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Global trends in forest ownership, public income and expenditure on forestry and forestry employment ☆

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ABSTRACT

This paper presents results of analyses of data from the 2015 Global Forest Resources Assessment on changes in forest ownership, public income and expenditure on forestry and forestry employment. Forest ownership continued to show less state control and ownership of forests. This was due to private-sector investment and, in some countries, the transfer of public forests to the private-sector (including local communities). This contrasts somewhat with results on public income and expenditure, which indicate that public expenditure on forestry has increased dramatically over the last decade, while income has increased by very little. Global employment in forestry has not changed much over the last two decades and has remained at about 12.7 million people, with the majority of these employed in informal activities, particularly in Asia. While production of many if not most forest goods and services has increased, labour productivity has improved at the same time, leading to this result. Comparing the results for groups of countries at different income levels, it appears that higher income countries tend to have a relatively high proportion of private forest ownership, high levels of labour productivity and high levels of public spending (per hectare) on forestry. However, apart from these very general differences in outcomes related to income levels, there does not appear to be strong correlation between these socioeconomic variables and other forest-related variables collected in the FRA.

1. Introduction

The structure of forest ownership and public sector income and expenditure on forestry are two major institutional variables that affect the way that forests are managed. Changes in ownership can occur as a result of transfers of forest from the state to the private sector or they can reflect different levels of investment in forest land management. Employment in forestry is one indicator of the socioeconomic benefits that are derived from forest management. It is important to note that for the purposes of this paper, employment in forestry is only that which occurs in the forest – up to the forest gate. Employment in transportation, processing, manufacturing and retailing of forest products is not included.

Ownership, management rights, income, expenditure and employment may be linked to wood production, forest area change, the designated purpose of forest management and other forest variables, although many of these factors are heavily influenced by macroeconomic dynamics outside the forestry sector (Contreras, 2000; Cañares, 2009).

1.1. Forest ownership

Forest ownership is a very rough indicator of the distribution of costs and benefits from forest management across different stakeholders in the public and private sectors (including different types of owner in the private-sector). Changes in forest ownership often follow large-scale political change – for example, the privatisation of land ownership in former Communist states or decentralization of government responsibilities for land management (Krott, 2008; Tomter, 2011). Shifts to decentralization of forest control have resulted in more control at more local levels over the past 25 years (Phels et al., 2010). In each of these cases (privatisation and decentralization) it may be difficult to detect significant impacts, negative or positive, in forest management. For example, Ribot et al. (2006) note that decentralization initiatives have been launched in the majority of developing countries, but these rarely lay the foundations necessary to reach decentralization's purported efficiency and equity benefits.

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1.2. Public sector income and expenditure on forestry

Public sector expenditure on forestry is a simple indicator of political commitment to sustainable forest management. It is also not an easy indicator to understand as differences in forest management costs and in income levels between countries are likely to have a major impact on this variable. Public sector income from forestry also provides useful information about the returns to the state from its support for forestry activities and comparing the two can show whether government involvement in the sector results in a net cost or net income to the government (Indufor, 2013). Income and expenditure data are difficult to find in part because in today's world government revenue and expenditure related to forests and forestry occur in multiple agencies. Production, recreation and conservation for example may all be funded through different departments with complex taxation and fee collection schemes.

1.3. Employment in forestry

Employment in forestry is an indicator of the social benefits derived from forests. Having a job brings many important benefits, including: providing a source of income, improving social inclusion, fulfilling one's own aspirations, building self-esteem and developing skills and competences (OECD, 2014). In addition, employment in forestry has always been and continues to be an important contributor to rural economies and to the livelihoods of people living in rural areas (Kastenholz, 2011).

Official statistics on forestry employment are often weak – largely due to informal and part-time activities. This informal employment includes people working in small-scale timber harvesting, wood fuel and charcoal production or collection of non-timber forest products. Despite the lack of data to produce a reliable global estimate of the informal employment, some country studies have shown that informal employment, especially in developing countries, is large and plays a crucial role in the livelihoods of rural areas (Cerutti and Tacconi, 2006; Forest Europe, 2014). Agrawal et al. (2013) mentioned that about 40–60 million people are employed in the informal forestry sector, while the findings of the recent State of the World's Forests report estimated this figure to be at least 41 million people (FAO, 2014).

2. Materials and methods

FRA 2015 was organized around 21 key questions grouped into eight topical categories for the years 1990, 2000, 2010 and 2015. FRA 2015 definitions, analytical categories, methods and applications are described in MacDicken (2015). For this paper, a listwise deletion method was used to select data for analysing trends, excluding all countries that did not provide data for one or more reporting year.[1] In addition, using the data to calculate the proportion of private forest ownership in countries, Pearson's correlation coefficients (r) were estimated to see if this was related to a number of other forest variables, such as the proportion of the total forest area used for production or under forest plantations or changes in the total forest area. Table 1 describes the reporting for each of the variables covered in this paper.

2.1. Forest ownership

A forest owner is defined in the FRA 2015 as an entity that has the legal rights to freely and exclusively use, control, transfer or otherwise benefit from a forest (FAO, 2010, 2012). This includes ownership of trees growing on land classified as forest, regardless of whether or not the owner of those trees also owns the land on which they grow. The FRA 2015 then divides forest ownership into the following three categories:

- *Public ownership* – forests owned by the state or lower-levels of government.
- *Private ownership* – forests owned by individuals and families, business entities and other private institutions, communities, or other types of private owner; and
- *Unknown ownership* – areas where ownership is unclear, unknown or disputed.

The public and private ownership categories are also further sub-divided into different types of owners (as listed above).

Information about the area of forests in each of the ownership categories was collected for four periods: 1990, 2000, 2005 and 2010 (Table 1). It is important to note that reporting was excluded for two significant forest area countries (Australia and Brazil) due to missing data.

Table 1
FRA 2015 reporting on ownership, income, expenditure and forestry sub-sector employment (1990–2010).

Topic	1990	2000	2005	2010
Employment				
Number of countries reporting	105	132	136	127
Forest area of countries reporting (1000 ha)	1,310,953	3,499,343	3,448,772	3,530,639
Percent of total forest reported (%)	32	86	86	88
Ownership (public)				
Number of countries reporting	177	183	187	184
Forest area of countries reporting (1000 ha)	2,950,921	3,332,131	3,422,597	3,880,771
Percent of total forest reported (%)	71	82	85	97
Income				
Number of countries reporting		110	126	115
Forest area of countries reporting (1000 ha)		2,995,567	3,006,334	3,179,230
Percent of total forest reported (%)		74	75	79
Expenditure				
Number of countries reporting		97	123	121
Forest area of countries reporting (1000 ha)		2,446,493	2,689,369	2,974,289
Percent of total forest reported (%)		60	67	74

2.2. Public sector income and expenditure on forestry

In the FRA 2015, public expenditure on forestry is defined as expenditure on forest activities of all government institutions (including at sub-national levels), but excluding publicly owned business entities (nationalised industries or state enterprises). It includes the total budget allocated to forestry and spent by all concerned institutions, including expenditures for administrative functions, reforestation funds, direct support to the sector (e.g. grants and subsidies) and support to other forest-related institutions (e.g. training and research centres).

Public sector income is defined to include all charges collected specifically from individuals and enterprises engaged in the production of forest products and services (e.g. concession fees and royalties, stumpage payments, public timber sales revenue, etc.), but excluding taxes and charges generally collected from all

[1] Other FRA reporting for a single year may include data from all countries, which will result in some differences in reported values with those reported in this paper.