover on vegetation present, and land use how the lands are employed.

Land cover and land use are often erroneously used interchangeably. To determine if a definition is land cover or land use, one simply has to ask two questions:

1. Can the land be covered with trees and be called something other than forest? An example would be an oil palm plantation or an orchard. If the answer is yes, then the definition is one of land use. If the answer is no, then the definition is one of land cover.

2. Can the land be void of trees and be called forest? An example would be a recent clear cut or perhaps a meadow. If the answer is yes, then the definition is one of land use. If the answer is no, then the definition is one of land cover.

Turkey's Forest Definitions

Turkey's definitions, based upon my limited literature review and understanding, morphed from a land cover, to a land use and to an administrative unit.

The first Forest Code (1937) defined forests as "areas covered by a collection of trees and shrubs grown either naturally or cultivated by humans, and producing woody materials or any kind of forest yield" (Güneş and Coşkun 2008). This appears to a very simple land-cover definition – but details for consistent identification are lacking. For example, what is the minimum size area that is to be considered, how much cover is needed to be considered covered and what is considered a tree? Over time, the definition has become more specific.

According to the official documents of Turkey, *A forest ecosystem is a natural unit consisting of all plants of which the main element is forest trees, animals and micro-organisms (biotic factors) in an area functioning together with all of the non-living physical (abiotic factors) factors of the environment. ...The forest area in terms of crown density is classified into two main groups. Forest area with the crown density of 11-100 percent is defined as productive forest area* eurasscience.com

constituting about 50 percent of the country's forest area while the area with the crown density of 1-10 percent, the remaining about 50 percent named as degraded¹ forest area (GDF 2009). Trees are defined as *plants of at least 8 m., or more height, have crowns and the wooden stems, at any age or diameter* (Source: Turkey's Forest Law No.6831 according to personal correspondence with Ersin Yilmaz yilmazersin@hotmail.com).

However, in Turkey, not all lands with trees are classed as forest. Exclusions include: *Sedges; the fields containing steppe plants; all kinds of prickly plants; parks; trees and groups of trees in city backyards and places in the territory of counties and villages; places existing in private areas and cultivated trees and small trees; registered places in territory of woody fields or separated or grouped places including agricultural activities with all kinds of benefit documents and private ownership and trees and tree groups in these areas; all kinds of trees in the fields less than 3 hectares as square meter out of woody places; ...places not including shrub or woody areas and places not having protection character* (GDF 1956). These exclusions make the definition of forest a land use.

The 21,188,746 ha estimate for 2004 was based upon this definition – 10,621,221 ha of areas with 10% or greater canopy cover (normal or productive forests) plus 10,567,526 ha of forests with less than 10% cover (degraded forests). The productive forest figure is very close to what FAO presented.

FAO's Definition

FAO's forest area estimate of 11,334,000 ha for Turkey for 2010 was based upon the following definition: *Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use.* FAO (2010a) has some additional explanatory notes attached to its definition as follows:

1. *Forest is determined both by the presence of trees and the absence of other predominant land uses. The trees should be able to reach a minimum height of 5 meters in situ.*

2. *Includes areas with young trees that have not yet reached but which are expected to reach a canopy cover of 10 percent and tree height of 5 meters. It also includes areas that are temporarily unstocked due to clear-cutting as part of a forest management practice or natural disasters, and which are expected*

¹ Degraded means a loss of productivity due to human intervention or natural causes. This means that at one time the land supported trees covering at least 10 percent of the land. I suspect that much of this area never contained many trees – so perhaps instead of 'degraded' forest, 'open' forest may be a more appropriate term. Degradation can occur in either category.

to be regenerated within 5 years. Local conditions may, in exceptional cases, justify that a longer time frame is used.

3. Includes forest roads, firebreaks and other small open areas; forest in national parks, nature reserves and other protected areas such as those of specific environmental, scientific, historical, cultural or spiritual interest.

4. Includes windbreaks, shelterbelts and corridors of trees with an area of more than 0.5 hectares and width of more than 20 meters.

5. Includes abandoned shifting cultivation land with a regeneration of trees that have, or is expected to reach, a canopy cover of 10 percent and tree height of 5 meters.

6. Includes areas with mangroves in tidal zones, regardless whether this area is classified as land area or not.

7. Includes rubber-wood, cork oak and Christmas tree plantations.

8. Includes areas with bamboo and palms provided that land use, height and canopy cover criteria are met.

9. Excludes tree stands in agricultural production systems, such as fruit tree plantations, oil palm plantations and agroforestry systems when crops are grown under tree cover. Note: Some agroforestry systems such as the "Taungya" system where crops are grown only during the first years of the forest rotation should be classified as forest.

Analysis

We obviously have a difference in definitions and in the thresholds used to characterize forest land in Turkey (Table 2).

Since the minimum area for FAO may be less than that of the GDF, FAO could classify more private land area as forest if they met the other criteria. The same may be said of the minimum tree height. However, the FAO ten percent threshold for forest cover is more restrictive than that of the GDF – i.e. GDF would classify more lands as forest than the FAO. In order to provide data to the FAO for its Global Forest Resources Assessment, the GDF had to reduce its forest area estimates using the FAO thresholds by subtracting its 'degraded forest land' from Turkey's total forest land - hence the difference in estimates.

Table 2 - Forest Thresholds

| Characteristic | GDF | FAO |
|---------------------|-----------------------------|----------|
| Type | Land cover/use | Land use |
| Minimum area | None specified ² | 0.5 ha+ |
| Minimum tree height | 8 m+ ³ | 5 m+ |
| Cover | 1% + ⁴ | 10 % + |
| Strip width | None specified | 20 m + |

Other Issues

When quoting a definition, make sure you get the terminology correct. For example, the wording "a natural unit consisting of all plants..." contained in the GDF (2009) definition given above can lead one to believe that only natural tree-covered areas are considered forests. A reader would therefore assume that plantations are not.

On the other hand, the version of Forest Law No. 6831, Article 1 (As Amended By Law No. 3373, 1987) states - Tree and woodland communities, which are grown by human efforts, are regarded as Forest, together with their lands (Knuth 2005). This can be interpreted that naturally occurring tree-covered areas may not be considered as forests. The amended law further implies that not only is the vegetation cover classified but the land itself. In reality both Turkey and FAO includes both natural and plantation lands in their forest estimates –but the readers of the reports would not know that.

Interpretations

For the most part, the GDF definition is one of land cover - any area with a tree crown cover of one percent or higher is 'forest' land. If that is the case then, deforestation would be the removal of tree cover below 1 percent; reforestation would be the re-establishment of tree cover one percent or greater; and afforestation would be the creation of tree cover of one percent or more.

Since FAO's forest definition excludes some lands having tree cover and includes some areas where tree cover is absent, it is a land use definition. That being the case, deforestation would be the change of

² Private lands that have the maximum 3 ha owned area, are outside the borders of forest, and covered with trees are not counted as forest. (Yalçin, 2012). The area threshold is the most decisive threshold for separating private forest from private non-forest (Ok and Kayacan 2005).

³ This threshold is essentially prescribed by lower level regulations (directives etc.), not by laws. According to MFWA (2013) five meters is now the threshold

⁴ This threshold is essentially prescribed by lower level regulations (directives etc.), not by laws. MFWA (2013) show that percent cover is now 10 %. If that is the case, the lands with less than 10 % (i.e. degraded forest lands) are no longer considered forests.

land use from forest to some other use – the removal of trees may or may not take place. Reforestation would be the re-establishment of forest land use where it previously existed – tree cover may or may not be created. Afforestation would be the change of a land use to forestry where it previously had not been used as such.

More recently, Turkey’s forest definition has become both a land use and an administrative unit. Edmund (2012) states, “*Clause 1 of Forest Law No 6831, (since it came into force in 1956), has always provided a Legal Definition of “FORESTS”. It does not define the boundaries of “STATE FORESTS.” It describes how Forest cover should be identified and delimited. Yet, in line with this, and previous directives, the Forest Cadastre Commissions regularly classify Private Registered Land as State Forest because it fits the Legal definition of Forest under Clause 1 of Law No 6831. The Turkish Government has effectively instructed the Forest Survey Commissions to treat the word “Forest” synonymously with the word “State Forest” in applying the text of the law. This inevitably leads to the classification of all Forest Cover as State Forest.*”

One can interpret this to mean that forest land is a state administration unit which is confirmed in 4785 law which nationalizes forest areas (Atasoy et al. 2004). In this case, *from the point of the Law of Goods, Forests are “unmovable property. They are a certain part of the Earth. They are compound goods as well. Combination of the land and plant cover forms forests. Plant is cover accepted as a fixture (Ayanoglu n.d.).* If the tree cover is removed from these nationalized lands, either temporarily or permanently, does the land remain State Forests? If that is the case, then deforestation would be removal of land from the State administration; reforestation would be the re-adding of lands that were once managed by the State, then removed and then returned to the State (Yalçın 2012). Afforestation would be the creation of State Administered Forest where they previously had not existed.

Table 3 summaries an interpretation of deforestation, reforestation and afforestation based upon if forest is defined as an administrative unit, land cover, land use or a combination of cover and use.

Table 3 –Literal interpretations of deforestation, reforestation, and afforestation based upon the definition of forest or forestland used (Lund 1999).

| Then literally | If the legal or official definition forest or forest land is | | | |
|------------------|--|---|---|---|
| | An administrative unit | A land cover | A land use | A combination land cover and use |
| Deforestation is | The act of changing the proclamation of the land to a category other than "Forest" | The act of reducing the tree cover to below the threshold value for "Forest." | The act changing the employment of the land to some other use other than forestry purposes. | The act of removing tree cover to below the threshold value for "forest cover" and changing the employment of the land to some use other than forestry. |
| Reforestation is | The act of re-proclaiming land previously listed as "Forest" as "Forest." | The act of re-establishing tree cover where it once existed to meet or exceed the threshold value for "Forest." | The act of reestablishing use back to forestry purposes. | The act of re-establishing tree cover where it once existed to meet or exceed the threshold value for "forest cover" and where the land has been or is currently used for forestry purposes. |
| Afforestation is | The act of proclaiming land as "Forest" where it was not previously (historically) so designated | The act of establishing tree cover where it previously (historically) has not existed, to meet or exceed the threshold value for “Forest” | The act of establishing forest use where it previously (historically) has not existed | The act of establishing tree cover where it previously (historically) has not existed, to meet or exceed the threshold value for “forest cover” where the land will be used for forestry purposes, where it has not been previously (historically) used for such employment |

From the above, it is obvious that one has to carefully define ‘forest’ so it cannot be misinterpreted.

Recommendations

It is clear that for one to understand what one means by ‘forest’ (and a tree is for that matter) clear definitions are required. Schoene et al. (2007) lists some key considerations for choosing and defining relevant terms as follows:

- They should be unambiguous and serve the purpose, i.e. providing estimates of and changes in land cover, land use or administration;
- Definitional parameters should be measurable during assessments (minimum area, crown cover, tree height, strip-width, etc.)
- Definitions should permit synergies and cost effective assessment and reporting, e.g. by being compatible with, or building on, related assessment and reporting processes such as the assessments developed by the FAO, UNFCCC and others.

Table 4 lists some of the basic criteria that one needs to define ‘forest’ under various schemes.

Table 4 - Basic information required for a variety of "forest land" classification schemes

| Administrative unit only | Land use only | Land cover only | Land use and cover |
|--------------------------|-------------------------|------------------------------------|------------------------------------|
| Location and boundaries | Location and boundaries | Location and boundaries | Location and boundaries |
| | + Owner's intentions | | + Owner's intentions |
| | | + Existing vegetation type | + Intended vegetation type |
| | | + Existing vegetation canopy cover | + Intended vegetation canopy cover |
| | | + Existing vegetation height | + Intended vegetation height |

How one defines and uses the term ‘forest’ requires careful consideration. When developing definitions, make sure you and others understand what

you really mean especially when they may apply to deforestation, reforestation and afforestation. Are you tracking and reporting on changes in land cover, use or administration? Can the changes be by any means or just by human intervention? For example when defining deforestation as the removal of tree cover, is that by any means or just by human intervention?

Be clear in use of definitions – for example, do the statistics on Turkey’s forest land include all lands (State, Public, and Private or both productive and degraded lands)? Be consistent in use of thresholds (Is 1% or 10 % the threshold for tree cover in Turkey? Is the minimum height for trees 5 meters or 10? Is there a minimum area threshold – 0.5ha, 3 ha, etc.?)

When providing statistics on forest land, deforestation, reforestation and afforestation provide the definitions upon which the estimates are made. When reviewing such estimates, make sure you know what the definitions were and how they were meant to be used.

Conclusions

I have used Turkey as an example but the same situations occur in most other countries. Our ability to effectively communicate depends on common understanding of terms and definitions. This is especially important when dealing with emotionally sensitive topics such as the state and management of forest resources. Having common understanding of various forestry terms is essential to avoid conflicts and misunderstandings especially when we are sharing, reviewing or comparing statistics.

There are many definitions of ‘forest’ depending on the collector and the intended use. In Turkey, ‘forest’ can be a land cover, a land use, or an administrative unit. Each could lead to different estimates of forest area for the country. Further, how ‘forest’ is defined can affect what is considered deforestation, reforestation and afforestation as discussed in this paper. Understanding the meaning of such terms as forest and forest land and associated statistics is a logical first step in reaching agreement on natural resource problems.

Hopefully this paper has provided some insight to the complexity of defining and in using a term as simple as ‘forest’.

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