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Specifics in the introduction of sustainability reporting by companies in the forestry sector

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ABSTRACT: Sustainability reporting is constantly paid attention by companies for its economic, environmental and social benefits. It supports making use of the wide potential for further development of enterprises and society. Individual sectors use types of indicators that correspond to their specifics. It is also the case of the forestry sector, which is especially characterized by a number of non-market outputs. However, we can find also other specific indicators that are relevant to forest management. The paper proposes indicators for sustainability reporting, which are not part of usual methodologies. These indicators will contribute not only to the formal preparation of sustainability reporting, but so that its benefits would be of significant influence on the development of forest enterprises and the forestry sector using its potential in all areas.

Keywords: ecosystem services; forest services; nonmarket outputs; forest enterprise; sustainable indicators

Disclosures of information on sustainable development are among the key preconditions for economic prosperity of businesses. It is obvious from the pressure frequently exerted by investors who invest in the medium and long term and want to have enough information about the risks and opportunities in relation to sustainable development, which is reflected, among others, in the scarcity of natural resources, climate change, quality of ecosystem services, etc. Information related to sustainable development has also positive impacts on the internal management and decision-making processes, which leads to reduced costs and lower consumption of material and energy (Roman et al. 1999). The positive impact on corporate economics is reflected in the improvement of innovation activities and competitiveness.

Practical experiences have confirmed that sustainability reporting helps towards a win-win-win solution for all the economic, environmental and social aspects of the enterprises. The aim is to improve the economics of organizations, their impact on the environment as well as establish social profitability as acknowledged by the notion of an organization internalizing its externalities (Hájek et al. 2012). The communication with the public is also important. Public understanding of multifunctional and sustainable forest management may be at a relatively low level (Riedel, Šišák 2013).

The article is focused on forestry outputs and their reflection in the system of sustainability reporting. Important are possibilities how to use results of research in practice on the level of forest enterprises. In addition, the article includes practical examples and guideline how to use the proposed approach. Annual reports in forestry are very often focused only on economic indicators which are based on expended costs and only on sales from those forest functions that pass through the market (Šišák et al. 2013). Other functions of forests are not included in annual reports. These functions are of considerable value. Market functions represent 22–40% of the total value of forest functions in the Czech Republic.

MATERIAL AND METHODS

The aim of sustainability reporting is to provide universal tools for communication of information

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with regard to the current needs of society, with the possibility of implementing various changes in future periods without disrupting the overall information value (Hahn, Kühnen 2013). Versatility is considered a very important factor. On the other hand, it is possible to extend the general rules for the important specifics of a sector such as forestry. In particular, this means to include the value of all ecosystem functions produced and other specifics and incorporate them into groups of indicators.

Most commonly used for sustainability reporting is the methodology of the Global Reporting Initiative (GRI). However, also other methodologies can be used:

- On 16 April 2013, the European Commission presented a proposal to amend the Directive as regards disclosure of non-financial and diversity information by certain large companies and groups. Non-financial information is considered information on environmental and social issues and on corporate governance. This also includes data relating to diversity, because the composition of the management and supervisory bodies is an integral part of corporate governance.
- Integrated reporting is a new approach to corporate reporting created by the International Integrated Reporting Council (http://www.theiirc.org/). It emphasizes the links between corporate strategy, management, financial performance and the social, environmental and economic context. It can thus strengthen corporate decision-making on sustainability issues, and allow investors and other stakeholders a deeper understanding of corporate performance.
- Basic Guide to Communication on Progress (http://www.unglobalcompact.org) was issued by UN Global Compact 27, which was established under the auspices of the United Nations Organization in 2000 as a platform for the development, implementation and disclosure of socially responsible policies and activities.
- OECD Guidelines for Multinational Enterprises (http://www.oecd.org/) are the OECD guidelines for multinational enterprises, released by the OECD already in 1976. Since then it has been updated five times, most recently in 2011, and in 2013 it was translated into Czech and published by the Ministry of Industry and Trade.
- Following the document from the UN RIO+20 conference (The Future We Want) there arose an initiative to paragraph 47 which focuses on corporate sustainability reporting – Group of Friends of Paragraph 47, this initiative is supported by the UNEP and GRI.
- LBG is the internationally recognized standard for measuring corporate community investment. More than 300 companies (http://www.lbg-online.net/) around the world use the LBG Framework to measure, manage and report the value and the achievements of the contributions they make (Papenfuss 2014).
- ISO 26000 encourages organizations to discuss their environmental and social responsibility issues and possible actions with relevant stakeholders including customers, employees, suppliers and investors. ISO 26000 encourages socially responsible behaviour for environmental issues.
- SA8000 is recognized worldwide as a reference standard for social responsibility and is the internationally most recognized benchmark for socially responsible management of human resources.

Most methodologies complement each other and thus form a system framework for a unified approach to implementing sustainability reporting. They have a defined relationship to GRI methodology and complement it. This includes, for example, the context of GRI methodology with integrated reporting (GRI 2013b).

GRI (2013c) developed a methodology containing standardized indicators for social responsibility reporting and sustainability reporting. Reports prepared in this way can be used for benchmarking of present progress in accordance with law, codes and standards valid in the reporting period (Willis 2003). This tool can also be useful for the introduction how the organization (the owner of the forest) is influenced by expectations in the area of sustainable development.

Rules for the preparation of reporting include a descriptive part and a practical part of the application itself (Marimon et al. 2012). Enterprises can choose from a wide range of themes that should be included in the annual report. The themes should be selected on the basis of the importance and usefulness to stakeholders. In the rules, three areas for the preparation of reporting are proposed: economics, environment and social aspects (Vincent, Binkley 1993). Indicators for these areas are set so that they are concise and understandable to stakeholders. The company determines the degree of evaluation according to the methodology, taking into account the necessity to keep it complete, transparent, predicative (Brown et al. 2007; Ahmed et al. 2014). A big mistake may be limiting the information that may cause the annual report to give the impression of being confused and incomplete. The determination of the degree of evaluation should be based,

among other things, on the internal and external factors, such as corporate management strategy or social aspects (GRI 2014).

The information and the themes should be published in a way allowing readers to sufficiently analyse changes in the company performance for the reporting period and allowing a mutual comparison between companies (Milne, Gray 2013). GRI rules comprise three groups: profile, managerial approach and indicators of performance. The paper focuses on performance indicators. The indicators allow to acquire comparable data on the performance of companies in selected areas (sectors) (Ahmed et al. 2014).

One of the main purposes of reporting is to inform stakeholders (Milne, Gray 2013). Reporting should not only lead to mechanical completion of the required data according to established rules. Reporting represents a complex of relevant information that can be used to improve the company management and public awareness. The main benefit of reporting may be obvious if the so-called significant statistical data is used.

Specifics of forest management. In spite of the fact that generally known methodologies can be applicable in different sectors, it is appropriate to take into account the criteria that are sector-specific. GRI methodology addresses in detail important sectors such as electric utilities, financial services, mining and metals, oil and gas. The sector of "Forest and Paper Products – Forestry, Timber, Pulp and Paper, Rubber" is included in the detailed specification (GRI 2013a), where the detailed context of the indicators in this area is described. Yet there are not taken into account all the specificities of forest management resulting, for example, from the publication by Klemprerer (2003), i.e. simultaneous outputs, many of which are not easily sold in the market, harvesting can cause unpriced negative side effects (externalities), clashes between public right and private property right because of nonmonetary outputs and externalities, the standing tree is both the factory and the final product, forestry involves long production period and uncertainty, etc. (Caeiro 2013, Ramos et al. 2013).

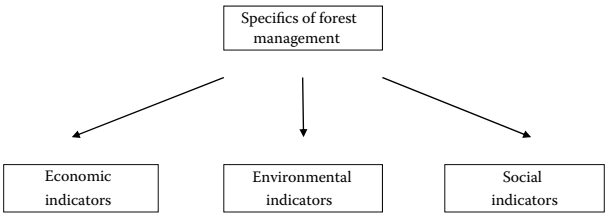

Fig. 1. Specifics of forest management broken down into individual pillars of sustainability reporting

Research methodology is very often focused on definitions of the forestry outputs because forestry is a unique sector which produces a lot of positive externalities (Schmithüssen 2007; Papenfuss 2014). Due to the special position of forestry it is necessary to find methods how to modify and use the general rules of sustainability reporting. Practical examples show how to handle externalities and their use in the methods of sustainability accounting (Kovalčík et al. 2012) (Fig. 1).

Forest ecosystem services are differentiated by their socio-economic content (Šišák 2013). The following table shows a breakdown of these functions into separate pillars for the purposes of sustainability reporting (Table 1).

Based on the methodology for the valuation of forest ecosystem services (Šišák 2013b) it is possible to quantify their value and in the evaluation of individual indicators to present it in reporting. More specifics of forest management can be described in the framework of different areas (Hector et al. 2014).

Economic indicators. The economic dimension of sustainability concerns the organization's impacts on the economic conditions of its stakeholders, and on economic systems at local, national, and global levels. GRI methodology includes the following groups of indicators: economic performance, market presence, indirect economic impacts and procurement practices. Forest enterprises may

Table 1. Breakdown of forest ecosystem services into different parts of the indicators

Forest services	Economic pillar	Environmental pillar	Social pillar
Market	timber production hunting and game management other market services		
Non-market		soil-protective hydrological forest air protective forest	non-wood forest production health-hygienic forest cultural-educational

furthermore quantify the value of ecosystem functions of the forest for the reported year.

Among the forest ecosystem functions which pass through the market, we classify timber-producing function, services in the area of hunting and game management, or other market functions related to forest management. The value of timber-producing function can be expressed by revenues from the sale of timber (Frias-Aceituno et al. 2014).The value of services in the area of hunting and game management corresponds to sales in this area, i.e. the lease of hunting grounds, charges for game shooting, etc. (Krieger 2001). Since forest management through its outreach provides ecosystem services not only to the private sector, but many of their services are of greater relevance to the entire society, the provided services can be considered public services (Ventrubová, Dvořák 2012).

In general we can say that economically efficient are considered those business activities that involve maximizing the benefits or minimizing the costs to achieve a certain goal pursued. In the case of forest management this means to maximize revenues from the sale of timber, which takes the form of maximizing the realization through the appropriate assortment of sold timber. In addition to this approach it would be recommendable to quantify the annual value of all non-production ecosystem services and increase revenues achieved by production ecosystem services. The revenues increased in this way can then be used in the financial analysis and quantify this modified coefficient of efficiency, profitability, etc.

In addition to ecosystem functions an important specific of forest management is the long-term nature of management, which is due to the felling rotation. In the case of annual reports, therefore, there occurs a certain disharmony in the sense that the annual report presents economic results for one year, but an objective assessment of the economic results would require a longer period of time (Prabhu et al. 1998). It is therefore necessary to consider the appropriate way of how to assess the economics of forest enterprises in annual reports and consider the long-term economic development so as to preserve the informational value and so that the information benefits will contribute to a decision-making of interest groups.

Environmental indicators. The environmental dimension of sustainability concerns the organization's impact on living and non-living natural systems, including land, air, water and ecosystems. GRI includes the following basic groups of indicators: materials, energy, water, biodiversity, emissions, effluents and waste, products and services, compliance, transport, total environmental protection expenditures, supplier environmental assessment, environmental grievance mechanisms.

In the forest sector indicator material used by weight or volume (GRI 2013c) is of specific significance, which is given by the fact that the most important material in the production process is timber, which is an important renewable resource. This is associated with the efforts to achieve the highest quality final product (assortment) and the best possible realization.

As regards water, according to the methodologies water consumption is monitored. In the forestry sector, on the contrary, hydrological forest services are concerned. These services consist of reducing maximum runoff in water streams, enhancing minimum runoff in water streams and protecting water quality (especially against contaminations with nitrogen oxides). Such forest services influence market relations, they have a mediated market character. Socio-economic valuation of the hydrological forest services was based on the "costs-of-prevention approach" (Šišák 2013b). The costs were calculated for technical measures like retention reservoirs and other constructions and technical equipment substituting the respective hydrological forest services reducing maximum runoff in water streams, enhancing minimum runoff in water streams and reducing the content of nitrogen oxides in water streams and reservoirs.

As regards biodiversity, commonly described are protected areas and endangered plants and animals and the negative impact of production on biodiversity is monitored. Forest management has a direct impact on biodiversity and important is the manner of forest management. Therefore, the indicator in this area may be, for example, the use of selective method of management, increasing the proportion of deciduous trees in woody species composition, and the best management practices by forest management plan.

In the area of CO_2 emissions, in the forest sector there is a different manner of monitoring again, because there is no production, but rather consumption. Air protection forest services influence market relations as the trade with CO_2 permits is developing (Maroto et al. 2013). Nevertheless, it is true that carbon-emissions trading can become direct market-based goods in the near future. Socio-economic valuation of CO_2 sequestration was based on the average unit price of international

trade with CO_2 permits in Europe and annual amount of CO_2 sequestered in timber increment. The value of these forest services varies in accordance with the CO_2 market price movements.

Social indicators. The social dimension of sustainability concerns the impacts the organization has on the social systems within which it operates. The Social Category includes the sub-categories (GRI 2014) labour practices and decent work, human rights, society and product responsibility.

Employees of forest enterprises are a very specific group (Kaňok 2007). Their work is carried out during the year under varying conditions (especially climate and conditions in the workplace in question). In recent years, the forest sector has been facing a steady decline and the loss of skilled workers, especially in felling activities for which there is no equal substitute in the labour market (Duncker et al. 2012)

In this context (Toppinen, Korhonen-Kurki 2013), also the emphasis on occupational safety training in the forest sector should be noted. In the whole country, forestry in terms of the number of work injuries per 1,000 employees and in terms of the severity of their injuries belongs to the most dangerous sectors (Albizu et al. 2013). The most risk posing activity in the forest sector is felling trees, skidding and removal of timber. Work injuries and fatal work injuries occurring in the context of performing these activities are in the majority of cases due to a constantly decreasing level of professional qualifications and the related failure to observe safety regulations.

Information about staff turnover in the forest sector is closely related to the seasonality of work (Toppinen, Korhonen-Kurki 2013). On the other hand, the system of work organization has a positive impact on regional employment. Therefore, the employment of local residents is an important indicator.

The social area is also related to certification systems (Glura 2007). Currently, in the Czech Republic there are two certification systems, covering the certification of forest management and certification of consumer chain. One of the independent organizations providing the certification is PEFC (Programme of the Endorsement of Forest Certification Schemes, formerly Pan European Forest Certification). In the Czech Republic, more than 70% of forests (approx. 400 individual forest owners) are certified by PEFC system. Competitive FSC (Forest Stewardship Council) system was used to certify only 2% of forests (PEFC 2014). Growing numbers of consumers demand environmentally responsible products. The standard of consumer chain of forest products is designed to allow its implementation within existing standards ISO 9000 and ISO 14000 (Kwanhatai et al. 2012) and, at the same time, not to create space for increasing workload or costs (PEFC 2014). While the abovementioned certification bodies will focus mainly on sustainable forest management, guaranteeing to consumers the products that are in compliance with sustainable development.

The proposed forest enterprise-specific indicators. Based on the definition of the main specifics of forest management, indicators for sustainability reporting have been proposed. The new directive GRI G4 simplified reporting mainly for smaller businesses that do not elaborate their socially responsible strategy into all existing CSR pillars (Kašparová, Kunz 2013). Reporting can be prepared in a simpler form failing to meet the prescribed number of indicators, but concentrating on the most important ones. Therefore, among the proposed indicators those that best meet specific conditions can be chosen.

The important point is that in assuming the viewpoint of society as a whole, we must take unbiased account of the full range of social benefits, whether they are priced or not (Zhang 2005; Zhang, Pearse 2011). Indicators are therefore presented not only in physical, but also in monetary units (Table 2).

RESULTS AND DISCUSSION

CULS Forest Establishment at Kostelec n. C. l. was selected for practical verification of the proposed indicators. It was established pursuant to Act No. 111/1998 on Universities, as a special-purpose facility within the organizational structure of the Czech University of Life Sciences Prague (CULS) in accordance with the position and programme specified by the CULS Statute. Its main activity focuses on the material and human resources for learning and practical training, students' exercises, excursions, operation of demonstration objects placed within the premises of the facility and the provision of board and lodging services for CULS students and teachers. The main activity has been extended to ensure conditions for the daily teaching and combined studies in the educational facility of the castle in Kostelec nad Černými lesy. CULS Forest Establishment manages an area of 6,721 ha of forest.

CULS Forest Establishment prepares annual reports pursuant to the Accounting Act. These re-

Table 2. Proposal of indicators

Part	Indicator	Method of evaluation
Economic	timber-producing function	timber sales in CZK
	hunting and game management function	sales in CZK
	efficiency coefficient including non-market forest services	monetary expression
Environmental	realization of raw wood	value in CZK/m^3 and annual trend
	hydrological forest services	description, costs, annual value
	soil-protective services	costs, annual value
	air protective forest services	annual value
	degree of forest naturalness	point value
Social	non-wood forest production services	annual value
	health-hygienic forest services	description, area, costs, annual value
	cultural-educational services	description, area, costs, annual value
	employment of local residents	% of employment of local residents
	acquired certification of products and management system	description
	other activities affecting sustainable development of forest management	description, financial indicators

ports include all the relevant economic and financial information on the management. Should the CULS Forest Establishment prepare a sustainability report, also environmental and social areas would be included. In addition to indicators proposed, for example, in the GRI methodology, it would be appropriate to specify also the indicators resulting from the specific status of forest management, or CULS Forest Establishment. Table 3 shows such specifics, using known data from the annual report for 2013, or other data sources of this organization. In the case of regular reporting it would be recommendable to establish a more detailed information system as a support for the annual preparation of these indicators.

The economic indicators include forest ecosystem services which are reflected in the profit of the organization in 2013. The functions in question are timber-producing and game management functions. In addition to these functions the economic part also includes the value of non-market functions, by which it is possible to increase sales and calculate the modified financial indicators. The value of these non-market functions is 80,040 thousand CZK and is twice as much as the value of market functions. In the case of corporate

Table 3. Evaluation of selected indicators for 2013 in the organization CULS Forest Establishment at Kostelec n. C. l.

Part	Indicator	Evaluation
Economic	timber-producing function	40,393 thousand CZK
	hunting and game management function	968 thousand CZK
	value of non-market forest services	85,040 thousand CZK
Environmental	realization of raw wood	see comment below
	hydrological forest services	10,800 thousand CZK
	soil-protective services	7 thousand CZK
	air-protective forest services	6,040 thousand CZK
	degree of naturalness of forest	3
Social	non-wood forest production services	9,073 thousand CZK
	health-hygienic forest services	17,293 thousand CZK
	cultural-educational services	41,827 thousand CZK
	employment of local residents	100%
	acquired certification of products and management system	PEFC certification

Source: CULS Forest Establishment at Kostelec n. C. l.

sustainability reporting, so far GRI methodology without the valuation of all forest ecosystem services has been in use (Toppinen et al. 2012), although the value of non-production functions represents multiples of market functions. It is therefore desirable that reporting also includes the quantification (valuation) of these functions. The profitability is often based on the growth and yield of the stand, and it is a well-established fact that silvicultural measures may have a considerable impact on wood production and its financial value (Kojola et al. 2012). The value of non-production functions is often part of statistical data, such as national green accounting (Bios, Goio 2009).

The indicator of raw wood realization is not quantified. In this case it is necessary to find a suitable indicator which would sufficiently express the management of raw wood. It can generally be stated that within the economic activity of the assessed organization the maximum realization of raw wood is supported. In addition, part of felled raw wood is further processed in the company's own lumber-mill, which results in even greater realization, compared to the only sale of felled raw wood in demanded assortments. Also in the case of CULS Forest Establishment at Kostelec n. C. l. it is paying to sell the finalized product, not the raw wood.

Calculation of the value of non-market forest functions was based on the comparison with non-forest land or grassland. One of the most important forest ecosystem functions is hydric function, comprising maximum flows, minimum flows and water quality. Calculation of the value related to the maximum flows was based on forest vegetation zones, average soil texture, average stand density and age, and the coefficient of forest weight according to the percentage of forest land in the catchment area. A certain level of forest 'disturbance' may be beneficial in creating resilience within the catchment to ensure an ongoing supply of high-quality water and other ecosystem services at low cost to local communities, but a limit on the level of disturbance over 5–10 year periods is recommended (Webb 2011). The evaluation of soil-protective function or potential water erosion was based on the maps of soil erosion – classification according to Stehlík. Optimal land use management can thus provide a way to reduce soil erosion while achieving the maximum net benefit (Jing-Cheng et al. 2013).

Calculation of air-protective function was based on the rate of 1,000 CZK per hectare of forest and the rate was related to the area of forests used for production (excl. national nature reserve). This function represents 15% of the timber-producing function. However, we can find examples where the value of air-protective function – carbon sequestration exceeds the value of the timber-producing function (Depro et al. 2008). In the case of public forests, the value of this function can even be flexibly increased by reducing felling.

In the social area, calculation was made for forest without differentiating to forest fruits and products (mushrooms, blackberries, etc.). The average rate was used for all regions, although the long-term statistical investigations show that in the Central Bohemian Region twice as much of forest fruits and products are picked, compared to other regions. Health and hygiene function was also calculated for the entire managed forest area. These ecosystem functions relate to the flow of visitors of the forest and, therefore, method of travel costs or surveys of the number and frequency of visits often associated with questionnaires are used in individual cases for the evaluation of these ecosystem functions (Klemperer 1996, Rönnqvist 2003).

The value of cultural and educational functions of forest is based on the mission of the organization, i.e. that it primarily serves for teaching students. Moreover, 681 ha of national nature reserve, 288 ha of forest under the NATURA 2000 system and 125 ha of research areas fall within the scope of the organization. After calculating the total value, the result was multiplied by the coefficient of 1.2 for the degree of forest naturalness 3 (Šišák 2013a). In this context, the influence of felling on nature conservation is often discussed. This stems from the fact that it is necessary to choose the optimal solution to the felling method and felling volume so as to maintain the subject matter of nature conservation (Klemperer 1996; Nalle et al. 2004). The assessment of optimization between felling and nature conservation, however, cannot be expressed by an indicator, on the other hand, it could be included in the comments.

An important indicator in the social area is employment of local residents. For CULS Forest Establishment at Kostelec n. C. l. it can be stated that all middle-management employees and workers are employed in the territory of the organization. The result confirms that forest management is an important industry providing employment in regions (Lien et al. 2007). This is also the reason for aiming the indicator towards local employment. It is also related to the rural regeneration (Kabir, Webb 2005), which is an important task today.

CONCLUSION

Sustainability reporting is one of the key tools of the sustainable development strategy. For the time being, it remains in most countries as a voluntary tool, however, interest in its use within the annual reports is constantly increasing (KPMG 2013). This implies its broad benefits through strengthening the relationship with investors and stakeholders, integration, improving internal and external communication of companies, identifying new opportunities for innovation, effective implementation of new regulatory requirements, etc.

Forest management plays a much more important role compared to industrial enterprises. Aspects of sustainable development are linked om a broader scale with the economic, environmental and social aspects through the production of ecosystem services and other specifics.

The proposed indicators extend the application of sustainability reporting in forest management, thus deepening its benefits. Among other things, larger awareness of investors and the general public of forest management and societal benefits can be expected. The use of these indicators will also widen the space for the management decision-making through taking into account all of the forest ecosystem services and allowing a broader view of economic efficiency of forest management.

The proposed indicators extend the general approaches of sustainability reporting and enhance thus its benefits for forestry. The main effect of the presented indicators can be seen that forest enterprises are more comparable in the public view. It is also possible to expect a deeper awareness of both investors and the general public of forest management and its societal benefits. The use of the proposed indicators also expands the scope for management decision-making in favour of all forest ecosystem services and with a higher effect in environmental and social aspects of management. When making decisions, managers should be more aware of the real value of the forest (including the capitalized value of all ecosystem services). Financial analysis can be extended by the value of all ecosystem services and decision-making would not be derived only from market ecosystem services. Monitoring indicators in the social area should have a positive effect not only on employees, but also on better economic results.

Currently, an increased interest in the use of sustainability reporting among enterprises and at the national and international levels can be noticed. In connection with this trend it can be expected that indicators specific to forest management will further be refined, including the design of a uniform methodology for their monitoring. This will also allow to learn more about their benefits for enterprises and society.

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