CONFLICT AND CONSENSUS REGARDING RESOURCE POLICIES IN A BORDERLAND OF THE HABSBURG EMPIRE: PERSPECTIVES ON AND PERCEPTIONS OF FORESTS AND THE ENVIRONMENT IN TRANSYLVANIA AT THE END OF EIGHTEENTH CENTURY AND IN THE NINETEEN-CENTURY

SUKOB I KONSENZUS U VEZI SA POLITIKOM RESURSA U POGRANIČJU HABSBURŠKE MONARHIJE: PERSPEKTIVE I PERCEPCIJE ŠUMA I OKOLIŠA U TRANSILVANIJI KRAJEM OSAMNAESTOG STOLJEĆA I TIJEKOM DEVETNAESTOG STOLJEĆA

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Summary

The central point of the proposal is the analysis of the interdependencies between rural communities and the natural environment of the forest in eighteenth-century Transylvania, as well as the perils to which the environment was exposed as a result of this relationship. At the same time, one will study the ways in which people perceived and approached their environment, thus revealing the contemporary normative procedures regarding the environment, with the possible outcome of a better understanding of the relativity of today's concepts of nature and the environment. The research will follow the anthropological constants that act at the structural level and often place the »usage« of forests chiefly for economic purposes and the »conflict« generated by the fulfillment of these needs in opposition, as well as the moral, customary, and juridical barriers that refers differently to the material resources of a community in general. That is why the present study will analyze how and to what extent the Enlightenment changed individuals and society's perception of the environment in Transylvania. The eighteenth century witnessed the emergence of the concept of »durability of forests,« which is important not only regarding the economic functions, but also the ecological and social ones. The study analyzes the policy of the Viennese authorities regarding forests in Transylvania, and the subsequent conflicts over forests it ignited. Thus, the forest can be differently described according to the cultural context, studying the conflicts over it and the trials these conflicts generated. Furthermore, after the completion of this study, it remains to be seen to what extent the thesis on the emotionalization of forests in the eighteenth century still stands. The central point of the history of forests is to find out who, when, to what purpose, and from which perspective showed interest in forests. The present research would like to be a contribution to the general European historiography on the issue of forests by means of its connection to the results of the schools in Austria, Germany, England and France. The study of the history of the environment's perception, especially the forest, is part of the new European tendency in the protection and development of the concept of durability in the current European cultural context.

Key words: Forests History, Transylvania, Eighteenth Century, Nineteenth Century
Ključne riječi: povijest šuma, Transilvanija (Sedmogradska), 18. stoljeće, 19. stoljeće

STATE OF THE ART

This branch of the history of economy was quite underrepresented in the Romanian historiography. In 1975, the historian Constantin c. Giurescu published the book *Istoria pădurilor româneşti din cele mai vechi timpuri până astăzi*[1], providing a general view of the evolution of the exploitation of forests, especially in the extra-Carpathian areas, and relevant information on Transylvania, together with methodological indications for future research.

Another important work is Rudolf Rösler's[2] study »Zur Forstgeschichte Rumäniens. Ein zusammenfassender Überblick,« published in *News of Forest History* (1999), which offers a historical overview of the forests in Transylvania and Romania as well as a description of the forest legislation in eighteenth-century Transylvania. In addition, one should also mention the contribution of István Csucsuja who, in the introductory part of his book *Istoria pădurilor din Transilvania (1848-1918)*[3], provides information on forests in eighteenth-century Transylvania. Other less important works, such as Eduard Zaminer, *Geschichte des Waldwesens der königlichen Stadt Kronstadt*[4] and Josef Binder, *Geschichte des Waldwesens der Stadt Hermannsstadt*[5], only superficially touch on the history of forests in the eighteenth century because of either the insufficient study of archival materials, or the insistence on agrarian history, as it is the case of Georg Adolf Schuller's book *Aus der Vergangenheit der siebenbürgisch-sächsischen Landwirtschaft*[6].

THE MAIN ISSUES

The central question of the study[7] is: »What type of conflicts occurred between the authorities and the population based on the official scientific knowledge, on the one hand, and traditional knowledge, on the other, as a result of the measures taken for the protection and conservation of forests, and how were these conflicts solved or reconciled?«

Eighteenth-century documents reveal data on these conflicts that took the shape of legal battles and even armed clashes.

As an energy source, wood was used in mining, the exploitation of metals and salt, as well as charcoal burning. Certain types of wood were used at glass works, ironworks, and in salt pits.

One should also mention the most important secondary uses of forests as pastures, as sources of brushwood and in complementary agriculture, as well as the use of forest products.

Secondary forest resources that generated conflicts were: 1.) *Water mills*: the rivers that ran through forests provided the necessary energy for various types of mills (paper mills, sawmills, etc.). In Transylvania, these were part of the small industry, an economic link between human settlements and forests. 2.) *Plants*: in forests, people gathered many plant species, edible or medicinal herbs, mushrooms, fruits, food for the animals, natural colors for the household to color textiles or Easter eggs, stains, etc; 3.) *Animals:* the forest ecosystem represented a hunting ground and pasture for animals. Many areas were rationally deforested in order to increase pastures and agricultural surfaces, to obtain food for domestic and wild animals.

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1 Constantin c. Giurescu published the book Istoria pădurilor româneşti din cele mai vechi timpuri până astăzi [The History of Romanian Forests from the Oldest Times until the Present], Bucureşti, 1976.

2 Rudolf Rösler: Zur Forstgeschichte Rumäniens. Ein zusammenfassender Überblick. In: News of Forest History, Wien, Nr. 28, 1999, pp. 2-76.

3 István Csucsuja: *Istoria pădurilor din Transilvania (1848-1918)* [The History of Forests in Transylvania, 1848-1918], Cluj-Napoca, 1998.

4 Eduard Zaminer, Geschichte des Waldwesens der königlichen Stadt Kronstadt, Kronstadt, 1891.

5 Josef Binder, Geschichte des Waldwesens der Stadt Hermannsstadt, Hermannstadt, 1909.

6 Georg Adolf Schuller: Aus der Vergangenheit der siebenbürgisch-sächsischen Landwirtschaft, Hermannstadt, 1895.

7 This item is part of the FWF project »Der Umgang mit dem Wald und die habsburgische Ressourcenpolitik in Siebenbürgen im 18. Jahrhundert« which runs at the Karl Franzens University Graz until 28. February 2015.

RESEARCH OBJECTIVES

The article discusses Transylvania's particular situation and especially the perception of its forests within the imperial official documents and the official attitude towards the environment. By achieving the research objectives focusing on the awareness of the importance of forests in Transylvania, the strategic interests of the Imperial authorities in the management of this province's rich forest resources will be reconfirmed. Observations will be assessed and integrated in the ensemble of modern European research by methods that have not been used in Romania thus far. For the Romanian culture, the novelty of this large project lies in the actuality of the topic and in the various methods taken from several interrelated disciplines, such as archival studies, folk studies, the history of mentalities, economic and military history, the history of forests, physical geography, anthropogeography, juridical sciences, ecology, ethnography/ethnology, and demography. The Brundtland Report, published in 1987, brought to the fore the concept of »sustainable development« according to which economic development must be achieved in such a way that it covers current needs without depriving future generations of the possibility to satisfy their needs as well (UN World Commission on Environment and Development, Our Common Future, Oxford, 1987). The eighteenth century witnessed the emergence of the idea that forests should be exploited in such a way that they can provide products to future generations as well. In the 1980s there was much debate on the type of development that sustainability implied and how it could be managed. The only consensus reached was that not only the sustainability of forests had to be taken into account.

The perception of the forest and its elements and the relationship with the forest are culturally influenced and differ from one period to the other. The way in which people approach it, appropriate it, know it, and use it is underpinned by traditions and collective images, namely by cultural predispositions. In this sense, the acquaintance with the forest or the relationship with it can be described as a mirror of any culture. It depends on the awareness degree – the individual ability for rationalization and reflection – and cultural level of the human being who perceives the cultural representation of the forest gradually differently.

CONFLICTS OVER THE FOREST AS NATURAL RAW MATERIAL

Natural raw materials can carry different cultural, social, economic, and environmental meanings that are sometimes in conflict with one other. These conflicts can occur over the ways to access raw materials and due to opposing interests regarding their use. They are open and sometimes even violent in nature, mainly during the stages of rapid transformations. They are especially interesting from the perspective of environmental history, but at the same time they represent key-points in researching the evolution of the relationship between man and the ecosystem.

A focal point in the history of forests is their manifold use. In the period under investigation, wood was the source of conflicts on many occasions. These conflicts, together with the representations of the environment in general and forests in particular, which sharpened them, are at the center of this article. Thus, one should follow forest representations that various social groups elaborated from the perspective of resource use in the eighteenth century. Special emphasis will be laid on the dynamics of the forces that took part in this conflict during this period.

The main questions that will be answered are: »Why did forests become causes for conflict in the eighteenth century« and »What role did the concept of 'sustainability' play in conflict resolution?«

THE BACKGROUND OF THE CONFLICTS: THE EIGHTEENTH-CENTURY WOOD CRISIS

In eighteenth-century Transylvania, resources were almost ruined[8], and this state-of-affairs led to a change in the attitude towards forests, to a better organization regarding wood as raw material: the exploitation of salt and gold, or for industrial purposes. Therefore, the forest was rediscovered as new important attributes were given to it. In this context, most forestry regulations, surveys, and travels in Central and Western Europe mention the devastation of woodlands as well as the extant and prognosticated depletion of forest resources[9]. Literary works[10] and non-forestry documents from the eighteenth and nineteenth centuries describe the same situation of forests and the population depending on them, from an interesting non-forestry perspective.

THE ACTORS IN THE CONFLICT AND THEIR INTERESTS REGARDING FORESTS[11]

The interests of the normative authority (state administration and noblemen):

1. The preservation of the interest in the right of ownership and property: a) the limitation of the right to use wood from a qualitative and quantitative perspective as well as from the perspective of entitled individuals; b) the limitation of pasturing rights with regard to the number and type of cattle as well as to time and place.

2. Financial interests: a) the use of wood: income from industrial use; the satisfaction of industrial needs by means of cuttings: charcoal tax and wood tax; b) income from the so-called secondary uses by craftsmen and peasants: forest tax, tax on the right to pasture, the collection of resin, and the tax on cattle.[12]

The interests of noblemen:

1. Economic interests: a) The increase in the levy of taxes by the state through the protection of mining, especially concerning precious metals, iron, and salt; b) the protection of industrial development through the durable assurance of the necessary energy; c) the preservation of the economic and social structure.

2. Private interests: hunting rights.[13]

The interests of peasants:

1. The preservation of the entire property: the right to free use of the property regarding the type, time, place, and scale of use;

2. The durable assurance of the necessary wood for the household through the right of free use, such as: a) usage rights over wood (demands for taking wood for construction, fire, fences, and tools) for the household (with no quantitative limits); b) usage rights over pastures (the demand for the free use of pastures; the allowed number of cattle was limited to the total that could be fed during winter); c) usage rights over brushwood (right to use fallen branches freely).[14]

3. Alpine economy. The demand for the use of alpine pasture land during the summer.

4. Uses for manufacturing: a) the production and sale of charcoal by the industry and manufacturing plants; b) the collection of resin.

5. Crop-rotation: agriculture and silviculture through the cultivation of crops on deforested lands.

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8 Konrad Müller: Siebenbürgische Wirtschaftspolitik unter Maria Theresia, München, 1961, p. 32.

9 Dorin-Ioan Rus: Berichte europäischer Reisender über Wald und Bevölkerung in Siebenbürgen im 18. Jahrhundert. In: Zeitschrift für Balkanologie, Jena, Nr. 51, 1/2015.

10 Dorin-Ioan Rus: Der Umgang mit dem Wald in Siebenbürgen – widergespiegelt in den siebenbürgischen Volksmärchen und -sagen. In: Forschungen- zur Volks- und Landeskunde, Bd. 57/2014, Hermannstadt/Sibiu, 2014, pp. 166-187.

11 Elisabeth Johann: Wald und Mensch. Die Nationalparkregion Hohe Tauern (Kärnten), Klagenfurt, 2004, pp. 459.

12 Sigmund: Quellen, Nr. 57, pp. 15; ANR Cluj, Tezaurariatul Minier al Transilvaniei, Dok. Nr. 2663/1788.

13 ÖStA, FHKA, Münz-und Bergwesen, 329, Siebenbürgische Akten, 15, 1792 Dok. Nr. 96, pp. 101-110.

14 ÖStA, NH, SK, Salzwesen, 199, Jahr 1780, Nr. 41 vom 29. Juli 1780, pp 402-403; Sigmund: Quellen, Nr. 79, pp. 20.

6. The free collection of secondary products, such as mushrooms, fruits, and resin.[15]

The interests of non-owners (manufacturers, miners, civil servants, and soldiers)

Covering personal needs (freely or for a fee) for: a) wood for construction, tools, fire, and fences; b) the use brushwood; pasturing; alpine economy.[16]

FOREST MANAGEMENT UNTIL 1879

Forest management until 1781

Forest policy until 1781 did not take into account the different and divergent interests of society. The measures were aimed not at improving access or limiting timber resources, but at the protection of the forest against hunting and pig grazing. As for forest management, the previous period was dominated by the concept of *Plenterwirtschaft*, namely the selective cutting of trees; eighteenth-century measures aimed at imposing a rational management through which certain forests were banned. Sixteenth and seventeenth-century provisions regulated the sharing of pastures for the neighboring communities and not the rational use of wood. Furthermore, forestry institutions emerged in this period, whose task was the protection of woods.[17]

There are several causes that led to the destruction of forests. Apart from their economic exploitation for mining purposes, there is significant destruction caused by the population.

Burning fires and trees in the forest

Andreas Xaverius Stütz (1747-1806), the head of the Natural History Collection in Vienna, deplored the bad state of forests and the population's traditional way of forest management after his visit to the Nagyág (rom. Săcărâmb) goldmine in the summer of 1795. He claimed that the improvement of transportation means and roads would not be enough to prevent the general decline of mining in Transylvania unless there was better protection, management and exploitation of forests by both the administrators and the population: »This type of treatment is rooted in nothing else but the innate destructive spirit of children and men, and it drives mainly Wallachians and Gypsies. Thus, I saw many beautiful forests, especially in Hungary and Transylvania, where I could hardly encounter one tree at whose root a fire had not been made. No sooner was a hole created with the help of a fire than the trunk ignited; as a result, complete and healthy trees lost their foliage and utility. The local shepherd's boy, a nomadic Gypsy, had done this so many times, because he never made the fire at a fallen tree or a hollow log lying beside it, but every time made a new fire next to it.«[18]

The access of herds into forests

Stütz deplored the disorganized exploitation of forests. While seed trees were cut, there was no talk of reforestation. Goat herds, cattle and horses destroyed buds and small trees: »Where there are no goats, their role is taken over by cattle and horses that, upon returning home, are usually set free onto the pa-

[15] Vgl. Hansotto Drotloff: Ein »Schweinekrieg« im Schemmert. In: Mediascher Infoblatt / Medischer Zeitung, Nr. 8 aus Dezember 2004, Balingen, S. 28-31; Tóth Zoltán: Mişcările ţărăneşti din Munţii Apuseni până la 1848 [The peasant movements in the Apuseni Mountains until 1848], Bucureşti 1955, pp. 104.

[16] Vgl. Imreh István: Viaţa cotidiană la secui (1750-1850) [Daily life at the Székelys (1750-1850)], Bucureşti, 1982, pp. 117-118; 119-120.

[17] Rudolf Rösler, Forstgesetzgebung, pp. 63.

[18] Andreas Stütz: Physikalisch- mineralogische Beschreibung des Gold - und Silberbergwerks bei Nagy-Ag in Siebenbürgen«. In: »Der Gesellschaft Naturforschender Freunde zu Berlin Neue Schriften«, Band 2, Berlin, 1799, pp. 1-2.

sture and enter the forest on their own, where they eat the tips and delicate foliage of offshoots.« A better situation was noticeable in forests that were in common or noble ownership.[19]

The destruction of seedlings and saplings

Archival documents[20] and travel accounts[21] recount physical punishments or fines applied to peasants who willfully destroyed seedlings or saplings.

This period also witnessed numerous *forest-related crimes*, such as wood theft, devastation and arson; the punishment given for these acts ranged between fines and shorter prison terms. [22]

Hunting was another source of conflicts between the official and traditional knowledge, Transylvania offering a great variety of wild animals to hunters. Law VI/1872 stipulated that hunting rights belonged to the landowner. The same piece of legislation strictly regulated closed seasons as well. Law XX/1883 forbade the hunting of useful wild species during the reproduction period. The closed season lasted between 1 February and 15 August. Poaching was forbidden and punished by law. Transylvania was famous for bear, deer and chamois hunting. Hungarian forestry policy also aimed at acclimatizing new wild animal species such as the mouflon and wild turkey. [23]

Wood saving strategies

The measures taken by the authorities targeted excesses and reveal their efforts for a rational technology, the substitution of wood, and the renunciation to consumption.

Fuel-saving stoves: In the European technical literature, one can find numerous references to the renewal of heating technologies. They include proposals for innovations of indoor fireplaces, for the reduction of stove sizes and their optimization by means of energy saving and for the reduction of heat loss. In this context, tile stoves, bread ovens and brickyard furnaces, which inefficiently used a massive quantity of wood, were the main targets of criticism. Very efficient was the combination of kitchen and room stoves.[24] It was only in 1805 that the *Regulativ-Punkte* ordered communities to replace the stoves that used great quantities of wood with fuel-saving stoves and ovens.[25]

Tiles instead of shingles: Wood was the main construction material in the pre-industrial era as well. The traditional construction method is a cause of the devastation of forests. On the other hand, the substitution of wood aimed at ensuring higher safety against fires. This is tightly connected to wood saving, because reconstruction in the aftermath of fires took a heavy toll on forests located in the proximity of urban settlements.[26]

The ordinance issued by Governor Seeberg in 1753 gave an impetus to the construction of brick houses in Transylvania.[27] In 1780, for example, citizen Balthes from Sighişoara (ung. Segesvár, germ. Schäßburg) submitted a request to the Town Hall to obtain construction wood. It was rejected, because

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19 Stütz: Beschreibung, pp. 2-97.

20 Österreichisches Staatsarchiv, Finanz- und Hofkamerarchiv, Münz- und Bergwesen Siebenbürgen. 2983. Zalathnaer Bergkonsultationsprotokolle. Bergwerksdirektion in Siebenbürgen und Zalathna, Personal, Protokolle, Amtierung, Proviantierung, Weiberverzichte, Siebenbürgische Thesaurariatsprotokolle, Dienstersetzungen, Entschädigungen, Reparationen, Waldwesen, Schankgerechtigkeiten. Jahr 1781, pp. 26-37; 40-49.

21 Rus: Berichte europäischer Reisender.

22 Rudolf Rösler, Forstgesetzgebung, pp. 66.

23 Otto Witting: Geschichte der Jagd, in Das Burzenland, Band 5, Teil 1, Kronstadt, 1929, pp. 41-49.

24 Martin Stuber: Wälder für Generationen. Konzeptionen der Nachhaltigkeit im Kanton Bern (1750-1880), Köln, Weimar, Wien, 2008, pp. 99-100.

25 Sammlung aller vom Jahr 1795 bis zum Jahr 1805 für die sächische Nation in Siebenbürgen von allerhöchsten Orten erlassenen Regulationsvorschriften, Hermannstadt, 1861, pp. 74.

26 Stuber: Wälder für Generationen, pp. 114-116.

27 Rudolf Rösler: Geschichte der Forstgesetzgebung in Siebenbürgen. In: Zeitschrift für Siebenbürgische Landeskunde, 82. Jahrgang, Köln-Wien, 1988, pp. 61-71.

he had to follow the ordinance that prescribed the replacement of wood with brick in the construction of houses.[28]

The introduction of hedges. Measures against the use of wood for fences were taken as early as 1781. Seeberg's Ordinance issued in 1753 banned the use of oak-tree twigs in the construction of fences, because this »prevented the growth of forests« (*weil dadurch das Wachstum der Waldungen verhindert ist*).[29]

According to paragraph 49 of Joseph's law, tree plantations had to be surrounded with hedges or ditches to prevent animals from entering and destroying them.[30]

In spite of this, forest protection measures were implemented with great difficulty, with certain areas implementing the reforms only in the first decade of the nineteenth century.

Forestry was a focal element in the nineteenth-century. Given the over-exploitation of Hungarian state forests, forestation was in the interest of forest owners and was regulated by law. Art. 17 of the 1879 Forest Act stipulated that forests whose soil was not suitable for other purposes (agriculture, pastures, gardens or vineyards) will be reforested at most six years after being cut through the execution of all works required for the completion of this task.[31] The forestation of devastated areas was sanctioned by law and promoted by the authorities. Legal provisions stipulated the free distribution of seedlings by foresters and nursery gardens. In many cases, deforestation occurred inappropriately, against agricultural interests, thus creating the conditions for the formation of marshes.[32]

Watercourse regulations were other measures needed for a proper use and management of forests. However, they provoked many conflicts due to different interests. On the other hand, forestation in the proximity of great rivers was necessary given the frequent overflows and floods that caused extensive material damage, mainly to agriculture.[33]

The Forest Act also stipulates artificial forestation because it compelled forest owners to replant deforested areas. The state favored the cultivation of tree species such as oak, pine, and spruce.[34]

The main causes for the destruction of forested areas were diseases, grazing and arson.

Another factor in the decline of forests was *excessive grazing*. Contemporary Transylvanian legislation regulated the grazing of goats, sheep and cattle in a timely manner. According to most contemporary authors, grazing was especially important to the regional forest economy, but it also represented a major cause for the strong decline of forests and the delays in their regeneration.[35] Generally, feeding animals in the stable was a rare occurrence in Transylvania in the eighteenth and during most of the nineteenth century, which led to the degradation of grazing lands. The great gap between the number of cattle and the size of the grazing land, which is visible in contemporary statistics, reveals the predominant application of traditional knowledge in forest economy.[36]

The official designation of the grazing period from 24 April (St. George's Day) to 11 November (St. Mary's Day) was another cause for conflict between traditionalists and modernists. In Marienburg (rom. Feldioara, hung. Földvár), they allotted a special place for the grazing of young cattle, draft oxen and cattle that could not reproduce anymore. Certain toponyms in Nösnerland (the Saxon region in Northern Transylvania) confirm the existence of these traditional grazing lands established by mutual agree-

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[28] Konrad Sigmund: Quellen zur Geschichte des Stadtwaldes von Schäßburg, Manuskript, Siebenbürgisches Archiv Gundelsheim. A VIII 189, Nr. 216, pp. 45.

[29] Sigmund: Quellen, Nr. 83, pp. 21-22.

[30] Josephinische Waldordnung 1781, § 49.

[31] Albert Bedö: Die wirtschaftliche und comercielle Beschreibung der Wälder des Ungarischen Staates, Budapest, 1896, I, pp. XXII.

[32] Ioan Dordea: Un proiect din anul 1790 privind reorganizarea economiei sarii din Transilvania (I) [A Project from 1790 on the Reorganization of Salt Economy in Transylvania] In: Anuarul Institutului de Istorie si Arheologie Cluj, Vol. XXIII, 1980, pp. 441-457;

[33] Ioan Dordea: Aspecte ale transportului sării pe Mureş în veacul al XVIII-lea, [Aspects of salt-transportation of the river Mures in 18-th Century] In: Sargetia, XV, Deva, 1981, pp. 165-193.

[34] Bedö: Waldungen I, pp. XXXIII.

[35] Johanna Regnath: Das Schwein im Wald. Vormoderne Schweinehaltung zwischen Herrschaftsstrukturen, ständischer Ordnung und Subsistenzökonomie. Ostfildern 2008 (with literature).

[36] [Thomann]: Siebenbürgische Landesbeschreibung, Österreichisches Staatsarchiv, Kriegsarchiv, K VII k 343, 1780, pp. 149-150.

ment between the local population and the authorities: for example, in Lechnitz (rom. Lechința, hung. Szászlekence), there is a place called *Där Gōldberich* (Galtvieh) (Young Cattle), which is a name given to several other grazing lands.[37] Another example of special grazing land for young buffaloes and cattle that could not be milked is called Zwischen den Wäldern (Between the Forests) at Ludwigsdorf (rom. Logig, ung. Ludvég)[38], an area that was also designated for forest protection by the German community.

Sheep grazing, and especially goat grazing, were central to rural society and causes for conflict between villages as well as between communities and authorities. Eighteenth-century documents reveal the frequent conflicts that broke out due to the devastation of forests by the Romanians' goat herds in certain villages in the Bârsa region (germ. Burzenland) and due to their trespassing of the grazing land reserved for cattle.[39] As a deterrent for unlawful goat grazing, in 1778, the Town Hall in Sighişoara issued a draconian ordinance going as far as allowing the shooting of all goats that repeatedly grazed in forests[40].

In Sibiu (germ. Hermannstadt, hung. Nagyszeben), local authorities took measures for the protection of forests against the trespass of cattle as early as the eighteenth century. As a result, communal areas were enclosed with fences, cattle breeding facilities were set up, and hunting was forbidden within the enclosures. Local forest legislation, such as the 1713 law issued in Bistriţa (germ. Bistritz, hung. Beszterce), which put forward measures for the exclusion of sheep and goats from grazing in forests, and the regulations for protection against fires were complemented by imperial legislation.[41] Thus, in 1773, Empress Maria Theresia ordered the hiring of personnel to prevent cattle theft and forest fires. Later, the forest legislation issued by Emperor Joseph II clearly regulated grazing areas and the access of herds into forests. [42]

Forest fires were more frequent in eastern Transylvania. They were caused mainly by shepherds who needed more extensive grazing areas. Traditional measures to combat them consisted of rituals and magical dances, performances of versified incantations in the middle of a fire circle at the edge of forests, especially in the Bucura and Călimani Mountains located in the Eastern Carpathians. The goal of contemporary scientific writings, disseminated by priests or cultural societies, such as the Romanian ASTRA and the German *Verein für siebenbürgische Landeskunde*, was the promotion of modern ideas on the collection of dead-wood from forests and the enclosure of fireplaces.[43]

Instead of being promoted, forestation was generally disregarded in communal and private forests. A great number of saplings were destroyed due to excessive grazing and cutting, which ultimately led to the devastation of large forested areas.

Until 1848, the exploitation of forests had been limited to the production of wood for construction and firewood, as well as byproducts. Apart from this, wood was used in mining and glass furnaces as well as navigation on inland rivers[44]. After 1867 and 1879, forestry policy was adjusted to the interests of industry. For a rational use of forest resources, special consideration was given to wood trade and transport. With respect to trade, one can note the forest owners' incorrect knowledge of prices, which led to significant financial losses and, implicitly, to the loss of forested areas at small prices.[45]

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37 Georg Falk, Lechnitzer Heimatbuch, Schweinfurt, 1968, pp. 119-133.

38 Jost Linkner, Heimatbuch Ludwigsdorf in Nordsiebenbürgen, Wels, 1997, pp. 16-20.

39 Hans Kaufmes: Die Geschichte der Landwirtschaft und Viehzucht. In: Das Burzenland, Band 5, Teil 1, Kronstadt, 1929, pp. 188-190.

40 Sigmund: Quellen, Nr. 182, pp. 38

41 Robert Csallner: Die Wirtschaftsgeschichte des Nösner Geländes. In: Landwirtschaftliche Blätter, 1912, pp. 471-472.

42 Kaufmes: Landwirtschaft, pp. 190.

43 Dorin-Ioan Rus: *Aspects of the Traditional and Scientific Knowledge of Forests in Eighteenth-Century Transylvania*. In: *In Memoriam: Grigore Ploesteanu*, Tg.-Mures, 2014, pp. 185-194.

44 Dorin-Ioan Rus: Din activitatea societății de plutărit din Reghinul-Săsesc (1853-1908) [From the Activity of the Sea Trade Society from Saxon-Regen (1853-1908)] In: Revista Bistritei, Band 14, 2000, Cluj-Napoca, pp. 91-95.

45 Bedö, Waldungen I, pp. XXIX-XXXII; XXXIV.

Wood transportation was limited to watercourses during summer, the most important being the rivers Mureş, Someş and Olt.[46] The advantage of this inadequate transportation infrastructure translated into a lower level of forest exploitation and devastation. Official documents reveal the Romanian population's lack of skills in water transportation techniques. Therefore, Austrian authorities brought specialists from Upper Austria to build rafts and ships from soft wood for the transportation of salt. Later, they instructed young Romanians in the art of navigation on inland watercourses. [47] The lack of modern technical knowledge was still visible in the 1880s, when Hungarian forest owners had to hire specialized rafting personnel from the area of the Black Forest.[48]

Oak and spruce bark *processing* was widespread in Transylvania, as everywhere in Hungary. However, authorities were worried because of the wasteful use of red beech forests. In many places, this type of wood covered the household and construction needs, being used in the construction of railroads among others. The dark side of this process were the big losses amassed during cutting, processing and transport, which reached up to 30-40% of the wood quantity. This occurred because of trader demands and the unskilled forest workers who were unfamiliar with modern exploitation methods, therefore using traditional ones.[49]

Toward the end of the nineteenth century, the collection of seeds from trees planted by forestry services gained substantial ground. All the while *hunting* lost some ground, being always regarded as a secondary activity. It was mostly practiced by the nobility, which is why it did not provide any revenues to the state. The advantage of hunting was that it contributed to a better management of those forests that were not exploited anymore. However, the lack of hunting could lead to a rise in the number of certain wild animals that were potentially harmful to forests.[50]

The valorization of wood was another cause for conflict. Traders bought a stock of wood from forest owners, which they sold to businessmen who then processed it into boards, timber or construction wood that they sold further on the external market. This method of selling in stocks was widespread because forest owners were not able to take over the transport and cutting costs. The disadvantage was that these wood traders did not have specialty knowledge in the fields of forestation or forest regeneration, which is why they did not follow durability principles. Wood processing was as unsatisfactory as the forest workers' level of specialty knowledge. In the nineteenth century, wood was used in the furniture manufacturing, viticulture, parquet manufacturing, railroad construction, mining and glass furnaces.[51]

The Forest Regulation (Waldordnung) of 1781

A major moment in the development of forestry in Transylvania was the Josephine Forestry Law from 30 May 1781, whose provisions on the exploitation, preservation and maintenance of forests were very progressive for the epoch. Moreover, it constituted the basis for the further development of forestry. Based on this Law, the city of Braşov (ung. Brassó, germ. Kronstadt) issued a forest ordinance in 1784, elaborated by the senator Petrus Traugott Clompe (1751-98). It differentiated between »forbidden« [*verbotene*] forests and »allowed« [*erlaubte*] forests, regulated their use (cleanings, fallen wood, etc.), cutting periods as well as night transport, prohibited the arbitrary creation of forest roads, etc[52].

Later pieces of legislation, such as Law XXX/1791 and Law XXIV/1811, contain other important provisions on the limitation of forest devastation, the preservation and durable exploitation of forests, and so forth.

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[46] Historisch-Politische Beschreibung des Großfürstentums Siebenbürgen, 1775. Österreichische Staatsarchiv, Kriegsarchiv, K VII k 341, Manuskript, angefertigt auf Weisung des HKR vom 18. Mai 1771, Sechstes Kapitel: von dem Comercio at externa, s.p.

[47] Österreichisches Staatsarchiv, Neue Hofkammer, Siebenbürgische Kammerale, Salzwesen, 200, Jahr 1781, pp. 281-318.

[48] Bedö, Waldungen I, pp. XXIX-XXXII; XXXIV.

[49] Bedö, Waldungen I, pp. XXXIV.

[50] Rudolf Rösler, Geschichte des deutschen Jagdwesens in Siebenbürgen. In: »Siebenbürgische Zeitung« from 4. February 2011.

[51] Eduard Zaminer: Geschichte des Waldwesens der königlichen freien Stadt Kronstadt, Kronstadt-Brasó, 1891, pp. 287-295.

[52] Rudolf Rösler: Zur Geschichte der Forstgesetzgebung in Siebenbürgen. In: Zeitschrift für Siebenbürgische Landeskunde, 1, (Köln-Wien, 1988), 61-71.

In 1781, Emperor Joseph II issued a law that limited the serfs' access to forests to two days a week. In those days, peasants had the right to cut and transport wood under the supervision of forest guards.[53] The Aulic Chancellery of the *Gubernium* as well as the *Comes Saxorum* and the *Universitas Saxorum* strove to supervise the application of the 1781 Forestry Law.[54]

The introduction of scientific forestry

In the eighteenth century, the state rediscovered the forest and wood, and assigned new attributes to them. Thus, they now became industry. The emerging perspectives generated conflicts which, in turn, generated other conflicts. Here, it is worth discussing what interests were defining for the imperial forest policies, what type of ideas the decision-making on the use of forest wood generated. In this respect, the contemporary debates on forest policies in Transylvania will be analyzed. At this point, the imperial economic plans for the rational exploitation of forests as well as the conflicts they generated will be discussed. The implementation of cameralist ideas by the state and the confrontation of these ideas with the emerging concept of sustainability will be assessed as well. Furthermore, the beginnings of the forest legislation in Transylvania will be analyzed by discussing the principles and rules that underpinned forestation. At this point, the type of trees preferred for forestation or deforestation as well as the criteria applied to this end will be analyzed. In addition, the administrative measures taken for the preservation of forests will also be assessed.

In 1806, the pastor Johann Theophil Ziegler publicly defended his dissertation *De Re Sylvestris* which was the first scientific work dealing exclusively with forests in Transylvania.[55] Right from the introduction, Ziegler indicates that, in the past, there had been plans and works pertaining to the regeneration and protection of forests, but they had never been successful. They had proposed measures for the random planting of seedlings and tree seeds in the middle of forests. Moreover, in his opinion, a third cause for the destruction of forested areas was the activity of harmful insects.

In the first part of the proper work, Ziegler describes amentaceous plants, their biological features, their growth and dissemination. Further, he underlines both the intellectuals and ordinary people's lack of knowledge pertaining to the cultivation of this type of plants. According to him, they willingly destroyed not only the newly planted trees, but also the mature ones that protected the growth of young trees with their shade.[56] Ziegler also describes the features of conifers, their economic use as well as their biological features. In addition, he underlines that one should avoid planting them next to amentaceous trees.

The second chapter discusses tree planting. The author explains the three methods of oak-tree planting that were prevalent at the time: 1. through acorn dissemination in a prepared soil; 2. through the planting of acorn among the oak trees; 3. through the planting of seedlings in clearings.[57]

The first method of planting acorn on a previously treeless piece of land involved control of acorn quality and quantity as well as preparation of the soil.

1. On the internal quality of acorns: they must be picked in October, in dry and clear weather, must be mature and healthy. They must be kept in fresh air in order to prevent them from heating up or fermenting.
2. On the needed quantity: An as big as possible quantity of seeds is necessary because oak does not produce acorn every year. He recommends the planting of a measure and a half of acorn for each acre.

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[53] Josephinische Waldordnung, 1781, § 45.

[54] Josef Binder: Geschichte des Waldwesens der Stadt Hermannstadt (Hermannstadt: Self-published 1909), pp. 22-24.

[55] De Re Sylvestri habita imprimis ad M.Transsylvaniae Principatum reflectione Dissertatio; quam pro loco inter professores gymn.Cib.Avg.Conf.solemniter obtinendo die XXIII. Aprilis Horis a X ad XII in Auditorio collegii Mai cum Adnexis Thesibus publice defendet Ioan.Theop.Ziegler, Cibinii, 1806.

[56] Ziegler, De re sylvestri, pp. 6-7.

[57] Ziegler, De re sylvestri, pp. 11-12.

3. Preparation and condition of the soil: It is necessary to choose a shaded place, protected from wind. The soil must be new and abundantly covered with black earth (*Dammerde*). The seed will be dispersed on the ground and then harrowed in. He recommends the planting of white beet seeds next to the acorns, because they protect each other during growth. [58]

The second method refers to the cultivation of acorn among oak trees. It is based on Lindsay's theory according to which light is harmful to the evolution of plants and animals immediately after their planting and birth, respectively. Thus, he recommends the use of the natural method in protecting plants, which he calls *Dunkler Schlag*. In such forests selected for growing young plants, oaks (with the exception of the beautiful and fertile ones) will be felled and the branches of the remaining ones will touch each other in order to protect the newly-planted plants from light. Before the planting, the ground must be allowed to be rooted by pigs. After sowing, which occurs either through dispersal by the trees themselves, or by hand, the seedlings will be left to grow for seven years, and the trees that served as support will be amputated after 10 or 25 years. They can be left to grow up to 150-200 years, after which the method can be renewed.

In Ziegler's opinion, the third method by which forests can be managed is the planting of offshoots in clearings. He put forward the creation of nursery gardens from where offshoots can be moved to clearings that already have the soil covered by leaves or that were made ready for this type of cultivation earlier. One should take into account the location of the clearing: if it is located at higher altitudes, it will be cultivated with Pinus Larix or Prunus Padus Virginiana, at mid-altitudes with Sessile oak, acacia and poplar, while at low altitudes with sycamore.

Ziegler discusses the issue of beech forests in his work, too. In the epoch, in Transylvania this type of forests covered approximately the same area as oak tree forests. He notes the population's lack of knowledge concerning their cultivation and protection, as well as their massive destruction in areas located in the proximity of towns. Beech served both as firewood and construction wood. He notes that farmers cut beech forests in order to expand agricultural lands, but this deforestation occurred arbitrarily and »unlawfully«, which caused serious harm to their development. Consequently, Ziegler proposed a rational and organized use of beech forests and the scientific planting of this type of trees. He argues that a forest selected for cultivation must be enclosed and divided into 35 plots; The 35th plot was to be cut and made ready for the next reproduction of the vegetation; then, the procedure was to be repeated for each plot, for 35 years, after which the whole process was restarted. This method did not allow for seed dissemination, but for the planting of seedlings brought from nursery gardens. Ziegler claims that this type of forest cultivation is futile for as long as the population does not observe the fundamental rules of forest protection.

According to Ziegler, horned animals were also causing harm to beech forests. Thus, he proposed three measures: firstly, the removal of these animals; secondly, the protection of forested areas against them by digging deep ditches bordered by earth mounds; thirdly, the punishment of shepherds who allowed their flocks to enter the forest.

As for conifer forests, he argues that they had to be developed both naturally and artificially. In the first case, it occurred through natural seed dispersal. However, because the wind played an important part in this respect, dispersal had to be supported artificially. Thus, this type of forests had to be cut gradually (*Durchforstung*). Trees situated west and south could be felled only after those in the middle had already matured in order to protect them from the harmful winds blowing from those directions. With regard to the artificial dispersal of conifer seeds, he proposes the implementation of the German method, namely the planting of forest pine seeds on sandy ground, in the plain areas of Transylvania.

The third chapter focuses on the issue of forest degradation in Transylvania. In Ziegler's opinion, a first reason was the lack of well-instructed guards to protect them. The protection of forests was entrusted to certain individuals whose attributions consisted of informing administrators of tree thefts and burnings. Another reason was the incompetence of forest administrators and their unfamiliarity with the

[58] Ziegler, De re sylvestri, pp. 14.

cultivation and management of trees. Another reason for the degradation was excessive cutting and burning. To this, he adds extreme weather conditions, such as sudden swelter, prolonged dryness, excessive humidity, frost, early rime, heavy snowfall and strong winds. He considers harmful insects as yet another degradation factor.

In Ziegler's opinion, the biggest mistake of the population and authorities was the misuse of wood for construction and fire, as well as the lack of a scientific forestry. Concerning the misuse of construction wood, Ziegler mentions a series of mistakes in the construction of peasant dwellings that were contiguous to stables and barns. Moreover, the close proximity of neighboring households increased the risk of fire propagation. Thus, he recommends the use of stone and brick masonry in construction. In his view, another mistake was the use of wood in the construction of surrounding fences, the filling of potholes, as well as the construction of river dams and mills, which led to the strong degradation of forests. As for the misuse of firewood, he mentions the erroneous building of household and distillation ovens as well as indoor heating stoves. In his opinion, ovens were huge, their mouths were big and ajar, and were equipped with a too large pipes. These technical shortcomings led to heat loss and implicitly great and wasteful wood consumption.

A last major issue he mentions was the lack of knowledge concerning the use of trees. He acknowledges that the planting and use of fragile willows to protect households against random fires had the opposite effect, fires being in fact spread by them. Therefore, he recommends:

1. The use of pine in high-altitude and sandy areas, and of acacia in lower-altitude and sandy areas.
2. Reforestation of plots that did not produce enough grain for three years after being sown with wheat.
3. The planting of ash trees, elms and balsam poplars on dams.
4. The planting of maple trees, elms, sycamores and poplars on river banks, lake shores, fen borders and ditch sides.
5. The planting of elms in grazing areas.

However, he does not recommend the planting of trees on roadsides because their shade could lead to constant high levels of moisture on clayey roads. He also appreciates the creation of parks around the town of Sibiu. [59]

Interests in forest durability. Art. 17 of the 1879 Hungarian Forest Act stipulates that all forests had to be exploited according to systematic economic plans approved by the Hungarian Ministry of Agriculture. These plans aimed at a durable use of forests[60]. Forest owners were legally bound to preserve the forest and exploit it rationally. Thus, the law regulated exploitation and care periods, established the periods and manner of reforestation, the division of forested areas, and created four categories of protected forests. Although the objective of the post-1879 Hungarian forest policy was durability, many forest owners did not have such interest regarding the future of forests, rather aiming at quick and substantial profits. The state could not implement its durable development policy with regard to private forests. According to the Forest Act, exploitation was not based on quantity, but the exploited surface that was limited. The central point was the production of the most valuable varieties for industrial and building purposes.[61]

Experimental facilities were still at an intermediate stage of development at the end of the nineteenth century. They experimented with the cultivation of foreign tree plants, hardwood trees and coniferous trees; apart from this, they also tested the behavior of *Quercus tardiflora* in frosty conditions and conducted research to increase the productivity of acorn. Furthermore, they showed interest in the field of durability by researching the influence of forests on the degree of precipitation.[62]

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[59] Ziegler, De re sylvestri, pp. 25-30.

[60] For Sighisoara, for example, the plan stipulated a rotation period of 100-140 years for oak forests and 80 years for beech forests. According to this strategy, oak trees were supposed to be cut only in 2010. (Sigmund: *Quellen,* No. 1355, p. 195-196).

[61] Julius Fröhlich: Einiges über die Waldwirtschaft in Siebenbürgen. In: Forstwissenschaftliches Centralblatt, 48. Jahrgang, Berlin, 1926, pp. 305-318.

[62] Bedö: Waldungen I, pp. LXI-LXII.

CONCLUSION

In general, conflicts between the official-scientific and traditional knowledge were generated by unfamiliarity with resources, lack of forestry education and illiteracy. Traditional knowledge is more typical of the rural Romanian population, while Saxons and Hungarians proved more receptive to innovations and ready to adapt to new realities.

From a historical perspective, the research can provide new examples of the management, surveillance, conservation as well as the rational exploitation of forest resources by means of juridical measures and their application in forestry; it can critically analyze these measures and propose the adaptation of certain solutions to the changing requirements of contemporary life; it can follow the geographical extent of these measures in other parts of Europe from a diachronic perspective, by analyzing the jurisdiction of forest ranges in the Habsburg Empire. The research findings can progressively and regressively indicate the way in which the centrally-imposed forest management measures influenced the periphery in terms of monitoring the exploitation of forest resources and ensuring the conservation of forests through direct and indirect measures.

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