

# The costs and cost accounting model (simplified) in State Forests National Forest Holding

## Koszty i model rachunku kosztów w Państwowym Gospodarstwie Leśnym Lasy Państwowe

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### Abstract

**Purpose:** The article aims to: (1) revise the costs and cost accounting model in State Forests National Forest Holding (PGL LP), (2) investigate the possibility of applying resource-process consumption accounting in the activities of the State Forests.

**Methodology/research approach:** A critical analysis of the literature, desk research, analysis of phenomena, synthesis of results, and a case study.

**Results:** A systematic, traditional cost accounting model is used at State Forests, which is mainly used for reporting purposes. It is possible to use the resource-process model of cost accounting from the perspective of its usefulness in disclosing information about the implementation of social and environmental goals in the activities of State Forests.

**Research limitations/implications:** The proposed cost accounting model was constructed with State Forests in mind as a specific unit operating in the field of social responsibility.

**Originality/value:** The article proposes solutions for modeling an accounting system, including resource-process cost accounting.

**Keywords:** costs, processes, cost accounting, State Forests, information.


### Streszczenie

**Cel:** Celem artykułu jest: (1) rewizja kosztów oraz modelu rachunku kosztów w Państwowym Gospodarstwie Leśnym Lasy Państwowe (PGL LP), (2) identyfikacja możliwości zastosowania zasobowo-procesowego rachunku kosztów w działalności Lasów Państwowych.

**Metodyka/podejście badawcze:** Metody badawcze to krytyczna analiza literatury, analiza źródeł wtórnych, analiza zjawisk i synteza wyników oraz studium przypadku.

**Wyniki:** W PGL LP prowadzony jest systematyczny, tradycyjny model rachunku kosztów, który służy głównie celom sprawozdawczym. Zasobowo-procesowy model rachunku kosztów z perspektywy jego przydatności w ujawnianiu informacji o realizacji celów społecznych i środowiskowych jest możliwy do zastosowania w specyficznej działalności PGL LP.

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**Ograniczenia/implikacje badawcze:** Zaproponowany model rachunku kosztów został skonstruowany z myślą o Państwowym Gospodarstwie Leśnym Lasy Państwowe jako specyficznej jednostce działającej z zakresie społecznej odpowiedzialności.

**Oryginalność/wartość:** Wskazanie propozycji rozwiązań w zakresie modelowania systemu rachunkowości, w tym zasobowo-procesowego rachunku kosztów.

**Słowa kluczowe:** koszty, procesy, rachunek kosztów, Lasy Państwowe, informacja.

## Introduction

Forests are the basic resource of the State Forests National Forest Holding (PGL LP) and remain under the management of PGL LP. PGL LP conducts forest management by managing land, other real estate, and movables related to forest management<sup>1</sup>, as well as keeping records of the property of the State Treasury. Forests are related to the production of standing timber and sawing timber<sup>2</sup>, and also the implementation of numerous non-production functions<sup>3</sup>. Forests perform environmental and social functions, including tourism and recreation, as well as health functions. The environmental functions include climatic, hydrological, soil, filtration and detoxification, biocenotic, and landscape functions (Korelski, 2000, pp. 9–10; Bowden, 2017, pp. 1–14; Gifford. 2014). In forestry, the basic means of production are soil and tree stands produced by nature and humans.

When setting goals, the PGL LP must take into account the tasks imposed on it by national law and international regulations. They determine the place of the PGL LP in the economic system of the country and the framework for its functioning, including the level of revenues and costs, as well as the principles of creating and using resources. Conducting sustainable<sup>4</sup> and multifunctional forest

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<sup>1</sup> Forest economy is forestry activity in the field of forest management, protection and development, and maintenance and expansion of forest resources and plantation, animal management, acquisition – with the exception of purchasing – wood, resin, Christmas trees, stumpwood, bark, needles, animals and undergrowth fruits, and also the sale of these products and the implementation of non-productive functions of the forest (Forest Act, Article 4 (4)).

<sup>2</sup> In forestry, unlike other sectors of the national economy, there are two areas of forest production: „standing timber” production and „sawing timber” production. The term standing timber production should be understood as the implementation of tasks (works) related to forest management. The measure of the effect of this range of forest production is the current increase in the volume of stands. The concept of sawing timber production is understood as the implementation of tasks (works) in the field of forest use (timber harvesting). The measure and effect of this scope of forest production is the size of forest use (<https://www.encyklopedialesna.pl>; retrieved: 18.12.2020).

<sup>3</sup> Non-productive functions of forest include ecological and social functions, e.g., soil and water protection functions, protection against avalanches, as well as didactic, tourist, recreational, and educational functions (Kožuch, Adamowicz, 2016).

<sup>4</sup> Sustainable forest economy – a multifunctional forest economy involves maintaining biodiversity, production, and regeneration capacities, as well as the social functions of forest ecosystems (Zawadzki, 2020).

management correlates with high employment costs, high costs of maintaining forest infrastructure, and other costs of resources that are necessary for running a business and fulfilling all the economic, ecological (environmental), and social functions of forests.

The PGL LP comprises the following institutional units (Adamowicz, Szczypa, 2016, pp. 214–223):

1. General Directorate of State Forests.
2. Regional Directorates of State Forests.
3. Forest districts.
4. Forestry.
5. Forestry companies.
6. Other organizational units.

Forest districts are units that perform all typical activities related to production and non-production forest management. They generate income and bear certain costs. Nowadays, costs are one of the most important economic categories that determine the success of an economic entity, with managing them being one of the important tasks of this entity. Cost accounting is a cost information system that can be run using various models. Bearing in mind the growing demand for a variety of information on the activities of the entity in the field of environmental protection and social environment, it becomes necessary to calculate and determine the costs of processes, activities, and resources. Sustainable cost management can be considered a multidimensional task of a socially responsible entity such as the PGL LP from the perspective of the cost impact assessment and the impact of the cost level on the environment of the entity.

## **1. Objective and methodology of the research**

The forest is a public good, and managing it requires certain costs. The research area of the study is the PGL LP's costs and the cost accounting model. The activities carried out by the PGL LP have a significant impact on the quality of life. On the one hand, this entity satisfies the needs of the economy (wood production); on the other, it meets human needs (non-productive functions) and has an effect on living conditions by interfering with the natural environment and the use of natural resources, which is correlated with bearing specific expenditures and costs. The study will examine measurable and hard-to-measure (unmeasurable) costs.

The author asked the following questions:

1. How are PGL LP's costs described in the accounting policy?
2. How are costs grouped in PGL LP's corporate chart of accounts?
3. What cost model is currently used in PGL LP?
4. Is it possible to apply the resource and process consumption accounting model in the specific activities of the PGL LP from the perspective of its usefulness in disclosing information about the implementation of social and environmental goals?

The article aims to: (1) revise the costs and cost accounting model in the PGL LP, and (2) investigate the possibility of using resource and process consumption accounting in the activities of the PGL LP. 1

The thesis states that PGL LP keeps systematic cost accounting that is subject to the requirements of obligatory external reporting, which results in its limited usefulness in disclosing information about the achievement of economic, social, and environmental goals.

In order to confirm the thesis, the following research methods and techniques were used:

- critical analysis of the literature,
- desk research,
- case study,
- analysis of phenomena and synthesis of results,
- graphical data presentation.

The research process was carried out in stages:

1. Preliminary research; the research area and problem were defined, questions and research goals were indicated, and the thesis was formulated.
2. Main research; a critical analysis of the literature was carried out, defining the key terms: costs in PGL LP and the cost accounting model; the accounting policy, corporate chart of accounts, financial and economic report of PGL LP were analyzed.
3. Deduction and recommendations; the results of the analysis were presented, conclusions were drawn, and a general model of resource-process consumption accounting for PGL LP was developed.

The research was carried out between December 2019 and January 2020.

The originality of the article is its attempt to provide up-to-date commentary and evaluate the cost accounting model in PGL LP, which is subject to modifications. The author hopes that the critical analysis covering the costs and cost accounting model of PGL LP will be a valuable contribution to further discussions on cost accounting modeling to implement the resource-process model in forestry.

## 2. Research results and discussion

The Forest Act defines the principles of preserving, protecting, and enhancing forest resources, as well as the principles of forest management, in conjunction with other elements of the environment and the national economy (The Forest Act, Article 1). The Forest Act comprises information on the forest management plan and conducting activities based on financial independence, indicating that PGL LP should cover the costs of its operations from its own revenues. The Act stipulates that the Director General of the State Forests sets the rules (accounting policy) for all organizational units of the State Forests, and PGL LP keeps accounting in accordance with the principles specified in the Accounting Act of 29 September 1994 (Journal of Laws of 2020, item 568).

In Article 2 (31) of the Act, costs are understood as reasonably anticipated reductions in economic benefits of a reliably determined value in a reporting period. The Accounting Standards Committee (see Masztalerz, 2012) adopted National Accounting Standard No. 13, “production cost measurement basis”, which also applies to the activities carried out by the PGL LP, including the selection of cost objects to determine the cost of manufacturing products, the scope of the cost of manufacturing products, variable and fixed indirect production costs, as well as the presentation and disclosure of information on the costs of manufacturing products, including the costs of unused production capacity in the financial statements (National Accounting Standards, 2019)

International Accounting Standards (IAS) 41, Agriculture, relates only to agricultural activity, not forest activity, although it does apply to biological assets and land related to agricultural activity. Crops are also considered biological assets. The IAS indicate the disclosure and measurement of biological assets, excluding forestry activities (Helin et al., 2016). Forestry does not have a dedicated CRS or IAS.

Article 3 of the Ordinance of the Council of Ministers of 6 December 1994 on the detailed principles of PGL LP’s financial management indicates that its activities, including organizational units (forest districts), are conducted on the basis of an economic calculation. These units prepare annual financial and economic plans, which include (Ordinance, 1994):

- a description of subject tasks,
- sales revenues,
- business costs,
- the financial result.

Article 17 of this ordinance indicates that the business costs of PGL LP are: basic contribution to the Forest Fund; administrative expenses; expenses for economic activity (primary, ancillary, additional).

The statute of PGL LP indicates that the Director General of PGL LP sets out, in particular, the detailed rules of forest management in forests managed by PGL LP; rules for the preparation and implementation of economic and financial plans of PGL LP, and the rules of accounting (Articles of Association). The PGL LP strategy for 2014–2030 (PGL LP Strategy, 2013) articulates the rational management of assets and operating costs. It was emphasized that the economic rationality of all the cost and investment decisions would reflect the actions of the employees of PGL LP who carry out detailed analyses of the expenditure-cost-effect correlation.

The forest district is the smallest and most important organizational unit in PGL LP. Czarnecki et al. (2016) indicated that the primary activity of the forest district is the sale of wood as a product – it essentially determines the financial result of the unit. Additional and ancillary activities generate much lower expenditures and business costs, which are often difficult to estimate and evaluate. In the forest district, the costs of fulfilling statutory tasks, i.e., breeding and protection works, amount to about 15%. Qualifying costs only with regard to the

basic activity seem unfavorable due to the nature of the works carried out in the forest, as the maintenance of the forest service and administration is a significant cost (40%) generated in the forest district. Can it be assumed that these are management costs? Most of the forest service is a group of field workers directly involved in the “production” of timber, and the general distribution of costs in the forest district is approximately as follows: forest service and administration – 40%, harvesting and removing of wood – 25%, forest management – 15%, other costs – 20%.

Krajski (1969, p. 242) emphasized that the concept of production cost, including forestry costs, should be understood as the value of the used production resources and the labor input paid in the form of remuneration. Knowledge of the production costs of “standing timber” and “sawing timber” makes it possible to determine the amount and types of costs incurred at a specific time, linking the costs incurred with the places where they arose. The basic cost classification systems include the type system and the calculation system. The economic effects of different levels of implementing individual forest functions are of fundamental importance for the rational shaping of a multifunctional forestry holding. Activities such as nature and forest education, recreational forest management, protection of the forest against pests and fires, eliminating human-caused damage and industrial and mining damage, prevention of forest diseases, felling and selection of assortments, and forest renewal involve expenditures and generate costs<sup>5</sup>, as be described by Janeczno and Mandziuk (2010, pp. 54–62), Kusiak (2015, pp. 126–136), Chodźko et al. (1971, pp. 226–228), Kocel (2020, pp. 736–746), Adamowicz (2020, pp. 531–538), Hryniewska and Mandziuk (2020, pp. 321–330), Kaliszewski and Młynarski (2015, pp. 558–564) and Porter (1980, 1994).

PGL LP’s costs are generated in connection with (Jarosz, 2011, pp. 241–242):

- administrative and basic activities that guarantee the continuity of forest management,
- maintaining higher-order units and covering the costs of forest management,
- paying taxes,
- managing fixed assets of a developmental and replacement character.

One should agree with Płotkowski (2009, pp. 211–220) that each economic decision to implement a multifunctional forest management model involves specific changes in cash flows, i.e., costs, income, revenues, expenses, and expenditures. Nowadays, it is not enough to know that “forest management pays off”; one should look for answers as to how forest management is the most profitable in terms of economic, social, and ecological (environmental) aspects. This requires not only extending the scope of analyses or research in the field of forestry activities, but also recognizing the incurred expenditures and costs, taking into account many different perspectives (cost accounting models).

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<sup>5</sup> Much has been written in the literature on activities, costs, expenditures, and cost accounting models, e.g., Cooper, Kaplan (1988, pp. 20–27); Cotton et. al., (2003, pp. 67–72); Kaplan, Anderson (2007); Cardinaels Labro (2008, s. pp. 735–753); Jelsy, Vetrivel (2012, pp. 41–57); Mayer (1993); Pemot et. al., (2007).

### 3. Conclusions and recommendations

Each business activity is inextricably linked with incurring costs, with costs being an important element in the assessment of management efficiency; therefore, the issue of costs, cost accounting, and cost level control plays an important role in the research issues of economy, finance, and business unit management (Szychta, 2002, 2010; Lew, 2018; Zimon, 2018; Masztalerz, 2017). Costs are reflected in PGL LP's accounting policy, the chart of accounts, reporting, and optional reports.

In accordance with PGL LP's accounting principles (policy) (Principles, 2009), the accounting period for State Forests is the calendar year beginning on January 1 and ending on December 31. The financial year includes reporting periods, which are successive calendar months. PGL LP's organizational units keep records of economic operations using the State Forests Information System (SILP). In all organizational units of State Forests, a uniform chart of accounts with a commentary, constituting Appendix No. 2 to Regulation No. 4 of the Director General of the State Forests of 23 January 2009, is used. SILP accounting records are kept on control and analytical accounts, called real and personal accounts. Accounts of subsidiary ledgers (analytical records) are kept in SILP, among others, for costs by type of activity and by function in the Forest subsystem at cost centers. The organizational units of PGL LP keep cost recording according to their type in the accounts under Category 4, for statistical purposes, and by type of activity in the accounts under Category 5.

PGL LP's organizational units prepare the profit and loss account by function, and the cash flow statement using the indirect method. The costs of maintaining the offices of the regional directorates of the State Forests and the Directorate General of the State Forests are financed from payments regarding operating costs of forest districts. The value of management costs incurred in the offices of the Regional Directorates of State Forests and the Directorate General of State Forests are eliminated in the total profit and loss account of State Forests, as they are included in the costs of forest districts as an overhead for the maintenance of higher-order units.

The list of control and analytical accounts of the chart of accounts, together with the PGL LP comment, indicates the record of economic operations in the cost accounts<sup>6</sup>:

1. Category 4 – costs by type and their settlement.
2. Category 5 – costs by type of activity and their settlement.

The detailed scope of Category 4 and 5 cost accounts is shown in Table 1.

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<sup>6</sup> Due to the type of forestry activities, extensive chart of accounts, and publication limits (i.e., page range), the article focuses on two basic groups of cost accounts, consciously omitting Category 6 – products and accruals, and Category 7 – revenues and the costs related to achieving them.

**Table 1.** Detailed scope of Group 4 and 5 cost accounts

<b>Control account</b>		
<b>Account name</b>	<b>1st degree analytics</b>	<b>Content</b>
<b>CATEGORY 4 – COSTS BY TYPE AND THEIR SETTLEMENT</b>		
400		USE OF MATERIALS AND ENERGY
	0	Use of materials
	1	Use of energy
410		OUTSOURCED SERVICES
420		TAXES AND FEES
	0	Taxes and fees - other
	1	Non-deductible VAT
	4	VAT on intra-Community acquisition of means of transport
	5	Mandatory contributions to the budget from the sale of wood
430		REMUNERATION
	1	Payroll
	2	Supplemental payroll and fees
	3	Additional annual salary
440		EMPLOYEE BENEFITS
	1	Contributions to social insurance and write-offs to the Labor Fund
	2	Contribution to the Company Social Benefits Fund
	3	Value of Uniforms Issued
	4	Health and safety costs
	5	Employee training costs
	6	Other benefits
450		Depreciation
460		Delegations and relocation costs
470		The remaining prime costs
	0	Other prime costs
	01	Representation costs (not constituting tax-deductible costs within the meaning of the Corporate Income Tax Act)
	02	Advertising costs
<b>CATEGORY 5 – COSTS BY TYPE OF ACTIVITY AND THEIR SETTLEMENT</b>		
501		Forest service costs
502		Costs of controlling ownership, overheads for maintaining higher-order units, forest management, and multi-area inventory
	1	Costs of controlling ownership
	2	Higher-order units



<b>Control account</b>		
<b>Account name</b>	<b>1st degree analytics</b>	<b>Content</b>
	3	Forest management costs
	4	Multi-area inventory costs
	5	Forest Data Bank costs
503		Other administrative costs
504		Maintaining supervision of forests of other properties
510		Forest development
	1	Seed production and selection
	2	Silviculture
	3	Tree plantings in state forests
	4	Forest protection against harmful factors
	5	Forest protection against fire
	6	Maintenance of general-purpose forest facilities (infrastructure)
511		Wood harvesting
512		Timber sales costs
513		Costs of budget tasks
514		Tasks performed in forests of other properties
516		Contribution to the forest fund
517		Forest tax
518		Mandatory contributions to the budget from the sale of wood in forest districts
520		Obtaining resin
521		Obtaining stumpwood
522		Obtaining bark and needles
523		Obtaining Christmas trees and brushwood
524		Woodend nurseries (commercial)
525		Hunting management
	1	Hunting management in the Game Breeding Centers of State Forests
	2	Hunting management in districts leased
526		Other auxiliary activity
530		Transport services
531		Workshop services
532		Industrial production
533		Commercial services
534		Meadow and agricultural economy
535		Fisheries economy

*cont. tab. 1*

<b>Control account</b>		
<b>Account name</b>	<b>1st degree analytics</b>	<b>Content</b>
536		Other auxiliary activity
537		Other services of auxiliary activity
539		Mandatory contributions to the budget from the sale of wood in plants
540		Transport services
	1	Mechanical transport
	2	Horse transport
	3	Other transport
541		Equipment operation
542		Workshop services
543		Carpentry services
544		Erection and construction works
545		Other in-house services
546		Forwarding of timber
550		Other general economic costs
560		Welfare activities
570		Costs of processing goods

Source: Consolidated text: Chart of accounts with a comment from State Forests, Annex 2 to Management No. 87 of the Director General of State Forests of 4 December 2012 as amended.

The task of Category 4 accounts is to recognize simple costs by type of expenditure, whereas the Category 5 accounts are used for recording and settling costs of the following types of activity by function:

- administrative,
- primary,
- ancillary,
- additional,
- auxiliary,
- welfare,

and recording indirect costs related to the above-mentioned types of activity, the reference of which to particular types of activity is complicated, and in some cases, even impossible.

The costs of PGL LP in the financial and economic report for a given financial year are presented by group (Report, 2019):

1. Administrative costs.
2. Forest tax.

3. Costs of primary activity (sales costs).
4. Costs of ancillary activity (sales costs).
5. Costs of additional activity (sales costs).
6. Costs of welfare activity (sales costs).
7. Difference in the value of inventories.
8. Remuneration.

PGL LP prepares the profit and loss account by function (Profit and Loss Account, 2020). The costs of products, goods, and materials sold are the manufacturing costs of the products sold broken down into:

- administrative activity, primary activity, ancillary activity
- additional activity,
- welfare activities,
- manufacturing cost of products sold by plants.

This group of costs also includes the level of costs – the value of goods and materials sold. Sales costs, general management costs, and other operating and financial costs are presented separately. The overall level of costs in PGL LP is presented in Table 2.

**Table 2.** Total costs of State Forests in PLN billions

Year	2014	2015	2016	2017	2018	2019
Total costs of PGL LP	7.568	7.786	7.986	8.520	9.236	8.710

Source: own study based on: Forestry. Statistics Poland. Warsaw 2018, 2019.

The PGL LP uses systematic cost accounting, and the creation of new cost accounting systems (models) in PGL LP may be determined by the demand for specific, parameterized information on the costs of the conducted activity (Cieciura, 2019, pp. 33–34). It may also result from the criticism of the external environment regarding the lack of information on the level of specific groups of costs incurred due to forestry activities or the lack of cost records or information on the level of indirect costs. It should be noted that in the foreign literature, systematic cost accounting was particularly criticized in the mid-1980s, when this method was widely used in practice. Today, entities are aware of the shortcomings of this traditional cost accounting and do not limit themselves to using only this single cost accounting model. In practice, optional (management) cost models are used (Skulmowski, 2014, pp. 147–157; Ankudo, Kowalczyk, 2013, p. 96).

When analyzing the costs and the cost accounting model in PGL LP, it should be articulated that the natural and economic conditions of forest production pose a number of problems in the field of accounting due to the problem of adapting accounting to the unique economic situation of a forest holding in terms of long-

term forest production, strict dependence on natural factors, and the fact that it is difficult to limit the cost accounting of PGL LP to one-year accounting periods.

Forest production is characterized by certain stages related to the age and development phase of the stand (Adamowicz, Szczypa, 2016):

- cultivation,
- greenwoods,
- poling, pole wooding,
- maturing stand, mature (felling) stand
- a tree stand that passed felling maturity.

In terms of cost analysis, the long production cycle of wood, which is the basic product of the activities of the organizational units of PGL LP, is also characteristic of the forest (Adamowicz, Szczypa, 2016):

- about 40 years – poplar, willow, aspen,
- 80–90 years – spruce, alder, birch, hornbeam, linden,
- at least 100 years – pine,
- 120–130 years – beech,
- 140–160 years – oak.

An additional problem is determining the proper links between revenues and the implementation of multilateral functions of forests, as well as the lack of compensation for the costs incurred for creating social benefits from the forest, such as forest education, pro-health aspects of forest use, forest exploitation (Burańczewski, Grygier, 2011). Imperfect cost accounting will result in operating incorrect values of the calculated measures, which in the case of the PGL LP means verifying the cost accounting system (model) and introducing new cost calculation methods (Śniezek, 2016, p. 186), or the need to develop a methodology for indirect cost settlement for “new” cost objects, with particular emphasis on the non-productive functions of the forest (Szczypa, 2016, pp. 174–182).

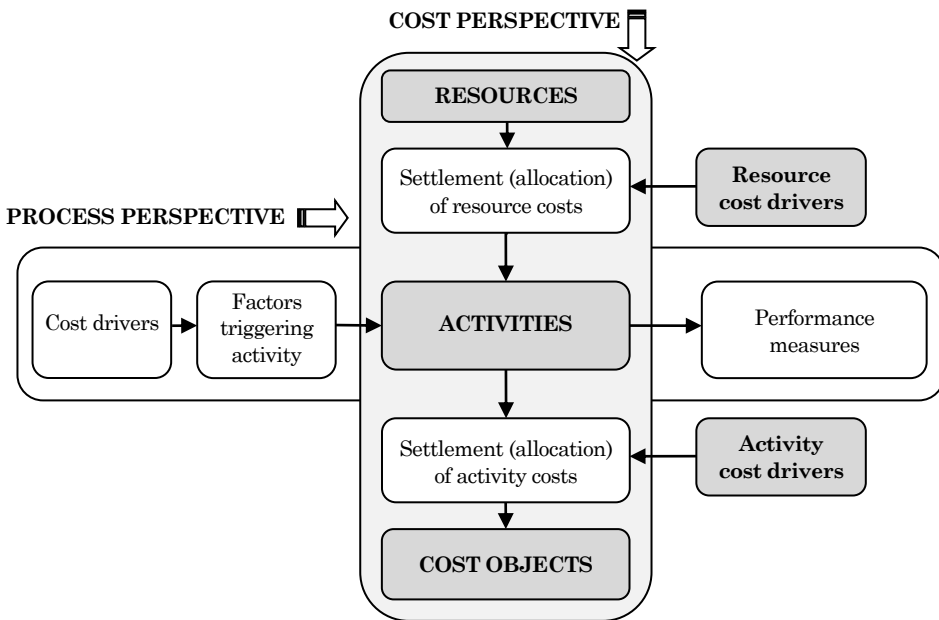
The basic premises for implementing a new resource-process consumption accounting model in PGL LP include (Kochański, 2018, p. 123):

- the obsolescence of systematic (reporting, traditional) cost accounting,
- the insufficient suitability of variable cost accounting or the failure to use this model to generate appropriately useful cost information,
- the growing importance of an action-based process approach,
- the constantly growing share of indirect costs in the structure of total costs and settling these costs only to a limited extent,
- looking for methods that make it possible to calculate costs and profitability of not only standard cost objects, but also environmental and social objects, such as clients, educational lessons, educational paths, organized events.

In a resource-process consumption accounting model (simplified) (Zieliński, 2018b, pp. 486–499; Rusek, Zieliński, 2014, pp. 75–84; 2018a, pp. 28–35; 2017), the classic perception of an enterprise, according to which primary costs are generated

in the places where they arise, should be rejected in favor of the process approach. The process approach includes a set of mutually interconnected activities, i.e., specific activities performed on the basis of the resources involved. The use of resources as part of individual activities results in relating their costs to activities, which are finally settled into separate cost objects (Rusek, 2014, pp. 75–84). The overriding effect of resource-process costing is the reliable settlement of indirect costs (from resources, through processes to cost objects). A model (simplified) approach to this cost accounting is shown in Figure 1.

**Figure 1.** Resource-process consumption accounting for PGL LP



Source: Zieliński (2017, pp. 119–147), Kochański (2018, p. 129).

The vertical perspective in the above model reflects the cost approach, while the horizontal perspective reflects the process approach. It should be noted that resource-process consumption accounting uses concepts such as process, operation, resources, resource cost drivers, activity cost drivers, and cost objects. Table 3 presents the terms from the resource-process area of cost accounting that can be used in the PGL LP on the example of the process: nature and forest education.

Catalogs of resources, activities, or their drivers are not exhaustive or named in advance; they can be freely modified in PGL LP and adapted to the area of activity. Table 4 shows the processes and activities identified in the scope of example forest district X.

**Table 3.** Presentation of terms in the resource-process consumption accounting dedicated to the State Forests with examples

Item	Description	Example
<b>Process</b>	A set of homogeneous activities aimed at achieving a specific goal.	The process of nature and forest education aimed at disseminating knowledge about the natural and forest environment, as well as sustainable forest management, raising awareness of the rational and responsible use of forest management, and building social trust in the professional activities of foresters. The process of nature and forest education at PGL LP includes the following activities:
<b>Activity</b>	A sequence of actions (parts of work) performed in the company by resources	<ul style="list-style-type: none"> <li>– field activities, activities in the Education Center of the Forest Research Institute,</li> <li>– lessons at school, educational meetings outside school,</li> <li>– forestry competitions,</li> <li>– educational exhibitions,</li> <li>– local government forums,</li> <li>– participation in fairs and festivals,</li> <li>– media activity,</li> <li>– educational paths,</li> <li>– press.</li> </ul> <p>In order to implement each of the activities, a number of actions should be undertaken, e.g. as part of the process: nature and forest education; as part of the activity: lessons at school, the following activities are carried out: printing of leaflets, crosswords for students, preparing other promotional materials, transporting an employee to school, conducting lessons, settlement of the trip, promotional activities.</p>
<b>Resources</b>	The constituent elements of the company used and consumed in order to perform specific activities.	In order to implement each of the activities, a number of actions should be undertaken, e.g., as part of the process: nature and forest education; as part of the activity: lessons at school, resources used include: employee working time, employee insurance, promotional materials (paper and toner), financial resources (the employee's business trip), the purchase of small infrastructure, e.g., a laptop, projector.

Item	Description	Example
<b>Resource cost drivers</b>	Measures of resources committed to specific activities. They enable the settlement of resource costs for individual activities.	For the resource: paper – the resource cost driver can be the number of reams of paper or sheets of paper used. For the resource: employee working time, the resource cost carrier may be one hour worked or one day in a given school.
<b>Activity cost drivers</b>	Measures of activities that reflect the demand of cost objects for specific activities and that are also used to settle the costs of activities to cost objects.	For the printing of crosswords (activities), a driver that will cover its costs for the client (a school) – e.g., for a lesson in science and forestry education (cost object), it may be the number of printed crosswords. For the activity: employee travel, the cost driver may be the time spent traveling to a given school or the number of km traveled.
<b>Cost objects</b>	Finished product/service /group of products or services/client or client segment/project/order etc.	In this process, the cost object may be: – a commune, – a school, – a class, – a student.

Source: own elaboration.

**Table 4.** Separate processes and activities within the scope of example forest district X

Processes	Activities	Resources
Forest management	<ul style="list-style-type: none"> <li>– forest protection</li> <li>– trade and marketing</li> <li>– forest management and use</li> <li>– wood management</li> <li>– spatial information</li> <li>– seed production, selection, nursery</li> <li>– fire protection</li> <li>– forest education</li> </ul>	Employees Means of transport Office equipment Fixed assets Financial resources IT system Machines and devices Energy
Finance and Accounting	<ul style="list-style-type: none"> <li>– planning</li> <li>– keeping records and reporting</li> <li>– correspondence</li> <li>– budgeting and financial analysis</li> <li>– inventory</li> <li>– fixed assets management</li> <li>– protection of property</li> <li>– control and recovery</li> </ul>	Infrastructure Materials

*cont. tab. 4*

<b>Processes</b>	<b>Activities</b>	<b>Resources</b>
Administrative and Economic	<ul style="list-style-type: none"> <li>– administration of forest infrastructure facilities</li> <li>– repairs and investments</li> <li>– transport and supplies</li> <li>– proceedings in the field of public procurement law</li> <li>– protection of forests against pests</li> <li>– protection of entrusted property</li> <li>– administration of the State Forests Information System (SILP)</li> <li>– construction of fixed assets</li> <li>– lease and rental agreements</li> <li>– property insurance</li> </ul>	
Forest ranger	<ul style="list-style-type: none"> <li>– combating forest crime</li> <li>– document workflow</li> <li>– protection of the forest against pests</li> <li>– protection of entrusted property</li> <li>– running a weapons warehouse</li> </ul>	
Forestry	<ul style="list-style-type: none"> <li>– forest management</li> <li>– protection of the forest against pests</li> <li>– protection of entrusted property</li> </ul>	

Source: own elaboration based on the organizational regulations of selected forest districts in Poland.

To sum up, the above specifications (Tables 1 and 2) may constitute a model of the identified activities, processes, resources, and resource and activity cost drivers in each hypothetical forest district. These specifications can be used as benchmarks when implementing resource-process consumption accounting in PGL LP.

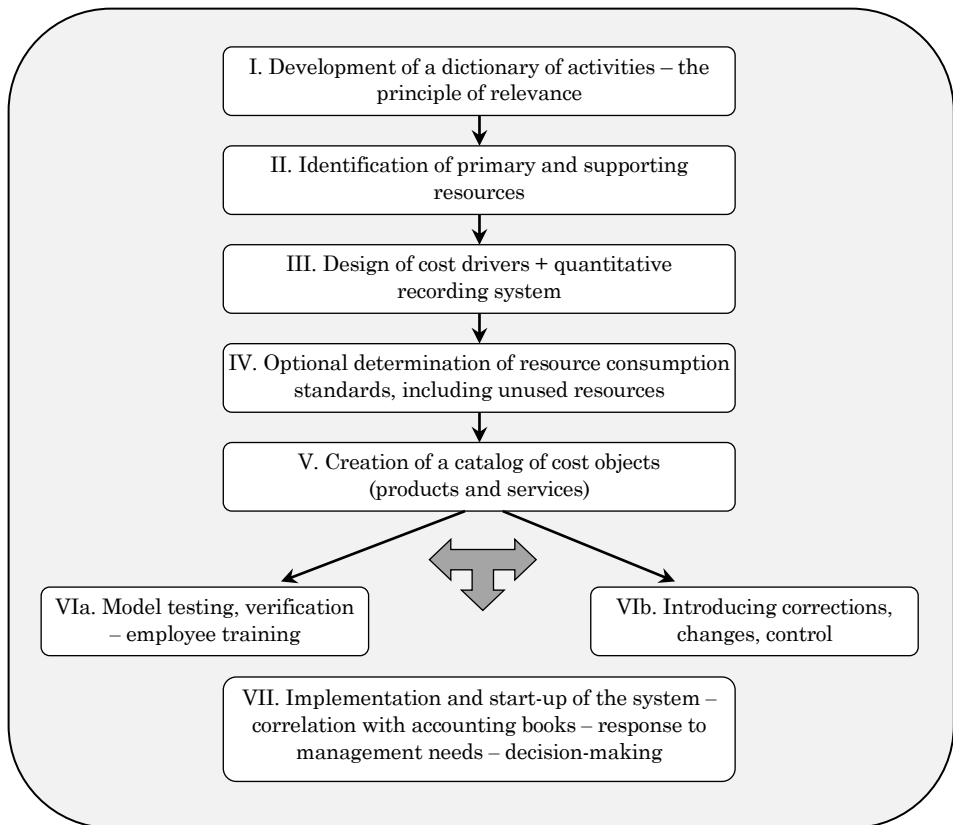
It should be noted that resource-process consumption accounting is the foundation of the highest levels of cost accounting maturity, and it should not be implemented for the sake of ownership, as it is time-consuming and cost-intensive (Kochański, 2018, p. 133). The stages of resource-process consumption accounting should be presented in two dimensions in PGL LP. The first dimension concerns its implementation (Figure 2), while the second is its systematic application.

The resource-process consumption accounting implemented in PGL LP is intended to meet the following basic goals:

1. Enable the calculation of product manufacturing costs (basic activity) and provide a cause-and-effect settlement of indirect costs for products.
2. Enable the settlement and calculation of costs of additional, ancillary, and administrative activities in State Forests.
3. Provide access to complete information on the costs of forestry activities.
4. Make it possible to control the effectiveness and efficiency of individual responsibility centers (e.g., for education in nature and forestry and for social activities).



**Figure 2.** Stages of implementing resource-process consumption accounting in PGL LP



Source: own elaboration based on Zieliński (2017, pp. 119-147) and Kochański (2018, p. 133).

In PGL LP, the structure of resources (cost centers) may be subordinated and divided into centers of responsibility for costs, which may be defined in terms of:

- space – the center covers a given area, building, or part of it; in the case of PGL LP’s activities, most often it will be one forest district, one parking lot located in the forest, or a given educational path,
- organization – the center is separated as a component of the organizational structure; it can be the Regional Directorate of the State Forests or the Forest Promotional Complex,
- subject – the processes taking place in a given responsibility center lead to the production of a product or service or the performance of specific activities that can be measured in terms of their costs, production capacity, and actual level of activity, for example, in Forest Education Chambers.

It is worth remembering that in PGL LP, there is no direct relationship between the costs incurred and the effects achieved. In particular, this applies to

the basic division of forestry production, i.e., forest management, in which many years elapse between the cause (expenditure) and the result (effect), which makes it difficult to limit the cost accounting to annual accounting closings.

In conclusion, it is also necessary to point out the barriers limiting the implementation of resource-process consumption accounting in PGL LP: the centralization of power and competences, the duplication of activities and processes, the specificity of PGL LP as an organization, atypical production (many years), dependence of production on natural conditions, the multitude of organizational units (forest districts), and the implementation of many functions and tasks.

## Summary

The primary goal of forest management is to protect and preserve the forest, and then to produce and maximize profit. Despite this, PGL LP includes an economic account. Efficiency and efficacy of operations, revenue generation, and cost control are important. As part of its basic, ancillary, additional and administrative activities, PGL LP conducts a systematic, traditional cost accounting, recording them by cost center. For PGL LP, as the entity that manages a national good, the correct recording and settlement of operating costs is of great importance; it implies transparency and openness of the public goods management process. The theoretical and empirical discourse carried out in this study is a map of possibilities for PGL LP that can be implemented in the recording and settlement of operating costs according to resource-process consumption accounting.

The article revises the costs and cost accounting model of State Forests National Forest Holding and identifies the possibilities of using resource-process consumption accounting in the activities of the State Forests. By analyzing the accounting policy, the chart of accounts, and the financial and economic report of State Forests, it was possible to verify the following thesis: PGL LP keeps systematic cost accounting that is subject to the requirements of obligatory external reporting, which results in its limited usefulness in disclosing information about the achievement of economic, social, and environmental goals.

1. The accounting policy of PGL LP provides that costs are recorded on control and analytical accounts, in accordance with the chart of accounts.
2. PGL LP's organizational units (districts) keep records of costs according to their type in the accounts of Category 4, for reporting purposes, and by type of activity in the accounts of Category 5.
3. In PGL LP, a systematic, traditional cost accounting model is operated, which is mainly used for reporting purposes.
4. It is possible to apply the resource-process consumption accounting model from the perspective of its usefulness in disclosing information about the implementation of social and environmental goals in the specific activities of PGL LP.

A simplified resource-process consumption accounting model has been proposed, which can be used by PGL LP's organizational units when operationalizing

the basic terms in the resource-process area of cost accounting dedicated to PGL LP, and proposing a phased implementation of this accounting model.

The author is of the opinion that any changes to the cost accounting model in PGL LP should be planned in a thoughtful and prudent manner due to the specific nature of the entity's operations. Therefore, the changes proposed in the article should also be approached with great caution, bearing in mind that the issues indicated in the article are presented in a simplified manner and certainly do not exhaust the entire problem of the model of forest activity cost accounting. Due to the limited framework of the publishing house, the author was forced to leave many issues outside of the research area. Leaving an unrecognized area generates a certain insufficiency and a number of doubts. The author hopes that the study will become a contribution to further in-depth empirical research in this area.

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