ONLINE ISSN 2069-7430
ISSN-L 1841-4737
PRO LIGNO
www.proligno.ro
Vol. 17 N° 4 2021
pp. 34-39

VARIETY OF WOOD SPECIES FROM ROMANIAN MOVEABLE CULTURAL HERITAGE

Emanuela BELDEAN
Lect.dr.eng. – Transilvania University in Brasov
Address: Str. Universitatii nr. 1, 500036 Brasov, Romania
E-mail: ebeldean@unitbv.ro

Abstract:

The paper presents a brief study on the variety of wood species constituting the artefacts from moveable Romanian cultural heritage. Data were collected from the National Cultural Heritage List and from the restoration laboratory inventory. Out of the 5,614 moveable artefacts, the following ones made of wood or wood predominantly were identified: 863 furniture objects of which 521 were traditional Romanian furniture, 429 traditional ethnographic objects and 263 other decorative or religious artefacts. Also, in the last decade, in the restoration laboratory were identified approx. 300 wooden artefacts distributed in three categories: 92 furniture objects, 119 traditional objects and 89 other decorative wooden, objects not registered in an official list. Variable proportions of indigenous wood species as: beech, walnut, spruce, oak, lime were calculated. The percentages of wood species were discussed for each category. Results indicated a great variety, according to the type of artefact and destination.

Key words**:** *wood species; identification; moveable cultural heritage; inventory.*

INTRODUCTION

Cultural heritage (CH) is a fundament for a group identity and contributes to social cohesion and creativity. Moreover, it can contribute to the world strategy for a smart, sustainable and inclusive growth. Preoccupation for conservation and study of CH in the last decades led to understand its importance, most of the countries and the specialised organisations being involved in programmes for preservation, digitisation and access, education, research and legislation (Campfens 2020, Kurniawan *et al.* 2011, Vecco 2010).

According to UNESCO "*Cultural heritage is defined as the legacy of intangible attributes of a group or society that are inherited from past generations, maintained in the present and bestowed for the benefit of future generations*" (www.europarl.europa.eu/RegData/etudes/BRIE/2018_EN.pdf).

As an important part of CH, the moveable heritage refers to *goods with historical, archaeological, documentary, ethnographic, artistic, scientific and technical, literary, cinematographic, numismatic, philatelic, heraldic, bibliophile, cartographic and epigraphic value, representing material testimonies of the evolution of the natural environment in relations with man, of the potential human creator and of the Romanian contribution, as well as of the national minorities to the universal civilisation* (https://legeaz.net/legea-182-2000-protejarea-patrimoniului-cultural).

Wooden cultural heritage is a permanent inexhaustible source of information for scientists and historians. In human existence the wood has been around constantly since the Stone Age. It was a primary material for construction and tools, preferred for its availability, versatility and aesthetic qualities. Another general characteristic of the art of woodworking is the great variety of species used by carpenters and craftsmen. Moreover, a wide variety of techniques are highlighted by craftsmen in accordance with wood species and the destination of the object. This has led to the development of areas and centres specialised, as well as few categories of dedicated craftsmen (Comsa 1979).

Wood identification is always a great challenge even for fresh woods, but when faced with aged or degraded artefacts the challenge is greater because the material appearance and properties were altered (Ruffinatto and Crivellaro 2019, Kim and Singh 2016). In the last years a lot of studies focused on identification of wood species from artefacts belonging to moveable heritage, by standard and modern methods. From Korea (Song and Park 2010, Jeong *et al.* 2013) to Europe, up to the North Atlantic area (Reeploeg 2013), wood identification is a compulsory part of restoration process. In many countries, with a huge historical legacy, studies focused on identification of wood species from artefacts present in cathedrals, temples and museums (Lo Monaco *et al.* 2020, Macchioni *et a*l. 2019, Kisternaya 2019, Lo Monaco *et al.* 2018, Kim and Choi 2016, Agresti *et al.* 2010) but also in monuments (Llerenas *et al.* 2013), or art pieces (Ruffinatto *et al.* 2014). In Romania the wood microscopy was approached as a part of scientific conservation for historic furniture or artisanal objects employed in the traditional processing of natural fibres (Timar *et al.* 2013, Timar *et al.* 2012, Timar *et al.* 2010) as well as objects belonging to the open-air Astra Museum from Sibiu (Beldean and Timar 2013) and it is a reliable method that remained important. When specific problems related to valuable artefacts of historical interest occur, even microscopy is difficult to be applied. When the sampling must be authorised by curator, reflected light microscopy facilitates accurate wood species identification (Ruffinatto *et al*. 2014). Image processing techniques were employed by different

authors to confirm the results obtained by classical methods (Hermanson *et al.* 2020, Lo Monaco *et al.* 2018). No matter what key is used, it is imperative that the identification be verified by reference and comparison to reliably identified samples, or descriptions and illustrations in atlases or other publications (Wheeler and Baas 1998). A recent study using XRF for the identification of tree species using convolutional neural network machine learning is presented as innovative approach (Shugar *et al.* 2021).

The paper presents a brief study on the variety of wood species constituting the artefacts from moveable Romanian cultural heritage, part of them included in the National Cultural Heritage List (www.cimec.ro) and the other part restored in laboratory, artefacts that are not cited in a list, but with the same cultural significance for CH.

OBJECTIVE

The aim of this paper is to highlight the importance of moveable heritage made from wood with focus on the percentage of species present in distinct categories of artefacts. Also, the data from the national inventory and the data from the practical experience in wood restoration were processed and compared.

METHOD

Initially, the official data banks available in the National Cultural Heritage Inventory (www.cimec.ro) were accessed. These historical goods were recognised as valuable through an official selection process, identified and recorded. The page of Moveable Heritage List is followed then and looked for wooden artefacts. A number of 113 pages of internet were accessed grouped in: Decorative Art, Ethnography, History, Archaeology, Science and Technique, Natural Sciences. Out of the 5,614 moveable artefacts, the following ones made of wood or wood predominantly were identified: 863 furniture objects of which 521 were traditional Romanian furniture, 429 traditional ethnographic objects and 263 other decorative or religious artefacts.

Afterwards, the inventory of restored wooden objects in the last ten years in laboratory of wood restoration from Faculty of Furniture Design and Wood Engineering, Brasov, Romania was checked. As a result, approx. 300 wooden artefacts were identified and distributed in: 92 furniture objects, 119 traditional objects (employed for cooking and weaving, agriculture working or other traditional crafts) and 89 other decorative wooden objects (mirror frames, photo frames, decorative boxes, musical instruments, fragments from artefacts), not classified or registered in an official list. These objects were saved from different country households, restored and valorised then by local exhibitions.

RESULTS AND DISCUSSION

The identification of wood species is a challenge whenever an object enters in restoration lab. It is important particularly when some parts are missing and must be completed or well justified replaced.

Generally, for the furniture from Romanian heritage, species as: walnut, spruce or fir, oak, beech and maple were often employed, alongside precious woods as: mahogany, ebony, rosewood, teak, highlighting the artistic details and beauty of wood. The artefacts from museum collections, some of them classified as “treasury” were manufactured in the most famous furniture factories from European countries: Austria, Germany, Italy, France, Spain, but Russia as well, or inspired from oriental culture. It proves that furniture manufacturing was a highly specialised work, in a permanent evolution, inspired from different styles and cultures (Youngs 2016). As illustrated in Fig.1, for the total objects considered in this study the dominant species that occurred were: walnut (*Juglans regia*) - 28%, spruce or fir (genus *Picea and Abies*) – 24% and oak (*Quercus sp.*) – 19%. Beech (*Fagus sylvatica*), maple (genus *Acer*) and lime (genus *Tilia*) represent between 9-4%, other species occurring less than 4% (mahogany, ash, cherry). There is well known that walnut wood has been widely used in the last centuries for cabinet- making and fine furniture due to medium hardness and texture, little deformation and nice colour (Lo Monaco *et al* 2020). Therefore, it is also present in furniture from Romanian heritage. The carpenters manufactured the furniture according to the quality and figure of wood and the destination of wood species vary from the basic structure of the furniture to the ornaments and surface decoration. Resinous species, probably spruce or fir, that are similar were employed for the structural elements of the furniture. Woods as cherry, oak, maple and pear are known to have been used since 15th century for fine intarsia in Florentine workshops (Kim and Singh 2016).

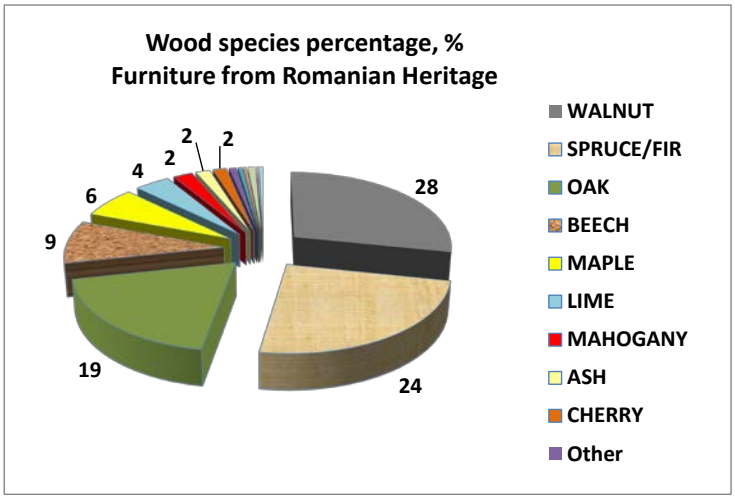
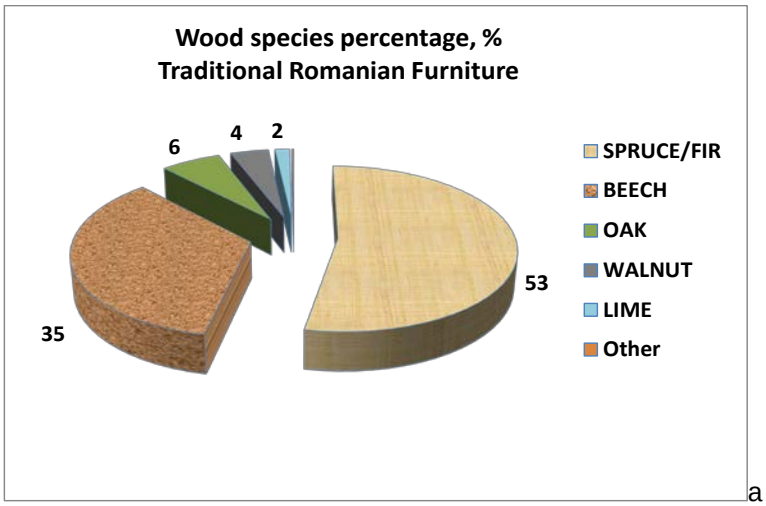


Fig. 1.
Percentage of wood species from furniture.
Generally data processed from National Inventory List.

The criterion of cost played an important role in furniture manufacturing. Only reach people from the high society could afford expensive furniture, decorated by carving, veneering or marquetry.

In Transylvania, an alternative for expensive furniture was the painted furniture, in perfect harmony with interior of peasant houses.



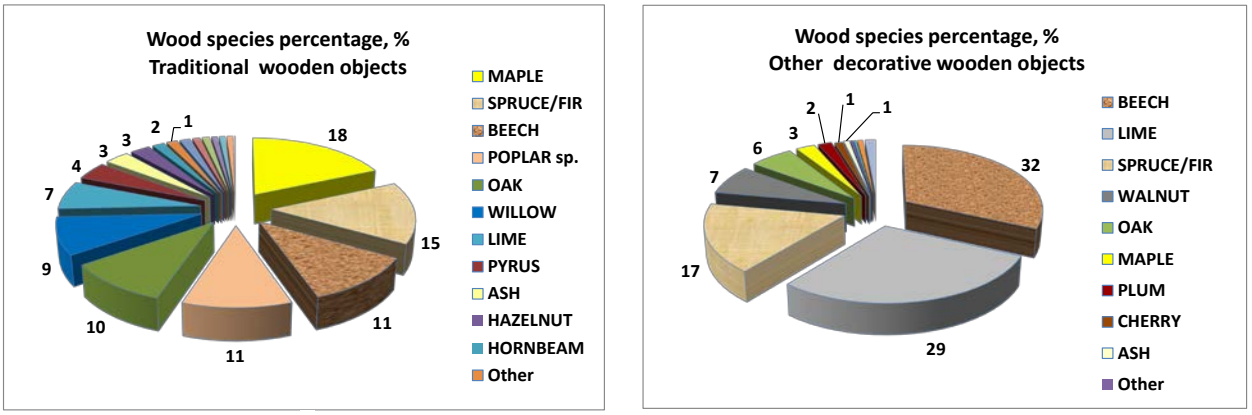
a

Fig. 2.
Wood species variety from traditional furniture.
Data processed from National Inventory List.

If only the traditional furniture is taken into account, the wooden material of which it was made is from inexpensive resinous species (53% spruce or fir). However, the objects were significantly improved by various polychrome techniques, specific to each ethnic group (with flower pattern or veneer imitation). The traditional, rustic chairs or wood storage chests were made primarily of beech (35%), in the north west of Romania (Bihor county) existing a group of specialised craftsmen (Fig. 2a). For the decoration of rural furniture notch and carving techniques were employed too.

Experience for generations of Romanian local woodworkers makes them to choose for traditional objects the commonly used species or other woody plants. For spoons, different cups and water jars species from genus *Acer, Salix, Tilia, Populus* (maple, willow, lime, poplar) frequently occurred in the descriptive files of the objects. Genus as: *Abies, Picea, Quercus, Populus, Pyrus, Prunus (fir, spruce, oak, poplar, pear wood, plum)* were found for different types of vessels, barrels, bottles. The elastic properties made species from genus *Salix, Corylus* (hazelnut) suitable for manufacturing of woven baskets and churns. Their percentages are presented in Fig 3a. A quite even distribution of the first 6 species could be observed with a percentage between 18 and 9% (Fig. 3a).

ONLINE ISSN 2069-7430
ISSN-L 1841-4737
PRO LIGNO
www.proligno.ro
Vol. 17 N° 4 2021
pp. 34-39

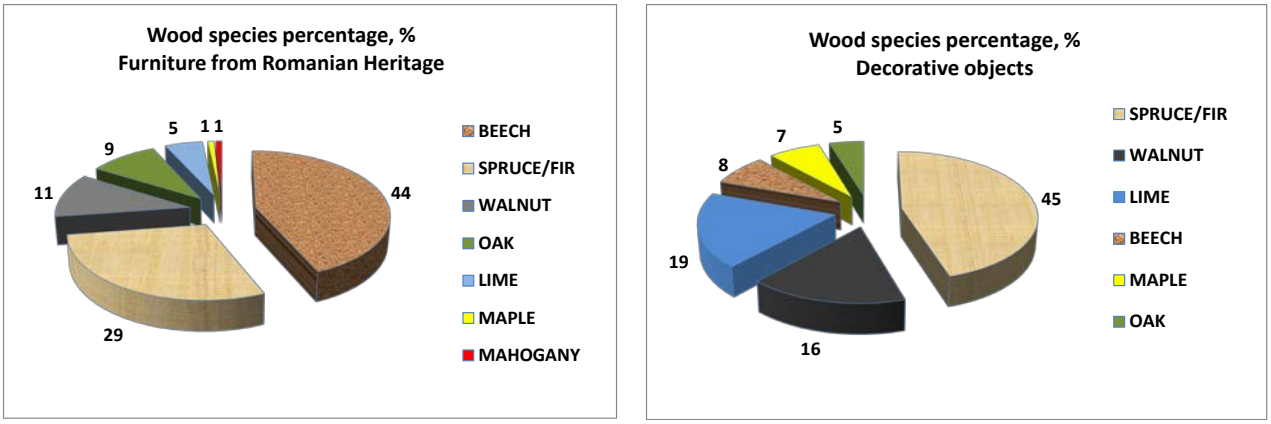


a b

Fig. 3.
Wood species variety from traditional and other decorative objects.
Data processed from National Inventory List.

On the other hand, decorative items are very diverse. An important part belongs to religious heritage: crosses, icons, carved iconostasis. Beech and lime are prevalent and represent 32% and 29% respectively. Resinous (spruce or fir) were also present in a percent of 17%. For the other objects of cultural or artistic significance species more valuable as walnut, oak, maple and cherry are common, but less than 10% each (Fig. 3b).

Through the years, the artefacts restored in laboratory from Brasov revealed a variety of wood species (Fig. 4a). Most of them were quite easy to be macroscopically identified but others required microscopic investigation.



a b

Fig. 4.
The percentage of wood species from artefacts restored in laboratory.

Sometimes a single object contained several species. Therefore, some parts of the object, with role of mechanical strength were made from hard species, resistant and durable (e.g. genus *Robinia, Cornus, Quercus, Carpinus* - robinia, dogwood, oak, hornbeam). On the other hand, distinct decorative parts were made from soft species, with good dimensional stability, easily to be processed into various shapes with simple tools (Fig. 4b). A conclusive example is the case-study of eclectic mirror frames dating from the 19th century or from the first decades of 20th century. Most of them were made from two or three wood species: the frame from resinous (e.g.*Picea or Abies*- spruce or fir), the ornaments from *Fagus* or *Tilia* (beech or lime) and surfaces veneered with *Juglans* (walnut). There are many such examples in the literature of artefacts containing several wood species (Machioni *et al.* 2019, Oliveira *et al.* 2018, Jeong *et al.* 2013, Timar *et al.* 2013, Song and Park 2010).

Some wood species, easy to find in the proximity of people households, were widely used for daily activity end uses. The artisanal objects for textile manufacturing or food preparation were made from species in proportion of: 55% beech, 15% spruce or fir and 13% poplar, the rest being different deciduous woods, as illustrated in Fig. 5.

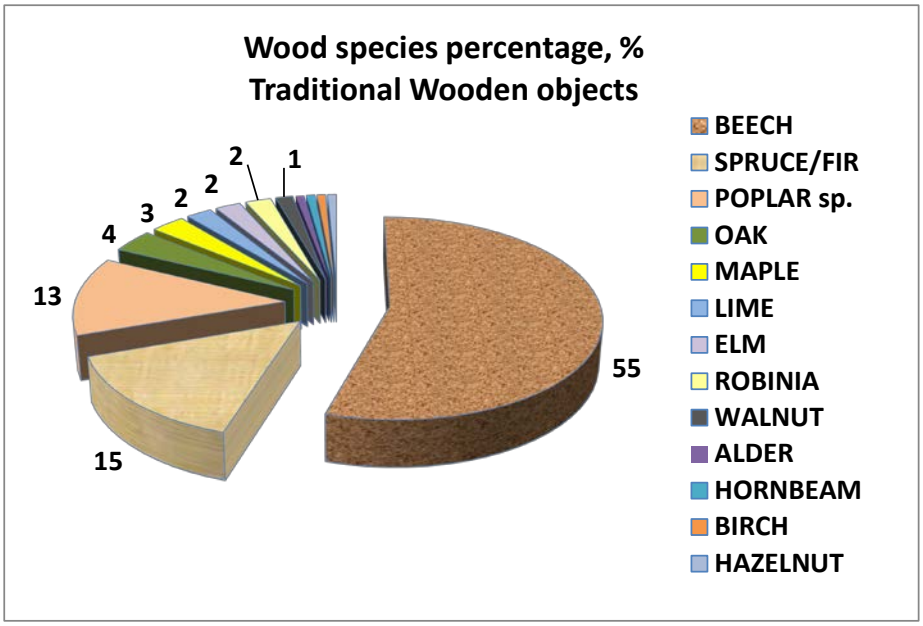


Fig. 5.
The variety of wood species from traditional wooden objects restored in laboratory.

In the routine of practical work these data are valuable especially when the same category of objects is repeating. Nevertheless, even a specialised person could be misled and the macroscopic identification is not sufficient or concluding. As a result, microscopy remained essential together with new image processing methods.

Another concern that may be reported is an incorrect specification of wooden material in artefacts description if the person who draws up the file or evaluates the artefact is not a specialist. That is why the evaluation and conservation-restoration processes must be advised by a team of experts.

CONCLUSIONS

The moveable cultural heritage maintains the connections with our past and it is essential for individual and collective identities. If not well managed it can be lost, sold or relocated.

The present study is original and can be permanently updated. The subject remains still open because the list of wooden objects inventoried and studied is small compared to the rich heritage that is not even known.

The most common species from Romanian moveable heritage are indigenous and variety of woods depends on the habitat of the species and geographical distribution, availability, destination, workability and cost.

The knowledge of wood species from artefacts allows conservators and restorers to make the right decision in completion operations and could be also a good indicator regarding the history of local community in relation with environment.

References

Agresti G, Pelosi C, Lo Monaco A (2010) Wood of chestnut in cultural heritage. Acta Horticulturae: 51-57.

Beldean E, Timar MC (2013) Microscopic investigation of degraded wood from cultural heritage. Pro Ligno 9(4):228-235.

Campfens E (2020) Whose Cultural Objects? Introducing Heritage Title for Cross-Border Cultural Property Claims. Netherlands International Law Review (2020) 67:257–295.

Comsa D (1979) Album de crestaturi in lemn (Album of wooden notch). Editat de revista Transilvania, Sibiu.

Hermanson J, Wiedenhoeft A, Gardner S (2020) A machine vision system for automated field–level wood identification. FPL WoodID. U.S. Forest Service Forest Products Laboratory.

Jeong HM et al. (2013) Species of Wooden Buddhist Statues in the Late Joseon Dynasty of Korea. Proc 8th Pacific Regional Wood Anatomy Conference Nanjing, China.

Kim SC, Choi J (2016) Study on Wood Species Identification for Daeungjeon Hall of Jeonghyesa Temple, Suncheon. J. Korean Wood Sci. Technol. 2016, 44(6):897-902.

Kim YS, Singh AP (2016) Secondary Xylem Biology. Chapter 12- Wood as Cultural Heritage Material and its Deterioration by Biotic and Abiotic Agents. Elsevier Inc. ISBN: 978-0-12-802185-9

Kisternaya M (2019) Conservation works of the Kizhi Pogost. In Proc 1st IIWC Course on Wooden Herittage conservation, 2019.

Kurniawan H, Hasibuan ZA, Salim A, Suhartanto H (2011) E- cultural heritage and natural history framework: an integrated approach to digital preservation. International Conference on Telecommunication Technology and Applications Proc of CSIT vol.5 IACSIT Press, Singapore.

LLerenas IMO et al. (2013) Identification and assessment of timber species case: Plaza de toros la Petatera. Online at: http://iiwc.icomos.org/assets/iriz-ortiz.pdf

Lo Monaco A et al. (2020) Investigation of some wooden decorated elements and restoration. European Journal of Science and Theology, Vol. 16(2):135-143.

Lo Monaco A, Pelosi C, Balletti F (2018) Wood in cultural heritage properties and conservation of historical wooden artefacts. European Journal of Science and Theology Vol. 14(2):161-171.

Macchioni N et al. (2019) Wood identification of the wooden components of a 19th century pipe organ. PRO LIGNO 15(4):138-143.

Oliveira W et al. (2018) Software for forest species recognition based on digital images of wood. Floresta, Curitiba, PR, v. 49(3):543-552.

Reeploeg S (2013) Reading Material Culture in the North Atlantic: Traditional Wooden Boxes as Intercultural Objects. Journal of the North Atlantic. Special Volume 4:52–60.

Ruffinatto F, Crivellaro A (2019) Atlas of Macroscopic Wood Identification, With a Special Focus on Timbers Used in Europe and CITES-listed Species. Springer.com

Ruffinatto F, Cremoninia C, Macchioni N, Zanuttinia R (2014) Application of reflected light microscopy for non-invasive wood identification of marquetry furniture and small wood carvings. Journal of Cultural Heritage 15:614–620.

Shugar A, Drake BL, Kelley G (2021) Rapid identification of wood species using XRF and neural network machine learning. Springer Nature. Scientific Reports (2021) 11:17533.

Song JA, Park WK (2010) Species of Korean Furniture in the Late Choseon Dynasty (I). KFS Journal, Vol. 21(6):486-498.

Timar MC, Gurau L, Cionca M, Porojan M (2010) Wood species for the Biedermeier furniture. Int J Conserv Sci 1,1 2010:3-12.

Timar MC, Gurau L, Porojan M (2012) Wood species identification, a challenge of scientific conservation. Int J Conserv Sci 3(1):11-22.

Timar MC, Gurau L, Porojan M, Beldean E (2013) Microscopic identification of wood species an important step in furniture conservation. European Journal of Science and Theology, vol 9(4):243-252.

Vecco M (2010) A definition of cultural heritage: From the tangible to the intangible. Journal of Cultural Heritage 11:321–324.

Wheeler EA, Baas P (1998) Wood identification - A review. IAWA Journal Vol. 19(3):241-264.

Youngs R L (2016) Forest and Forest Plants – Vol. II - History, Nature and Products of wood. Encyclopedia of Life Support Systems (EOLSS).

UNESCO Culture for development indicators. Heritage. Online at:
https://en.unesco.org/creativity/sites/creativity/files/cdis_methodology_manual_0_0.pdf

Cultural heritage in Eu policies (2018). Online at:
https://www.europarl.europa.eu/RegData/etudes/BRIE/2018/621876/EPRS_BRI(2018)621876_EN.pdf

https://legeaz.net/legea-182-2000-protejarea-patrimoniului-cultural/

https://cimec.ro/